

**11th ECPR Summer School in Methods and Techniques, 28th July to 13th August, 2016**  
**Central European University, Budapest, Hungary**  
**Course Description Form<sup>1</sup> - 1st week course (15 hrs) (1st - 5th August)**

## **SD201: Analyzing Political and Social Sequences**

### **Instructor details**

Dr. Philippe Blanchard  
PAIS Department  
University of Warwick  
p.blanchard@warwick.ac.uk

### **Short Biography**

[Philippe Blanchard](#), PhD in political science, is an Associate professor in political science at the University of Warwick, UK. He works on green politics, political communication, and methods for social and political sciences: multivariate statistics, longitudinal methods, interviewing, content analysis and digital data. He has taught methods and techniques for social and political sciences in France, Switzerland, Austria, Denmark, Singapore, the USA and the UK. He co-chairs the [ECPR Standing group on Political Methodology](#) and is currently co-director of a [BA in Politics, International Studies and Quantitative Methods](#) and a [MA in Politics and International Studies: Big Data & Quantitative Methods](#).

### **Prerequisite knowledge**

Two prior knowledges are requested:

- Basic applied statistics and use of data sets, through either an Excel-like software, statistics software like SPSS or Stata, or R. Participants who have never practiced any statistics should attend an introductory course or at least read an introductory textbook and practice by themselves.
- Basic knowledge of R: data manipulation and basic descriptive statistics. Most of the hands-on work will be done in R. R-beginners may prepare themselves on their own, or, ideally, by attending beforehand an introductory course prior to the course, such as the one offered in Budapest.

### **Short course outline**

Sequence analysis is the systematic descriptive and causal study of sequences, that is, successions of standard categorical states or events. Sequence analysis is a unique method for representing, comparing and clustering sequences, for extracting prototypical sequences and for mining sequence populations. Its core tool, the optimal matching algorithm, imported from genetics and bio-computing, screens and discriminates longitudinal processes according to the nature of events, their duration and their order.

Numerous fields in the social and political sciences are concerned with sequences, for example: life course analysis (e.g. family and residential transition from youth to adulthood), sociology of professional careers (such as gendered careers or transition to retirement), political sociology (elite and activist careers), evolution of regimes (stages of development or transition to democracy), speech

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analysis (rhetorical strategies), geopolitics (stages in crises or democratic transition), comparative studies (stages of diffusion of reforms or mobilizations), elections (stages of public opinion formation during campaigns), human geography (distribution of space occupation from city centre) and ethnographic practices (rituals).

### Long course outline

Sequence analysis (SA) is the systematic descriptive and causal study of sequences, that is, successions of standard states or events. It is a unique method for representing, comparing and clustering sequences, for extracting prototypical sequences, for describing groups of sequences and mining sequence populations. Its core tool, the optimal matching algorithm, imported from genetics and bio-computing, screens and discriminates longitudinal processes according to the nature of events, their duration and their order.

The course will be both theoretical and practical. A project will be provided by the instructor as a running example throughout the course. For participants who come with their own data and/or who have a precise research project in mind, the course will provide some help to set up a treatment strategy and to articulate SA with other methods.

The course is mainly designed for beginners in sequences, but researchers who have already used R or Stata on sequences may attend so as to improve their theoretical and/or practical knowledge, as well as take advantage of the confrontation with varied fieldworks from students and instructor.

Participants will be invited to do exercises on their own or by pairs if level or fieldwork match. Students are invited to bring their own laptop and to install R prior to the course (<http://cran.r-project.org/>), as well as the following packages: boot, cluster, colorspace, foreign, graphics, RcolorBrewer, rgrs and TraMineR. All kinds of hardware and operating systems fit.

The course is made of the following sections. Each might be developed more or less, according to the needs of the audience.

1. **What is a sequence?** This first part proposes definitions of sequences and subsequences, which are very common objects for social scientists at large, but seldom considered by social statisticians.
2. **What are the principals of sequence analysis?** After a short retrospective glance at the origins of SA, the second part develops the main statistical principles of the method.
3. **What is the specificity of sequence analysis?** Other longitudinal methods, popular in the social and political science, may attempt at treating longitudinal objects in the social sciences. Yet, none of these approaches can treat *categorical* time series in a comprehensive approach to time-related phenomena.
4. **What data can be treated by means of sequence analysis?** Several concrete examples are given, from numerous scientific fields. I also show how different kinds of data may best be investigated. Reference data from personal questionnaire surveys are given as examples, as well as large national database such as the Swiss Household Panel. Students are also encouraged to bring their own data, so that their suitability may be discussed collectively.
5. **How should the data be prepared and coded?** Due to the diverse origins of sequence data, they need to be cleaned and formatted so as to be properly processed.
6. **How are the data processed?** This part presents the core tools of sequence analysis, the optimal matching algorithm, its variants and its alternatives.

Sequence analysis is still an emerging method in the field of political science and social sciences at large. If you wonder about its usefulness for your own research project, do not hesitate to contact the instructor: p.blanchard@warwick.ac.uk.

## Day-to-day schedule (Monday 1st to Friday 5<sup>th</sup> of August)

	Topic(s)	Details
Day 1	Definitions and principles	
Day 2	Review and preparation of sequence data	Hands-on session 1
Day 3	Case study. Optimal matching (1)	Hands-on session 2
Day 4	How to make the best use of optimal matching Treatment of OM outputs	Hands-on session 3
Day 5	Sequence graphs and sequence statistics If time allows and on request: Advanced issues	Hands-on session 4

## Day-to-day reading list

Participants should choose their priority readings in the list below according to their disciplinary interests. However all recommended readings are representative of some aspects of the method that are useful for all disciplines. It is strongly recommended to start reading before the course kicks off, so that you may focus during the course on exercises and in-class discussions.

Day 1	<p><b>Compulsory</b></p> <ol style="list-style-type: none"> <li>Gauthier J.-A, F. Bühlmann and P. Blanchard. 2014. "Introduction: Sequence Analysis in 2014" Pp. 1-17 <i>in</i> Blanchard P., F. Bühlmann and J.-A. Gauthier (eds.). <i>Advances in Sequence Analysis: Methods, Theories and Applications</i>. London: Springer</li> <li>Abbott Andrew, Alexandra Hrycak. 1990. Measuring resemblance in sequence data : an optimal matching analysis of musicians' careers. <i>American Journal of Sociology</i> 96: 144-185.</li> </ol> <p><b>Optional</b></p> <ol style="list-style-type: none"> <li>Accominotti Fabien. 2009. Creativity from interaction: Artistic movements and the creativity careers of modern painters. <i>Poetics</i> 27: 267-294.</li> <li>Abbott Andrew. 1992. From Causes to Events: Notes on Narrative Positivism. <i>Sociological Methods &amp; Research</i> 20: 428-455 (republished in Abbott Andrew. 2001. <i>Time Matters</i>. Chicago: University of Chicago Press).</li> </ol>
Day 2	<p><b>Compulsory</b></p> <ol style="list-style-type: none"> <li>Casper Gretchen and Matthew Wilson. 2014. Using Sequences to Model Crises. <i>Political Science Research and Methods</i> 3 (2): 381-397</li> <li>Abbott Andrew and Stanley Deviney. 1992. The Welfare State as Transnational Event: Evidence from Sequences of Policy Adoption. <i>Social Science History</i> 16 (2) 245-274.</li> </ol> <p><b>Optional</b></p> <ol style="list-style-type: none"> <li>Halpin Brendan and Tak Wing Chan. 1998. Classs Careers as Sequences: An Optimal Matching Analysis of Work-Life. <i>European Sociological Review</i> 14 (2): 111-130.</li> <li>An introductory course in R, for example: <ul style="list-style-type: none"> <li>Venables W. N., D. M. Smith and the R Development Core Team. 2011. <i>R: A Language and Environment for Statistical Computing</i>. Reference Index, <a href="http://cran.r-project.org/doc/manuals/R-intro.pdf">http://cran.r-project.org/doc/manuals/R-intro.pdf</a></li> <li>or: Crawley Michael J. 2005. <i>Statistics: An Introduction using R</i>. Chichester: Wiley and Sons, chapters 1 and 2.</li> <li>or: Zuur Alain F., Elena N. Ieno and Erik H.W.G. Meesters. <i>A Beginner's Guide to R</i>. Springer: Dordrecht, chapters 1 to 3.</li> <li>see <a href="http://www.r-project.org/doc/bib/R-books.html">http://www.r-project.org/doc/bib/R-books.html</a> for more possibilities, in several languages.</li> </ul> </li> </ol>

Day 3	<p><b>Compulsory</b></p> <p>9. Widmer Eric and Gilbert Ritschard. 2008. <i>The De-Standardization of the Life Course: Are Men and Women Equal?</i> Geneva: University of Geneva.</p> <p><b>Optional</b></p> <p>10. Brzinsky-Fay Christian, Ulrich Kohler and Magdalena Luniak. 2006. Sequence analysis with Stata. <i>The Stata Journal</i> 6 (4): 435-460.</p> <p>11. Gabadinho Alexis, Gilbert Ritschard, Matthias Studer and Nicolas Müller. 2009. Mining sequence data in R with the TraMineR package: A user's guide. Department of Econometrics and Laboratory of Demography, Geneva: University of Geneva.</p>
Day 4	<p><b>Compulsory</b></p> <p>12. Buton François, Lemerrier Claire, Mariot Nicolas. 2012. The household effect on electoral participation. A contextual analysis of voter signatures from a French polling station (1982–2007), <i>Electoral Studies</i> (2012), doi:10.1016/j.electstud.2011.11.010</p> <p><b>Optional</b></p> <p>13. Han Shin-Kap and Phyllis Moen. 1999. Clocking Out: Temporal Patterning of Retirement. <i>American Journal of Sociology</i> 105 (1): 191-236.</p> <p>14. Lesnard Laurent and Man Yee Kan. 2009. Two-Stage Optimal Matching Analysis of Workdays and Workweeks. Sociology Working Papers 2009-04, Department of Sociology, University of Oxford, <a href="http://hal.archives-ouvertes.fr/halshs-00435422">http://hal.archives-ouvertes.fr/halshs-00435422</a>.</p> <p>15. Salmela-Aro Katariina et al.. 2010. Mapping pathways to adulthood among Finnish university students: Sequences, patterns, variations in family- and work-related roles, <i>Advances in Life Course Research</i> 16: 25–41: <a href="http://www.unil.ch/sequences2012/files/2012/04/SalmelaAroEtAl-LaCOSA-Paper.pdf">http://www.unil.ch/sequences2012/files/2012/04/SalmelaAroEtAl-LaCOSA-Paper.pdf</a></p>
Day 5	<p><b>Compulsory</b></p> <p>16. Pollock Gary. 2017. Holistic trajectories: a study of combined employment, housing and family careers by using multiple-sequence analysis. <i>Journal of the Royal Statistical Society Series A</i> 170, part 1: 167-183.</p> <p><b>Optional</b></p> <p>17. Lelièvre Eva and Nicolas Robette, A Life Space Perspective to Approach Individual Demographic Processes. <i>Canadian Studies of Population</i> 37 (1-2): 207-244.</p> <p>18. Piccarreta Raffaella and Orna Lior. 2010. Exploring sequences: a graphical tool based on multi-dimensional scaling, <i>Journal of the Royal Statistical Society Series A</i> 173, part 1 : 165–184.</p> <p>19. Colombi D. and S. Paye. 2014. “Synchronising Sequences. An Analytic Approach to Explore Relationships Between Events and Temporal Patterns” Pp. 249-264 in Blanchard P., F. Bühlmann and J.-A. Gauthier (eds.). <i>Advances in Sequence Analysis: Methods, Theories and Applications</i>. London: Springer</p>

### Software requirements

R + following packages (to be installed prior to the course): boot, cluster, colorspace, foreign, graphics, RcolorBrewer, rgfs and TraMineR.

### Hardware requirements

Personal laptop.

One easily accessible power outlet per student.

## Literature

See "Optional readings" in section 8.

## Recommended training tracks

The following other ECPR Methods School courses could be useful in combination with this one in a 'training track'. NB this is an indicative list.

### Before this course

	Course title	Summer School	Winter School
1	Research design	X	X
2	Introduction to R	X	X
3	Event History and Survival Analysis	X	
4	Introduction to Statistics for Political and Social Scientists		X
5			

### After this course

	Course title	Summer School	Winter School
1	Event History and Survival Analysis	X	
2			
3			
4			
5			

## Disclaimer

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## Note from the Academic Convenors

By registering to this course, you certify that you possess the prerequisite knowledge that is requested to be able to follow this course. The instructor will not teach these prerequisite items. If you are not sure if you possess this knowledge to a sufficient level, we suggest you contact the instructor before you proceed with your registration.