10th ECPR Summer School in Methods and Techniques, 23 July - 8 August
University of Ljubljana, Slovenia
Course Description Form[1] - 2 week course, 30 hrs

Course title
SB104. Qualitative Comparative Analysis and Fuzzy Sets

Instructor details
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Short Bio
Carsten Q. Schneider is Head of the Department of Political Science at Central European University, Budapest. His research focuses on regime transitions, the consolidation and qualities of democracy, and measuring political regimes. His book *The Consolidation of Democracy in Europe and Latin America* has been published with Routledge in 2009. His second field of interest consists in methodology, especially set-theoretic methods, with a focus on Qualitative Comparative Analysis (QCA). He has published in *Sociological Methods and Research*, *European Journal of Political Research*, *Political Research Quarterly, Socio-Economic Review*, and others. His book *Set-Theoretic Methods for the Social Science*, co-authored with Claudius Wagemann, has been published with Cambridge University Press in 2012.

Instructor details
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Short Bio
Patrick A. Mello is a research associate and lecturer at the Chair of International Politics, Technische Universität Dresden (Germany). His substantive research focuses on matters of international relations theory, international security, and foreign policy analysis. His methodological research interests evolve around comparative and case study approaches, with an emphasis on fuzzy-set Qualitative Comparative Analysis. He has recently published in the *European Journal of International Relations* and the *Journal of International Relations and Development*. His book *Democratic Participation in*

Armed Conflict: Military Involvement in Kosovo, Afghanistan and Iraq has been published with Palgrave Macmillan in 2014.

Prerequisite knowledge

Students are not required to have any prior knowledge of QCA or the R software environment and its QCA package. However, they are strongly encouraged to familiarize themselves with the basic principles of the method in advance by reading the recommended literature as specified in the reading list. A previous introduction to the basic functions of R and RStudio will be useful to start working with the software from day 1.

Short outline

This course introduces participants to set-theoretic methods and their application in the social sciences with an emphasis on Qualitative Comparative Analysis. The introductory course is complemented by an advanced course that is taught during the ECPR Winter School in Bamberg. The course starts out by familiarising students with the basic concepts of the underlying methodological perspective, among them the central notions of necessity and sufficiency, formal logic and Boolean algebra. From there, we move to the logic and analysis of truth tables and discuss the most important problems that emerge when this analytic tool is used for analysing social science data. All analytical issues will be introduced on crisp sets and later expanded to fuzzy sets. Right from the beginning, students will be exposed to performing set-theoretic analyses using the relevant R software packages. When discussing set-theoretic methods, in-class debates will further engage on broad, general comparative social research issues, such as case selection principles, concept formation, questions of data aggregation and the treatment of causally relevant notions of time. Real-life published applications are used throughout the course. Participants are encouraged to bring their own data for in-class exercises and assignments, if available. To get the most out of the course, participants would profit from some basic empirical-comparative training and an introduction to the R environment (e.g., Refresher Course), but these are no prerequisites in a strict sense.

Long outline

The central aim of week 1 (P. Mello) is to familiarise the participants with the formal logic of set-theoretic methods and to introduce QCA as an approach, its main assumptions, the technical environment (software) and the standard procedures and operations. The course begins with applications of crisp-set QCA (csQCA), before moving on to multi-value QCA (mvQCA) and fuzzy-set QCA (fsQCA) once the fundamentals are in place. Particular emphasis is put on a thorough understanding of the notions of necessity and sufficiency, as they are the nuts and bolts of QCA that set it apart from the majority of other available cross-case comparative techniques.

- On day 1, participants will be introduced to the course topic, the content and sequence of the course sessions, as well as the course resources. We will also touch upon the basics of set-theoretic methods, the epistemology of QCA, its different variants, and how it compares to other standard qualitative and quantitative social scientific research designs. The centrepiece of the first session will be a demonstration of QCA on the basis of a recently published study.
- On day 2, we turn to the methodological foundations of QCA including a thorough discussion of the basic mathematical concepts of QCA, which are derived from set theory. The session begins by with an outline of sets and set membership, including the notion of fuzzy sets as opposed to crisp sets. Once these essentials are in place, we turn to Boolean and fuzzy algebra, formal logic and operations on complex expressions.
- On day 3, we will address the question of how to prepare observational data to perform QCA, i.e. how to calibrate. In doing so, we will cover various modes of calibrating raw data for crisp-set, multi-value and fuzzy-set QCA. We will go through various calibration techniques using R and discuss the consequences of different calibration decisions.

- On day 4, we will define the notion of a truth table in crisp-set and fuzzy-set QCA and how it differs from a data matrix. We will show how to analyse truth tables with respect to necessary and sufficient conditions in order to derive solution formulas. This includes the Quine-McCluskey Algorithm for the logical minimization of the sufficiency statements in a truth table.
- On day 5, we will turn to the so-called parameters of fit that are central to any QCA study, i.e. the measures of consistency and coverage for necessary and sufficient conditions. We will further discuss some methodological issues that are related to the parameters of fit. The first week will be concluded with an informal course evaluation and a consideration of topics that the participants would like to see covered in more depth in week 2.

The purpose of week 2 (C. Schneider) is fourfold: (1) to re-visit the core points of QCA addressed in week 1 (calibration, tests of necessity and sufficiency, truth tables, parameters of fit); (2) to elaborate on further issues that arise when neat formal logical tools and concepts, such as necessity, sufficiency, and truth tables, are applied to social science data (mainly the issues of limited diversity and the challenge to make good counterfactuals on so-called logical remainders); (3) to get better acquainted with the standards of good practice, both in its fundamental aspects and in using the relevant software programmes; (4) to discuss general methodological issues such as robustness and theory evaluation from a set-theoretic point of view.

- On day 6, we will start by briefly reviewing what we learned in week 1, above all with regard to the basics of the analysis of necessary and sufficient conditions and how truth tables are used to reveal the latter. Putting everything together, we explain how the Truth Table algorithm, the standard mode for analysing crisp and fuzzy sets in QCA, works. We will recap the notions of parameters of fit, problematize some of their properties, and elaborate on potential improvements of these formulas. Since several of the problems have their roots in what could be called skewed set membership scores, we will be looking into this issue more closely.
- On day 7, we will discuss the second problem of incomplete truth tables: logical remainder rows. We will explain how this phenomenon of limited diversity arises and which basic strategies are at the researcher's disposal to mitigate its impact on drawing inferences. Above all, we will show how counterfactual thinking can be used to resolve problems of limited diversity. This leads to the development of "intermediate solutions" in a so-called standard analysis.
- On day 8, we continue with the issue of limited diversity and introduce several amendments to the standard analysis. In addition to distinguishing between easy and difficult counterfactuals, we introduce the notion of tenable and untenable assumptions on remainders.
- On day 9, we put together the material of the entire course by spelling out the Truth Table algorithm, i.e. the process from turning the data matrix into a truth table, then logically minimizing the table, allowing for different strategies vis-à-vis the logical remainders, and calculating the parameters of fit for each solution formula. During this day, participants are asked to apply their knowledge gained during the course to different published data sets and/or their own data.
- Day 10 will be devoted to deepening our knowledge on how to perform a QCA. In addition, we spell out the principles of set-theoretic Multi-Method Research, that is, which cases to choose for process tracing on the basis of a QCA.

In all sessions, we will analyse fake (mostly week 1) and real data (week 2) in the computer lab, using the most important software packages R and fsQCA. During the computer lab sessions, students will be able to choose whether to follow the software instructions for the fsQCA program or for R. In addition to the prepared datasets, participants are encouraged to bring their own data (even if this

data is still tentative), which they may use during the lab hours and project work. The instructors and TAs will be available for appointments (individual counselling) to discuss personal research projects, "formatting" of own data to be compatible with QCA, etc.

Day-to-day schedule

Week 1 (Patrick A. Mello)

Goals:
- Address fundamental issues in comparative research
- Introduce set-theoretic principles and formal logic
- Present the main concepts of QCA approaches
- Introduce the main variants of QCA (crisp set, fuzzy set, multi-value)
- Become acquainted with the QCA software package for the R environment

	Lecture topic(s)	Lab session
Day 1 Mon. 27 July	**Course Introduction (90')** - Detailed course overview - Set-theoretic methods - Causal complexity - Comparison of QCA and standard qualitative and quantitative research designs - Empirical demonstration	**Exercises (90')** - Tour of QCA resources - Introduction to the R environment and the QCA software package
Day 2 Tue. 28 July	**Set Theory (90')** - Methodological foundations: set theory, Boolean and fuzzy algebra, formal logic - Set operations and set relations - Forms of representation	**Exercises (90')** - Further introduction to R - Calculation of Boolean operations - Assessing necessity and sufficiency
Day 3 Wed. 29 July	Calibration (90') - Measurement and calibration - Calibration techniques - Differences in calibration and their consequences	**Exercises (90')** - Calibrating fuzzy sets (participants are encouraged to bring their own data for this exercise!)
Day 4 Thur. 30 July	Truth Tables (90') - From data matrix to truth table - Analyzing truth tables - Quine-McCluskey Algorithm	**Exercises (90')** - Running the standard analysis - Calculation of solution terms
Day 5 Fri. 31 July	**Parameters of Fit (90')** - Consistency and coverage measures for necessary and sufficient conditions - Issues related to the parameters of fit	**Exercises (90')** - Calculating parameters of fit - Graphical tools for assessing consistency - Informal evaluation of week 1

Week 2 (Carsten Q. Schneider)

Goals:
- Deepen the skills and knowledge on QCA
- Apply QCA to real data and learn how to handle the most important challenges that typically arise in applied QCA
- Further acquaintance with standards of good practice

- Explore the limitations and pitfalls of set-theoretic methods

Day 6 Mon. 3 August	**Recap of Week 1; Alternative Parameters of Fit I (120')** - Calibration - Set relations - Truth Table analysis - Parameters of Fit - Skewed set membership scores	Lab session on calibration (60'): Rehearsal of analytic procedures learned during week 1
Day 7 Tue. 4 August	**Limited Diversity I (90')** - Origins of remainders - Types of remainders - Types of assumptions on remainders - The Standard Analysis	Lab session (90'): using the appropriate software package for producing the conservative, intermediate, and most parsimonious solution
Day 8 Wed. 5 August	**Limited Diversity II (90')** - Untenable versus tenable assumptions - Enhanced Standard Analysis	Lab session (90'): using the appropriate software packages for performing the Enhanced Standard Analysis
Day 9 Thur. 6 August	**Truth Table Algorithm (60')** - From data matrix to truth table - From truth table to solution formula	Lab session (120'): practicing full-blown QCA, from the raw data to calibrated data to truth table representation to analyses of truth table and the interpretation of the resulting solution formula
Day 10 Fri. 7 August	**Deepening of Knowledge and Set-Theoretic Multi-Method Research (60')** - Post-QCA case selection principles and practices - Conclusion/debriefing of course	Lab session (120'): exercises on reanalysing published QCA and further improving such analyses; identification of typical cases and deviant cases after a QCA

(Day 11, Saturday, 8 August, 9:00-12:00: Exam)

Day-to-day reading list
General note: the mandatory reading for this course is:
Schneider, Carsten Q. and Claudius Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis*. Cambridge: Cambridge University Press
Below, we specify for each day which chapter(s) from this book are to be read and which additional optional literature students may want to consult.

Week 1 (Patrick Mello)
NB: The reading list is subject to minor changes in order to adapt to the quickly evolving field

	Recommended readings (*compulsory text)
Day 1 Mon. 27 July	*Schneider, Carsten Q. and Claudius Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis.* Cambridge: Cambridge University Press, pp. 1-20.
Day 2 Tue. 28 July **Set Theory**	***Schneider, Carsten Q. and Claudius Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis*. Cambridge: Cambridge University Press, pp. 21-31; 42-90. Goertz, Gary and James Mahoney (2012). *A Tale of Two Cultures: Qualitative and Quantitative Research in the Social Sciences*. Princeton: Princeton University Press, chapter 2. Ragin, Charles C. (1987). *The Comparative Method. Moving Beyond Qualitative*

	and Quantitative Strategies. Berkeley: University of California Press, chapter 6.
Day 3 Wed. 29 July **Calibration**	*Schneider, Carsten Q. and Claudius Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis*. Cambridge: Cambridge University Press, pp. 32-41. Ragin, Charles C. (2008). *Redesigning Social Inquiry: Set Relations in Social Research*. Chicago: University of Chicago Press, chapters 4 & 5.
Day 4 Thur. 30 July **Truth Tables**	*Schneider, Carsten Q. and Claudius Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis*. Cambridge: Cambridge University Press, pp. 91-115. Ragin, Charles C. (2008). *Redesigning Social Inquiry: Set Relations in Social Research*. Chicago: University of Chicago Press, chapter 7.
Day 5 Fri. 31 July **Parameters of Fit I**	*Schneider, Carsten Q. and Claudius Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis*. Cambridge: Cambridge University Press, pp. 119-150. Ragin, Charles C. (2008). *Redesigning Social Inquiry: Set Relations in Social Research*. Chicago: University of Chicago Press, chapter 3.

Week 2 (Carsten Q. Schneider)

Day 6 Mon. 4 August **Review of Week 1; Parameters of Fit II**	*Schneider, Carsten Q. and Claudius Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis*. Cambridge: Cambridge University Press, chapter 9.2. Goertz, Gary (2006). "Assessing the Trivialness, Relevance, and Relative Importance of Necessary or Sufficient Conditions in Social Science". *Studies in Comparative International Development*, vol. 41, issue 2, pp. 88-109.
Day 7 Tue. 5 August **Limited Diversity I**	*Schneider, Carsten Q. and Claudius Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis*. Cambridge: Cambridge University Press, chapter 6. Ragin, Charles C. (1987). *The Comparative Method. Moving Beyond Qualitative and Quantitative Strategies*. Berkeley: University of California Press, chapter 7. Ragin, Charles C. (2008): *Redesigning Social Inquiry: Set Relations in Social Research.* Chicago: University of Chicago Press, chapters 8+9
Day 8 Wed. 6 August **Limited Diversity II**	*Schneider, Carsten Q. and Claudius Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis*. Cambridge: Cambridge University Press, chapter 8 Emmenegger, Patrick (2012). "How Good Are Your Counterfactuals? Assessing Quantitative Macro-Comparative Welfare State Research." *Journal of European Social Policy*, vol. 21, issue 4, pp. 365-380.
Day 9 Thur.	*Schneider, Carsten Q. and Claudius Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis*. Cambridge:

7 August **Advanced Standard Analysis**	Cambridge University Press, chapter 7 Ragin, Charles C. (2008): *Redesigning Social Inquiry: Set Relations in Social Research.* Chicago: University of Chicago Press, chapter 9.
Day 10 Fri. 8 August **Standards of Good Practice; Set-Theoretic Multi-Method Research**	*Schneider, Carsten Q. and Ingo Rohlfing (2013). "Set-Theoretic Methods and Process Tracing in Multi-Method Research: Principles of Case Selection after QCA", *Sociological Methods and Research,* DOI: 10.1177/0049124113481341 *Schneider, Carsten Q. and Claudius Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis*. Cambridge: Cambridge University Press, chapters 11.1 and conclusion. Rohlfing, Ingo, and Carsten Q. Schneider. 2013. "Combining QCA With Process Tracing in Analyses of Necessity." *Political Research Quarterly* 66(1): 220–35.

Software and hardware requirements

Software programme
R, RStudio

Hardware requirements

Literature
a.   Mandatory reading

Schneider, Carsten Q. and Claudius Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis*. Cambridge: Cambridge University Press

b.   Important books:

Goertz, Gary, and James Mahoney (2012). *A Tale of Two Cultures: Qualitative and Quantitative Research in the Social Sciences*. Princeton: Princeton University Press.

Rihoux, Benoît and Charles C. Ragin, eds. (2009). *Configurational Comparative Methods. Qualitative Comparative Analysis (QCA) and Related Techniques*. Thousand Oaks and London: Sage.

Ragin, Charles C. (1987). *The Comparative Method: Moving Beyond Quantitative and Qualitative Strategies*. Berkeley: University of Berkeley Press.

Ragin, Charles C. (2000). *Fuzzy-Set Social Science*. Chicago: University of Chicago Press.

Ragin, Charles C. (2008). *Redesigning Social Inquiry: Set Relations in Social Research*. Chicago: University of Chicago Press.

Schneider, Carsten Q. and Claudius Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative*. Cambridge: Cambridge University Press.

Schneider, Carsten Q. und Claudius Wagemann (2007). *Qualitative Comparative Analysis (QCA) und Fuzzy Sets. Ein Lehrbuch für Anwender und jene, die es werden wollen*. Opladen & Farmington Hills: Verlag Barbara Budrich. [for German speakers]

c.   General Background Readings (during and after the course):

Amenta, Edwin, and Jane D. Poulsen. 1994. "Where to Begin." Sociological Methods & Research 23 (1):22-53.

Brady, Henry/Collier, David/Seawright, Jason (2004): Refocusing the discussion of methodology. In Brady, Henry E./Collier, David: *Rethinking Social Inquiry: Diverse Tools, Shared Standards*. Lanham: Rowman&Littlefield, pp. 3-20.

Baumgartner, Michael. 2008. "Uncovering deterministic causal structures: a Boolean approach." *Synthese* 170(1): 71-96.

Baumgartner, Michael. 2009. "Inferring Causal Complexity." *Sociological Methods & Research* 38 (1):71-101.

Baumgartner, Michael. "Detecting Causal Chains in Small-N Data." *Field Methods*: 1–18.

Baumgartner, M., and R. Epple. 2013. "A Coincidence Analysis of a Causal Chain: The Swiss Minaret Vote." *Sociological   Methods   &   Research*:   1–33. http://smr.sagepub.com/cgi/doi/10.1177/0049124113502948 (November 29, 2013).

Braumoeller, Bear F. 2003. "Causal Complexity and the Study of Politics." Political Analysis 11 (3):209-33.

Braumoeller, Bear F., and Gary Goertz. 2000. "The Methodology of Necessary Conditions." American Journal of Political Science 44 (4):844-58.

Braumoeller, Bear F., and Gary Goertz. 2003. "The Statistical Methodology of Necessary Conditions." In Necessary Conditions: Theory, Methodology, and Applications, ed. G. Goertz and H. Starr. Lanham: Rowman & Littlefield.

Cioffi-Revilla, Claudio A. 2003. "Necessity and Sufficiency in Social Phenomena: Theoretical and Methodological Progress." In Necessary Conditions: Theory, Methodology, and Applications, ed. G. Goertz and H. Starr. Lanham: Rowman & Littlefield.

Davies, James W. (2005). *Terms of Inquiry: On the Theory and Practice of Political Science.* Baltimore: John Hopkins Press, chapters 2 and 3.

Ebbinghaus, Bernhard (2005). When Less is More: Selection Problems in Large-N and Small-N Cross-National Comparisons. *International Sociology* 20(2): 133-152.

Geddes, Barbara (2003). *Paradigms and Sand Castles. Theory Building and Research Design in Comparative Design*. Ann Arbor: University of Michigan Press, chapter 3.

George, Alexander and Andrew Bennett (2005). *Case Studies and Theory Development in the Social Sciences*. Cambridge (Mass.): The MIT Press, chapters 1 and 8.

Goertz, Gary (2003): The substantive importance of necessary condition hypotheses. In Goertz, Gary/Starr, Harvey: *Necessary Conditions*. Lanham: Rowman & Littlefield Publishers, pp. 65-94.

Goertz, Gary (2006): Social Science Concepts: A User's Guide. Princeton: Princeton University Press.

Goertz, Gary, and James Mahoney. (2012). *A Tale of Two Cultures: Qualitative and Quantitative Research in the Social Sciences*. Princeton: Princeton University Press.

Greckhamer, Thomas; Misangyi, Vilmos and Peer Fiss (2013). "The Two QCAs: From A Small-N To A Large-N Set Theoretic Approach". In Configurational Theory and Methods in Organizational Research, ed. P. Fiss, B. Cambré and A. Marx. Emerald Group: Bingley, pp. 49-75.

Hall, Peter A. (2003): Aligning ontology and methodology in comparative politics. In Mahoney, James/Rueschemeyer, Dietrich: *Comparative Historical Analysis in the Social Sciences*. Cambridge/New York: Cambridge University Press, pp. 373-404.

Hino, Airo (2009). "Time-Series QCA". *Sociological Theory and Methods*, 24 (2): 247-265.

Hug, S. (2013). Qualitative Comparative Analysis: How Inductive Use and Measurement Error Lead to Problematic Inference. *Political Analysis*, *21*(2), 252–265. doi:10.1093/pan/mps061

Kittel, Bernhard (2006): A crazy methodology? On the limits of macroquantitative social science research. *International Sociology,* vol. 2 , issue 5, pp. 647-677.

Lijphart, Arend (1975): The comparable-cases strategy in comparative research. *Comparative Political Studies,* vol. 8, issue 2, pp. 158-177.

Mahoney, James, Erin Kimball, and Kendra L. Koivu. 2009. "The Logic of Historical Explanation in the Social Sciences." *Comparative Political Studies* 42 (1):114-46.

McNeill, Daniel, and Paul Freiberger (1993): *Fuzzy Logic*. New York: Touchstone.

Ragin, Charles C. 2000. Fuzzy-Set Social Science. Chicago: University of Chicago Press. Chapters 6 – 11.

Ragin, Charles C. (2006). The limitations of net-effect thinking. In Rihoux, Benoit/Grimm, Heike: *Innovative Comparative Methods for Policy Analysis. Beyond the Quantitative-Qualitative Divide*. New York: Springer, pp. 13-41.

Rihoux, Benoît and Axel Marx (2013)."QCA, 25 Years after 'The Comparative Method': Mapping, Challenges, and Innovations: Mini-Symposium. *Political Research Quarterly,* 66 (1):167-235.

Rohlfing, Ingo. 2012. *Case Studies and Causal Inference: An Integrative Framework*. Houndsmill: Palgrave McMillan.

Schneider, Carsten Q. and Bernard Grofman (2006). It might look like a regression ... but it's not! An intuitive approach to the presentation of QCA and fs/QCA results. Compasss Working Paper, WP2006-39

Schneider, Carsten Q., and Claudius Wagemann (2006): "Reducing Complexity in Qualitative Comparative Analysis (QCA): Remote and Proximate Factors and the Consolidation of Democracy." *European Journal of Political Research* 45 (5):751-86.

Seising, Rudolf (2007): *The Fuzzification of Systems. the Genesis of Fuzzy Set Theory and Its Initial Applications - Developments up to the 1970s*. Berlin: Springer.

Smithson, Michael and Jay Verkuilen (2006): *Fuzzy Set Theory: Applications in the Social Sciences.* Thousand Oaks: Sage Publications.

Thiem, Alrik. 2013. "Clearly Crisp, and Not Fuzzy: A Reassessment of the (Putative) Pitfalls of Multi-Value QCA." *Field Methods*. 25(2): 197-207.

Vink, M. P., and O. van Vliet. 2009. "Not Quite Crisp, Not Yet Fuzzy? Assessing the Potentials and Pitfalls of Multi-Value QCA." *Field Methods* 21(3): 265–89.

Vink, Maarten P., and Olaf van Vliet. 2013. "Potentials and Pitfalls of Multi-Value QCA: Response to Thiem." *Field Methods* 25(2): 208-213.

Wagemann, Claudius, and Carsten Q. Schneider (2010). "Qualitative Comparative Analysis (QCA) and Fuzzy-Sets: Agenda for a Research Approach and a Data Analysis Technique." *Comparative Sociology* 9 (3):376-96.

Zadeh, Lofti A. (1965): Fuzzy sets. *Information and Control,* vol. 8, pp. 338-353.

d.   On Software

Huang,   Ronggui   (2009).   "Package   'QCA3'   for   R",   URL: http://cran.r-project.org/web/packages/QCA3/QCA3.pdf

Longest, Kyle C./Vaisey, Stephen (2008). fuzzy: a program for performing qualitative comparative analysis (QCA) in Stata. *The Stata Journal* 8 (1):79-104.

Thiem, Alrik, and Adrian Dusa (2013). "QCA: A Package for Qualitative Comparative Analysis." *The R Journal* 5 (1): 87-97.

Thiem, Alrik, and Adrian Dusa (2013). *Qualitative Comparative Analysis with R: A User's Guide*. New York: Springer.

Thiem, Alrik and Adrian Dusa (2012). "Introducing the QCA Package: A Market Analysis and Software Review", *Qualitative and Multi-Method Research* 10 (2): 45-49.

Thiem, A., and A. Dusa. 2013. "Boolean Minimization in Social Science Research: A Review of Current Software for Qualitative Comparative Analysis (QCA)." *Social Science Computer Review* 31(4): 505–21.

e.   Applications (selection)

NB: the most up-to-date list of QCA applications can be found at the Compasss website (compasss.org)

Aleman, Jose. 2009. "The Politics of Tripartite Cooperation in New Democracies: A Multi-level Analysis." *International Political Science Review* 30 (2):141-62.

Amenta, Edwin; Bruce G. Carruthers & Yvonne Zylan (1992). "A Hero for the Aged? The Townsend Movement, the Political Mediation Model, and U.S. Old-Age Policy, 1934-1950." *American Journal of Sociology*, Vol. 98, No. 2, pp. 308-339.

Amenta, Edwin, and Jane D. Poulsen. 1996. "Social Politics in Context: The Institutional Politics Theory and Social Spending at the End of the New Deal." *Social Forces* 75 (1):33-60.

Amenta, Edwin & Drew Halfman (2000). "Wage Wars: Institutional Politics, WPA Wages, and the Struggle for U.S. Social Policy."*American Sociological Review*, Vol. 65, No. 4, pp. 506-528

Amenta, Edwin; Neal Caren & Sheera J. Olaski (2005). "Age for Leisure? Political Mediation and the Impact of the Pension Movement on US Old-Age Policy." *American Sociological Review*, Vol. 70, No. 3 pp. 516-538.

Amenta, E., N. Caren, S. J. Olasky, and J. E. Stobaugh. 2009. "All the Movements Fit to Print: Who, What, When, Where, and Why SMO Families Appeared in the New York Times in the Twentieth Century." *American Sociological Review* 74 (4):636-56.

Arvind, T. T., and Lindsay Stirton. 2010. "Explaining the Reception of the Code Napoleon in Germany: A Fuzzy-Set Qualitative Comparative Analysis." *Legal Studies* 30 (1):1-29.

Avdagic, Sabina. 2010. "When Are Concerted Reforms Feasible? Explaining the Emergence of Social Pacts in Western Europe." *Comparative Political Studies* 43 (5):628-57.

Berg-Schlosser, Dirk. 2008. "Determinants of Democratic Successes and Failures in Africa." *European Journal of Political Research* 47 (3):269-306.

Blake, Charles H., and Jessica R. Adolino. 2001. "The Enactment of National Health Insurance: A Boolean Analysis of Twenty Advanced Industrial." *Journal of Health Politics, Policy & Law* 26 (4):679.

Blatter, Joachim, Matthias Kreutzer, Michaela Rentl, and Jan Thiele. 2010. "Preconditions for Foreign Activities of European Regions: Tracing Causal Configurations of Economic, Cultural, and Political Strategies." *Publius-the Journal of Federalism* 40 (1):171-99.

Bochsler, Daniel. 2011. "It is not how many Votes you get, but also where you get them. Territorial Determinants and Institutional Hurdles for the Success of Ethnic Minority Parties in Post-Communist Countries." *Acta Politica* 46 (3):217-38.

Christmann, Anna. 2010. "Damoklesschwert Referendum? Die indirekte Wirkung ausgebauter Volksrechte auf die Rechte religiöser Minderheiten." *Swiss Political Science Review* 16 (1):1-41.

Davidsson, Johan Bo and Emmenegger, Patrick (2013), 'Defending the Organization, Not the Members: Unions and the Reform of Job Security Legislation in Europe', *European Journal of Political Research,* Online first at URL: http://onlinelibrary.wiley.com/doi/10.1111/j.1475-6765.2012.02073.x/abstract

Delreux, Tom. 2009. "The EU negotiates Multilateral Environmental Agreements: Explaining the Agent's Discretion." *Journal of European Public Policy* 16 (5):719-37.

Emmenegger, Patrick (2008), 'Religion und Arbeitnehmerschutzgesetzgebung. Eine Fuzzy-Set Analyse', *Swiss Political Science Review,* 14 (1), 85-130.

Emmenegger, Patrick (2011), 'Job Security Regulations in Western Democracies: A Fuzzy-Set Analysis', *European Journal of Political Research,* 50 (3), 336-64.

Freitag, Markus, and Raphaela Schlicht. 2009. "Educational Federalism in Germany: Foundations of Social Inequality in Education." *Governance* 22 (1):47-72.

Grant, D., M. N. Trautner, L. Downey, and L. Thiebaud. 2010. "Bringing the Polluters Back In: Environmental Inequality and the Organization of Chemical Production." *American Sociological Review* 75 (4):479-504.

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Lecture room requirement
Seminar room, computer lab, TA room.