

# **Set-Theoretic Methods for the Social Sciences: A Primer for Qualitative Comparative Analysis (QCA) and Fuzzy Sets**

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## **Course Description**

Set-theoretic methods are becoming increasingly popular in the social sciences and adjacent fields. Qualitative Comparative Analysis (QCA) is the most formalized of these set-theoretic methods. In a first step, the course spells out the fundamental concepts that characterize the set-theoretic methodological perspective. This requires that the participants are made familiar with at least some knowledge of set-theory, formal logic, and Boolean algebra. Then the course proceeds by outlining the basic principles and practices of QCA, both the crisp-set and the fuzzy-set version. We gain research-practical insights, discuss best practices, and get a first introduction to computer-based QCA using the *R* packages *QCA* and *QCAGUI*. Both fake and real-life published data are used throughout the course. Participants are also encouraged to bring their own data, if available. The goal is to equip participants with sufficient knowledge to distinguish better from worse applied QCA and to make some first steps towards performing an own QCA.

## **Instructor**

The course is taught by Carsten Q. Schneider. He is the Head of the Political Science Department at Central European University (CEU). He has published extensively on the process of democratization and the use of set-theoretic methods, such as QCA, in the social sciences.

## **Practical Matters**

- The mandatory reading is Schneider & Wagemann (2012): *Set-Theoretic Methods for the Social Sciences*”, Cambridge University Press, chapters 1- 7
- Participants are asked to install the following freely available software on their laptops and bring them to the course
  - o R, packages *QCA* and *QCAGUI* ([cran.r-project.org](http://cran.r-project.org))
  - o RStudio ([rstudio.com](http://rstudio.com))
- Further useful information and material can be found at [compasss.org](http://compasss.org)
- The course is designed to be very interactive, with questions and debates at any point of time, depending on needs and interest

## Course Structure

The course lasts for one days (9am to 5pm), with a one-hour lunch break in-between. There will be some practical (computer) exercises scattered throughout the course.

- *Basics of Set Theory and Formal Logic*
  - o *Sets*
    - Operations on sets
    - Set calibration
  - o *Set Relations*
    - Necessity, sufficiency, INUS, SUIN
    - Truth tables and their logical minimization
- *Neat set theory meets noisy social science data*
  - o *Parameters of fit*
    - Contradictory truth table rows and strategies of handling them
    - The notion of set-theoretic consistency and coverage
  - o *Limited diversity*
    - Notion and types of logical remainders and strategies of handling them
    - The “Standard Procedure”
    - The “Truth Table Algorithm”
    - Standards of good QCA practice
- *Selected advanced topics (to be chosen upon interest of participants)*
  - o Practicing the relevant software packages
  - o Set-theoretic multi-method research
  - o The inclusion of the temporal dimension

## **Mandatory Reading**

Schneider, Carsten Q. and Claudius Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative*. Cambridge: Cambridge University Press, chapter 1-7 (mandatory), rest optional

## **Suggested Readings**

- 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.), *Configurational Comparative Methods. Qualitative Comparative Analysis (QCA) and Related Techniques*. Thousand Oaks and London: Sage, chapter 1.
- Kvist, Jon (2007): Fuzzy set ideal type analysis. *Journal of Business Research*, vol. 60, pp. 474-481.
- Ragin, Charles C. (2008). *Redesigning Social Inquiry: Set Relations in Social Research*. Chicago: University of Chicago Press, chapter 1.
- Ragin, Charles C. (1987). *The Comparative Method. Moving Beyond Qualitative and Quantitative Strategies*. Berkeley: University of California Press, chapter 6+7.
- Rihoux, B., and a. Marx. (2013). *QCA, 25 Years After "The Comparative Method": Mapping, Challenges, and Innovations--Mini-Symposium*. *Political Research Quarterly*, vol. 66, issue 1, pp. 167-235
- Schneider, Carsten Q. and Claudius Wagemann (2010). "Standards of Good Practice in Qualitative Comparative Analysis (QCA) and Fuzzy Sets". *Comparative Sociology*, vol. 9, issue 3, pp. 397-418.

## **Core Books for Set-Theoretic Methods**

- Goertz, G., & Mahoney, J. (2012). *A Tale of Two Cultures: Qualitative and Quantitative Research in the Social Sciences*. Princeton: Princeton University Press.
- Ragin, Charles C. (1987). *The Comparative Method. Moving Beyond Qualitative and Quantitative Strategies*. Berkeley: University of California 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.
- Rihoux, Benoît and Charles C. Ragin, eds. (2009). *Configurational Comparative Methods. Qualitative Comparative Analysis (QCA) and Related Techniques*. Thousand Oaks and London: Sage
- Smithson, M., & Verkuilen, J. (2006). *Fuzzy set theory: applications in the social sciences*. Thousand Oaks: Sage Publications.
- Thiem, Alrik, and Adrian Dusa. 2013. *Qualitative Comparative Analysis with R: A User's Guide*. New York: Springer.