

Ken Frank Social Networks Seminar/ CEP991B
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Fall 2005
Time: Thurs 12:40-3:30
Room 108 Morrill Hall

Motivation

Many quantitative analyses in the social sciences are applied to data regarding characteristics of people, but not to data describing interactions among people. But interactions play an important role in affecting people's behavior and beliefs that cannot be explained purely in terms of individual attributes or organizational context. In this seminar we will focus on analyzing social network data (who interacts with whom) so that we can relate people's interactions with what they think and do. We draw on statistical concepts that account for the unusual nature of network data as well as substantive theories across the social sciences to specify and interpret social network models.

Students taking this course should have roughly one year of applied statistics so that they are extremely comfortable with the general linear model (regression and ANOVA), and analysis of 2x2 tables. Students will be solicited to critique an empirical or review article using social network ideas and tools (see "Outline for article presentations," second from last page in course pack). Students will be responsible for one paper due at the end of the semester, topic to be arranged with the professor (see "Your Final Papers," last page of coursepack).

Plan of the course: In the first section of the course (Sept -Oct) I will introduce concepts of social networks and related statistical tools. I will provide applications through current work on social capital. In the middle of the course (Mid-Oct to mid Nov) students will present critiques of articles. The last part of the course will be devoted to student presentations and special topics, including an introduction to KliqueFinder.

Goals:

- *Help you appreciate the special nature of social network data
- *Help you use social network data in statistical analysis as independent or dependent variables
- * Help you use using graphs and formulas to represent the structure of the social network data.
- * Help you integrate the use and interpretation of social network data with sociological, psychological or other theory.
- * Help you understand the application of social network theory and analysis to the study of schools, education, and general sociological phenomenon.
 - * Take you into my work as a basis for future collaboration.
 - * Help you develop an understanding of the research process.

Resources for Networks

Text Book – on-line

Models and Methods in Social Network Analysis -- Peter J. Carrington, John Scott, Stanley Wasserman

Other books (optional)

Wasserman, S., & Faust, K. (2005). *Social networks analysis: Methods and applications*. New York: Cambridge University. Go to Amazon to order electronically.

For highly accessible introductions, see Freeman, Linton (2004). *The Development of Social Network Analysis: A Study in the Sociology of Science*. Empirical Press of Vancouver, BC, Canada
<http://www.booksurge.com/product.php3?bookID=GPUB01133-00001>

Scott, J., 1992, *Social Network Analysis*. Newbury Park CA: Sage.

Wellman, Barry and S.D. Berkowitz, 1997. *Social Structures: A Network Approach*.(updated edition) Greenwich, CT: JAI Press.

On the Web

Borgatti's slide show: <http://www.analytictech.com/networks/intro/index.html>

David Knoke's intro to social network methods:
<http://www.soc.umn.edu/%7Eknoke/pages/SOC8412.htm>

Wasserman, S., & Faust, K. (1994). *Social networks analysis: Methods and applications*. New York: Cambridge University.

Jim Moody's course: http://www.sociology.ohio_state.edu/jwm/

Other Web Resources

<http://www.ssc.wisc.edu/econ/Durlauf/> **International social network analysis web page:**
<http://www.insna.org/>

Agna portal: <http://www.geocities.com/imbenta/agna/links.htm>

Individual Web Pages:

Phil Bonacich <http://www.sscnet.ucla.edu/soc/faculty/bonacich/home.htm>

Ron Breiger (<http://www.u.arizona.edu/~breiger/>):

Ronald Burt (google Ron Burt):
http://portal.chicagogsb.edu/portal//server.pt/gateway/PTARGS_0_2_332_207_0_43/http%3Bportal.chicagogsb.edu/Facultycourse/Portlet/FacultyDetail.aspx?&min_year=20044&max_year=20063&person_id=30400

Ken Frank <http://www.msu.edu/~kenfrank/>

Linton Freeman <http://moreno.ss.uci.edu/lin.html>

James Moody http://www.sociology.ohio_state.edu/jwm/

Tom Snijders <http://stat.gamma.rug.nl/snijders/>

Barry Wellman: <http://www.chass.utoronto.ca/~wellman/>

Software

Huisman and Van Duijn chapter 13 in Carrington et al

Social Networks web site http://www.insna.org/INSNA/soft_inf.html

Introduction to Social Network Ideas and Methods (Weeks 1-7: 9-1 through 10-20)
(NOTE NO CLASS ON 10-13)

Background Reading and Theory

Frank, K. A. 1998. "The Social Context of Schooling: Quantitative Methods" *Review of Research in Education*, 23, chapter 5: 171-216. See my web page: <http://www.msu.edu/~kenfrank/>
Reviews application of multilevel models and network tools in education. See especially pages 184-203

Breiger, R.L. "The Analysis of Social Networks." Pp. 505–526 in *Handbook of Data Analysis*, edited by Melissa Hardy and Alan Bryman. London: Sage Publications, 2004.

<http://www.u.arizona.edu/~breiger/NetworkAnalysis.pdf>

Conceptualization of network studies from a sociological and social-psychological perspective

Wellman, B. "Structural Analysis: From Method and Metaphor to Theory and Substance" Pp. 19_61 in *Social Structures a Network Approach*, edited by Barry Wellman & S.D. Berkowitz. Cambridge, Cambridge University Press, 1988. Available at: <http://www.chass.utoronto.ca/~wellman/publications/index.html>

An oldy but a goody, grounded in theory of science

Doreian, Patrick (2001). "Causality in Social network Analysis." *Sociological Methods and Research*, Vol 30, No. 1, 81-114. <http://smr.sagepub.com/cgi/reprint/30/1/81>

Critique of Wellman 1988 in terms of contemporary understandings of causality.

Wasserman S.; Scott, J. and Carrington, P. "Introduction" in Carrington et al.

General commentary on the social networks field, and mapping of rest of book

Presentations in Class

Frank, K. Introduction to the Tools of Social Networks

Technical overview of fundamental network tools. Available on Angel and my web site.

See also: Carrington et al chapter 8(selection model); chapter 12 (Graphical)

Applications of Network Models and Tools (Weeks 8-9: 10-27 to 11-3)

Influence Model

Frank, K. A., Zhao, Y., and Borman (2004). Social Capital and the Diffusion of Innovations within Organizations: Application to the Implementation of Computer Technology in Schools." *Sociology of Education*, 77: 148-171
How access to expertise of others helps teachers. Examples of Influence Models.

Selection Model

Frank, K.A. "Theory and Empirical Test of Identification with the Collective as a Quasi-Tie (sub Aug 04).
Teachers who identify with the collectives of their schools will help everyone, not just colleagues. Application of selection models.

Graphical Representations

Frank, K. A. and Zhao, Y. (2004). "Subgroups as a Meso-Level Entity in the Social Organization of Schools. Chapter 10, pages 279-318. Book honoring Charles Bidwell's retirement, edited by Larry Hedges and Barbara Schneider. New York: Sage publications.

Uses subgroups to integrate organizational theories (multilevels, loose coupling, school decision-making, open systems). Example of Graphical Representation

Responds to: Bidwell, Charles (2001). "Analyzing Schools as Organizations: Long term Permanence and Short-term Change." *Sociology of Education, Extra Issue*, 100-114.

Affiliation Networks

Sam Field, Kenneth A. Frank (equal first author), Kathryn Schiller, Catherine Riegler-Crumb and Chandra Muller "Identifying positions from affiliation networks: Preserving the duality of people and events" *In Press, Social Networks*

Cases for Review (Weeks 10-11, beginning 11-10 to 11-17)

Burt, R (2002). "**The Network Structure of Social Capital**," (Pre-print of a chapter in *Research in Organizational Behavior*, Volume 22, edited by Robert I. Sutton and Barry M. Staw. Elsevier Science, 2000) .
<http://gsbwww.uchicago.edu/fac/ronald.burt/research/NSSC.pdf>

Building on Burt's distinction between structural equivalence and cohesion, translated into social capital

Matsueda, R. and Anderson, K. (1998). "The Dynamics of Delinquent Peers and Delinquent Behavior." *Criminology*, Vol 36 (2). 269-308.

Combination of selection and influence, taking into account school organizational effects

Extended by Crosnoe, Robert (2002). "High School Curriculum Track and Adolescent Association with Delinquent Friends." *Journal of Adolescent Research*, Vol 17, 144-168.

Delpit, L. D. (1988). The silence dialogue: Power and pedagogy in educating other people's children. *Harvard Educational Review*, 58(3). *Relationship of teachers and students in social context*

Bendor, Jonathan and Swastik, Piotr. 2001. "The Evolution of Norms." *American Journal of Sociology* 106(6, May):1493_545.

Example of Game Theory as it relates to social capital.

Bearman, P. 1997. "Generalized Exchange." *American Journal of Sociology*, 102 (5): 1383-1415.
Full, recent theory of generalized exchange

Moody, James. 2001. "Race, school, integration and friendship formation in America." *AJS*, vol 107(3) 679:716
Great example of use of Add Health data

Identifying Cohesive Subgroups (Week 12: Dec 1)

{214-229} Frank, 2000. *Introduction to CliqueFinder*. Unpublished, based on published articles.

Collecting and entering Network data (Dec 8)

Marsden in Carrington et al.

Final Papers {see 231}

Physicists and Social Networks

Barabasi, A., 2002, *Linked: The New Science of Networks*, Cambridge MA: Perseus Books.

Mark Newman and Duncan Watts

<http://www.santafe.edu/~mark/>

M. E. J. Newman, A. L. Barabasi, and D. J. Watts (Eds). *The Structure and Dynamics of Complex Networks* (Princeton University Press, Princeton, 2003). Duncan J. Watts.

<http://smallworld.columbia.edu/watts.html>

Six Degrees: The Science of a Connected Age. (Norton, New York, 2003). *The Dynamics of Networks Between Order and Randomness* (Princeton University Press, Princeton, 1999).

Economists and social networks

Institute for Social Network Analysis of the Economy (ISNAE: is-nay)

<http://www.isnae.org/>

<http://www.fas.at/business/en/>

Kenneth Arrow: <http://cesp.stanford.edu/mediaguide/kennethjarrow/>

Axelrod, R., 1997, *The Complexity of Cooperation: Agent-Based Models of Competition and Collaboration*, Princeton: Princeton University Press.

http://www_personal.umich.edu/~axe/

Stephen Durlauf:

<http://www.ssc.wisc.edu/econ/Durlauf/>