

# **SOCIAL NETWORKS: THEORY, METHODS AND APPLICATIONS**

SOCI 398/898-001

Spring (Jan 12, 2015–May 8, 2015)

Tuesday, Thursday 2:00 PM – 3:15 PM

Teachers College 247

University of Nebraska-Lincoln

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Office Hours: Tuesday 3:30 – 5:30 PM or by appointment

“To speak of social life is to speak of the association between people – their associating in work and in play, in love and in war, to trade or to worship, to help or to hinder. It is in the social relations men establish that their interests find expression and their desires become realized.”

Peter M. Blau *Exchange and Power in Social Life*, 1964

“For the last thirty years, empirical social research has been dominated by the sample survey. But as usually practiced, . . . , the survey is a sociological meat grinder, tearing the individual from his social context and guaranteeing that nobody in the study interacts with anyone else in it. It is a little like a biologist putting his experimental animals through a hamburger machine and looking at every hundredth cell through a microscope; anatomy and physiology get lost, structure and function disappear. . . . If our aim is to understand behavior rather than simply record it, we want to know about primary groups, neighborhoods, organizations, social circles, and communities; about interaction, communication, role expectations, and social control.”

Barton 1968, quoted from Freeman 2004

## **Course Overview**

Network analysis is the “study of interaction among social actors” (Freeman 2004). Network analysis has a long history in sociology and anthropology and has experienced a dramatic increase in popularity over the last 15 years. Network techniques are now utilized by a wide range of academic disciplines (including sociology, anthropology, physics, biology, computer science, economics, political science, etc.), as well as by some of the most successful companies in the world (amazon, twitter, google. . .).

This class offers an introduction to the theoretical, methodological and substantive underpinnings of social network analysis. Network analysis is a unique approach as the focus is on the relationships connecting actors, rather than on the properties of the actors themselves. At its core, network analysis is an approach for studying the social world that recognizes: a) that actors are interdependent, that the behavior of one actor cannot be understood in isolation; and b) that a social system can not be understood based on isolated individual actors-that the whole is larger than the sum of its parts. Just as we cannot understand how an engine works by laying out the pieces of the engine, we cannot understand how the social world works by studying individuals. The key is how the pieces (or actors) are *connected*.

The class combines theory, methods and substantive applications. The substantive topics are varied and are subject to change, depending on the interests of the class. At minimum, we will cover issues of disease spread, delinquent behavior, power/status, friendship, getting a job, organizational affiliations, and cultural consumption.

Overall, there are three main objectives:

- a) learn the theoretical/conceptual ideas at the heart of the network approach
- b) learn how to analyze and interpret network data using R, a statistical language and platform
- c) learn how to apply network ideas and methods to substantive, social problems.

### **Prerequisites**

There are no formal prerequisites for this class. I will make no assumptions about your mathematical or programming background. You must, however, be willing to learn a little bit of matrix algebra, graph theory and R programming.

### **Readings**

I will often list more papers than we will actually have time to discuss. I hope this will provide you with a good reference list, although I do not necessarily expect you to read every paper for every week (although you are welcome to do so). I have listed the core readings for each week separately from the supplemental readings. You are expected to have read the core readings before class that day.

### **Format of the class**

The class will be a mix of lectures, discussion and labs. It is important that you read the material prior to class. This will ensure that we can have an interesting, dynamic discussion. This is especially important for days where we go over substantive applications. The lectures on these days will be short as I want to allow for a free flowing discussion about the articles. In general, you are expected to be engaged with the material and the class. This means that you should be on time to class, should be not engaged in distracting behavior (e.g. texting), should ask and answer questions, etc. You are also expected to be an active participant during the labs, where we will learn how to apply the ideas presented in class to actual data. The labs will use R to analyze actual network data. The labs will (hopefully) be held in our normal classroom. On such days you must bring a laptop with R installed on it (or be able to remotely connect to a computer with R on it). During the labs you will be given the opportunity to try your hand at an open-ended exercise. You will apply the skill and ideas discussed in class to a particular example. I will then post the answer (or at least my answer) to the problem posed in class the next week.

### **Text and Software**

There are two main textbooks for the class:

Kadushin, Charles. 2011. *Understanding Social Networks: Theories, Concepts, and Findings*: Oxford University Press, USA.

Wasserman, Stanley and Katherine Faust. 1994. *Social Network Analysis: Methods and Applications*. Cambridge: Cambridge University Press.

These books can be found online for a reasonable price. The remaining reading will come from journal articles and will be posted on blackboard.

The class will make heavy use of [R](#). R is a *free* programming/statistical platform. It works on windows, mac and linux platforms. You are required to have R installed on your computer. You are also required to have a laptop that you can bring to class on lab days.

## **Grading**

*Participation: 20%*

This is a graduate level course and in-class participation is crucial for the class.

*Weekly Response Pieces: 20%*

You will have to write weekly (or so) write-ups in response to the readings assigned for that day. These weekly responses should only be 1 page in length. They are designed for you to think through the readings and to come into class having something to say. This is your opportunity to decide what is interesting about the material and to shape the discussion in the class. This should (ideally) make the in-class discussion smoother. These are not summaries of the articles per se (although you may quickly summarize things if you like) but rather reactions to the articles. You may respond as you feel fit, but here are a number of possible questions you may address in the course of the response:

- What did you find most interesting, challenging or confusing about the article?
- How does the main thrust of the article fit (or not fit) with your own research?
- What did you disagree with in the article?
- Can you think of another substantive or empirical setting where the argument of the article could be applied?

You can respond to all of the articles for the day or focus on one. I will not accept late response papers as they are designed to facilitate in-class discussion. Accepting the papers after the class would defeat that purpose. They are also not a substitute for missing class.

*Research Paper: 50% for actual research paper; 10% for initial submission of results and summary of project*

The main assignment in the course is a research paper, in which you perform an empirical analysis on real network data and write up the results. The research paper must include: an introduction with a substantive/theoretical justification for the project; an analysis of network data; a summary of results; and a conclusion. The hope is that this will be a start to a publishable paper. The paper is due during the scheduled final for the class.

You will also be required to turn in some initial results and a summary of the project a month before the actual paper is due. This is designed to ensure that you are making sufficient progress.

You must include a visualization of the network, summary measures, and a 3 page intro/summary of the project.

I leave it you to decide what question you want to answer, what data you would like to use, etc., but you must get my approval for the project before you begin. I can also help you find data and a research question if you are struggling on your own. We will discuss the researcher paper in more detail during class, including a discussion of possible data sources.

### **Key Dates**

Jan 20: 1 page response paper due (this can be in response to the background readings or the readings on data and measurement)

Jan 27: 1 page response paper due

Feb 12: 1 page response paper due

Feb 17: 1 page response paper due

Feb 26: 1 page response paper due

Mar 3: Deadline for getting my approval for your proposed research project. After this date, I will take 1% off your final grade everyday until you discuss your proposed project with me.

Mar 5: 1 page response paper due

Mar 17: 1 page response paper due

Apr 2: Parts of research paper due: visualization of network, summary measures and (at least) 3 page written summary of the project.

Apr 7: 1 page response paper due

Apr 16: 1 page response paper due

Apr 23: 1 page response paper due

May 4 at 3 pm: Final paper is due

### **Course policies**

Academic Misconduct (or Don't Cheat):

“The maintenance of academic honesty and integrity is a vital concern of the University community. Any student found guilty of academic dishonesty shall be subject to both academic and disciplinary sanctions. Academic dishonesty includes, but is not limited to, the following:

Cheating; Fabrication or Falsification; Plagiarism; Abuse of Academic Materials; Complicity in Academic Dishonesty; Falsifying Grade Reports; Misrepresentation to Avoid Academic Work.”  
Quoted from the UNL Student Code of Conduct

### **Disabilities**

“It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the [Services for Students with Disabilities \(SSD\) office](#), 132 Canfield Administration, 472-3787 voice or TTY.”

If you need accommodations it is your responsibility to discuss this with me early on in the semester.

### **Paper Policy**

The research paper must be turned in by the end of the official exam period for the class, stipulated by the university (May 4). There will be no papers accepted after the fact unless there are extraordinary circumstances and the student has received permission from me to turn in the paper late.

### **Course Schedule (subject to change)**

#### **Day 1: Introduction to the Class and Network Analysis (Jan 13)**

#### **Day 2: Background and Motivation for Network Analysis (Jan 15)**

#### *Required Readings*

\*Wasserman & Faust: Chapter 1

\*Kadushin: Chapter 1

\*Borgatti et al. 2009. “Network Analysis in the Social Sciences” *Science* 323, 892

#### *Supplementary Readings*

Borgatti, Stephen P., and Pacey C. Foster. "The network paradigm in organizational research: A review and typology." *Journal of management* 29.6 (2003): 991-1013.

Brown , Radcliff. 1940. "On Social Structure." *Journal of the Royal Anthropological Society of Great Britain and Ireland*. 70:1-12

Butts, Carter T. 2009. “Revisiting the Foundations of Network Analysis” *Science* 325, 414

Emirbayer, M. 1997. "Manifesto for Relational Sociology." *American Journal of Sociology* 103:281-317.

Freeman, Linton. *The Development of Social Network Analysis*

Mayhew, Bruce H. 1980. "Structuralism versus Individualism: Part 1, Shadow Boxing in the Dark." *Social Forces* 59:335-375.

Wellman, Barry. 1988. "Structural Analysis: From Method and Metaphor to Theory and Substance. *Social Structures: A Network Approach*." Cambridge, England: Cambridge University Press.

### Day 3: Data and Definitions (Jan 20)

#### *Required Readings*

\*Wasserman & Faust: Chapter 2

\*Kadushin: Chapter 2

\*Lazer, et al. 2009. "Computational Social Science." *Science* 323:721-723.

\*Marsden, P.V. 1990. "Network data and measurement." *Annual Review of Sociology* 16:435-63

#### *Supplementary Readings*

Lewis, Kevin, Jason Kaufman, Marco Gonzalez, Andreas Wimmer, and Nicholas Christakis. 2008. "Tastes, Ties, and Time: A New Social Network Dataset using Facebook.com." *Social Networks* 30: 330-342.

Marsden, Peter V. 2005. "Recent Developments in Network Measurement." Pp. 8-30 in *Models and Methods in Social Network Analysis*, edited by Carrington, Peter J., John Scott, and Stanley Wasserman. New York: Cambridge University Press.

McPherson, J. Miller, Lynn Smith-Lovin, and Matthew E. Brashears. 2006. "Social Isolation in America: Changes in Core Discussion Networks over Two Decades." *American Sociological Review* 71(3): 353-375.

Merli, Giovanna M, James Moody, Jeffrey A. Smith, Jing Lie, Sharon Weir, Xiangsheng Chene. 2014. "Challenges to Recruiting Population Representative Samples of Female Sex Workers in China Using Respondent Driven Sampling." *Social Science & Medicine*.

Moody, James, Wendy D. Brynildsen, D. Wayne Osgood, Mark E. Feinberg, and Scott Gest. 2011. "Popularity trajectories and substance use in early adolescence." *Social Networks* 33:101-112.

Eagle et al. 2010. "Network Diversity and Economic Development" *Science* 2010, 328: 1029-1031

Eagle et al. 2009. "Inferring Social Network Structure using Mobile Phone Data", *Proceedings of the National Academy of Sciences (PNAS)*, 106(36), pp. 15274-15278

Smith, Jeffrey A. 2012. "Macrostructure from Microstructure: Generating Whole Systems from Ego Networks." *Sociological Methodology* 42:155-205

Tamburrini, Nadine, Marco Cinnirella, Vincent A. A. Jansen, and John Bryden. 2015. "Twitter users change word usage according to conversation-partner social identity." *Social Networks* 40:84-89.

### Day 4: Matrix and Graph Representations of Networks and Simple Measures (Jan 22)

#### *Required Readings*

\*Wasserman and Faust Ch 3&4

\*Kadushin Chapters Ch 2&3

#### *Supplementary Readings*

Bradley, Ian, Meek Ronald L., 1986 *Matrices and Society*. Pelican. Ch 1-2

Hanneman, Robert A. and Mark Riddle. 2005. Introduction to social network methods. Riverside, CA: University of California, Riverside [Chapter 5](#)

Healy, Kieran and James Moody. 2014. "Data Visualization in Sociology." *Annual Review of Sociology* 40:105-128

### **Day 5: Simple Network Measures Continued: Centrality (Jan 27)**

#### *Required Readings*

\*Wasserman and Faust Ch 5

\*Borgatti, Stephen P. 2005. "Centrality and Network Flow." *Social Networks* 27:55-71.

\*Rothenberg, R. B et al. 1995. "Choosing a Centrality Measure: Epidemiologic Correlates in the Colorado Springs Study of Social Networks." *Social Networks: Special Edition on Social Networks and Infectious Disease: HIV/AIDS* 17:273-97.

#### *Supplementary Readings*

Baker, W. E. and R. R. Faulkner. 1993. "The Social Organization of Conspiracy: Illegal Networks in the Heavy Electrical Equipment Industry." *American Sociological Review* 58:837-60.

Bonacich, P. 1987. "Power and Centrality: A Family of Measures." *American Journal of Sociology* 92:1170-1182.

Borgatti & Everett. 2006. "A Graph-theoretic perspective on centrality" p466-484 *Social Networks*

Freeman, Linton. 1977. "A set of measures of centrality based on betweenness". *Sociometry* 40: 35–41. doi:10.2307/3033543.

Freeman, Linton C. 1979. "Centrality in Social Networks: Conceptual Clarification." *Social Networks* 1:215-239.

Rossman, Gabriel, Nicole Esparza and Phillip Bonacich. 2010. "I'd like to thank the Academy, Team Spillovers, and Network Centrality" *American Sociological Review* 75:31-51.

### **Day 6: Introduction to R (Jan 29)**

### **Day 7: Introduction to R (Feb 3)**

### **Day 8: Introduction to R (Feb 5)**

### **Day 9: Cohesive Sub-Groups: Theoretical and Technical Introduction (Feb 10)**

#### *Required Readings*

\*Wasserman and Faust Ch 7

\*Kadushin Ch 4

\*Porter, Mason A, Jukka-Pekka Onnela, and Peter J Mucha. 2009. "Communities in networks." *Notices of the AMS* 56:1082-1097.

#### *Supplementary Readings*

Fershtman, M. 1997. "Cohesive Group Detection in a Social Network by the Segregation Matrix Index." *Social Networks* 19:193-207.

Frank, K. A. 1995. "Identifying Cohesive Subgroups." *Social Networks* 17:27-56.

Moody, James. 2002. "Peer Influence Groups: Identifying dense clusters in large networks." *Social Networks*. 2001; 23:261-283."

- Mucha, Peter J., Thomas Richardson, Kevin Macon, Mason A. Porter, and Jukka-Pekka Onnela. 2010. "Community Structure in Time-Dependent, Multiscale and Multiplex Networks" *Science* 328:876-878
- Newman, Mark E. J. 2006. "Modularity and community structure in networks." *Proc. Natl. Acad. Sci.* 103:8577-8582.

### **Day 10 Cohesive Sub-Groups and Embeddedness: Substantive Applications (Feb 12)**

#### *Required Readings*

- Frank, K. A. and J. Y. Yasumoto. 1998. "Linking Action to Social Structure Within a System: Social Capital Within and Between Subgroups." *American Journal of Sociology* 104:642-86.
- Moody, James & Douglas R. White. 2003. "Structural Cohesion and Embeddedness" *American Sociological Review* 68:103-127

#### *Supplementary Readings*

- Bearman, Peter S., and James Moody. "Suicide and friendships among American adolescents." *American Journal of Public Health* 94.1 (2004): 89-95.
- Coleman, J. 1988. "Social Capital in the Creation of Human Capital" *American Journal of Sociology* 95: 95-120
- Falci, Christina, and Clea McNeely. "Too many friends: Social integration, network cohesion and adolescent depressive symptoms." *Social Forces* 87.4 (2009): 2031-2061.
- Granovetter, Mark. "Economic Action and Social Structure: The problem of Embeddedness." *American Journal of Sociology* 91: 481-510. 1985.
- House, James S., Karl R. Landis, and Debra Umberton. "Social Relationships and Health." *Science* 241: 540-545. 1988.
- Porter, Mason A., Peter J. Mucha, M. E. J. Newman, and Casey M. Warmbrand. 2005. "A network analysis of committees in the U.S. House of Representatives." *Proceedings of the National Academy of Sciences of the United States of America* 102:7057-7062.
- Traud, Amanda L., Peter J. Mucha, and Mason A. Porter. 2012. "Social structure of Facebook networks." *Physica A: Statistical Mechanics and its Applications* 391:4165-4180.
- Uzzi, Brian. 1996. "The Sources and Consequences of Embeddedness for the Economic Performance of Organizations: The Network Effect." *American Sociological Review* 61:674-698.
- Vedres, Balazs and David Stark. 2010. "Structural Folds: Generative Disruption in Overlapping Groups" *American Journal of Sociology* 115:1150-1190

### **Day 11 Groups Norms and Homogeneity Feb (17)**

#### *Required Readings*

- \*Carley, Kathleen. 1991. "A Theory of Group Stability." *American Sociological Review* 56:331-54.
- \*Dana L. Haynie. "Delinquent Peers Revisited: Does Network Structure Matter?" *American Journal of Sociology*, volume 106 (2001), pages 1013–1057



### *Readings to Skim*

\*DiMaggio Paul and Filize Garip. "How Network Externalities can Exacerbate Intergroup Inequality" *American Journal of Sociology* 116:1887-1933.

### *Supplementary Readings*

Aral, Sinan, Lev Muchnik, and Arun Sundararajan 2009. "Distinguishing influence- based contagion from homophily-driven diffusion in dynamic networks" *PNAS* 2009 106: 21544-21549

Baldassarri and Bearman (2007) "Dynamics of Political Polarization" *American Sociological Review*

Cohen, J. M. 1983. "Peer Influence on College Aspirations." *American Sociological Review* 48:728-34.

Erickson, Bonnie H. The Relational Basis of Attitudes. *Social Structures: A Network Approach*, Barry Wellman and S. D. Berkowitz, eds. Pp. 99-122. Cambridge, England: CambridgeUniversity Press. 1988.

Friedkin, Noah. Social Networks in Structural Equation Models. *Social Psychology Quarterly* 53: 316-328. 1990.

Friedkin, N. E. and K. S. Cook. 1990. "Peer Group Influence." *Sociological Methods and Research* 19(1):122-43.

Friedkin, N. E. 1993. "Structural Basis of Interpersonal Influence in Groups: A Longitudinal Case Study." *American Sociological Review* 58:861-72.

Mark, Noah. 1998. "Beyond Individual Differences: Social Differentiation from First Principles" *American Sociological Review*, Vol. 63, No. 3. pp. 309-330.

### **Day 12 R lab on Groups (Feb 19)**

### **Day 13: Diffusion Over a Network (Feb 24)**

#### *Required Readings*

\*Kadushin Chapter 9

\*Keeling, Matt J. and Ken T. D. Eames. 2005. "Networks and epidemic models." *Journal of the Royal Society Interface* 2:295-307.

\*Moody, James and Ashton Verdery. Working Draft. Network Structure and Diffusion.

#### *Supplementary Readings*

Centola, Damon. 2010. "The Spread of Behavior in an Online Social Network Experiment" *Science* 2010: 1194-1197.

Eames, K.T.D. . 2008. "Modeling Disease Spread through Random and Regular Contacts in Clustered Populations." *Theoretical Population Biology* 73:104-11.

Moody, James. The Importance of Relationship Timing for Diffusion. *Social Forces*. 2002; 81:25-56.

Morris, Martina. 1993. "Epidemiology and Social Networks: Modeling Structured Diffusion." *Sociological Methods and Research* 22:99-126.

Morris, Martina and Mirjam Kretzschmar. 1995. "Concurrent Partnerships and Transmission Dynamics in Networks." *Social Networks* 17:299-318.

Newman, M. E. J. . 2002. "Spread of Epidemic Disease on Networks." *Physical Review E*. 66:1-11.

Valente, Thomas. 2005. "Network Models and Methods for Studying the Diffusion of Innovations." in *and Methods in Social Network Analysis*. Cambridge: Cambridge University Press.

### **Day 14 Diffusion: Substantive Applications (Feb 26)**

#### *Required Readings*

- \*Bearman, Peter S, James Moody, and Katherine Stovel. 2004. "Chains of Affection: The Structure of Adolescent Romantic and Sexual Networks." *American Journal of Sociology* 110:44-91.
- \*Morris, Martina, et al. "Concurrent partnerships and HIV prevalence disparities by race: linking science and public health practice." *American Journal of Public Health* 99.6 (2009): 1023.

#### *Supplementary Readings*

- Nicholas A. Christakis. 2010. "Cooperative Behavior Cascades in Human Social Networks" PNAS 107:5334-5338
- Coleman, James, Elihu Katz, and Herbert Menzel. 1957. "The Diffusion of Innovation Among Physicians." *Sociometry* 20:253-270.
- Davis, Gerald F. and Henrich R. Greve. 1997. "Corporate Elite Networks and Governance Changes in the 1980s." *American Journal of Sociology* 103:1-37.
- Kerckhoff, Alan C. and Kurt W. Beck. 1968. *The June Bug: A Story of Hysterical Contagion*. New York: Appleton- Century-Crofts.

### **Day 15 Small World Phenomena and Diffusion (Mar 3)**

#### *Required Readings*

- \*Kadushin Ch 8
- \*Travers, Jeffrey and Stanley Milgram (1969) "An Experimental Study of the Small World Problem," *Sociometry* 32(4): 425-443.
- \*Watts, Duncan J. (1999) "Networks, Dynamics, and the Small-World Phenomenon" *American Journal of Sociology*. v. 105:493-527.

#### *Supplementary Readings*

- Dodds, Peter, Mohamad, Roby and Duncan Watts. 2003. "An Experimental Study in Search of Global Networks." *Science* 301:827-829.
- Pool, I. d. S. and M. Kochen. 1978. "Contacts and Influence." *Social Networks* 1:5-51.
- Schnettler, Sebastian. 2009. "A structured overview of 50 years of small-world research." *Social Networks* 31.3 165-178.
- Robins, G., P. Pattison, and Jodie Woolcock. 2005. "Small and Other Worlds: Global Network Structures from Local Processes." *American Journal of Sociology* 110:894-936.
- Watts, Duncan J. 1999. *Small Worlds: The Dynamics of Networks between Order and Randomness*. Princeton University Press
- Watts, Duncan, Peter Sheridan Dodds, and M E J Newman (2002) "Identity and Search in Social Networks," *Science* 296(17 May 2002): 1302-1305.

## **Day 16 Small World: Substantive Applications (Mar 5)**

### *Required Readings*

- \*Centola, Damon and Michael Macy. 2007. "Complex contagions and the weakness of long ties." *American Journal of Sociology* 113:702-734.
- \*Granovetter, Mark. 1973. "The Strength of Weak Ties." *American Journal of Sociology* 78:1360-80.

### *Supplementary Readings*

- Burt, Ronald S. 1992. *Structural Holes: The Social Structure of Competition*. Cambridge: Harvard University Press.
- Ronald S. Burt. 2004. "Structural Holes and Good Ideas." *American Journal of Sociology* 110:349-399.
- Granovetter, M. 1995. *Getting a Job: A Study of Contacts and Careers*: University of Chicago Press.
- Grannis, Rick. "Six Degrees of 'Who Cares?'" *American Journal of Sociology* 115:991-1017
- Montgomery, James. 1992. "Job Search and Network Composition: Implications of the Strength-of-Weak-Ties Hypothesis." *American Sociological Review* 57:586-96.
- Uzzi, Brian and Jarrett Spiro. 2005. "Collaboration and Creativity: The Small World Problem." *American Journal of Sociology* 111:2, 447-504

## **Day 17: R day on Diffusion and Small World Networks (March 10)**

## **Day 18: Hierarchy, Balance and Ranked Group Structure (Mar 12)**

### *Required Readings*

- \*Wasserman and Faust Ch 6, 14
- \*Kadushin Ch 5
- \*Simmel Georg. "Triad" in Kurt Wolff (ed.), *The Sociology of Georg Simmel*, part 2, chap. 4.

### *Skim*

- \*Johnsen, E. C. 1985. "Network Macrostructure Models for the Davis-Leinhardt Set of Empirical Sociomatrices." *Social Networks* 7:203-24.

### *Supplementary Readings*

- Davis, J. A. 1963. "Structural Balance, Mechanical Solidarity, and Interpersonal Relations." *American Journal of Sociology* 68:444-62.
- Doreian, P., R. Kapuscinski, D. Krackhardt, and J. Szczypula. 1996. "A Brief History of Balance Through Time." *Journal of Mathematical Sociology* 21(12):113-31.
- Feld, Scott. 1981. "The Focused Organization of Social Ties." *American Journal of Sociology* 86:1015-35.
- Holland, P. W. and S. Leinhardt. 1975. "Local Structure in Social Networks." *Sociological Methodology*: 1-45.
- Hummon, Norman P. and Patrick Doreian. 2003. "Some Dynamics of Social Balance Processes: Bringing Heider Back into Balance Theory." *Social Networks* 25:17-49.

- Marvel, Seth A., Jon Kleinberg, Robert D. Kleinberg, and Steven H. Strogatz. 2011. "Continuous-time model of structural balance" *PNAS* 108:1771-1776
- Simmel Georg. "The Isolated Individual and the Dyad" in Kurt Wolff (ed.), *The Sociology of Georg Simmel*, part 2, chap. 3.

### **Day 19: Balance and Hierarchy: Substantive Examples (Mar 17)**

#### *Required Readings*

- \*Gould, Rodger (2002). "The Origins of Status Hierarchies: A formal theory and Empirical Test." *American Journal of Sociology*. 107:1143-1178
- \*Papachristos, Andrew V. 2009. "Murder by Structure: Dominance Relations and The Social Structure of Gang Homicide." *American Journal of Sociology* 115:74-128.

#### *Supplementary Readings*

- Burris, Val. 2004. "The Academic Caste System: Prestige Hierarchies in PhD Exchange Networks." *American Sociological Review* 69:239-264.
- Chase, Ivan D. 1980. "Social Process and Hierarchy Formation in Small Groups: A Comparative Perspective." *American Sociological Review* 45:905-924.
- Faris, Robert and Diane Felmlee. 2011. "Status Struggles: Network Centrality and Gender Segregation in same- and cross- gender Aggression" *American Sociological Review* 76: 48-73.
- Kilduff, Martin, and David Krackhardt. "Bringing the Individual Back In: A Structural Analysis of the Internal Market for Reputation in Organizations." *Academy of Management Journal*, 37: 87- 108. 1994.
- Mayhew, Bruce and Roger L. Levinger. 1976. "On the Emergence of Oligarchy in Human Interaction." *American Journal of Sociology* 81:1017-49.
- McFarland, Daniel A., James Moody, David Diehl, Jeffrey A. Smith, and Reuben J. Thomas. 2014. "Network Ecology and Adolescent Social Structure." *American Sociological Review* 79:1088-1121.
- Martin, J.L. 2005 "Is Power Sexy?" *American Journal of Sociology*. 111:408-446
- Smith, Jeffrey A and Robert Faris. 2015. "Movement without mobility: Adolescent status hierarchies and the contextual limits of cumulative advantage." *Social Networks* 40:139-153.

### **Day 20 R day on Hierarchy, Balance, and Ranked Groups (Mar 19)**

### **Day 21 Position: Structural and Regular Equivalence (Mar 31)**

#### *Required Readings*

- \*Wasserman and Faust Ch 9, 12
- \*Hanneman [Ch 12](#)
- \*Borgatti, Stephen P. and Martin G. Everett. 1992. "Notions of Position in Social Network Analysis." *Sociological Methodology* 22:1-35.

*Supplementary Readings*

- Burt, R. S. 1978. "Cohesion Versus Structural Equivalence As a Basis for Network Sub-Groups." *Sociological Methods and Research* 7:189-212.
- Patrick Doreian (1988) "Equivalence in a Social Network," *Journal of Mathematical Sociology* 13:243-82.
- Borgatti, Stephen P and Martin G Everett. 1993. "Two algorithms for computing regular equivalence." *Social Networks* 15:361-376.

**Day 22 Positions and Roles: Blockmodels (Apr 2)**

*Required Readings*

- \*Wasserman and Faust Ch 10, 11
- \*White, H. C., S. A. Boorman, and R. L. Breiger. 1976. "Social Structure From Multiple Networks I." *American Journal of Sociology* 81:730-780.

*Supplementary Readings*

- Boorman, Scott A. and Harrison C. White. 1976. "Social structure from multiple networks II: Role structures." *American Journal of Sociology* 81:1384-1446.
- John Paul Boyd (1969) "The Algebra of Group Kinship" *Journal of Mathematical Psychology* 6:139-167.

**Day 23: Substantive Applications for Roles and Positions (Apr 7)**

*Required Readings*

- \*Bearman, P. 1997. "Generalized Exchange." *American Journal of Sociology* 102(5):1383-415.
- \*Padgett, J. F. and C. K. Ansell. 1993. "Robust Action and the Rise of the Medici, 1400-1434." *American Journal of Sociology* 98:1259-319.

*Supplementary Readings*

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## **Day 24: R day on Roles and Positions (Apr 9)**

## **Day 25: Duality: Persons through Groups (Apr 14)**

### *Required Readings*

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## **Day 26: Duality: Substantive Applications (Apr 16)**

### *Required Readings*

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**Day 27: R Day on Duality, Persons through groups (Apr 21)**

**Day 28 Homophily (Apr 23)**

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**Day 29 (Apr 28) TBD**

**Day 30 (Apr 30) TBD**