

MGMT 935
NETWORK THEORY AND APPLICATIONS
FALL 2009, 2ND QUARTER (Oct 28 - Dec 9)

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Class meets Wednesdays 12:00 – 3:00, 2034 SH-DH
Office hours by appointment

This course explores network analysis models and their applications to organizational phenomena. By examining the structure of relations among actors, network approaches seek to explain variations in beliefs, behaviors, and outcomes. The beauty of network analysis is its underlying mathematical nature – network ideas and measures apply equally well at micro and macro levels of analysis. In this course, then, we will read and discuss articles both at the micro level (where the network actors are individuals within organizations) and at the macro level (where the network actors are organizations within larger communities) that utilize network constructs such as small worlds, cohesion, structural equivalence, centrality, and autonomy.

The course has two major themes. In the first half, we compare various models of social network structure, explore the antecedents of network ties, and examine the contagion of information and behaviors across networks. In the second half, we address several mechanisms by which an actor's position in a network affects its performance. For each week, three or four articles are listed as the key readings we will discuss in detail during the class session; you should focus on these articles. Numerous related articles are listed as "recommended" for additional reading, but I do not expect you to prepare them for class. Most readings are posted on webCafe. Please feel free to post any missing readings (or additional related readings) in the webCafe folders. I will provide copies of any articles not available through Penn's e-journals.

Evaluation is based on three components: article critiques, empirical analyses, and class participation. For five of the sessions, you are expected to critique an article you select from the required readings assigned for that day (maximum 750 words). These critiques must be handed in at the beginning of the class, and you are free to choose the five sessions you prefer. For one of these five critiques, you will also lead the discussion around that article (we will coordinate selections for leading discussions on webCafé to insure an appropriate assignment of students to articles after the first class session). There will be one written assignment which requires empirical analysis using UCINET and associated graphics software. This software will be provided to you. Detailed instructions for these assignments are posted on webCafe. As in any seminar, consistent attendance and high-quality participation will help your grade.

Watts, D. (1999). "Networks, Dynamics and the Small-World Phenomenon." American Journal of Sociology **105**:493-527.

Barabasi, A., R. Albert and H. Jeong (1999). "Mean-Field Theory of Scale-Free Random Networks." Physica A **272**:173-187.

Powell, W., D. White, K. Koput and J. Owen-Smith (2005). "Network Dynamics and Field Evolution: The Growth of Interorganizational Collaboration in the Life Sciences." American Journal of Sociology **110**:1132-1205.

Cowan, R. and N. Jonard (2009). "Knowledge Portfolios and the Organization of Innovation Networks." Academy of Management Review **34**:320-342.

Recommended:

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

White, H., Boorman, S. and R. Breiger (1976). "Social Structure from Multiple Networks. I. Blockmodels of Roles and Positions." American Journal of Sociology **81**:730-780.

Nohria, N. and C. Garcia-Pont (1991). "Global Strategic Linkages and Industry Structure." Strategic Management Journal **12**(special issue):105-124.

Baker, W. and R. Faulkner (1993). "The Social Organization of Conspiracy: Illegal Networks in the Heavy Electrical Equipment Industry." American Sociological Review **58**: 837-860.

Wasserman, S. and K. Faust (1994). Social Network Analysis: Methods and Applications. New York, Cambridge University Press. (Chapters 1-3)

Kogut, B., and G. Walker (2001). "The Small World of Germany and the Durability of National Networks." American Sociological Review **66**:317-355.

Davis, G., M. Yoo, and W. Baker (2003). "The Small World of the American Corporate Elite, 1982-2001." Strategic Organization **1**:301-326.

Uzzi, B. and J. Spiro (2005). "Collaboration and Creativity: The Small World Problem." American Journal of Sociology **111**: 447-504.

Rosenkopf, L. and M. Schilling (2007). "Comparing Alliance Network Structure Across Industries: Observations and Explanations," Strategic Entrepreneurship Journal, 1:191-209.

Nov 4 Session 2 CONTAGION

Coleman, J., E. Katz, and H. Menzel (1957). "The Diffusion of an Innovation Among Physicians." Sociometry: 253-270.

Krackhardt, D. and L. Porter (1985). "When Friends Leave: A Structural Analysis of the Relationship between Turnover and Stayers' Attitudes." Administrative Science Quarterly **30**: 242-261.

Burt, R. S. (1987). "Social Contagion and Innovation: Cohesion versus Structural Equivalence." American Journal of Sociology **92**: 1287-1335.

Davis, G. and H. Greve (1997). "Corporate Elite Networks and Governance Changes in the 1980s." American Journal of Sociology **103**(1): 1-37.

Recommended:

Galaskiewicz, J. and R. S. Burt (1991). "Interorganization Contagion in Corporate Philanthropy." Administrative Science Quarterly **36**(1): 88-105.

Strang, D. and N. Tuma (1993). "Spatial and Temporal Heterogeneity in Diffusion." American Journal of Sociology **103**(3): 614-639.

Abrahamson, E. and L. Rosenkopf (1997). "Social Network Effects on the Extent of Innovation Diffusion: A Computer Simulation." Organizational Science **8**(3): 289-309.

Shah, P. (1998). "Who are Employees' Social Referents? Using a Network Perspective to Determine Referent Others." Academy of Management Journal **41**(3): 249-268.

Nov 11 Session 3 DETERMINANTS OF NETWORK TIES

Gulati, R. and M. Garguilo (1999). "Where do Interorganizational Networks Come From?" American Journal of Sociology **104**: 1439-1493.

Hinds, P., K. Carley, D. Krackhardt and D. Wholey (2000). "Choosing Work Group Members: Balancing Similarity, Competence and Familiarity." Organizational Behavior and Human Decision Processes **81**: 226-251.

Moody, J. (2001). "Race, School Integration, and Friendship Segregation in America." American Journal of Sociology **107**(3): 679-716.

Baum, J., A. Shipilov and T. Rowley (2003). "Where Do Small Worlds Come From?" Industrial and Corporate Change **12**:697-725.

Reagans, R. (2005). "Preferences, Identity and Competition: Predicting Tie Strength from Demographic Data." Management Science **51**:1374-1383.

Recommended:

Walker, G., B. Kogut, and W. Shan (1997). "Social Capital, Structural Holes and the Formation of an Industry Network." Organization Science **8**(2): 109-125.

Podolny, J. and D. Phillips (1996). "The Dynamics of Organization Status," Industrial and Corporate Change **5**: 453-371.

Chung, S., H. Singh and K. Lee (2000). "Complementarity, Status Similarity and Social Capital as Drivers of Alliance Formation." Strategic Management Journal **21**: 1-22.

Rosenkopf, L., Metiu, A. and V. George (2001). "From the Bottom Up: Technical Committee Activity and Alliance Formation." Administrative Science Quarterly **46**: 748-772.

Mollica, K., B. Gray and L. Trevino (2003). "Racial Homophily and its Persistence in Newcomers' Social Networks," Organization Science **14**: 123-136.

Klein, K., B. Lim, J. Saltz and D. Mayer (2004). "How Do They Get There: An Examination of the Antecedents of Network Centrality in Team Networks." Academy of Management Journal **47**: 952-963.

Rosenkopf, L. and G. Padula (2008). "Investigating the microstructure of network evolution: Alliance formation in the mobile communications industry," Organization Science, **19**:669-687.

Ahuja, G., F. Polidoro and W. Mitchell (2009). "Structural Homophily or Social Asymmetry? The Formation of Alliances by Poorly-Embedded Firms," Strategic Management Journal, in press.

Nov 18 Session 4 NETWORKS AS KNOWLEDGE CONDUITS

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

Ahuja, G. (2000). "Collaboration Networks, Structural Holes, and Innovation: A Longitudinal Study." Administrative Science Quarterly **45**: 425-455.

Reagans, R. and W. McEvily (2003). "Network Structure and Knowledge Transfer: The Effects of Cohesion and Range." Administrative Science Quarterly **48**: 240-267.

Schilling, M. and C. Phelps (2007). "Interfirm Collaboration Networks: The Impact of Large Scale Network Structure on Firm Innovation," Management Science **53**(7): 1113–1127.

Recommended:

Freeman, L. (1979). "Centrality in Social Networks: Conceptual Clarification." Social Networks **1**: 215-239.

Powell, W., K. Koput, et al. (1996). "Interorganizational Collaboration and the Locus of Innovation: Networks of Learning in Biotechnology." Administrative Science Quarterly **41**: 116-145.

Rosenkopf, L. and P. Almeida (2003). "Overcoming Local Search through Alliances and Mobility." Management Science **49**: 751-766.

Dec 2 Session 5 NETWORKS AS INDICATORS OF POWER AND STATUS

Cook, K. and R. Emerson (1978). "Power, Equity and Commitment in Exchange Networks." American Sociological Review **43**: 721-739.

Krackhardt, D. (1990). "Assessing the Political Landscape: Structure, Cognition, and Power in Organizations." Administrative Science Quarterly **35**: 342-369.

Podolny, J. M. (1993). "A Status-based Model of Market Competition." American Journal of Sociology **98**: 829-872.

Stuart, T., H. Hoang, and R. Hybels (1999). "Interorganizational Endorsements and the Performance of Entrepreneurial Ventures." Administrative Science Quarterly **44**: 315-349.

Recommended:

Bonacich, P. (1987). "Power and Centrality: A Family of Measures." American Journal of Sociology **92**: 1170-82.

Burkhardt, M. and D. Brass (1990). "Changing Patterns or Patterns of Change: The Effects of a Change in Technology on Social Network Structure and Power." Administrative Science Quarterly **35**: 104-127.

Ibarra, H. (1993). "Network Centrality, Power, and Innovation Involvement: Determinants of Technical and Administrative Roles." Academy of Management Journal **36**:471-501.

Dec 9 Session 6 NUANCED APPROACHES TO NETWORK POSITION

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

Podolny, J. and J. Baron (1997). "Resources and Relationships: Social Networks and Mobility in the Workplace." American Sociological Review **62**(October): 673-693.

Sorenson, O. and T. Stuart (2001). "Syndication Networks and the Spatial Distribution of Venture Capital Investments." American Journal of Sociology **106**: 1546-86.

Castilla, E. (2005). "Social Networks and Employee Performance in a Call Center." American Journal of Sociology **110**: 1243-83.

Recommended:

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

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

Coleman, J. S. (1988). "Social Capital in the Creation of Human Capital." American Journal of Sociology **94**: S95-S120.

Salancik, G. R. (1995). "Wanted: A Good Network Theory of Organization." Administrative Science Quarterly **40**: 345-349.

Fernandez, R., E. Castilla and P. Moore. (2000). "Social Capital at Work: Networks and Employment at a Phone Center." American Journal of Sociology **105**: 1288-1356.

Yakubovich, V. "Weak Ties, Information and Influence: How Workers Find Jobs in a Local Russian Labor Market." American Sociological Review **70**: 408-21.