

Social Network Analysis

POS 6933, Sect. 5008

Department of Political Science
University of Florida
Spring 2007

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Time: Class Meets on Wednesdays, 6:15pm-9:00pm (periods 11-E2)
Location: Anderson 216

- This course counts toward the requirements of the political methodology field in the Department of Political Science.
- This course counts toward the requirements of the Social Science Methodology Graduate Certificate Program.

COURSE DESCRIPTION

Traditional social science methodologies focus on the attitudes, decision-making, and behavior of individual actors, such as consumers, voters, legislators, executives, judges, courts, firms, non-profit organizations, interest groups, and nation-states. These methodologies generally examine how variations in the qualities of individuals affect some characteristic of interest. For example, how does a nation-state's form of government affect the likelihood that it will wage war on its neighbors? Or, how does a citizen's level of education affect her or his propensity to vote in elections? Or, how does a state legislature's partisan balance affect the chances that it passes a constitutional amendment to ban same-sex marriage?

Social network analysis moves beyond the methodological individualism that lies at the heart of much social-scientific research. It begins with the assumption that individual actors are constructed through relationships with other social actors. Without abandoning the individual as a unit of analysis, network analysis introduces the relational dyad as a basic unit of analysis. From the dyad, the properties of triads, networks, and broader social contexts can be modeled. Network analysis allows social scientists to explore questions such as, how do interwoven patterns of marriage, business, and political alliances affect the emergence of new forms of government? Or, how do teenagers'

friends affect the timing of first intercourse? Or, which job applicants are most likely to find a job and to get promoted once they do? Or, which kinds of institutions protect sensitive information most effectively?

Social network analysis is an interdisciplinary approach to research. Its original practitioners came from diverse fields, such as anthropology, sociology, psychology, political science, biology, and physics. Applications of network analysis have broadened in recent years to include fields such as management, economics, education, and neuroscience.

The course begins by considering the theoretical scope of network analysis and by exploring the development of the field over time. Second, it explicates the methodological foundations of network analysis, including the collection of data, formal models of network structure, and methods of statistical analysis. Third, it surveys several of the major problems addressed by network research, including the small world problem, vacancy chains, embeddedness, brokerage, social capital, multiplexity, and dynamics. Finally, the course concludes by examining applications of network analysis to international politics, political behavior, legislatures, and public policy. The objectives of the course are achieved through a mix of lectures, seminars, computer laboratories, short memos, and a capstone assignment that requires students to design or conduct a research project using network analysis. The course is taught at the introductory graduate level, so there are no prerequisites other than admission to graduate standing. Prior knowledge of statistics is not assumed.

COURSE REQUIREMENTS

1. *Attendance and Active Participation* (20% of the course grade). Students are expected to attend all sessions of the course and to be prepared to offer informed commentary during class discussions. Please show up with printed copies of the assigned readings in hand so that you can refer to them if necessary. The reason you are attending classes in person – as opposed taking an on-line seminar – is in order to interact directly with the professor and your colleagues. These interactions are vital to the learning process and will be weighted appropriately in determining your final course grade.
2. *Lab Reports* (15% of the course grade). Students are expected to write short lab reports corresponding to the six computer laboratories held in class. Lab reports are due at 5pm on the Tuesday preceding the class. Upload to www.turnitin.com, Class ID: 1781136, Password: Networks.
3. *Reading Memos* (15% of the course grade). During the weeks when lab reports are not due, students are expected to submit a 500-word summary and critique of the readings for the week. Memos are due at 5pm on the Tuesday preceding the class. Upload to www.turnitin.com, Class ID: 1781136, Password: Networks.

4. *Final Paper* (50% of the course grade). Recognizing that different students are entering this class as varied stages of their academic careers, three options are available for the capstone assignment:
 - A. *Research Design*. Students may write a research design of approximately twenty-five pages in length, modeled on a dissertation prospectus. The design should identify a problem amenable to network analysis and explain how network analysis could be expected to lead to a theoretical advance over the extant literature. The design should elaborate a particular network model, outline data collection procedures, and address potential threats to the validity of the design. Students are not expected to carry out the research, but the research should be on a scale that it could be carried out within a two-year period. An excellent research design is one that, if carried out, would likely lead to an important contribution to knowledge within the student's chosen field. Students may propose research in any academic discipline within which they have formal graduate training including, but not limited to, political science, anthropology, sociology, psychology, business, economics, education, criminology, biology, or physics.
 - B. *Original Data Collection and Analysis*. Students may write an original research paper, formatted based on the submission requirements of a specific journal of their choosing (e.g., *Social Networks*, *American Journal of Sociology*, *Administrative Science Quarterly*). The paper should develop a network theory and hypotheses, collect appropriate original network data, and conduct tests of the hypotheses using accepted network methods. An excellent paper is one that would stand a reasonable chance of receiving an offer to "revise and resubmit" to the selected journal.
 - C. *Advanced Replication and Extension*. Students may write a paper that reanalyzes the data collected by another researcher. It is expected that the reanalysis will both replicate the original findings correctly and conduct new analysis using advanced network methods. The methods utilized in this paper should extend beyond those taught in the course. The findings should be presented in two parts. First, the student should complete an extensive report that documents all of the data analysis and offers a persuasive interpretation of those data. Second, the student should complete a short paper (10-15 pages) that could be published as research note in a professional journal. An excellent paper is one that demonstrates a deep understanding of social network methodology through an innovative and carefully executed study.
5. *E-mail*. Students are expected to provide the professor with an e-mail address that they check regularly. Announcements or updates may be sent to the class via e-mail.

REQUIRED READINGS

Students are expected to read carefully all of the readings listed below in the course outline. The various recommended methods of obtaining the readings are listed in brackets []. Some readings will be available for purchase and others may be downloaded through the University of Florida libraries.

1. *Books for purchase* at UF-affiliated bookstores
 - John Scott. 2000. *Social Network Analysis: A Handbook*, Second Edition. London: Sage Publications.
 - Duncan J. Watts. 2003. *Six Degrees: The Science of a Connected Age*. New York: W.W. Norton and Company.
 - Linton C. Freeman. 2004. *The Development of Social Network Analysis: A Study in the Sociology of Science*. Vancouver, BC, Canada: Empirical Press.
 - Ronald S. Burt. 2005. *Brokerage and Closure: An Introduction to Social Capital*. New York: Oxford University Press.
2. *A required reading packet* will be handed out by the instructor on the first day of class.
3. *All other readings are available on-line* through the University of Florida libraries.

COMPUTER SOFTWARE

Computer laboratory assignments will make use of the following software, all of which is downloadable for free on the Internet:

1. Ucinet: <http://www.analytictech.com/downloaduc6.htm> [A free copy of UCINET may be downloaded and used for 30 days. For longer use, individual students must pay \$40.00 per copy, which is highly recommended.]
2. Pajek: <http://vlado.fmf.uni-lj.si/pub/networks/book/>
3. SoNIA: <http://www.stanford.edu/group/sonia/>

POLICY ON AUDITING

Auditing the course is not permitted. Students who are interested in the material of the course are strongly encouraged to register to take the course for credit.

ACADEMIC HONESTY

All students are required to abide by the Academic Honesty Guidelines of the University of Florida. Among other things, this means: (1) Students must submit only their own, original work in fulfillment of course requirements; (2) Consulted works must be cited using an accepted documentation style; and (3) Students must provide truthful representations to the professor on issues such as reasons for missing class. Violating this policy may cause a student to suffer severe grade penalties, failure of the class, academic probation, or expulsion from the university.

MISCELLANEOUS

1. The use of wireless communication devices (such as cell phones or pagers) during class is prohibited, unless specifically authorized by the professor. Please turn them off. (Do not put your cell phone on “vibrate.”) The professor reserves the right to confiscate devices operating in violation of this policy.
2. Students requiring any special accommodation for this course are responsible for making an appointment to see the professor at the beginning of the semester. Every effort will be made to meet your needs in accordance with University guidelines.
3. The lectures and handouts of this course are the intellectual property of the professor. You do not have the right to sell your notes or recordings from this class for profit without the express written consent of the professor. No recording devices are permitted in class without the consent of the professor.

Course Outline

PART I. FROM INDIVIDUALS TO DYADS, TRIADS, AND BEYOND

1. January 10: The Logic and Applications of Network Analysis
2. January 17: Relational Theories, Organizations, and Networks
 - Georg Simmel. 1955. "The Web of Group-Affiliations." In Kurt H. Wolff and Reinhard Bendix (trans.), *Conflict and the Web of Group-Affiliations*, pp. 125-195. New York: The Free Press. [HANDOUT]
 - Mustafa Emirbayer. 1997. "Manifesto for a Relational Sociology." *American Journal of Sociology*, Vol. 103, No. 2 (September): 281-317. [J-STOR]
 - Joel M. Podolny and Karen L. Page. 1998. "Network Forms of Organization." *Annual Review of Sociology*, Vol. 24: 57-76. [J-STOR]
 - Joel M. Podolny. 2001. "Networks as the Pipes and Prisms of the Market." *American Journal of Sociology*, Vol. 107, No. 1 (July): 33-60. [LIBRARY ON-LINE]
 - Edward O. Laumann. 2006. "A 45-year Retrospective on Doing Networks." *Connections*, Vol. 27, No. 1: 65-90. [LIBRARY ON-LINE]
 - MEMO #1 DUE
3. January 24: The Network Construction of Social Network Analysis
 - John Scott. 2000. *Social Network Analysis: A Handbook*, Second Edition. London: Sage Publications. Chapters 1-2. [PURCHASE]
 - Linton C. Freeman. 2004. *The Development of Social Network Analysis: A Study in the Sociology of Science*. Vancouver, BC, Canada: Empirical Press. [PURCHASE]
 - MEMO #2 DUE

PART II. METHODOLOGICAL FOUNDATIONS

4. January 31: Relational Data: Conceptualization, Collection, and Computation
 - Edward O. Laumann, Peter V. Marsden, and David Prensky. 1989. "The Boundary Specification Problem in Network Analysis." In Linton C. Freeman, Douglas R. White, and A. Kimball Romney (eds.), *Research Methods in*

Social Network Analysis, pp. 61–87. Fairfax, VA: George Mason University Press. [HANDOUT]

- Peter V. Marsden. 1990. “Network Data and Measurement.” *Annual Review of Sociology*, Vol. 16: 435-463. [J-STOR]
- John Scott. 2000. *Social Network Analysis: A Handbook*, Second Edition. London: Sage Publications. Chapter 3. [PURCHASE]
- Peter V. Marsden. 2005. “Recent Developments in Network Measurement.” In Peter J. Carrington, John Scott, and Stanley Wasserman (eds.), *Models and Methods in Social Network Analysis*, pp. 8-30. New York: Cambridge University Press. [HANDOUT]
- LABORATORY #1: Data Entry and Manipulation
- MEMO #3 DUE

5. February 7: Points, Graphs, and Centrality

- Linton C. Freeman. 1979. “Centrality in Social Networks: I. Conceptual Clarification.” *Social Networks*, Vol. 1: 215 – 239. [LIBRARY ON-LINE]
- Phillip Bonacich. 1987. "Power and Centrality: A Family of Measures." *American Journal of Sociology*, Vol. 92, No. 5 (March): 1170-82. [J-STOR]
- John Scott. 2000. *Social Network Analysis: A Handbook*, Second Edition. London: Sage Publications. Chapters 4-5. [PURCHASE]
- LABORATORY #2: Competing Measures of Centrality
- LAB REPORT #1 DUE

6. February 14: Cliques, Roles, and Positions

- Harrison C. White, Scott A. Boorman, and Ronald L. Breiger. 1976. “Social Structure from Multiple Networks I: Blockmodels of Roles and Positions.” *American Journal of Sociology*, Vol. 81, No. 4 (January): 730-781. [J-STOR]
- Ronald S. Burt. 1987. “Social Contagion and Innovation: Cohesion versus Structural Equivalence.” *American Journal of Sociology*, Vol. 92, No. 6 (May): 1287-1335. [J-STOR]
- John Scott. 2000. *Social Network Analysis: A Handbook*, Second Edition. London: Sage Publications. Chapters 6-8. [PURCHASE]

- LABORATORY #3: The Diffusion of Innovations
- LAB REPORT #2 DUE

PART III. PROBLEMS IN NETWORK ANALYSIS

7. February 21: Complexity and the Small World Problem

- Jeffrey Travers and Stanley Milgram. 1969. "An Experimental Study of the Small World Problem." *Sociometry*, Vol. 32, No. 4 (December): 425-443. [J-STOR]
- Duncan J. Watts. 2003. *Six Degrees: The Science of a Connected Age*. New York: W.W. Norton and Company. [PURCHASE]
- Peter D. Killworth, Christopher McCarty, H. Russell Bernard, and Mark House. 2006. "The accuracy of small-world chains in social networks." *Social Networks*, Vol. 28:85–96. [LIBRARY ON-LINE]
- LAB REPORT #3 DUE

8. February 28: Affiliation / Vacancy Chains

Affiliation

- Ronald L. Breiger. 1974. "The Duality of Persons and Groups." *Social Forces*, Vol. 53:181-90. [J-STOR]
- Stephen P. Borgatti and Martin Everett. 1997. "Network Analysis of 2-Mode Data." *Social Networks*, Vol. 19: 243-269. [LIBRARY ON-LINE]
- J. Miller McPherson, Lynn Smith-Lovin, and James Cook. 2001. "Birds of a Feather: Homophily in Social Networks." *Annual Review of Sociology*, Vol. 27: 415-444. [LIBRARY ON-LINE]

Vacancy Chains

- Ivan D. Chase. 1980. "Social Process and Hierarchy Formation in Small Groups: A Comparative Perspective." *American Sociological Review*, Vol. 45, No. 6 (December): 905-924. [J-STOR]
- John F. Padgett. 1990. "Mobility as Control: Congressmen through Committees." In Ronald L. Breiger (ed.), *Social Mobility and Social Structure*. New York: Cambridge University Press. [http://home.uchicago.edu/%7ejpadgett/papers/published/mobil.pdf]

- Ivan D. Chase. 1991. "Vacancy Chains." *Annual Review of Sociology*, Vol. 17: 133-154. [J-STOR]
- LABORATORY #4: Analyzing Multimodal Data
- MEMO #4 DUE

9. March 7: Weak Ties, Strong Ties, and Embeddedness

- Mark S. Granovetter. 1973. "The Strength of Weak Ties." *American Journal of Sociology*, Vol. 78, No. 6 (May): 1360-1380. [J-STOR]
- Mark Granovetter. 1985. "Economic Action and Social Structure: The Problem of Embeddedness." *American Journal of Sociology*, Vol. 91, No. 3 (November): 481-510. [J-STOR]
- Wayne E. Baker and Robert R. Faulkner. 1993. "The Social Organization of Conspiracy: Illegal Networks in the Heavy Electrical Equipment Industry." *American Sociological Review*, Vol. 58, No. 6 (December): 837-860. [J-STOR]
- Brian Uzzi. 1997. "Social Structure and Competition in Interfirm Networks: The Paradox of Embeddedness." *Administrative Science Quarterly*, Vol. 42, No. 1 (March): 35-67. [J-STOR]
- Ranjay Gulati and Martin Gargiulo. 1999. "Where Do Interorganizational Networks Come From?" *American Journal of Sociology*, Vol. 104, No. 5 (March): 1439-1493. [J-STOR]
- Gwendolyn K. Lee. 2007. "The Significance of Network Resources in the Race to Enter Emerging Product Markets: The Convergence of Telephony Communications and Computer Networking." *Strategic Management Journal*, Vol. 28, No. 1 (January): 17-37.
- LABORATORY #5: Regression Analysis of Network Data
- LAB REPORT #4 DUE

10. March 21: Brokerage and Social Capital

- Ronald S. Burt. 2005. *Brokerage and Closure: An Introduction to Social Capital*. New York: Oxford University Press. [PURCHASE]
- LAB REPORT #5 DUE

11. March 28: Multiplexity

- Lois M. Verbrugge. 1979. "Multiplexity in Adult Friendships." *Social Forces*, Vol. 57, No. 4 (June): 1286-1309. [J-STOR]
- Ronald S. Burt. 1980. "Cooptive Corporate Actor Networks: A Reconsideration of Interlocking Directorates Involving American Manufacturing." *Administrative Science Quarterly*, Vol. 25, No. 4 (December): 557-582. [J-STOR]
- Roger V. Gould. 1991. "Multiple Networks and Mobilization in the Paris Commune, 1871." *American Sociological Review*, Vol. 56, No. 6 (December): 716-729. [J-STOR]
- John F. Padgett and Christopher K. Ansell. 1993. "Robust Action and the Rise of the Medici, 1400-1434." *American Journal of Sociology*, Vol. 98, No. 6 (May): 1259-1319. [J-STOR]
- John F. Padgett and Paul D. McClean. 2006. "Organizational Invention and Elite Transformation: The Birth of Partnership Systems in Renaissance Florence." *American Journal of Sociology*, Vol. 111, No. 5 (March): 1463-1568. [LIBRARY ON-LINE]
- MEMO #5 DUE

12. April 4: Dynamics

- Walter W. Powell, Douglas R. White, Kenneth W. Koput, and Jason Owen-Smith. 2005. "Network Dynamics and Field Evolution: The Growth of Interorganizational Collaboration in the Life Sciences." *American Journal of Sociology*, Vol. 110, No. 4 (January): 1132-1205. [LIBRARY ON-LINE]
- James Moody, Daniel McFarland, and Skye Bender DeMoll. 2005. "Dynamic Network Visualization." *American Journal of Sociology*, Vol. 110, No. 4 (January): 1206-1241. [LIBRARY ON-LINE]
- David Stark and Balazs Vedres. 2006. "Social Times of Network Spaces: Network Sequences and Foreign Investment in Hungary." *American Journal of Sociology*, Vol. 111, No. 5 (March): 1367-1411. [LIBRARY ON-LINE]
- LABORATORY #6: Network Movies
- MEMO #6 DUE

PART IV. APPLICATIONS IN POLITICAL SCIENCE

13. April 11. International Politics (This session will be rescheduled due to an out of town trip. We do our best to find a time convenient for everyone.)

- Christopher K. Ansell, Craig Parsons, and Keith Darden. 1997. "Dual Networks in the European Union." *Journal of Common Market Studies*, Vol. 35, No. 3 (September): 347-375. [LIBRARY ON-LINE]
- Patrick Thaddeus Jackson and Daniel H. Nexon. 1999. "Relations Before States: Substance, Process and the Study of World Politics." *European Journal of International Relations*, Vol. 5, No. 3 (September): 291-332. [LIBRARY ON-LINE]
- Christopher K. Ansell. 2000. "The Networked Polity: Regional Development in Western Europe." *Governance*, Vol. 13, No. 3 (July): 303-333. [LIBRARY ON-LINE]
- David M. J. Lazer. 2005. "Regulatory Capitalism as a Networked Order: The International System as an Informational Network." *Annals of the American Academy of Political and Social Science*, Vol. 598, No. 1 (March): 52-66. [LIBRARY ON-LINE]
- Emilie M. Hafner-Burton and Alexander H. Montgomery. 2006. "Power Positions: International Organizations, Social Networks, and Conflict." *Journal of Conflict Resolution*, Vol. 50, No. 1 (February): 3-27. [LIBRARY ON-LINE]
- LAB REPORT #6 DUE

14. April 18. Public Opinion, Voting Behavior, and Political Participation

- Ada W. Finifter. 1974. "The Friendship Group as a Protective Environment for Political Deviants." *American Political Science Review*, Vol. 68, No. 2 (June): 607-625. [J-STOR]
- Heinz Eulau. 1980. "The Columbia Studies of Personal Influence: Social Network Analysis." *Social Science History*, Vol. 4, No. 2 (Spring): 207-228. [J-STOR]
- Robert Huckfeldt and John Sprague. 1987. "Networks in Context: The Social Flow of Political Information." *American Political Science Review*, Vol. 81, No. 4. (December): 1197-1216. [J-STOR]

- Diana C. Mutz. 2002. "The Consequences of Cross-Cutting Networks for Political Participation." *American Journal of Political Science*, Vol. 46, No. 4 (October): 838-855. [J-STOR]
- Scott D. McClurg. 2006. "The Electoral Relevance of Political Talk: Examining the Effect of Disagreement and Expertise in Social Networks on Political Participation." *American Journal of Political Science*, Vol. 50, No. 3 (July): 737-54. [LIBRARY ON-LINE]
- MEMO #7 DUE

15. April 25. Legislative Politics and Public Policy

- John P. Heinz, Edward O. Laumann, Robert H. Salisbury, and Robert L. Nelson. 1990. "Inner Circles or Hollow Cores? Elite Networks in National Policy Systems." *Journal of Politics*, Vol. 52, No. 2 (May): 356-390. [J-STOR]
- Mark Schneider, John Schloz, Mark Lubell, Denisa Mindruta, and Matthew Edwardson. 2003. "Building Consensual Institutions: Networks and the National Estuary Program." *American Journal of Political Science*, Vol. 47, No. 1 (January): 143-158. [LIBRARY ON-LINE]
- H. Brinton Milward and Keith G. Provan. 2003. "Managing the Hollow State: Contracting and Collaboration." *Public Management Review*, Vol. 5, No. 1 (March): 1-18. [LIBRARY ON-LINE]
- Daniel P. Carpenter, Kevin M. Esterling, and David M. J. Lazer. 2004. "Friends, Brokers, and Transitivity: Who Informs Whom in Washington Politics." *Journal of Politics*, Vol. 66, No. 1 (February): 224-246. [LIBRARY ON-LINE]
- James H. Fowler. 2006. "Legislative Cosponsorship Networks in the U.S. House and Senate." *Social Networks*, Vol. 28, No. 4 (October): 454-465. [LIBRARY ON-LINE]
- Michael T. Heaney. 2006. "Brokering Health Policy: Coalitions, Parties, and Interest Group Influence." *Journal of Health Politics, Policy and Law*, Vol. 31, No. 5 (October): 887-944. [LIBRARY ON-LINE]
- MEMO #8 DUE

16. May 3. RESEARCH DESIGN DUE at 11:55pm. Submit to www.turnitin.com, Class ID: 1781136, Password: Networks.