

International Relations/Political Science Department

Academic year 2019–2020

Social Networks Theories and Methods

IRPS093 – Spring – 6 ECTS

Course Description

Networks represent the structure of relations among entities. Researchers of politics, sociology, economics, history, and law employ networks to analyse and model structures and the agency of actors to construct and change them. This introductory course aims to enable students to be discriminating consumers of network literature and advanced users of network techniques. We will learn core theories, measures, and models used in social and political networks, and discuss how networks are structured, change, and affect the entities they connect. Theory is matched with practical exercises conducted in R. No prior knowledge of R is required, though basic statistics (i.e. regression) is highly recommended.

PROFESSOR

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Syllabus

Course Summary

This survey course consists of two main sections. The first half of the course describes and analyses social networks, or what is called “network analysis”. The second half builds on this by exploring how we can explain network structures or other aspects of socio-political life and investigate relational mechanisms using networks, or what is called “network modelling”. The main lecture programme covers central concepts in the network literature and discusses how these concepts are theoretically motivated, methodologically operationalized, and applied. Various in-class exercises encourage familiarity and reflection on these concepts. In addition, a number of practical sessions (dates, times and room to be confirmed in the first week of class, but probably every second Wednesday from 16-18) will offer the opportunity to work through a script in R (so do bring your laptops). These scripts and practical exercises help connect the concepts discussed in the lecture to the homework assigned.

Course Evaluation

Evaluation for the course consists of three parts:

Reports (x3, 20% each) Following each of the first three practical sessions, an assignment will be given that requires students to practice applying the theory and methods learned to new datasets. Datasets and further instructions will be provided once the course begins.

Poster (40%) At the end of the course, students prepare and present posters summarising the results of analysing and modelling a relational dataset of the student’s choice. I encourage you to begin identifying a relevant dataset/research question early. We will provide consultancy sessions in week 13 to support your projects.

Course Materials

There is no required textbook for this course, however many of the books and journals contained in the remainder of the syllabus also hold additional or alternative readings that may be useful for deepening your understanding of network theory and/or methods in preparation for your presentations, the exam, and/or your own research. For an almost comprehensive overview of current topics, see:

Scott, John, and Peter J Carrington. 2011. *The SAGE Handbook of Social Network Analysis*. London: Sage Publications.

In terms of software, we will be using the free statistical software R. Don't worry if you haven't used R before, we will start from the basics. We will begin in the first lesson with getting acquainted with the software though, so make sure you bring your laptop with you, ideally with R (www.r-project.org) and RStudio (www.rstudio.com) already installed! For general support with the practical component of the course, see:

Kolaczyk, Eric D, and Gábor Csárdi. 2014. *Statistical Analysis of Network Data with R*. New York: Springer.

Course Policies

Auditing is possible, but auditors are expected to attend the course and fulfil all obligations associated with the course. Auditors' will receive feedback on their assignments, but no grades.

Grading is according to a 20 point scale. I reserve the right to rescale the final grades at the end of the course, but as a general guide a 10 is roughly a passing grade.

Plagiarism means presenting another's thoughts, ideas, or expressions as one's own, and is a breach of academic integrity that is **not tolerated at the Graduate Institute**. Students who present others' work as their own may receive a 0. Please cite appropriately and contact the TA if you have any doubts.

Course Schedule

Descriptive

Week 1 (18 Sep)

Suggested

Network Analysis

Networks, Or how to talk networks

Lazer, David. 2011. "Networks in Political Science: Back to the Future." *PS: Political Science & Politics* 44 (1): 61–68.

Prell, Christina. 2012. "A Brief History of Social Network Analysis" in *Social Network Analysis: History, Theory and Methodology*, 19–52. London: Sage.

Brandes, Ulrik, Garry Robins, Ann McCranie, and Stanley Wasserman. 2013. "What Is Network Science?" *Network Science* 1 (1): 1–15.

Week 2 (25 Sep)

Suggested

Relations, Or how to find networks

Mische, Ann. 2011. "Relational Sociology, Culture, and Agency." In *Sage Handbook of Social Network Analysis*, edited by John C Scott and Peter J Carrington, 80–97.

Robins, Garry L. 2015. "Thinking about networks: Research questions and study design" in *Doing Social Network Research: Network-based Research Design for Social Scientists*, 39–62. Sage.

Marsden, Peter. 2005. "Recent developments in network measurement" in *Models and Methods in Social Network Analysis*, ed. Peter Carrington, John Scott, and Stanley Wasserman, 8–30. Cambridge: Cambridge University Press.

Week 3 (2 Oct) <i>Suggested</i>	<p>Centrality, Or how to stand out</p> <p>Smith, Jason M, Daniel S Halgin, Virginie Kidwell-Lopez, Giuseppe Labianca, Daniel J Brass, and Stephen P Borgatti. 2014. "Power in Politically Charged Networks." <i>Social Networks</i> 36: 162–76.</p> <p>Fowler, James H. 2006. "Connecting the Congress: a Study of Cosponsorship Networks." <i>Political Analysis</i> 14 (4): 456–87.</p> <p>Brandes, Ulrik, Patrick N Kenis, Jörg Raab, Volker Schneider, and Dorothea Wagner. 1999. "Explorations Into the Visualization of Policy Networks." <i>Journal of Theoretical Politics</i> 11 (1): 75–106.</p>
Week 4 (9 Oct) <i>Suggested</i>	<p>Community, Or how to stand together</p> <p>Newman, Mark E J. 2011. "Communities, Modules and Large-Scale Structure in Networks." <i>Nature Physics</i> 8 (1): 25–31.</p> <p>Maoz, Zeev. 2006. "Network Polarization, Network Interdependence, and International Conflict, 1816–2002." <i>Journal of Peace Research</i> 43 (4): 391–411.</p> <p>Kadushin, Charles. 2012. "The Psychological Foundations of Social Networks" in <i>Understanding Social Networks: Theories, Concepts, and Findings</i>, 56–73. Oxford: Oxford University Press.</p>
Week 5 (16 Oct) <i>Suggested</i>	<p>Actors, Or how to get things</p> <p>Burt, Ronald S. 2004. "Structural Holes and Good Ideas." <i>The American Journal of Sociology</i> 110 (2): 349–99.</p> <p>Padgett, John F, and Christopher K Ansell. 1993. "Robust Action and the Rise of the Medici, 1400-1434." <i>The American Journal of Sociology</i> 98 (6): 1259–1319.</p> <p>Borgatti, Stephen P, and Martin G Everett. 1997. "Network Analysis of 2-Mode Data." <i>Social Networks</i> 19 (3): 243–69.</p>
Week 6 (23 Oct) <i>Suggested</i>	<p>Structures, Or how to share things</p> <p>Merton, Robert K. 1968. "The Matthew Effect in Science." <i>Science</i> 159 (3810): 56–63.</p> <p>Watts, Duncan J. 2004. "The 'New' Science of Networks." <i>Annual Review of Sociology</i> 30: 243–70.</p> <p>Graham, Erin R, Charles R Shipan, and Craig Volden. 2012. "The Diffusion of Policy Diffusion Research in Political Science." <i>British Journal of Political Science</i>, September, 1–29.</p>
Inferential Week 7 (30 Oct) <i>Suggested</i>	<p>Network Modelling</p> <p>Network Linear Models, Or how to model (weighted) networks</p> <p>McPherson, Miller, Lynn Smith-Lovin, and James M Cook. 2001. "Birds of a Feather: Homophily in Social Networks." <i>Annual Review of Sociology</i> 27: 415–44.</p> <p>Robins, Garry L, Jenny M Lewis, and Peng Wang. 2012. "Statistical Network Analysis for Analyzing Policy Networks." <i>Policy Studies Journal</i> 40 (3): 375–401.</p> <p>Lee, In Won, Richard C Feiock, and Youngmi Lee. 2012. "Competitors and Cooperators: A Micro-Level Analysis of Economic Development Networks." <i>Public Administration Review</i> 72 (2): 253–62.</p>
Week 8 (6 Nov)	–no class–

- Week 9 (13 Nov)** **Network Logistic Models, Or how to model (multilevel) networks**
Suggested
 Amati, Viviana, Alessandro Lomi, and Antonietta Mira. 2018. "Social Network Modeling." *Annual Review of Statistics and Its Application* 5 (1): 343–69.
 Koskinen, Johan, and Galina Daraganova. 2013. "Exponential Random Graph Model Fundamentals." In *Exponential Random Graph Models for Social Networks: Theory, Methods, and Applications*, 49–76. Cambridge: Cambridge University Press.
 Lubell, Mark, Garry L Robins, and Peng Wang. 2014. "Network Structure and Institutional Complexity in an Ecology of Water Management Games." *Ecology and Society* 19 (4): art23.
- Week 10 (20 Nov)** **Network Panel Models, Or how to model (longitudinal) networks**
Suggested
 Snijders, Tom A B, Gerhard G Van de Bunt, and Christian E G Steglich. 2010. "Introduction to Stochastic Actor-Based Models for Network Dynamics." *Social Networks* 32 (1): 44–60.
 Steglich, Christian E G, Tom A B Snijders, and Michael Pearson. 2010. "Dynamic Networks and Behavior: Separating Selection From Influence." *Sociological Methodology*, October, 329–93.
 Manger, Mark S, and Mark A Pickup. 2016. "The Coevolution of Trade Agreement Networks and Democracy." *Journal of Conflict Resolution* 60 (1): 164–91.
- Week 11 (27 Nov)** **Network Event Models, Or how to model (time-stamped) networks**
Suggested
 Lerner, Jürgen, Margit Bussman, Tom Snijders, and Ulrik Brandes. 2013. "Modeling Frequency and Type of Interaction in Event Networks." *Corvinus Journal of Sociology & Social Policy* 4 (1): 3–32.
 Stadtfeld, Christoph, James Hollway, and Per Block. 2017. "Dynamic Network Actor Models: Investigating Coordination Ties Through Time." *Sociological Methodology* 47: 1–40.
 Kitts, James A, Alessandro Lomi, Daniele Mascia, Francesca Pallotti, and Eric Quintane. 2017. "Investigating the Temporal Dynamics of Interorganizational Exchange: Patient Transfers Among Italian Hospitals." *American Journal of Sociology* 123 (3): 850–910.
- Week 12 (4 Dec)** **Review**
- Week 13 (11 Dec)** **Consultations**
- Week 14 (18 Dec)** **Posters**

– This syllabus is subject to change –