

Elective Course:

Social Networks in Social Science Research: Theory and Practice

Anna Sokolova, MSc.
24.02.2025

Course Description

This course provides a comprehensive introduction to the theoretical framework and methods used in social network analysis (SNA). It will focus on different aspects of social reality that can be studied using SNA, including social capital, innovation diffusion, online social networks, the effects of social networks on health, etc. Other topics covered are the methodological developments in SNA, existing network datasets, and network data collection. The hands-on part of the course covers basics of SNA in R, including data management, descriptive analysis, and visualization. This course also aims to enhance students' scientific writing and discussion skills and develop their research agenda.

Learning Objectives

- Define core network characteristics and concepts.
- List and compare theories of social networks.
- Handle network data and calculate network characteristics.
- Explain the role of social networks in the various aspects of social reality.
- Analyze scientific articles on social network research.
- Evaluate social network data sources.
- Apply theoretical and methodological framework of SNA to social science research.
- Formulate research questions connected to social networks.
- Reflect on opportunities and limitations in social network research.

Course Outline

1) 13.02.2025 *Introduction to Social Networks I*

- Overview of social network analysis and its theoretical foundations
- Key concepts and measures in social network analysis

Readings: none.

2) 20.02.2025 *Introduction to Social Networks II*

- Social networks formation
- Effects of social networks and effects on social networks
- Causal inference in social networks research

Readings:

Fuhse, J. A. (2020). Theories of social networks. *The Oxford Handbook of Social Networks*, 34-49.

Vander Weele, T. J., & An, W. (2013). Social networks and causal inference. *Handbook of causal analysis for social research*, 353-362.

3) 27.02.2025 *Social Capital and Networks*

- Definition and importance of social capital
- Bridging vs Closure social capital theories
- Social capital and inequality in networks

Readings (* marks the article to prepare notes on, see “Studienleistung”):

Burt, R. S. (2017). Structural holes versus network closure as social capital. *Social capital*, 31-56.

*Pichler, F., & Wallace, C. (2009). Social capital and social class in Europe: The role of social networks in social stratification. *European Sociological Review*, 25(3), 319-332.

4) 06.03.2025 *Networks in Education*

- Network effects in the educational context
- Methodological challenges and features of studying classroom networks
- Ongoing project: “Stickiness of academic aspirations in the face of social influence”

Readings:

Kretschmer, D., & Roth, T. (2021). Why do friends have similar educational expectations? Separating influence and selection effects. *European Sociological Review*, 37(2), 201-217.

*Raabe, I. J., Boda, Z., & Stadtfeld, C. (2019). The social pipeline: How friend influence and peer exposure widen the STEM gender gap. *Sociology of Education*, 92(2), 105-123.

5) 13.03.2025 *Online Networks*

- Overview of social media platforms and their network structures
- Analysis of social media data using social network analysis
- Discussion of the advantages and limitations of studying networks on social media

Readings:

Cinelli, M., De Francisci Morales, G., Galeazzi, A., Quattrociocchi, W., & Starnini, M. (2021). The echo chamber effect on social media. *Proceedings of the National Academy of Sciences*, 118(9), e2023301118.

*Hofstra, B., Corten, R., Van Tubergen, F., & Ellison, N. B. (2017). Sources of segregation in social networks: A novel approach using Facebook. *American Sociological Review*, 82(3), 625-656.

6) 20.03.2025 *Criminal Networks*

- Structures of criminal networks around the world
- Discussion of the challenges of studying criminal networks

Readings:

Campana, P., & Varese, F. (2022). Studying organized crime networks: Data sources, boundaries and the limits of structural measures. *Social networks*, 69, 149-159.

*Calderoni, F. (2012). The structure of drug trafficking mafias: the 'Ndrangheta and cocaine. *Crime, law and social change*, 58, 321-349.

7) 27.03.2025 *Family networks*

- Familial ties and family network structures
- Effects of family networks on various life outcomes

Readings:

Cross, C. J. (2020). Racial/ethnic differences in the association between family structure and children's education. *Journal of Marriage and Family*, 82(2), 691-712.

*de Bel, V., Kalmijn, M., & van Duijn, M. A. (2019). Balance in family triads: How intergenerational relationships affect the adult sibling relationship. *Journal of Family Issues*, 40(18), 2707-2727.

8) 03.04.2025 *Social Networks and Health*

- The effects of social networks on health and well-being
- Social support and health outcomes
- Discussion of the challenges of studying social networks and health

Readings:

Smith, K. P., & Christakis, N. A. (2008). Social networks and health. *Annual Review of Sociology*, 34, 405-429.

*Shor, E., Roelfs, D. J., & Yogev, T. (2013). The strength of family ties: A meta-analysis and meta-regression of self-reported social support and mortality. *Social Networks*, 35(4), 626-638.

9) 10.04.2025 *Network Data: Collection, Use, and Limitations*

- Different sources of network data and their characteristics
- The benefits and challenges of using network data
- Overview of some of the existing network datasets and their applications
- Final paper Q&A

Readings:

Marsden, P. V. (2005). Recent developments in network measurement. Models and methods in social network analysis, 8-30.

10) 08.05.2025 *Social Network Analysis: Hands-on Tutorial in R – I*

- Handling network data
- Calculating network statistics

11) 15.05.2025 *Social Network Analysis: Hands-on Tutorial in R – II*

- Regression analyses with network data

12) 22.05.2025 *Social Network Analysis: Hands-on Tutorial in R – III*

- Visualizing networks in R & in Gephi

Holidays:

- 17.04.2025, 24.04.2025 – Easter break.
- 01.05.2025 – May Day.
- 29.05.2025 – Ascension Day.

Assessment

- Article notes (*Studienleistung*): Preparing concise summarizing and analytical notes on the articles (marked by *) from the readings list for the respective session.

For several selected sessions, students must submit notes on an assigned a research article. These notes should summarize the article's core elements (research question, theoretical framework, methods, main results, discussion), and identify two strong and two weak aspects of the study. Students may use AI tools for summaries but must integrate their own critical analysis into the output. Guidelines and recommendations for these tools and details on the notes structure will be provided in the first session. Submissions are individual and should be uploaded on ILIAS before the class. At least 5 out of 6 of submissions must be marked as "passed".

- Final paper: extended project proposal (*Prüfungsleistung*).

The final paper will consist of an extended research proposal on a topic that includes social networks. Students will be required to formulate a research question, provide a theoretical framework, propose a methodological design, and discuss possible limitations of their research. For the detailed guide that includes the proposal structure, recommended timeline, deadline, and other information, see "*Final_paper_guide*" on ILIAS.