

ECPR Summer School in Methods and Techniques - 24 July – 9 August 2014
Course Description Form

Course title:

B05. Set-Theoretic Methods: Qualitative Comparative Analysis and Related Approaches

Instructor details:

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Short Bio:

Carsten Q. Schneider is Associate Professor of Political Science at the Central European University (Hungary). 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*, 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. His research interests include international relations theory, the influence of domestic politics on foreign policy and comparative and case study research methods. 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' will be published with Palgrave Macmillan in 2014.

Short outline:

This course introduces participants to set-theoretic methods and their application in the social sciences with an emphasis on Qualitative Comparative Analysis and fuzzy sets. The introductory course is complemented by an advanced course that is taught during the ECPR Winter School in Vienna. 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 analytic issues will be introduced based on crisp sets and later expanded to fuzzy sets. Right from the beginning, the course will also teach the use of the available software packages (predominantly R and fsQCA). 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. If available, participants are also encouraged to bring their own data. Some basic empirical comparative training is useful to get more out of the course, but this is no prerequisite 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. In addition, we will have a look at some of the main software programs for performing QCA (fsQCA, R, Tosmana) and the available tools for calibrating data.
- On day 4, we will focus on notions of causal complexity in set-theoretic methods and how these relate to QCA applications. We will learn how QCA produces causally complex results defined in terms of conjunctural causation, equifinality, and asymmetric causation. On this basis, we will further investigate complex expressions such as INUS and SUIN conditions.
- On day 5, 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 causal conjunctions. This includes the Quine-McCluskey Algorithm for the logical minimization of the sufficiency statements in a truth table. We will conclude the first week with an informal evaluation of the first week and proposals of some core points which the participants would like to touch upon again 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); (2) to elaborate on the 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 contradictory, or inconsistent set relations and 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. From day 6 onwards, we will leave the realm of neat formal logic and straightforward set relations and discuss the core issues that arise in the application of QCA to observational data. These issues manifest themselves in the form of incomplete truth tables. We start with the issue of contradictory truth table rows and discuss strategies for solving such contradictions. We will also look at the issue of contradictory truth table rows and introduce the parameters of fit, consistency and coverage.
- On day 7, we further expand on the issue of contradictory rows and introduce the parameters of fit consistency and coverage. We learn how these parameters are calculated both for sufficient and for necessary conditions and elaborate on potential improvements of these formulas.
- On day 8, 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. Putting everything together, we explain how the Truth Table algorithm, the standard mode for analysing crisp and fuzzy sets in QCA, works.
- 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.
- 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 Mello)

Goals:

- Address the 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 existing software packages (fsQCA, R, Tosmana, Kirq)

	Topic(s)	Details [NB: incl. timing of lecture v/s lab or fieldwork etc. hours]
Day 1 Mon. 28 July	Presentation of the course (120') <ul style="list-style-type: none"> - Instructors & TAs - Key aims of set-theoretic methods - Comparison of QCA and standard qualitative and quantitative research designs - Demonstration of QCA on a recently published study 	Lab session (60'): <ul style="list-style-type: none"> - Tour of QCA resources: web pages, databases, presentation of available software packages (fsQCA, Tosmana, Kirq)

	<ul style="list-style-type: none"> - Introduction of QCA variants (crisp set, fuzzy set, multi-value) - Detailed course structure and organizational questions 	
Day 2 Tue. 29 July	QCA's epistemology (90') <ul style="list-style-type: none"> - Introduction to methodological foundations - Set theory, Boolean and fuzzy algebra, formal logic - Necessity and sufficiency - Forms of representation: Truth table, Venn diagram, two-by-two table 	Lab session (90'): <ul style="list-style-type: none"> - Computer-based calculation of Boolean operations (intersection and negation) - Focussed introduction to the R software environment - Assessing necessity and sufficiency with R and the fsQCA program
Day 3 Wed. 30 July	Sets and calibration procedures (90') <ul style="list-style-type: none"> - Coding criteria - Calibration techniques - Introduction to available software programs 	Lab session (90'): <ul style="list-style-type: none"> - Practising coding criteria and calibration procedures (participants are encouraged to bring their own data for this exercise)
Day 4 Thur. 31 July	Causal complexity (120') <ul style="list-style-type: none"> - Conjunctural causation, equifinality, asymmetric causation - Complex expressions: INUS and SUIN conditions 	Lab session (60'): <ul style="list-style-type: none"> - Identification of SUIN conditions - Test of subset relations for predefined conjunctions
Day 5 Fri. 1 August	Applying QCA to fake data (90') <ul style="list-style-type: none"> - Quine-McCluskey Algorithm - The Standard Analysis - The Truth Table Algorithm 	Lab session (90'): simple QCA applications <ul style="list-style-type: none"> - Truth tables in the software - Calculation of solution terms with the help of appropriate software - QCA examples (without limited diversity) + 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. 4 August	Review of Week 1; Parameters of Fit I (120') <ul style="list-style-type: none"> - Calibration - Set relations - Truth Table analysis - Parameters of Fit I 	Lab session on calibration (60'): Rehearsal of analytic procedures learned during week 1
Day 7 Tue. 5 August	Parameters of Fit II (90') <ul style="list-style-type: none"> - Separate analysis of necessary and sufficient conditions - Skewed set membership scores 	Lab session (90'): Calculating consistency and coverage; graphical tools for assessing consistency
Day 8 Wed. 6 August	Limited Diversity (90') <ul style="list-style-type: none"> - 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 9 Thur.	Truth Table Algorithm (60') <ul style="list-style-type: none"> - From data matrix to truth table 	Lab session (120'): practicing full-blown QCA, from the raw data to calibrated data to truth

7 August	- From truth table to solution formula	table representation to analyses of truth table and the interpretation of the resulting solution formula
Day 10 Fri. 8 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, 9 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)

	Readings (please read at least the compulsory reading - marked with a * - for the scheduled day)	
Day 1 Mon. 28 July	---	
Day 2 Tue. 29 July Set Theory, Boolean and Fuzzy Algebra	<p>*Schneider, Carsten Q. and Claudius Wagemann (2012). <i>Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis</i>. Cambridge: Cambridge University Press, pp. 1-31; 42-76.</p> <p>Berg-Schlosser, Dirk, Gisèle DeMeur, Benoît Rihoux and Charles C. Ragin, (2009). "Qualitative Comparative Analysis (QCA) as an Approach". In Benoît Rihoux and Charles C. Ragin (eds.), <i>Configurational Comparative Methods. Qualitative Comparative Analysis (QCA) and Related Techniques</i>. Thousand Oaks and London: Sage, chapter 1.</p> <p>Goertz, Gary and Harvey Starr, eds. (2003). <i>Necessary Conditions: Theory, Methodology, and Applications</i>. Lanham: Rowman & Littlefield, chapters 3 & 4.</p> <p>Ragin, Charles C. (1987). <i>The Comparative Method. Moving Beyond Qualitative and Quantitative Strategies</i>. Berkeley: University of California Press, chapter 6.</p> <p>Klir, George J., Ute St. Clair and Bo Yuan (1997). <i>Fuzzy Set Theory. Foundations and Applications</i>. Upper Saddle River: Prentice Hall PTR, pp. 1-9, 47-72, 90-95.</p>	
Day 3 Wed. 30 July Sets and Calibration Procedures	<p>*Schneider, Carsten Q. and Claudius Wagemann (2012). <i>Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis</i>. Cambridge: Cambridge University Press, pp. 32-41.</p> <p>Ragin, Charles C. (2008). <i>Redesigning Social Inquiry: Set Relations in Social Research</i>. Chicago: University of Chicago Press, chapters 4 & 5.</p>	
Day 4 Thur. 31 July Causal	<p>*Schneider, Carsten Q. and Claudius Wagemann (2012). <i>Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis</i>. Cambridge: Cambridge University Press, pp. 76-90.</p> <p>Ragin, Charles C. (2000). <i>Fuzzy-Set Social Science</i>. Chicago: University of Chicago</p>	

complexity	<p>Press, chapter 4.</p> <p>Rohlfing, Ingo (2012): <i>Case Studies and Causal Inference: An Integrative Framework</i>. Houndsmill: Palgrave/Macmillan, chapter 2.4</p> <p>Mahoney, James, Erin Kimball, and Kendra L. Koivu (2009). "The Logic of Historical Explanation in the Social Sciences." <i>Comparative Political Studies</i> 42 (1): 114-46.</p>
<p>Day 5 Fri. 1 August</p> <p>Applying QCA</p>	<p>*Schneider, Carsten Q. and Claudius Wagemann (2012). <i>Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis</i>. Cambridge: Cambridge University Press, pp. 91-115.</p> <p>Ragin, Charles C. (2008). <i>Redesigning Social Inquiry: Set Relations in Social Research</i>. Chicago: University of Chicago Press, chapter 7.</p>

Week 2 (Carsten Q. Schneider)

<p>Day 6 Mon. 4 August</p> <p>Review of Week 1; Parameters of Fit I</p>	<p>*Schneider, Carsten Q. and Claudius Wagemann (2012). <i>Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis</i>. Cambridge: Cambridge University Press, chapter 5 and 7.</p> <p>Ragin, Charles C. (2008): Qualitative comparative analysis using fuzzy sets (fsQCA). In Rihoux, Benoit/Ragin, Charles C.: <i>Configurational Comparative Methods</i>. Thousand Oaks/London: Sage, chapter 3.</p>
<p>Day 7 Tue. 5 August</p> <p>Parameters of Fit II</p>	<p>*Schneider, Carsten Q. and Claudius Wagemann (2012). <i>Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis</i>. Cambridge: Cambridge University Press, chapter 9.2.</p> <p>Goertz, Gary (2006). "Assessing the Trivialness, Relevance, and Relative Importance of Necessary or Sufficient Conditions in Social Science". <i>Studies in Comparative International Development</i>, vol. 41, issue 2, pp. 88-109.</p>
<p>Day 8 Wed. 6 August Limited Diversity</p>	<p>*Schneider, Carsten Q. and Claudius Wagemann (2012). <i>Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis</i>. Cambridge: Cambridge University Press, chapter 6.</p> <p>Ragin, Charles C. (1987). <i>The Comparative Method. Moving Beyond Qualitative and Quantitative Strategies</i>. Berkeley: University of California Press, chapter 7.</p> <p>Ragin, Charles C. (2008): <i>Redesigning Social Inquiry: Set Relations in Social Research</i>. Chicago: University of Chicago Press, chapter.</p> <p>Emmenegger, Patrick (2012). "How Good Are Your Counterfactuals? Assessing Quantitative Macro-Comparative Welfare State Research." <i>Journal of European Social Policy</i>, vol. 21, issue 4, pp. 365-380.</p>
<p>Day 9 Thur. 7 August</p> <p>Advanced Standard Analysis</p>	<p>*Schneider, Carsten Q. and Claudius Wagemann (2012). <i>Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis</i>. Cambridge: Cambridge University Press, chapter 8</p> <p>Ragin, Charles C. (2008): <i>Redesigning Social Inquiry: Set Relations in Social Research</i>. Chicago: University of Chicago Press, chapter 9.</p>

Day 10 Fri. 8 August	*Schneider, Carsten Q. and Ingo Rohlfing (2013). "Set-Theoretic Methods and Process Tracing in Multi-Method Research: Principles of Case Selection after QCA", <i>Sociological Methods and Research</i> , DOI: 10.1177/0049124113481341
Standards of Good Practice; Set-Theoretic Multi-Method Research	*Schneider, Carsten Q. and Claudius Wagemann (2012). <i>Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis</i> . 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." <i>Political Research Quarterly</i> 66(1): 220–35.

Requested prior knowledge

Students are not required to have any prior knowledge of QCA or the respective computer programs (Tosmana, fsQCA, R). However, they are strongly encouraged to familiarize themselves with the basic principles of the method in advance by reading the recommended literature (see 9.)

Software used

fsQCA, Tosmana, R

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.

R. 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. Eppler. 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 MacMillan.

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. *Compass 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)

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.
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Lecture room requirement

Seminar room, computer lab, TA room.