

## Social Network Analysis

**Károly Takács**

**karoly.takacs@bkae.hu**

The course provides a simultaneous introduction to theoretical, methodological, and practical aspects of social network analysis.

Main objectives: A, Introduction to substantive theories in social network analysis, including fundamental theoretical aims and concepts. Reading a selection of prominent literature. B, Introduction to the methodology of social network analysis, including practical issues as a design of survey questions, observation, data analysis, and basic statistical methods. C, Planning of an individual research strategy and preparation of a research proposal in a selected field of interest with the application of social networks analysis.

The list of recommended readings can be found at the detailed course outline.

WF = Wasserman, S. and Faust, K. (1994): *Social Network Analysis. Methods and Implications*. Cambridge, Cambridge University Press.

Evaluation is based on a preparation of a short research proposal or completion of a small-scale research (70% of grade) and active participation in class (30% of grade).

**1<sup>st</sup> week:** A, What are social networks and why are they important? The concept of social embeddedness. Social network properties as independent and dependent variables. The dynamics of social networks. The concept and importance of social capital. B, Measurement of social capital. C, Discussion of ideas for individual research.

*Recommended readings:*

Granovetter, M. 1985. Economic Action and Social Structure: The Problem of Embeddedness. *American Journal of Sociology*, 91: 481-510.

Uzzi, B. 1996. The Sources and Consequences of Embeddedness for the Economic Performance of Organizations: The Network Effect. *American Sociological Review* 61(4): 674-698.

Coleman, J. S. 1990. *Foundations of Social Theory*, Chapter 12.

Putnam, R. D. 2000. *Bowling Alone: The Collapse and Revival of American Community*. New York, Simon & Schuster. Selected parts.

**2<sup>nd</sup> week:** A, Ego-centered networks and full networks. Analysis of ego-centered networks and dyadic connections. Social support. The who is who (wiw) network, [www.tribe.net](http://www.tribe.net), friendster. The value and content of connections. B, The who is who on the internet. Some fundamental properties of ego-centered networks. Operationalization of the content and intensity of relations. Survey analysis of social connections. Practical issues of network survey design. C, Discussion of individual research questions.

*Recommended reading:*

Wellman, B. and Wortley, S. 1990. Different Strokes from Different Folks: Community Ties and Social Support. *American Journal of Sociology*, 96: 558-588.

**3<sup>rd</sup> week:** A, Analysis of full networks. The “small world” hypothesis. Some basic descriptives of social networks. Paths, trails, walks, geodesics, distance. B, Representation of networks. Symmetrical and asymmetrical relations. Graphs and directed graphs. In-degree and out-degree. C, Discussion of individual research questions. Formulating hypotheses for small-scale research.

*Recommended readings:*

WF Chapters 4.2 and 4.3: 93-136.

Travers, J. and Milgram, S. 1969. The Experimental Study of the Small World Problem. *Sociometry*, 32(4): 425-443.

Dodds, P. S.; Muhamad, R., and Watts, D. J. 2003. An Experimental Study of Search in Global Social Networks. *Science*, 301(5634): 827-829.

Granovetter, M. 2003. Ignorance, Knowledge, and Outcomes in a Small World. *Science*, 301(5634): 773-774.

**4<sup>th</sup> week:** A, Matrix representation of social networks. Density, centrality, prestige, structural equivalence, homophily. B, Display of social networks with computer software (Netdraw). Introduction to software packages of social network analysis (UCINET, Pajek). Practical issues of obtaining network data. C, Formulating working hypotheses for individual research plans. Design of small-scale research.

*Recommended readings:*

WF Chapters 4.9 and 5: 150-164, 169-220.

**5<sup>th</sup> week:** A, The importance of theoretical approach in social network analysis. Causal explanations. C, Discussion of the fundamentals of individual research proposals. Debate on methodological issues. Finalization of small-scale research plans.

*Recommended readings:*

(Granovetter, M. 1979. The Theory-Gap in Social Network Analysis. In: Holland, P. W. and Leinhardt, S. (eds.): *Perspectives on Social Network Research*. New York, Academic Press.)

Wellman, Barry. 1997. Structural Analysis: From Method and Metaphor to Theory and Substance. Pp. 19-61 in *Social Structures: A Network Approach* edited by Wellman, B. and Berkowitz, S. D. Greenwich, CT: JAI Press.

**6<sup>th</sup> week:** A, Distinguished network forms. Bridges, brokerage, the strength of weak ties. The theory of structural holes. B, Assignments for calculating descriptive network statistics (e.g., density, betweenness centrality) with ready data files using software packages of social network analysis. The measurement of tie strength. C, Discussion of the fundamentals of

individual research proposals. Practical part of small-scale research (occasional field work).

*Recommended readings:*

Granovetter, M. 1973. The Strength of Weak Ties. *American Journal of Sociology*, 78: 1360-1380.

Burt, R. S. 1997. The Contingent Value of Social Capital. *Administrative Science Quarterly*, 42: 339-365.

Marsden, P. and Campbell, K. 1984. Measuring Tie Strength. *Social Forces* 63: 482-501.

**7<sup>th</sup> week:** A, Transitivity and social cohesion. Network closure. Structural balance theorems. Segregation and clustering in networks. B, From descriptive statistics towards explanation. Cycles and semicycles. The measurement of structural balance. Clustering in networks. Cliques, clans, clubs, LS-sets. C, Elaboration of individual research proposals. Practical part of small-scale research (occasional field work).

*Recommended readings:*

WF Chapters 6 and 10: 220-248, 394-424.

(Cartwright, D. and Harary, F. 1956. Structural Balance: A Generalization of Heider's Theory. *Psychological Review*, 63: 277-292.)

**8<sup>th</sup> week:** A, Innovation chains, the diffusion of innovations. B, Anthropological methods in social network analysis. Preparation and input of new data files into computer packages of social network analysis. C, Finalization of individual research proposals. Data input of small-scale research.

*Recommended readings:*

Coleman, J. S.; Katz, E., and Menzel, H. 1957. The Diffusion of Innovation among Physicians. *Sociometry*, 20: 253-270.

Valente, T. W. 2003. Network Models and Methods for Studying the Diffusion of Innovations. In: Carrington, P.; Wasserman, S., and Scott, J. (Eds.): *Recent Advances in Network Analysis*. Cambridge, MA, Cambridge University Press.

**9<sup>th</sup> week:** A, Games in networks. Embedded exchange. B, Experimental methods in social network analysis. C, Deadline for completion of individual research proposals. Analysis of the results of small-scale research.

*Recommended reading:*

Yamagishi, T. and Cook, K. S. 1993. Generalized Exchange and Social Dilemmas. *Social Psychology Quarterly*. 56: 235-48.

**10<sup>th</sup> week:** A, Excursion in other fields of social network analysis. Small presentations of readings from various topics. (Dynamic network models. Stability of networks. Network simulations. Gender and social networks. Sexual networks. Connections of the elite. Interlocking directorates. Snowball techniques in social network analysis. Deviant networks. Mafia and terrorist networks. The spread of HIV and other diseases.) B, Blockmodels. C, Discussion of individual research proposals. Deadline for completion of reports on small-scale research.

*Recommended reading:*

WF Chapter 16: 675-724.

**11<sup>th</sup> week:** A, Social impact. Simplified network models. Cellular networks. Strategic tie formation. Structural learning. B, Cellular networks and attractor neural networks at work. Advanced statistical analysis. Stochastic blockmodels.  $p^*$  models. C, Deadline for completion of corrected individual research proposals. Discussion of reports on small-scale research.

*Recommended readings:*

(Nowak, A.; Szamrej, J., and Latané, B. 1990. From Private Attitude to Public Opinion: A Dynamic Theory of Social Impact. *Psychological Review*, 97: 362-376.)

Kitts, J. A.; Macy, M. W., and Flache, A. 1999. Structural Learning: Attraction and Conformity in Task-oriented Groups. *Computational and Mathematical Organization Theory*, 5(2): 129-145.

<http://kentucky.psych.uiuc.edu/pstar/>

**12<sup>th</sup> week:** C, Evaluation of individual research proposals and reports on small-scale research.