EuDARe
CHALLENGES TO DEMOCRACY AND REPRESENTATION IN THE EU

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Jean Monnet Chair EuDARe

Challenges to Democracy and Representation in the EU

Department of Political and Social Sciences, University of Catania

Research Design and Methods in Political Science

Master's Programme in Data Science; Master's Programme in Global Politics and Euro-Mediterranean Relations

Academic year 2024-25

Syllabus

Syllabus as distributed to students. The course is now titled Research Design and Data Analysis in Political Science.

The course is taught under the Jean Monnet Chair EuDARe (Erasmus+ Jean Monnet Chair, project 101127735). This cover sheet was added by the Chair to the archive copy published on eudare.eu.

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Research Design and Methods in Political Science

Master Programme in Data Science

Master Programme in Global Politics and Euro-Mediterranean Relations

2024-2025

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AIM AND SCOPE

This course focuses on the methods for designing political (and social) science research. We will discuss how to design a political science research project, from asking good research questions to selecting data sources, formulating and testing hypotheses, and evaluating findings. Throughout, we will highlight the key differences between designing research for exploring problems, for developing theories, and for making forecasts – and we will attempt to build bridges between them.

While you will be expected to pick up your topic and develop your own research project throughout the course, this is not a primarily technical course. Rather than on analytical techniques or statistical modelling, the emphasis will be on developing the ability to *design, carry out and evaluate* research.

Note that this course is offered within the Master Programme in Global Politics and Euro-Mediterranean Relations *and* the Master Programme in Data Science. These are rather different audiences. Large parts of the course can work well for both audiences. For some parts, however, and notably for lab sessions, we will organize separate activities. For example, while political science students will be doing training sessions on R, data science students will analyse their data using the methods learnt in. In general, with data science students we will focus on exploiting the potential of data science and innovative data sources to understand political and social problems.

In our experience, this can work well! And indeed, political science and data science students can learn very interesting things from each other.

PREREQUISITES

We will start from the basics of research design and methods, so the course does not assume any prior knowledge of political/social science. However, un understanding of the basic notions of data science will be useful to carry out your own research project, which will be a basic requirement for evaluation.

LEARNING OBJECTIVES

COURSE MATERIALS

CORE TEXT – THIS IS THE MAIN TEXT WE USE FOR SEMINARS

- Toshkov, D. (2016). *Research Design in Political Science*. London New York, NY: Palgrave.

SUPPLEMENTARY READINGS – MAIN ONES, SOME CHAPTERS FROM THESE ARE USED FOR SOME SEMINARS (see section on "Detailed course contents" below)

- Cunningham, S. (2021) *Causal Inference: The Mixtape*. Yale University Press. Available as free bookdown at https://mixtape.scunning.com
- Huntington-Klein, Nick. (2022). *The Effect. An Introduction to Research Design and Causality*. Routledge & CRC Press. Available as free bookdown at theeffectbook.net
- Kellstedt, P.M. & Whitten, G.D. (2018). The Fundamentals of Political Science Research. Cambridge: *Cambridge University Press*.

OTHER SUPPLEMENTARY READINGS – NOT DIRECTLY USED FOR SEMINARS, LISTED FOR YOUR REFERENCE

- Alvarez, R.M. (2016). *Computational Social Science: Discovery and Prediction*. New York, NY: Cambridge University Press.
- Curini, Luigi, and Robert Franzese, eds. (2020). *The Sage Handbook of Research Methods in Political Science and International Relations*. Thousand Oaks: Sage Pubns Ltd.
- Ceron, A., Curini, L. & Iacus, S.M. (2017). *Politics and Big Data: Nowcasting and Forecasting Elections with Social Media*. London ; New York, NY: Routledge.
- Cioffi-Revilla, C. (2017). *Introduction to Computational Social Science: Principles and Applications* (2 edition.). New York, NY: Springer-Verlag
- Jungherr, A. (2015). *Analyzing Political Communication with Digital Trace Data: The Role of Twitter Messages in Social Science Research*. Cham: Springer Verlag.
- King, G., Keohane, R.O. and Verba, S. (1994) Designing Social Inquiry: Scientific Inference in Qualitative Research. Princeton, N.J: Princeton University Press.
- Lowndes, V., Marsh, D. & Stoker, G. (2017). *Theory and Methods in Political Science* (4 edition). Basingstoke: Palgrave MacMillan.

NB: Students should not be intimidated by the amount of readings. Before each seminar, you will normally be expected to read one chapter on the 'general' topic under discussion, see below. One additional reading will normally be a piece of research (see *research in focus* below) that we will use to make sense of how 'general' questions are addressed 'in practice' in applied research.

TEACHING METHOD

Seminars will typically include presentations by the lecturer as well as by students. Normally, at each seminar we will first discuss topics in general terms. We may call these sections *lectures*, although I will make an effort to make them as interactive as possible.

Some sessions will be more interactive than others, and they will be organised as Lab sessions which will be dedicated to the practical application of some methods, tools or data analysis. This year's lab sessions will focus mainly on causal diagrammes (to be more precise, Directed Acyclic Graph – DAGs – a very useful tool for designing theories) and some large-N design methods.

We will also discuss one or two real pieces of research – *research in focus*. The discussion of *research in focus* will concentrate both on substantive elements (the question or problem that the study addresses and its main findings) and research design aspects (the data and design used). In this way, we will improve our capacity to understand and evaluate research while we will also learn how innovative data and methods are used in real computational social science.

Finally, we will dedicate some sessions to the presentation of your own projects. This year we are grouping all student presentations in two sessions. More details below, and in a separate document with all readings and instructions.

METHOD OF ASSESSMENT

Assessment is based on class participation, presentations (30%), final paper (40%), and final exam (30%).

The **final paper** is a 3-5000-word original *research design proposal* carried out by applying course materials. The research design proposal should include the basic elements of an original research project, namely a research question, theoretical contribution, testable hypotheses, and a description of the proposed data collection and analysis. This paper should focus narrowly on a topic of the student's choice and display a greater depth of understanding of a smaller set of ideas raised in the course. More information in a separate document (see "Student deliverables").

Students should work on the research design proposal over the full term. Indeed two or three of the course seminars – the *student workshops* – will include students' presentations of 1) possible research topics/questions (tentatively in the sixth week of the course); 2) literature review and theory/hypotheses (around the nineth week); 3) data and preliminary design (around the end of the course).

The **final exam** focuses largely on an oral discussion of the research design proposal, that will (also) be used as a basis for discussing the key topics of the course.

DETAILED COURSE CONTENTS

1. Introduction to the scientific study of politics (and to the course). What does political (or social) science mean. Approaching politics scientifically. Contents and structure of the course.

Readings:

- Kellstedt and Whitten 2018 chapter 1
- Toshkov 2016 chapter 1

2. Asking good research questions. Why bother with research questions. Types of research questions. Why good research questions are so important to good science, and how to formulate good research questions.

Readings:

- Toshkov 2016 chapter 2.
- Huntington-Klein 2022 chapter 2

Further readings:

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- Roberts Clark, W. (2020) "Asking interesting questions", in Curini and Franzese, eds. *The Sage Handbook of Research Methods in Political Science and International Relations*. Thousand Oaks: Sage Pubns Ltd.
- McCauley A and Ruggeri A (2020) "From Questions and Puzzles to Research Projects" , in Curini and Franzese, eds. *The Sage Handbook of Research Methods in Political Science and International Relations*. Thousand Oaks: Sage Pubns Ltd.

Optional topic: Literature review. Finding, selecting, assessing, organising and presenting science – 'without getting buried in it'!

Readings:

- Knopf, J.W. (2006) 'Doing a Literature Review', PS: Political Science & Politics, 39(1), pp. 127–132. doi:10.1017/S1049096506060264.
- Slides + selective readings to be analysed and discussed in class.

3. Theory. The function of theory in social science – and the difference with theories in natural science. Paradigms, frameworks, theories and models. Developing theories. Assessing theories.

Readings:

- Toshkov 2016 chapter 3
- Kellstedt and Whitten 2018 chapter 2

Further readings:

- Roberts Clark, W. (2020) "Asking interesting questions", in Curini and Franzese, eds. *The Sage Handbook of Research Methods in Political Science and International Relations*. Thousand Oaks: Sage Pubns Ltd.
- Kellstedt and Whitten 2018 chapter 2

4. Concepts and operationalisation. The role of concepts in social science, and the challenge of concept definition. Operationalising concepts to make them measurable.

Readings:

- Toshkov 2016 chapter 4.

Further readings:

- Gerring 2012 chapter 5

5. Measuring and describing variables. Measurement strategies and descriptive inference.

Readings:

- Toshkov 2016 chapter 5
- Kellstedt and Whitten 2018 chapter 5

Further readings:

- Gerring 2012 chapter 7

6. Explanation and causal relations. Types of explanation: laws, probabilistic, functional, intentional and mechanistic explations. Notions of causality and causal inference.

Readings:

- Toshkov 2016 chapter 6
- Huntington-Klein 2022 chapters 6, 7

Further readings:

- Cunningham, chapter 3
- Huntington-Klein 2022 chapters 8, 9
- King, Keohane and Verba, selected chapters

**** LAB SESSION: CAUSAL DIAGRAMS**

**** FIRST STUDENT WORKSHOP.** *Presentation of research questions, concepts, and theories for their research design proposal.*

7. Experimental research designs. The basics, goals and logic of experimental research; the design of experimental research; randomised controlled trials and quasi-experiments; analysis and limitations; experiments in political science and public policy research.

Readings:

- Toshkov 2016 chapter 7

8. Large-N research designs: logic and pitfalls. Conditions and strategies for causal inference: naturals experiments, instrumental variables, mediation analysis, conditioning. Common designs for causal inference: time series, cross-sectional, panel, multilevel designs. Estimating causal effects: varieties and size of association; uncertainty and statistical significance; linearity and beyond; limited outcomes. Design: variable and case selection; levels of analysis and observation: measurement error and missing data. Use and limitations.

Readings:

- Toshkov 2016 chapter 8

Further readings:

- Cunningham chapters 4-10
- Huntington-Klein chapters 14-20

**** LAB SESSION: LARGE-N DESIGN**

9. 'Standard' research designs/I. Comparative designs: logic and types of small-n comparative research, most similar/most different designs; qualitative comparative analysis; use and limitations.

Readings:

- Toshkov 2016 chapter 9, 10

Further readings:

- King, Keohane and Verba, selected chapters

10. 'Standard' research designs/II. Case studies: selecting evidence to observe; conducting case studies research; use and limitations. Mixed and nested designs: selecting and using cases in mixed and nested designs; use and limitations.

Readings:

- Toshkov 2016 chapter 10, 11
- King Keohane and Verba?

Further readings:

- King, Keohane and Verba, selected chapters

Optional topic. 'Big data' research designs. Social networks: understanding and analysing social interactions; statics and dynamics. Social complexity: origins, laws, theories. Simulations.

Readings:

- Cioffi-Revilla 2017 chapters 4-5.

Further readings:

- See readings in Appendix

**** LAB SESSION: DATA ANALYSIS (WITH R)**

**** SECOND STUDENT WORKSHOP**. *Presentation of data sources and preliminary design for research design proposal.*

APPENDIX. SOME COMPUTATIONAL POLITICAL SCIENCE RESEARCH

- **Computational political science: applications of big data science to political science research/II**.
  - International Trade with Big Data

    C. A. Hidalgo, B. Klinger, A.-L. Barab´asi, R. Hausmann. "The Product Space Conditions the Development of Nations." Science 317.5837 (2007): 482-487
  - Lobbying and Campaign Contribution

    In Song Kim. "Political Cleavages within Industry: Firm-level Lobbying for Trade Liberalization." American Political Science Review, 111.1: 1-20.

    Stephen Ansolabehere, John M. de Figueiredo, and James M. Snyder. "Why is There so Little Money in U.S. Politics?" Journal of Economic Perspectives, 17.1 (2003): 105-130
  - Identifying Behavioral Patterns using Massive Data:

    Gary King, Jennifer Pan, and Margaret E Roberts. "How Censorship in China Allows Government Criticism but Silences Collective Expression." American Political Science Review, 107.2: 326-343.

    Pierson, E., Simoiu, C., Overgoor, J., Corbett-Davies, S., Ramachandran, V., Phillips, C., and Goel, S. (2017). "A large-scale Analysis of Racial Disparities in Police Stops across the United States." arXiv preprint arXiv:1706.05678.
  - Measuring Ideological and Political Preferences using Social Network Data

Robert Bond and Solomon Messing. "Quantifying Social Media's Political Space: Estimating Ideology from Publicly Revealed Preferences on Facebook." American Political Science Review 109.1 (2015): 62-78.

Pablo Barbera "Birds of the Same Feather Tweet Together: Bayesian Ideal Point Estimation Using Twitter Data." Political Analysis 23.1 (2014): 76-91

- What do Politicians Do?

  Justin Grimmer, Solomon Messing, and Sean Westwood. "How Words and Money Cultivate a Personal Vote: The Effect of Legislator Credit Claiming on Constituent Credit Allocation." American Political Science Review, 106.4 (2012), 703-719

- Big Administrative Data: Promises and Pitfalls

  Connelly, R., Playford, C.J., Gayle, V., Dibben, C., 2016. "The Role of Administrative Data in the Big Data Revolution in Social Science Research." Social Science Research,

  Special issue on Big Data in the Social Sciences 59, 112

  Kopczuk, W., Saez, E., Song, J., 2010. "Earnings Inequality and Mobility in the United States: Evidence from Social Security Data Since 1937." The Quarterly Journal of Economics 125, 91128.

- Machine Learning Algorithms in Society

  Kleinberg, Jon, Himabindu Lakkaraju, Jure Leskovec, Jens Ludwig, and Sendhil Mullainathan. 2018. "Human Decisions and Machine Predictions." The Quarterly Journal of Economics 133 (1):23793