Sunbelt XXVIII
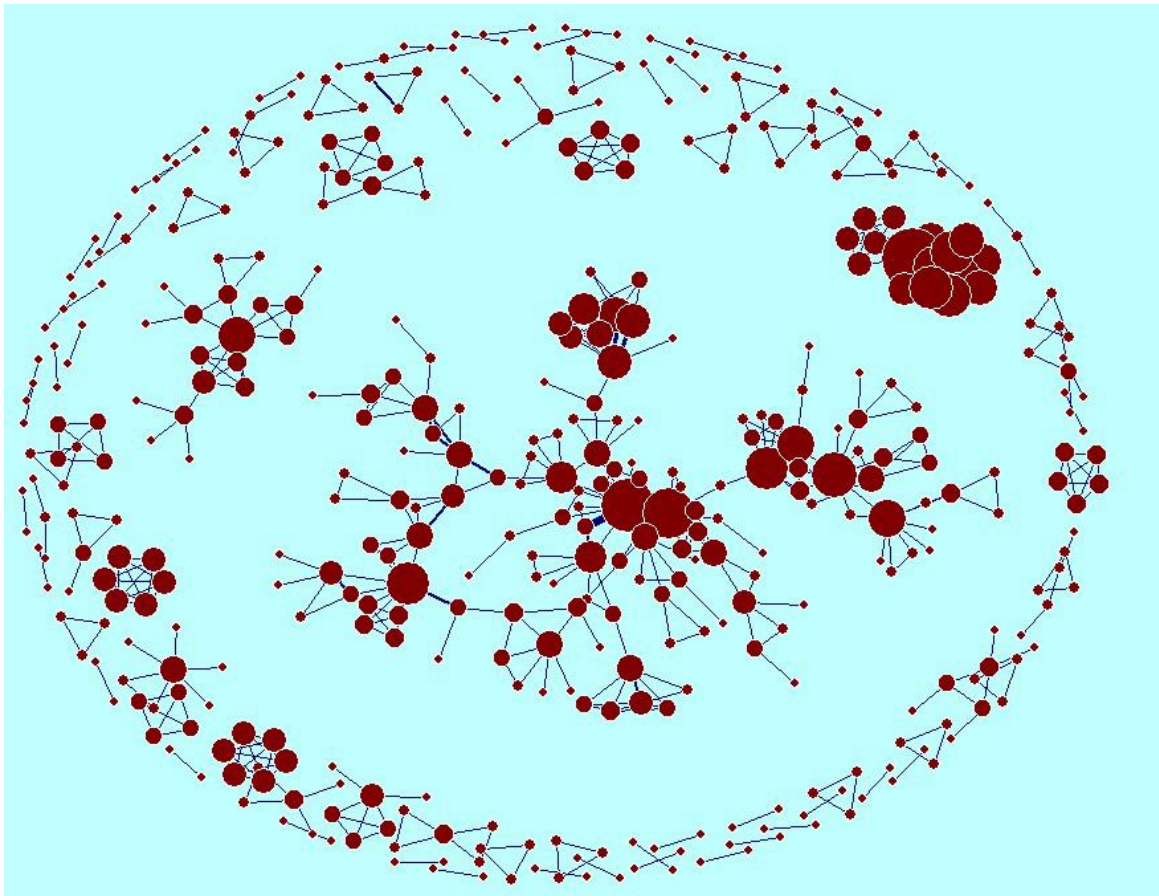
International Sunbelt

Social Network Conference

International Network for Social Network Analysis

Tradewinds Resort Hotel, St. Pete Beach, FL

January 22-27, 2008

Sunbelt XXVIII

International Sunbelt Social Network Conference

St. Pete Beach, FL

January 22-27, 2008

Sponsors

International Network for Social Network Analysis

University of South Florida

Conference Organizers

John Skvoretz
University of South Florida

H. Russell Bernard
University of Florida

Christopher McCarty
University of Florida

Mark House
Q-Squared Research, LLC

University of Florida Student Assistants
Aryeh Jacobsohn
Chad Maxwell
Doug Monroe
Jose Antonio Tovar

Contents

International Sunbelt Social Network Conference History

Sunbelt	Year	Location	Keynote Speaker	Organizers
I	1981	Tampa	None	H. Russell Bernard & Alvin Wolfe
II	1982	Tampa	John Barnes	H. Russell Bernard & Alvin Wolfe
III	1983	San Diego	James Coleman	Douglas White
IV	1984	Phoenix	Harrison White	Brian Foster
V	1985	Palm Beach	Linton Freeman	H. Russell Bernard & Alvin Wolfe
VI	1986	Santa Barbara	J. Clyde Mitchell	Eugene Johnsen & John Sonquist
VII	1987	Clearwater	Everett M. Rogers	H. Russell Bernard & Alvin Wolfe
VIII	1988	San Diego	Charles Kadushin	John Sonquist, Eugene Johnsen, Sue Freeman & Linton Freeman
IX	1989	Tampa	Frank Harary	Jeffrey Johnson
X	1990	San Diego	Mark Granovetter	Everett M. Rogers
XI	1991	Tampa	James Davis	Katie Faust, Jeffrey Johnson, John Skvoretz & Alvin Wolfe
XII	1992	San Diego	Peter Blau	Phillip Bonacich & Sue Freeman
XIII	1993	Tampa	A. Kimball Romney	H. Russell Bernard & Alvin Wolfe
XIV	1994	New Orleans	Barry Wellman	Scott Feld & Jill Suitor
XV	1995	London	Patrick Doreian	Martin Everett & Keith Rennolls
XVI	1996	Charleston	Bonnie Erickson	Katie Faust & John Skvoretz
XVII	1997	San Diego	H. Russell Bernard & Peter Killworth	Pat Doreian & Sue Freeman
XVIII	1998	Stiges	Rolf Zeigler	José Luis Molina, Josep A. Rodríguez, Nuria R. Ávila, Frans N. Stokman, Tom A. B. Snijders, Evelien P.H. Zeggelink, Stephen P. Borgatti, Alain Degenne & Thomas Schweizer
XIX	1999	Charleston	Nan Lin	John Skvoretz & Katie Faust
XX	2000	Vancouver	Linton Freeman	Bill Richards & Andrew Seary
XXI	2001	Budapest	Martin Everett	Endre Sik
XXII	2002	New Orleans	Philippa Pattison	Ruth Aguilera, Noshir Contractor, Scott Feld, Caroline Haythornthwaite, Shin-Kap Han, Ravi Madhavan & Stan Wasserman
XXIII	2003	Cancún	Alvin Wolfe	Jorge Gil-Mendieta, Narda Alćantra Valverde, Silvia Casasola Vargas, Jore Castro Cuellar, Alejandro Ruiz Léon, José Luis Molina, Samuel Schmidt & Enrique Pérez Garcia
XXIV	2004	Portorož	Frans Stokman	Anuška Ferligoj, Vladimir Batagelj, Andrej Mrvar, Hajdeja Iglič, Andrej Rus, Gregor Petrič, Tina Kogovšek, Matjaž Završnik, Nataša Kejžar & Darinka Kovačič
XXV	2005	Redondo Beach	Ronald Breiger	Carter Butts, Becca Davis, Katherine Faust & Tom Valente
XXVI	2006	Vancouver	Ed Laumann	Bill Richards
XXVII	2007	Corfu	Vlado Batagelj & Anuška Ferligoj	Moses Bourdoudis & Iosif Botetzagias
XXVIII	2008	St. Pete Beach	Stephen Borgatti	John Skvoretz, H. Russell Bernard, Christopher McCarty & Mark House

Workshops

Introduction to the Analysis of Network Data via UCINET and NetDraw

Stephen Borgatti & Martin Everett

Tuesday, January 22nd, 1:00pm - 5:00pm, Wednesday, January 23rd, 9:00am - noon

A beginners tutorial on the concepts, methods and data analysis techniques of social network analysis. The course begins with a general introduction to the distinct goals and perspectives of network analysis, followed by a practical discussion of network data, covering issues of collection, validity, visualization, and mathematical/computer representation. We then take up the methods of detection and description of structural properties such as centrality, cohesion, subgroups, cores, roles, etc. Finally, we consider how to frame and test network hypotheses. An important element of this workshop is that all participants are given a demonstration version of UCINET 6 for Windows and the Netmap visualization software, which we use to provide hands-on experience analyzing real data using the techniques covered in the workshop. In order to participate fully in the workshop, participants should bring laptop computers so that they can run the analyses on their machines at the same time as they are being demonstrated by the instructors.

Introduction to Pajek & Advanced uses of Pajek

Vladimir Batagelj, Andrej Mrvar & Wouter de Nooy

Introduction: Tueasday, January 22nd, 1:00pm - 5:00pm

Advanced: Wednesday, January 23rd, 9:00am - noon

Pajek is a program for Windows for analysis and visualization of large networks. It is free for noncommercial applications and can be downloaded from its home page. To actively follow the workshop participants are expected to bring their laptops. The workshop consists of two parts.

In the first part we will give an introduction to the use of Pajek based on our textbook on social network analysis 'Exploratory Social Network Analysis with Pajek'. At the end some hints on converting excel/text file datasets into Pajek format (using Jurgen Pfeffer's program Text2Pajek) and on exporting networks to different output graphics formats will be given.

In the second part we will present some efficient approaches (valued cores, triangular and short cycle connectivity, citation weights, pattern search, generalized blockmodeling, islands) to analysis and visualization of real-life large networks. We will also demonstrate some newest additions to Pajek: network multiplication and kinship relations, (p,q)-cores and 4-rings weights in analysis of two-mode networks, matrix display of dense networks, linking network visualizations to Internet, and clustering of large datasets with relational constraint

Introduction to models for network dynamics and working with the SIENA program

Tom Snijders & Christian Steglich

Introductory Session: Tuesday, January 22nd, 1:00pm - 5:00pm

Advanced Session: Wednesday, January 23rd, 9:00am - noon

This workshop is about statistical inference for longitudinal observations on social networks. Longitudinal social network data are understood here as two or more repeated observations of a directed graph on a given node set (usually between 30 and a few hundred nodes). The workshop teaches the statistical method to analyze such data, as described in Snijders (2005) and Snijders, Steglich & Schweinberger (2006), and implemented in the SIENA program. The statistical model used for the network evolution allows to include various network effects (reciprocity, transitivity, cycles, popularity, etc.), effects of individual covariates (covariates connected to the sender, the receiver, or the similarity between sender and receiver), and of dyadic covariates. One interpretation of this model is an actor-oriented model where the nodes are actors whose choices determine the network evolution. An important extension is to have, in addition to the network, one or more actor variables that evolve in mutual dependence with the network; an example is a friendship network of adolescents where drinking behavior is a relevant actor variable which influences, and is influenced by, the friendship network. This leads to models for the simultaneous dynamics of networks and behavior, which are a special option in SIENA.

Further information about this method, including references and a JAVA demo, can be found at the SIENA website (see below). The statistical analysis is based on Monte Carlo simulations of the network evolution model and therefore is a bit time-consuming. The computer program SIENA is included in the StOCNET package which runs under Windows. The workshop will demonstrate the basics of using StOCNET and SIENA. Attention will be paid to the underlying statistical methodology, to examples, and to the use of the software.

The first session (**3a**, Tuesday afternoon) is intended for those without previous experience with this method, and will focus on the intuitive understanding of the model and operation of the software. The second session (**3b**, Wednesday morning) is intended for those with previous experience with the method and the software, and also for those who followed the first session. will present models for the simultaneous dynamics of networks and behavior and other more advanced topics such as model specification, structurally determined values, and models for nondirected relations.

Participants are requested to check the SIENA website in the week before the workshop to download the workshop materials. For optimal benefit, it is advisable to bring an own laptop with StOCNET already installed, such that some steps of data manipulation and analysis can be followed hands-on.

Networks for Newbies

Barry Wellman

Wednesday, January 23nd 8:30pm - noon

This is a non-technical introduction to social network analysis. It describes the development for social network analysis, some key concepts, and some key substantive methods and findings. It is aimed at newcomers to the field, and those who have only seen social network analysis as a method.

The Practice of Exponential family Random Graph (ERG or p*) modeling.

Martina Morris, Steven M. Goodreau, Carter Butts, Mark S. Handcock

Wednesday, January 23, 9:00am - noon

This workshop will provide a hands-on tutorial to **statnet**, a statistical package for the visualization, analysis and simulation of social network data. The modeling capabilities of **statnet** include the class of exponential random graph (ERG) models. These models recognize the complex dependencies within relational data structures, and provide a very flexible framework for representing them. Examples include degree distributions and stars, attribute-based mixing patterns, triadic patterns that lead to clustering, shared partner distributions, the new specifications in Snijders et. Al. 2006, and other systematic network configurations. **statnet** has a coherent and flexible user interface and can handle relatively large networks (~3,000 is the largest network we have estimated models for), and it has very efficient algorithms for data manipulation and analysis. The package provides tools for both model estimation and model-based network simulation, with visualization, tools for inference and validation, and goodness of fit diagnostics. The package is written for the **R** statistical computing environment, so it runs on any computing platform that supports **R** (Windows, Unix/Linux, Mac), it is freely available through the Comprehensive **R** Archive Network (CRAN), and it has a seamless interface to SNA (an **R** package for traditional network analysis written by Carter Butts).

Social Network Approaches for Behavior Change

Tom Valente

Wednesday, January 23rd 8:30am - noon

This workshop will be conducted in 2 sections. Section 1 will review existing evidence for the utility of using social network data for behavior change in a variety of settings including health behaviors and organizational performance. We present a typology of such efforts. Section 2 will demonstrate existing software programs for implementing social network interventions. The workshop will be conducted by Tom Valente who has developing and implementing network based interventions for over 10 years.

Posters

Thursday Jan. 24   Morning

9:00 to 10:00   **Dynamic associations between children's social knowledge and social status in the peer network across the upper elementary school grades**
Alice Davidson
ajd267@psu.edu
The present 3-year longitudinal study of 427 youth examined bidirectional associations between children's social knowledge (knowledge of the connections among peers (i.e., social network knowledge) and knowledge of the individual academic characteristics of classmates (i.e., academic skills knowledge) and their social status (indegree centrality and peer-rated social preference) in the peer social network across the upper elementary school grades. Multi-level models were used to examine differences between children and variation within children in these processes across six waves of assessment. Findings supported the notion that social knowledge has meaningful, dynamic associations with social outcomes for girls and boys during middle childhood. For the two indicators of social knowledge, between-person effects of academic skills knowledge (ASK) and indegree centrality predicted social network knowledge (SNK), and between-person effects of SNK and indegree centrality as well as a within-person variation effect of indegree centrality predicted academic skills knowledge. For the two indicators of social status, between-person effects of social preference, SNK and ASK (for boys) as well as within-person variation effects of social preference, SNK and ASK predicted indegree centrality and between-person effects of indegree centrality and ASK (for girls) and a within-person variation effect of indegree centrality predicted social preference. Further analyses will explore social network knowledge regarding same-sex peers and expand academic skills knowledge to encompass additional social behaviors in the peer network.

What does 'Network' mean in Public Policy and Management? Mapping Network Research by Using Citation Network Analysis
sungsoo hwang
shwang@pitt.edu
Il-Chul Moon

The purpose of this research is to engage in a dialogue of what the term 'Network' means among different network research in public policy and management disciplines. Since O'Toole (1997) called for scholars of Public Administration and Policy to "[treat] network seriously", a growing number of researches use the term 'Network' as if it is a rising fashion trend. A recent article in Public Administration Review (PAR), "Three traditions of network research" by Berry et al (2004), illustrates this trend well. In short, this paper will empirically examine influential authors in the discipline and patterns of research streams using citation network analysis with citation data from SSCI. This can also be an opportunity to see which authors appear in journals outside the Public Administration subject category as an indicator of being interdisciplinary.

Relationship between Formal and Informal Human Network as a Key Factor of Leadership: Comparing Two Leaders in a Korean National Research Institute
Dae Joong Kim
hellokdj@hotmail.com

Organizational human network for leadership has not much studied. Most leadership studies focus on leader's traits and skills, organizational situation, subordinate's motivation, etc. However, the fact that organizational success or stable operation depends on how leaders understand the informal human network in their organization and apply the network into their formal structure has been relevantly ignored in leadership study. Based on this aspect I have analyzed a Korean national research institute I had been worked at for two years. During the period, there was one time when our leader was changed. The leader had been selected through an open competition. In addition, the new leader had a face-to-face interview with people to see where they wanted to be posted. Most of them had been rearranged to the places they hoped. However, the organization would not be stable for one year. Other conditions such as the number of employees and salary are same. If so, why? There was much more disconnection between formal and informal human network than the previous leader. This can be easily checked through the diagrams supported by social network analysis programs. On the diagrams, his predecessor has a similar pattern between formal and informal human network is not large, but the new leader does not. The discrepancy between formal and formal human network caused the organization unstable. Thus, in the future leadership studies are needed to add a study between informal human network and formal human network as a prescriptive approach.

9:30 to 10:30

Influence and Selection Effects in Adolescent Smoking Behavior

Myong H Go

mhgo@prgs.edu

Numerous studies have found that peer relationships are associated with youth smoking behavior, although the nature of this association is far from understood. It is often assumed that these associations reflect the influence of peer relationships on youth smoking. However, similarities in the smoking behavior of adolescents and members of their friendship network may be due to adolescent smoking influencing friendship selection (selection effect), as well as friendship networks influencing adolescent smoking (influence effect). Unless data are properly analyzed in a longitudinal setting, selection effects may be misattributed as influence effects. Using longitudinal network friendship data from National Longitudinal Study of Adolescent Health (Add Health), our study has two goals. The first goal is to extend the groundbreaking work of Ennett and Bauman (1994) on peer relationships and smoking by determining the extent to which friendship networks influence smoking, and smoking influences friendship selection over a one-year period. We hypothesize that individual smoking behavior is the combined product of influence and selection effects. The second goal is to use the six-year follow-up data from Add Health to evaluate the long-term impact of smoking-related peer influences during adolescence on smoking behavior during young adult. In these analyses we control the estimates for personal and school characteristics, family factors, and neighborhood effects. Both the fields of tobacco research and prevention may be enhanced by gaining a clearer understanding of the ways in which peer relationships influence, and are influenced by, youth smoking behavior.

The Socialization of Dominance: Peer Group Contextual Effects on Heterosexist and Dominance Attitudes

Harold Green

hankgreen@gmail.com

Homophobic behavior toward gay and lesbian youth has remained consistently high over several decades of research (D'Augelli, 2002; Gross, Aurand, & Adessa, 1988), and emerging findings indicate that heterosexual students can also be targets of homophobic epithets (Phoenix, Frosh, & Pattman, 2003). Recently, homophobic behavior has been studied in relation to the broader aggression literature (Poteat & Espelage, 2005). However, much of the research has remained at the individual level, without attention to the social context in which this behavior occurs. Peer group membership becomes especially salient during adolescence (Rubin, Bukowski, & Parker, 2006) and the aggression literature has highlighted the social context in this behavior (Espelage, Holt, & Henkel, 2003; Salmivalli & Voeten, 2004). Using the framework of social dominance theory, the current investigation tested for the contextual effects of adolescent peer groups on individuals' heterosexist and social dominance attitudes. Peer groups were identified through NEGOPY analysis of friendship nomination data. Results from multilevel models indicated that significant differences existed across peer groups on heterosexist attitudes. In addition, these differences were accounted for based on the hierarchy-enhancing or -attenuating climate of the group. A group socialization effect on individuals' social dominance attitudes over time was also observed. Furthermore, the social climate of the peer group moderated the stability of individuals' social dominance attitudes. Findings support the need to examine more proximal and informal group affiliations and earlier developmental periods in effort to build more comprehensive theoretical models explaining when and how prejudiced and dominance attitudes are formed and the way in which they are perpetuated.

ETHNIC GROUP DIFFERENCES IN FRIENDSHIP NETWORKS AND PATTERNS OF SUBSTANCE USE AMONG URBAN PREADOLESCENTS

Cassandra Stanton
Cassandra_Stanton@brown.edu
Daniel Halgin
Susan Ennett
Raymond Niaura

Substance use is commonly understood as a peer group phenomenon; however little is know regarding the peer context of substance use in schools where there is considerable racial/ethnic heterogeneity. This study examines ethnic group differences in friendship networks and patterns of substance use susceptibility in two low-income inner-city middle schools in RI, USA. Seventh graders (School 1 N=225; School 2 N=249; 20% Cape Verdean, 13% Puerto Rican, 14% European decent (White), 7% Columbian, 10% African decent, 4% Dominican, 6% Portuguese, 9% Other, 17% Multi-ethnic; 24% born outside the US) nominated their 5 closest friends and responded to various measures of cigarette, alcohol and other drug use. Results indicate patterns of friendship groups that differ by gender and ethnicity, with females more likely to have a greater number of reciprocal friendship ties, higher centrality in the schools' networks, greater connectivity to others, and greater susceptibility to smoking uptake. Although students from various backgrounds were integrated throughout the networks of each school, some ethnic groups clustered in larger and more connected groups. Cape Verdean students were more likely to be tied to each other forming a large component, whereas friendships among White students were comprised mostly of disconnected dyads in one school or small trees in the other school. The number of friendship nominations received was associated with ethnicity, with White students scoring the lowest on this measure and those from Columbian, Puerto Rican, and Cape Verdean decent scoring the highest. Notably, Cape Verdeans reported the lowest prevalence of lifetime smoking (5%) compared to the other groups (Portuguese 24%, Whites 19%), indicating a possible association between ethnicity, friendship structure, and smoking behavior. Results have implications for better understanding the social context of substance use and more effectively tailoring prevention programs for multiethnic urban youth.

10:00 to 11:00   Social Network Influences on Adolescent Weight and Physical Activity
Kayo Fujimoto
tvalente@usc.edu

Thomas Valente
Chih-Ping Chou
Donna Spruijt-Metz
Many factors have been identified as contributors to the obesity epidemic that currently affects so many young people in the US. No studies to date, however, have investigated how adolescent friendships may influence diet and physical activities. Here we take a first step in this line of investigation by measuring whether a young person's weight and physical activities are similar to those of his/her closest friends. We also investigate whether social position, being popular or marginal, was associated with weight and/or physical activity, and assessed whether these associations held net of social support for physical activity. We interviewed 617 adolescents recruited from 4 schools (17 classes) in southern California. The sample was 64% female with a mean age of 12.7 years (SD=) and ethnically diverse (Asian, 35.9%; Hispanic/Latino, 26.7%; White, 21.0%; African American, 4.5%). Results showed that being at risk for overweight and being overweight were associated with a twofold increase in the likelihood that one's friends were also at risk for overweight and overweight (Adjusted odds ratio (AOR)=2.39, 95% CI=1.04, 5.50). There was a weak association between social position and weight status, overweight youth nominated more friends but were nominated as friends less frequently than their normal weight peers (AOR=1.50, 90% CI=1.03, 2.18; AOR=0.85, 90% CI=0.73, 0.99; respectively).

Mediated Issue Networks as Complex Systems: A look at organic foods policymaking in the United States

Dawn Gilpin
dgilpin@temple.edu
While issues management is an important area of research and practice in organizational communication and public relations, the literature focuses primarily on instrumental applications. Little is known of the social, cultural, and political processes underlying issue evolution and institutionalization (Curtin & Gaither, 2006). Conceiving of issue networks—loose configurations of institutional actors, interest groups, organizations, technical specialists, and concerned citizens—as complex systems of interconnected agents offers a fresh perspective on these questions. Combined use of social and semantic network analysis makes it possible to examine complex, dynamic linkages between social relationships and conceptual positions. This paper reports on a study of the organic foods issue network in the United States, based on the minutes of National Organics Standards Board meetings and media coverage of the issue. The use of textual as well as relational data allows for more sophisticated computations of patterns, providing insight on power structures as well as organizational and issue identities. This study is intended as a first step toward understanding the mechanisms of issue emergence and development as an aid for scholars and practitioners of media communication, organizational issues management, cultural economy, and policy studies.

Network Weaving

June Holley
june@networkweaving.com

Network mapping can be a very useful strategy to help community groups and interorganizational collaborations understand their networks. However, once groups have analyzed their networks, they usually need to learn techniques that they can employ so that their networks become more effective. June Holley will provide examples from more than a dozen collaborative networks to illustrate this Network Weaving training process. She will describe the role of Network Weaver and outline the many network weaving practices that have been employed to enhance networks.

10:30 to 11:30 ## Social Networks as an Introduction to Computer Science

Jeffrey Forbes
forbes@cs.duke.edu

Despite exponential increases in computational power, examples used in computer science courses have remained largely unchanged and enrollment have seen a recent marked decline. The goal of the HarambeeNet project is to bring educators together to design modules that introduce computer science into existing courses in various disciplines in a way that increases interest for pursuing further study in computer science. We have chosen the Science of Networks as the overarching theme and Social Networks as our immediate focus on which to develop materials and modules that form an alternative introduction to computer science. One reason for choosing this theme is its roots in mathematics, computer science, sociology, and operations research. Another reason is that the topic grounds abstract concepts in a concrete setting immediately familiar, relevant, and intriguing to college students. After surveying the relevant literature, network analysis and visualization tools, sources of data, and curricular materials, a faculty learning community will develop and evaluate modules that can be incorporated into existing courses in math, statistics, computer science, sociology, economics, and related fields. In this talk, we will discuss the current status of our project: highlighting trends in networks courses and demonstrating a module that utilizes our adaptation of a network analysis and visualization tool and web-based social network to analyze user's music listening profiles.

Sensation Seeking and Social Network Development

Ashley Sanders-Jackson
asanders@asc.upenn.edu
The purpose of this paper is to begin to address the possible role of individual psychological differences in network size and formation, specifically sensation seeking. Sensation seeking is a psychological individual difference that can predict diverse aspects of behavior. Sensation seeking was tested as a correlational variable for network size, density, and strength of network ties. It was predicted that high sensations will have more network ties, more heterogeneous networks and lower network density than individuals who are low in sensation seeking. Results suggest that individuals high in sensation seeking have slightly less strong ties than individuals who are low in sensation seeking in both year 1 ($R2=-0.093$, $p<0.01$) and year 2 ($R2=-0.081$, $p<0.01$) of data collection. Sensation seeking is slightly negatively correlated with more in-bound and out-bound ties ($R2=-.067$ $p<0.05$) and slightly positively correlated with more racial ($R2=0.094$ $p<0.01$) but not gender variation intra-network. Sensation seeking is slightly significantly negatively correlated with ties outside of grade level ($R2=-0.06$ $p<0.05$). There is no significant difference in terms of network density between individuals who are high in sensation seeking and low in sensation seeking. Overall, results suggest a small but significant possible effect of sensation seeking on network development and maintenance.

Networking, Access, Norms, and Cognition: Forms and Functions of Social Capital in a First Grade Classroom

Stephanie Wexler-Robock
steph@dynamicresearchandevaluation.com
Social capital refers to access and use of resources available through one's networks to solve problems, and the norms that reflect inclusive or exclusive access to those networks and resources. Research has found positive relationships between social capital, academic achievement, and attainment. Studies however, have generally examined social capital through factors that occur outside the classroom; students who have social capital, acquired through their family and community networks, seem to be more successful academically. Limited research has explored what if any factors within the classroom might impact the creation of social capital, or its possible forms and functions in a classroom. Using methods of qualitative data collection and mixed methods of analysis, an examination of social capital in a first grade classroom revealed 8 networking factors and 3 broad discourse norms that appeared to function interdependently to promote or inhibit student engagement in social and cognitive networking, regardless of students' reading level. Ongoing outcomes of networking included conceptual understanding, in this case, about birds, and bridging and bonding forms of social capital. Bridging social capital appeared related to willingness to engage in weak tie networking. Expository sources more than narrative

texts generated intertextually dense networks, often between members with weak ties. Together the networking factors and discourse norms shed light on the way classroom discourse, resources, and practice might impact social capital, suggesting that social capital, rather than determined solely by family and community factors, may be produced by factors that are open to variation and occur within the classroom.

11:00 to 12:00

A Non-hierarchical Neural Network Approach for Analyzing Textual Data

Brenda Battleson
blb@buffalo.edu
Hao Chen
Carolyn Evans
Joseph Woelfel

Artificial neural networks excel at recognizing patterns in textual data. Its pattern recognition capability allows a neural network engine to assign weights representing the multiple connections among concepts. These weights can then be used to create dendograms or otherwise categorize concepts in a hierarchical manner. However this approach has its limitations. Words often have different meanings depending on the context in which they occur. For instance, the term 'mustang' can refer to a horse, car or airplane and thus appear in up to 3 clusters. Yet a hierarchical clustering method is unable to fully describe multiple relationships because it is only able to show concepts connected in one way. Each concept is assigned to only one "best" cluster in the output suggesting that there is only one meaning of that concept in the data analyzed. The use of a non-hierarchical approach can address this limitation since it allows the researcher to interact with the neural network to explore all possible meanings of a concept. Thus, in the resulting output a concept may appear in as many clusters as are appropriate. In this study hierarchical and non-hierarchical procedures are compared. Two large datasets, one containing multiple newspaper articles, the other pre-processed data listing only terms of interest, are examined.

Artificial Neural Networks for Pattern Recognition in Multilingual Text

Carolyn Evans
c5a@buffalo.edu
Hao Chen
Brenda Battleson
Joseph K. Woelfel

Neural networks are able to discover patterns in data; it need not be textual data. When a neural network is used to analyze textual data, however, it does not need grammar, heuristics, parsing or other linguistic artifacts to recognize, store and retrieve clusters. This is because what the system considers is not words per se, but rather, patterns in the stream of bits that represents the words. The neural network searches for recurrent patterns in this bit stream. Previous neural software has been based on ASCII code, but the present study utilizes UNICODE rather than ASCII code and extends the possibility of text analysis to a wide range of languages, including those such as Hindi, Korean and Chinese which are pictorial rather than alphabetic. If language is a vehicle for culture, then different cultures may use language differently. This would be suggested by inconsistent language usage and patterns. Using a system able to look at multilingual texts, different languages can be compared with each other quantitatively to explore the idea of discrepancy between cultures. This paper utilizes a neural network for analysis of text across cultures and languages. Different language versions of the United Nations' Human Rights Declaration were compared with each other to find out whether language difference affects the translation of official texts. Observed differences are presented quantitatively and graphically.

Discovering Scientific Trends in Medicine through Semantic Social Network Analysis

Paul Willems
Paul_Willems@gmx.de
Peter Gloor
Kai Fischbach
Detlef Schoder

By doing a semantic social network analysis of the Medline database we are trying to predict trends in medical research. Medline contains the majority of all biomedical research papers of the last decades and therefore offers an ideal testbed for predicting scientific trends by analyzing co-authorship networks of trendsetters in medical research. We further rely on PubMed Centrals' archive of full text articles for the creation of co-citation networks for a subset of Medlines' papers'. Our hypothesis is that by identifying the most central actors (authors) in the networks, trends can be discovered through analysing dynamic growth patterns of the contents of their scientific communication. Trends are measured as changes in centrality of the most significant terms, where the terms are weighted by the social network position of the author. The SNA tool Condor is used for analysing the networks and calculating centrality values as well as for processing the content and generating term rankings by applying a standard information retrieval tfidf metric. Condor is unique in that it combines content analysis with dynamic social network analysis. For the final weighting of the centrality of terms we combine the social network position of an author with the keywords obtained by doing a content analysis of paper title and abstract. The results of our semantic social network analysis are compared to external performance indicators such as patent submissions and awards won by scientists to verify their practical relevance and to show a correlation between network structure and success.

Thursday, Jan. 24   Afternoon

2:00 to 3:00

Visualizing diffusion on networks: contrasting the social influence and viscosity models

Jim Blythe
blythe@isi.edu
Cathleen McGrath
David Krackhardt

An important challenge in graph visualization is helping users explore and understand processes that unfold on networks. We describe a tool to explore the evolution of a diffusion process, where users want to both gain an appreciation of the major paths of influence over a period of time and also be aware of significant temporal patterns in the process that are not permanent. On each cycle, the tool computes the amount of change to each node that can be attributed to each dyad, and uses animation to draw attention to those dyads that pass a threshold. It uses a variable decay time on the animation of a dyad to combat "change blindness", that might otherwise obscure a temporary influence between individuals. Initial user experiments indicate that the use of motion helps users identify the individuals that play a significant role in a diffusion process as it unfolds. The tool includes implementations of four different models of diffusion, including the social influence and viscosity models. We use the animations to highlight the different effects that these models have with the same network and starting conditions, both in the end results and in the way the process unfolds.

Large Network Visualisation by Interactive Hypercomputing with Ruby on GRAPE

Yuji Fujita
yuji@webmasters.gr.jp

In order to get good network visualization, there are so many things to consider such as what kind of algorithm to use, their accompanied parameters and the like. Unfortunately, such matters are usually not trivial and hard to predict their effect before we can obtain the result which takes long time in many cases due to required amount of computation. I propose here a method and a system implementation based on it to overcome these limitations. A script programming language capable of expressing highly abstracted concepts and data that runs on hypercomputing device should provide enough agility and computing power, which means proper solution for problems like this. If such system should equipped with adequate interface to process network data and related concepts, data processing and analysis could be done entirely on interactive hypercomputing environment. To achieve enough versatility to evaluate the algorithms and related parameters, I built a network data handling class and related visualization methods on Ruby, the object-oriented script programming language which is known for its highly sophisticated ability to denote abstract data and complicated algorithms, as well as its interpreter-driven behaviour is suitable for quick implementation and trial. But Ruby itself has relatively limited numerical computation ability. To add hypercomputing power to Ruby, I wrote an extension library to control GRAPE-7, the latest production of special-purpose computer series for n-body simulations. GRAPE-7 is a FPGA-based reconfigurable add-in PCI card which can be plugged to ordinary PC, realizes 456Gflops of performance. By way of these implementations, I present analysis and visual representation of some large networks.

CI-KNOW: Recommendation based on Social Networks

Yun Huang
yun@northwestern.edu

Recent advances in Web 2.0 and Cyberinfrastructure have enabled new levels of interactions and interconnections among individuals, documents, data, analytic tools and concepts. For communities to be more effective in using these resources, it is even more crucial that they have tools help them identify the right expertise or knowledge resources from within this large "multidimensional network." Cyberinfrastructure Knowledge Networks on the Web (CI-KNOW) is a suite of Web-based tools that facilitates Discovery of resources within communities. CKNOW facilitates discovery ("If only the community knew what the community knew") by implementing a network recommendation system that incorporates social motivations for why we create, maintain, and dissolve our knowledge network ties. The network data is captured by automated harvesting of digital resources using Web crawlers, text miners, tagging tools that automatically generate community-oriented metadata, and scientometric data such as co-authorship and citations. Based on this knowledge network, the CI-KNOW recommender system produces personalized search results through two steps: identify matching entities according to their metadata and network statistics and select the best fits according to requester's perspectives and connections in the

social network. Integrated with community Web portals, CI-KNOW navigation and auditing portlets provide analysis and visualization tools for community members and serves as a research testbed to test social networks models about individuals' motivations for seeking expertise from specific resources (people documents, datasets, etc.). As a proof-of-concept, this presentation will demonstrate how CI-KNOW has been integrated with the NCI-supported Tobacco Informatics Grid (tobIG) to facilitate knowledge sharing in the tobacco control research community.

2:30 to 3:30

Network Workbench: A Large-Scale Network Analysis, Modeling and Visualization Toolkit for Biomedical, Social Science and Physics Research

Russell Duhon
rduhon@indiana.edu
Ann McCranie
Bruce Herr
Weixia (Bonnie) Huang

Network Workbench is a newly developing distributed, shared resources environment for large-scale network analysis, modeling, and visualization. This data-code-computing resources environment provides a one-stop online portal for researchers, educators, and practitioners interested in the study of biomedical, social and behavioral science, physics, and other networks. NWB allows a powerful algorithm integration framework that can allow researchers to both build their own specific measurement tools and take advantage of those developed by others. It has a streamlined menu-based, online portal interface for interactive algorithm selection, data manipulation, user and session management. In our demonstration, we will illustrate some of NWB's early features and tools. NWB is free and the most recent beta release is available at http://nwb.slis.indiana.edu/software.html.

MultiNet and Negopy: Together again for the first time

Andrew Seary
seary@sfu.ca
Ken Riopelle
Bill Richards

MultiNet and Negopy are now integrated for social network analysis. MultiNet, written by Andrew Seary and Bill Richards, is a computer program for exploratory data analysis of network data with interactive graphical display of node (attribute), link (network) and derived variables. Negopy, written by Bill Richards, is one of the oldest network analysis programs used for finding network structures such as cliques, liaisons, and isolates. In 2007 Negopy was integrated into MultiNet along with eight other enhancements sponsored by Wayne State University. The most important enhancement is the incorporation of Negopy as a module which runs inside MultiNet. The Negopy module was further extended by Seary to handle up to 32,700 nodes, 830,000 links and 8,000 groups. The extensions also include the ability to import Negopy classifications of groups, roles and distances into MultiNet node and link variables for further display and analysis. Other new MultiNet enhancements include: hybrid data displays of node attributes in eigenspace, node and link variables derived from triadic census, log files (histories of analyses and data transformations), macros (for automated analyses of multiple datasets), direct import of Excel spreadsheets, direct export of Negopy output for use in UCINet, and new controls for displaying data and labels. Andrew Seary will demonstrate the new features, and Ken Riopelle will show how these features are used in practice. A CD with the new software, documentation, and sample datasets will be provided.

PNet: A program for Simulation & Estimation of Exponential Random Graph (p*) Models.

Peng Wang
pwang@unimelb.edu.au
Garry Robins
Philippa Pattison

PNet is a program for the simulation and estimation of Exponential Random Graph (p*) Models (ERGMs). It is one of the program packages under the StOCNET platform. With PNet, one can: explore properties of a given ERGM by simulation; perform MCMC maximum likelihood estimations of proposed models on observed networks; and assess model goodness of fit. It has a collection of graph statistics for both nondirected and directed networks based on various tie dependence assumptions from the Bernoulli model to the recent specifications described in Snijders et al (2006). Actor attributes and values of ties can be treated as model covariates in the program. PNet also features several simulation constraints for conditional models. Extensions of PNet includes models for bipartite networks, multivariate networks, social selection and influence models, snowball sampled networks, and longitudinal network analysis. PNet produces file outputs that are compatible with other SNA and statistical packages (Pajek, SPSS). With a user friendly interface and a high performance simulation engine, PNet allows new and experienced network researchers to apply ERGMs for various network data.

3:00 to 4:00

Jacob's Ladder 11.0 and Information Saturation ABM 1.0

Benjamin Elbirt
Sarq_6669@yahoo.com

This presentation demonstrates two new software packages, Jacob's Ladder 11.0© and ABM. Jacob's Ladder 11.0© is software for the visualization, intonation and animation of network data in a virtual reality (VR) space. Jacob's Ladder 11.0© is targeted toward individuals interested in the examination of social networks and or any research involving the use of multidimensional data matrices. The software provides individuals with the ability to animate and/or overlay real-time data of any type or size in a VR space with maximum variability in dimensional representations including, but not limited to, object size, type, position, color, transparency, temporal positioning and audio frequency. This paper demonstrates Jacob's Ladder 11.0© with data describing the migration among Canadian provinces. The results are presented along with implications and future directions for this software. Agent based modeling (ABM) is rapidly becoming a common methodology for analyzing and understanding the underlying process of social behavior. Network evolution and dynamics are two of its applications (Monge & Contractor, 2003). This presentation introduces ABM software created to understand information diffusion among network connections based on weighted probabilities of communication likelihood, message type and age of message. The software provides users with the ability to designate the originators of messages. Results include two visual representations of the model in action to determine message saturation percentage and time to saturation.

ORA:Organizational Risk Analyzer

Terrill Frantz

terrill@org-sim.com
Kathleen Carley

ORA is a dynamic network analysis tool that enables the analysis of both standard social network data and meta-network data. It can handle large networks (10 to the 6th nodes). Features include routines for generating networks with particular characteristics, measures organized by task, integrated visualization, integrated simulation package for evolving the network.

SoNIA: The Social Network Image Animator

James Moody
jmoody77@soc.duke.edu
Skye-Bender deMoll
Dan McFarland

This "dynamic poster" presents the Social Network Research Animator (SoNIA) - a tool designed to visualize a wide array of dynamic network data. We provide examples of how the tool works, data formats, limitations and future directions with numerous examples drawn on youth, disease and science networks.

3:30 to 4:30

Geo-space Enabled Social Network Analysis: Introduction to ORA-GIS

Il-Chul Moon
icmoon@cmu.edu

We demonstrate how Organization Risk Analyzer (ORA) integrates a geospatial component into social network analysis. ORA has a function, called as ORA-GIS, which 1) visualize a social network with geospatial coordinates on a map, 2) display the aggregated network metrics of nodes in a region, and 3) output input files for ArcGIS, the most frequently used tool in the GIS community. This process displays that ORA can handle the initial geo-space visualization, basic network analysis for regions and interoperability with an advanced GIS analysis suite. For the demonstration, we use a global terrorist network that specifies the geospatial coordinates of key personnel, resources and location as well as the social links among them. Throughout the demonstration, we show how ORA can analyze the dataset in the social and geospatial perspectives. Furthermore, we show that a multi-agent network simulation in ORA can also utilize this GIS capability. The multi-agent network simulation, Dynet, is able to evolve the network in social and geospatial dimensions simultaneously. Hence, we evolve the global terrorist network by Dynet and analyze the evolution with ORA-GIS.

Visual Programming for Social Network Analysis

Michael Pastore
mpastore@bluespiders.net

We will demonstrate a software application which provides users the ability to construct sequences of algorithms, logic (if-the-else, triggers, loops), data manipulation, and visualization, as if they were creating a flow chart. Each "element" of functionality is dragged and dropped onto a workspace. Data flow is created by linking the elements together with pipes. Execution of each element will follow the logical structure of the flow. Once a flow has been defined, the user can package it up into a single procedural element and re-distribute it to colleagues or students for use. The application was designed with the ability to add many types of functional modules. Algorithms from multiple disciplines can be combined into new methodologies within a single environment. This visual programming paradigm will provide a powerful platform for analysts to model and develop new analytical processes. This software was conceived as a means of providing and expandable, flexible toolset by which researchers can develop methodologies to apply to a broad swath of problem domains and data sets.

Visualizing Temporal Properties of Actors Permits Prediction of Psychological Characteristics

Renaud Richardet
pgloor@mit.edu
Peter Gloor

In this paper we introduce an extension of our Condor software tool (formerly called "TeCFlow") for the visualization of dynamic social networks. In the past we have extended Condor from showing movies of the changes of social networks to also include visualizations of semantic social networks by showing movies of the contents of the discussion topics of the actors. In this paper we are describing a new extension of Condor, which adds the capability for continuously visualizing changes of attributes of actors over time. As an application of this visualization technique we have collected measurements of inter-human interaction with sensor-equipped tags worn on the body to visualize changes in speech and acceleration patterns of individuals. In a research project with 22 study subjects, who wore the badges during work for one month, our visual approach permitted us to predict social and psychological characteristics such as extroversion, neuroticism, openness, and agreeability based on microscopic social network analysis. We obtained control measures of these values with a standard psychological test (NEO-FFI) and found that a high contribution index was positively correlated with extroversion, and negatively correlated with neuroticism. Fluctuation in betweenness centrality was positively correlated with openness, and negatively correlated with agreeability. Using our visual approach to microscopic social network analysis offers organizations novel ways to realign their social structures to increase organizational creativity and effectiveness.

4:00 to 5:00

Construct: a dynamic network analysis tool

Brian Hirshman
hirshman@cs.cmu.edu
Kathleen Carley
Eric Daimler

The Construct simulation tool (Carley 1991; Hirshman and Carley 2007) is a simulation tool designed to predict how social behavior changes in response to the spread of information. Construct agents, embedded in a social network, will exchange information with other agents and learn over time. Agents can use the information they accrue from others to formulate beliefs, perform tasks, and make decisions. This session will present users with an overview of the Construct system and introduce potential users to what it has done and what it has potential to do in the future.

Mining Calls Record Data to Define and Analyze Network Culture

Madiha Sajjad
madihasajjad@gmail.com

A major problem in social network analysis is the discovery of hidden structure and features present in the enormous amount of high dimensional data. With advances in technology, providing large quantities of communication data, allows us to analyze social behavior and predict relationships. The foundation for this project is to model techniques that provide meaningful analysis of communication data and define the network culture and behavior. To fulfill its goals, the thesis focuses on call records data for defining groups in social networks as it is the most widely used tools for building and establishing relationships. This research is focused to find out relationships, build associations, mapping of communication networks and predicts the activeness of these networks. Calls record network analysis techniques such as sociogram generation algorithm have been implemented allowing discovery of the telephone user's communication network. These networks are dynamic in nature and are updated on the basis of different date the record is taken into consideration. The techniques studied have been applied on the PTCLV calls record dataset. Behavior of each of the actors in the network is determined by number of features that are used to predict the activeness of their relationship. The results of this research, gives an interesting insight into user behavior as its importance in the social network, its influence on other callers in the network and the importance of the specific user for the telecom company as their presence will enhance their customers count.

A Tool to Measure Connectivity & Visualize Networks Among Public Health Partnerships

Danielle Vogenbeck Varda

varda@rand.org
This paper explains the development and final product of a tool developed to assist public health departments in measuring and monitoring their connectivity with their partners. One of the major challenges of state and local public health agencies is how to effectively partner with others to leverage limited resources to fulfill their mission. This need spans many domains of public health, ranging from chronic disease prevention to public health preparedness, for example. This tool contributes to an ongoing effort to expand and measure connectedness (intersectoral interactions and the strength of them) across the public health system. The goal of the tool is to enable public health stakeholders/partners to measure their intersectoral connectivity, thereby enhancing their organizational operations and providing a mechanism for accountability, efficiency, and high quality care. Prior to tool development, a public health advisory panel was convened and interviews were conducted with end users to identify important aspects of connectivity that they desired to measure and visualize. The tool allows the "administrator" to go from data gathering to analysis and visualization without having to learn new software or hiring an analyst. All of these steps are explained in a technical guide and everything is programmed in Excel (the survey, analysis, and visualization) to meet the needs of a community of end users that desire easy-to-use, simple and intuitive ways to measure their collaborative activity.

Friday, Jan. 25   Morning

9:00 to 10:00

Extended Assortitivity and the Structure in the Open Source Development Community

Joseph Cottam

jcottam@indiana.edu
Open source software development represents the work of hundreds of thousands (perhaps millions) of developers around the world and is a critical component of many widely-used software products. Much of this development is self-organizing, taking place outside the structures of specific organizations. In this regard, open-source development communities are similar to academic research communities, which are also self-organizing and trans-institutional in nature. The structure of academic research communities has been characterized by the use of Bibliometrics techniques, which provide a quantitative basis for the self-organizing networks of academic artifacts (publications). In this paper, we introduce `Developmetrics,' the application of Bibliometrics techniques to similarly characterize the artifacts produced by open source development (software). Similar cross-over analysis has been done before in the study of other self-organizing networks, such as the Internet. We use a standard Bibliometrics visualization technique to guide our discussion and we introduce extensions to concepts of network assortativity, node afference and node efference to accommodate network meta-data. With the help of these tools, we investigate issues related to community formation and the product development life-cycle. Through visualizations and measurement, we show that the strongest organizing factor in the open source community is the choice of programming language. This paper describes how we reached this (and other insights) and discusses the implications these results may have on open source software development. We also discuss future questions and directions for Developmetrics analysis.

Building bridges to research subjects in businesses

Alexander Morren

a.morren@science.ru.nl

Social network analysis (SNA) is an exponentially growing research field but so far does not seem to recognize enough the need to make its theory and methods applicable for outsiders. Businesses could benefit from the strong visual possibilities as well as from a variety of useful SNA parameters developed for R&D networks. The most appealing problem in SNA-developments so far is the lack of a clear approach to empower the research subjects. Although SNA-consultants have arrived in businesses more than a decade ago, there is no common conceptual framework to bridge the insights to people who have had no education on this subject. This research aims to contribute to such a framework by introducing business terms into SNA. This approach enables the feedback of theorists to be clearly understood by research subjects. ISAPP, the Integrated System Approach for Petroleum Production, is the main case considered (an R&D network of Shell, TNO and the Technical University Delft in the Netherlands). The case shows that valuable management support can be realised if network strategies are linked to emergent results in an understandable way.

Question-order effects in social network name generators

James Pustejovsky

j-pustejovsky@northwestern.edu

Social network surveys are becoming more prevalent in many different areas of empirical research, including the evaluation of educational policy and reform. Often it is crucial to collect data on several types of network ties in an organization in one survey instrument. While a growing body of research sheds light on the accuracy and validity of data regarding uni-dimensional social networks, less attention has been paid to measurement of multi-dimensional networks and the validity of dimensional comparisons. Drawing on research about context effects in surveys (Tourangeau and Rasinski, 1988; Schuman and Presser, 1996; Sudman et al., 1996), we develop several hypotheses about relations between social network name generators and question-order effects. Multiple-generator surveys may be sensitive to satisficing effects, or may be sensitive to more complex shifts in context created by previous questions. Results are reported from a split-ballot experiment that randomized the name generator prompts in a multiple-generator, multiple-interpreter survey of teachers' social networks. Questions about sources of advice were randomized across subject matter for math and language arts. We find that question order has a marked effect on the number of alters named in one subject-specific advice network, but not the other. We then examine differences in the composition of teachers' networks due to question order, measured in terms of frequency of interaction, influence of interaction, and role of alter. Descriptive evidence is presented for each hypothesis, after which a p2 model is estimated to evaluate the relative strength of the hypotheses as an explanation for the observed order effects. We conclude by discussing implications for the design of multiple-name generator social network surveys.

9:30 to 10:30

Meta-Network Evaluation: Linking Ties to Performance in California Weed Management Networks

Thomas Bryer

tbryer@mail.ucf.edu

The weed population in California is large. Its size poses danger to communities and property owners, particularly due to the risk of fire and the intrusion of invasive weeds into natural habitat. To combat the weed problem in California, the state's legislature created a system of Weed Management Areas (WMAs). These WMAs are formalized networks of local, state, and federal government officials from across multiple agencies. There are currently forty-six WMAs throughout California. This study seeks to understand how effective WMAs are at (1) securing funding for their area to combat the weed population, and (2) eradicating the weed population in their area. The approach taken is a network approach. That is, the study will ask members of WMAs to identify with whom they communicate within their WMA and across to other WMAs, how often they communicate with those individuals, and how important such communication is in helping them combat the weed population in their area and secure funding for the effort. Data will be collected from participants at statewide WMA conference taking place in Sacramento, California in mid-October 2007. The study's hypothesis is that WMAs that are linked to other WMAs in their region

through network relationships and that maintain strong relational ties within each WMA will be more successful at acquiring funding and combating weeds. Implications of the study are the following: (1) empirical evidence can be presented to continue and refine theory building about bridging and bonding social and political capital, (2) data can be used to expand on network performance and evaluation frameworks that have been presented for use in public policy implementation networks, specifically suggesting a "meta-network" level that needs to be integrated, and (3) findings can assist actors in policy implementation networks in forging relationships that enable them to successfully accomplish policy goals.

Personal Networks and Multiple Ethnic Identifications

Rosalyn Negron
rosalyn.negron@gmail.com

Responding to the unique problems of counting a diverse population, in 1993 the White House Office of Management and Budget changed federal regulation to allow multiple race / ethnicity reporting in the US Census. Beyond the socio-demographic survey, an increasing number of people negotiate between multiple ethnicities in their daily interactions. In this paper I examine the relationship between personal networks and the use of multiple ethnic identifications. I argue that multiple ethnic identifications arise from participation in multiple spheres of social interaction, as reflected in a person's social network. To explore this idea, a factorial survey about ethnic identification in a number of hypothetical scenarios was administered to 119 New York City Latinos. Additionally, they completed a personal network questionnaire using Egonet. This Egonet questionnaire asked about the ethnic composition of their networks, among other measures.

PLACE HOLDER

10:00 to 11:00

Evaluating an Innovative National Interprofessional Psychosocial Oncology Distance Project

Janet Curran
janet.curran@iwk.nshealth.ca
Deborah Mcleod
Maureen White

The Interprofessional Psychosocial Oncology Distance Education (IPODE) Project is a two-year project focused on the development and delivery of web-based, interprofessional learning opportunities in psychosocial oncology at the graduate (post-licensure) level. The project partners include 8 universities (including 5 health disciplines or faculties) and clinical cancer agencies in 7 provinces across the country. A key project objective is to establish a Canadian network of psychosocial oncology educators and researchers that will sustain course delivery and conduct research in the area of interprofessional, psychosocial oncology and distance education. A variety of interactive strategies have been used to support communication and the development of relationships within the partner network. It is expected that synergy from a strong interprofessional network will contribute to the ongoing sustainability of the national educational initiatives. Use of traditional evaluation strategies pose a challenge for meaningful assessment of the networks formed, or supported by, the project activities. Social network theory provides a methodological framework for evaluation of this complex initiative and has allowed us to explore the changing patterns of network relations over the life of the project. In this paper will be discuss our evaluation design and the role of social network analysis in exploring the relational data. Preliminary data will be presented demonstrating formative learning regarding the intricate process of linking individuals

across professions, practices and provinces with the goal of enhancing education and research in psychosocial oncology.

Online Health Conversation: Placing Content in its Social Context

Itai Himelboim
hime0006@umn.edu
John Wirtz
Julie Jones

This study aims to examine online health conversation in their social context – the social networks they create. Specifically, we explore the relation between a discussion's topic and participants' motivation for engaging in online discussion by analyzing root messages, thread lengths, and the structure of social networks created within the threads. The independent variables are (1) group topic: life threatening versus chronic diseases and (2) motivation: "I" motivations – information and emotional support seeking – versus "we" motivations – belonging and community seeking. The dependent variables are (1) the size of discussion they evoke and (2) the structure of the threaded interactions they evoke: the percentage of direct replies and indirect replies. Implications are for the study of online forums as an alternative or at least additional platform for health-related information exchange and social support seeking. In an initial analysis, one month's worth of discussions in two health newsgroups – cancer and arthritis – were retrieved using the Microsoft Netscan dataset (Smith, 2006). Content of root messages were collected using Google Groups and content analyzed. Preliminary findings suggest that "I" motivations were most popular in the cancer-related group, and information-seeking was the most common thread starter motive. The arthritis group showed more equal distribution of motivations, with slightly more "we" motives. Both groups showed somewhat "star-shaped" discussions where most of the replies in threads were directed to the root message; yet, this was slightly more prevalent in the arthritis group.

Culinary networks of power. Dining with the kings of Belgium (1831-1909)

Danielle De Vooght
danielle.devooght@vub.ac.be

According to the renowned sociologist Norbert Elias, studying court societies is relevant to learn about power relations and networks, not just with regard to the micro cosmos of the court, but to society as a whole. Moreover, he acknowledged that eating, as an important (and perhaps central) part of this court society, creates hierarchies, delineates fields of influence, and constructs power. Power however, in whatever form, is relational and variable in time and place. Since the 19th century brings a definite shift in power where monarchies are concerned, one might wonder how the networks at the court evolve. For my research, I will conduct a Social Network Analysis of the dinner guests of the Belgian kings of the nineteenth century. I will examine who was invited on the same day (i.e. not just the name, but also the function of the invité, his/her relationship to the court, social status et cetera), how many times per year people were invited, who got to sit next to whom at the King's table and I will try to find out whether these groups of people formed some kind of (political, social, economic, cultural) network. Particularly, I will be able to investigate the development of networks over time in terms of rigidity, openness, and duration. This way, I might be able to say something about the relationship between food and power and about the position of

the Belgian monarchy during the nineteenth century. I will be able to show the first results of these analyses at the next Sunbelt Conference.

10:30 to 11:30

Take me to your Leader: Predicting Political Leadership using Social Network Metrics

Francesca Grippa
francesca.grippa@ebms.unile.it
Pasquale Del Vecchio

The increasing use of the web for sharing opinions and interests has spawned an area of research matching social network metrics - derived from the linking structure of the web - with the predictability of social events (Aizen et al. 2004, Gloor, 2007). Our research addressed the validity of using high-betweenness websites to identify likely winning candidates. We matched national polls' results with the relative popularity of six candidates for Secretary of the new Italian Democratic Party. We determined web popularity using a degree-of-separation search with the software tool Condor, that computes nodes' betweeness centrality by the number of links pointing to it (Gloor, 2007). We observed changes in candidates' relative centrality by identifying the most "talked about" candidates both on the Web and in the Blogosphere. When the search was done on google.com and technorati.com, the results show a negative correlation between the national polls' results and the betweeness centrality of candidates The same query on Google Blog showed a positive correlation between centrality and the likelihood of winning according to the polls. These findings suggest that a search on the Blogosphere, where knowledge can be shared among experts, might provide a more accurate projection of election outcomes. A possible evolution of this research might be to match political leadership with blog betweenness centrality across different countries and cultures.

New Zealand Dairy Industry Merger

Niels Martin Kristensen
niels.martin.kristensen@hotmail.com

In the early 2000's, the New Zealand political system was challenged as its dairy industry wanted to merge its two largest entities. The dairy sector produces 20% of the total NZ goods export. Therefore the political decision of a go to this merger was of national interest. This presentation focuses on the positions of the decision makers and the stakeholders in the process, and how the power structures affected the outcome of the process. Among the actors were the involved companies, their competitors, the political parties in government as well as opposition parties, and unions of farmers for and against the merger. Besides from the power analysis, a pseudo dynamic p* model of the actor behavior was modelled and tested for robustness in order to reveal the importance of the single network behavior variables as well as the more explicit factors such as pre process power status.

Prerequisites for the Unfolding of Policy Consensus in Germany's Parliament

Klaus Liepelt

---

liepelt@htwm.de
Lothar Krempel
We will demonstrate a particular mode of using relational data for understanding large scale policy production. Building on previous findings that emphasised the inportance of informal networks for decision making in Germany's Parliament, as presented to INSNA at Sunbelts 2006 (Liepelt, Lietz) and 2007 (Liepelt), we here add a historic dimension into Mittweida's relational data base on MP networks, as well as a systematic day-by-day observation of political pressures that accompany actions and transactions in the ongoing legislative process. In order to detect the building stones and stumbling blocks that eventually will or will not give way to a consensual roll call in plenary session, we seek to understand the underlying dynamics of the policy production markets. By applying Harrison White's models in analysing the role structures of parliamentary performance, we expect that a major step forward can be made in understanding the functioning of crucial small scale decision units that emerge and disappear in the political production game. Our focus is on 612 members of parliament of whom a workforce of about 550 comes from 5 competing political caucuses, spread over 22 parliamentary committes, who are engaged in the parallel processing of an average of 10 pieces of legislation per month. This requires a high degree of specialization among them. While on their caucus lines the MPs experience a continuous stream of poltical homophily, they may, on their policy committee assignments, share expert experience with trustworthy colleagues, independent of party. And they will protect and promote their individual interests by continueing participation in institutions of the society at large. As has been observed for the membership of other large scale settings which are geared to the production of social knowledge, a division of tasks that emphasizes diversity and self organization will improve the outcome. An analysis of the infrastructure of decision preparation in two committees with drastically different output records over time, will show that performance "styles" of committees carry on over election interrupts, even where individual members circulate. A detailed comparison of the Committeee performance in Environmental Policies and Health Reform reveals a strong contrast in production inftastructure. In Environmental Policies, a back stage network of trust and competence has emerged from cross-party cooperation, feeding a highly successful Committee performance: a "council" discipline that precedes the partisan presen-tations of the Grand Stage "interfaces". In contrast, a bachstage structure that would predefine policies in the Health Domain is practically absent. Performance is dominated by some members who engage in "arena" strategies of their own. In the absense of a "council" discipline, the top political elites, in order to get the recent Health Reform through Parliament (and even to avoid Government breakup) had to follow a time consuming protracted bargaining process. Beaten by lobbies, media and their own dissenters alike, they had to pull it off in the end, exclusive based on a top-down "interface" procedure. The presentation of our findings and the discussion of future research will be on poster.

11:00 to 12:00

Re-examining qualitative (ethnographic) research through a network theory lens: Gains in sampling and data analysis

Susan Haas
shaas@asc.upenn.edu

A network-location theory of culture offers a way of viewing qualitative research through a social network lens. This paper re-examines qualitative interview sampling methodology and preliminary interview data for a project in progress, an investigation of the interplay of journalism and public diplomacy as mission and practice in the Cold War era's Radio Free Europe, a U.S. government-funded organization managed by Americans and staffed by western journalists and, in language broadcast services, émigrés from the nations of East-Central Europe. In an analysis of 24 preliminary interviews conducted to date, this paper reconsiders an identity-centered interpretation in favor of integrating a network-location theory of culture. A re-examination of sampling and data derived from a strictly ethnographic point of view reveals opportunities for a network approach toward obtaining organizational depth and breadth, and illuminated organizational constraints (material, symbolic and conceptual) on intra-organizational networks . This analysis has implications for a growing number of organizations that are global in mission, yet deploy human capital in homophilous groups toward specialized, local production.

Terrorist networks and intelligence: characteristics of a Dutch islamist terrorist cell

Renee C. Van der Hulst
r.van.der.hulst@minjus.nl

The recent developments of radicalization and terrorist threats are associated with local cells of tight and close groups of fanatics. These groups are generally small with the core members sharing strong family or friendship bonds. Motivated by intense and frequent interaction and debate, members often share a progressive form of indoctrination, radicalization and extremism and increasingly withdraw contacts from their outer social circles. Such groups are also referred to as cliques and, according to Sageman (2004), they are considered to be the torment success behind unorganized and spontaneously evolving Jihadism. A major question therefore is, whether and how law enforcement interventions could come to grips and disrupt or destabilize the ongoing criminal activities of such terrorist cells. In this paper we used qualitative intelligence data on a Dutch islamist terrorist cell and examined the key players and strategic positions within the network (centrality, clique analysis) along with the associated brokerage roles of the various actors. Implications of the study are discussed.

MITIGATING THE EFFECTS OF MISSING DATA IN THE ANALYSIS OF COVERT NETWORKS

Grazyna Kazmierska
Grazyna.Kazmierska@homeoffice.gsi.gov.uk
Simon Green

Last year the UK Home Office conducted a research study into the use of Social Network Analysis to investigate criminal networks. Amongst the findings was an appreciation of the difficulty in interpreting the results of analysis whilst accounting for biases created by missing data issues that are inherent in covert social network datasets. Here, initial findings from a research programme that aims to investigate the potential of various techniques to mitigate the effects of missing data are presented. The first strand of our work concerns sampling methodology. A covert network is potentially a very large network with poorly defined boundaries. This is a problem for an analyst with only a limited amount of time in which to gather data from intelligence sources. A poor sampling approach may lead to missing data. We have analysed various sampling methodologies to define how to obtain the best (most accurate or most complete) representation of the network for the smallest cost. The second strand of our work concerns the inference of links. This will enable us to predict the existence of links in areas of the network about which we have incomplete or unreliable data. This work uses Bayesian Inference to predict links between actors in the network on the basis of their attributes; and Exponential Random Graph Models to predict links on the basis of structural characteristics of the graph and of attribute data.

Friday, Jan. 25   Afternoon

2:00 to 3:00

Networks of events and action over time

Wouter De Nooy
wdenooy@fmg.uva.nl

Current models for the dynamics of social networks focus on repeated measurements of a network. They seek to predict or explain the appearance, maintenance, and disappearance of ties between consecutive measurements of a network both from previous network structure and properties of actors in the network. These models presuppose that (1) the measured relation is manifest and potentially enduring, and (2) any actor is able and likely to consider changing its tie to any other actor in the network. Friendship within a set of interacting people is an example of a social relation meeting these criteria. Lots of longitudinal network data, however, do not meet these criteria, especially data from archives documenting events or actions from one actor towards another. For instance, an email contact between two actors need not be known to other actors, so how could the latter take this email into consideration? Marriages are known to all members of the group, but not every person can (re)consider marrying any other person due to institutional constraints. As a consequence, the structural property to be modelled needs to be rethought, e.g., is it the presence of a tie (if so, which) or a characteristic of the tie that can be explained? This paper presents statistical designs taking advantage of the fact that we know who acted towards whom at what moment.

Educational Interventions in a Social Network Setting

Brian Hirshman
hirshman@cs.cmu.edu
Kathleen Carley

Social networks can be powerful tools for understanding and gaging the effectiveness of educational interventions. Modeling work using Construct (Hirshman and Carley, forthcoming; Carley 1995) attempts to understand how these educational interventions manifest their effects and how agents. Aggregate results indicate that relatively mild interventions, such as advertisements, can have similar strength as more information-intensive interventions, such as web pages, when placed in social network settings. Since both information and belief information propagate in the Construct model, interventions which vary information content and belief strength may have non-linear impacts on participation. Further research suggests that combinations of interventions may not be additive due to competing effects between knowledge and belief. By understanding how educational interventions work in social networks, intervention designers will be able to better predict the success of future educational intervention campaigns.

Exponential random graph models and snowball sampling

Philippa Pattison
pepatt@unimelb.edu.au
Garry Robins
Peng Wang
Galina Daraganova

In this paper we discuss conditional maximum likelihood estimation of exponential random graph models from partial network data obtained from multi-wave snowball and related sampling schemes. By snowball sampling schemes, we mean those in which one or more "seed node" actors report ties in his or her personal network, and each of those named network partners reports ties in his or her personal network, and so on. We describe several different sampling designs and estimation approaches and we report the results of some simulation studies designed to explore the different properties of these approaches. We also present some empirical applications and discuss issues for further research.

2:20 to 3:30

Statistical Analysis of Friendship Patterns and Bullying Behaviors Among Youth

Dorothy Espelage
espelage@uiuc.edu
Harold D. Green Jr

Stanley Wasserman
This study used p* modeling to demonstrate how adolescent friendship structures grow into dyads, triads, and tetrads (groups of four) and then possibly into larger entities, and how peer effects can be examined within these structures. Seventh graders (N = 188) completed a self-report bullying scale and listed who they "hang out with" at school. The p* models were calculated on friendship data using the PNET program (Wang, Robins, & Pattison, 2006), which allows conditional, MCMC modeling of structural and behavioral parameters of networks. The hypotheses tested were based on homophily theories, balance theories, and theories of group and collective action, Homophilous dyads, triads, and stars were found to be significant building blocks of the friendship groups, and all served as micro-level mechanisms that motivate the macro-level construct of peer group effects. Analyses supported the homophily effect of bullying perpetration, in that children tended to be friends with others who shared similar levels of bullying perpetration. Results of this investigation highlight the importance of moving beyond the common practice among developmentalists of focusing solely on dyads—the lowest level of social structure—and cliques—the highest level of social structure—toward an examination of those structures that lie in between (Haynie, 2001).

Mapping Conversations in a Computer-Mediated Environment

Andrew Feldstein
andrew.feldstein@gmail.com
Unprecedented access to online communications, specifically threaded discussions taking place in community forums, is creating new opportunities for researchers. In order to observe the online interactions among online community members this study will employ a form of ethnographic analysis called netnography (Kozinets 2002). Advantages of conducting a netnographic study include the ability to gather data in an unobtrusive and economical way. The purpose of this paper is to illustrate the enhanced perspective that can be gained by applying a Social Network Analysis to netnographic data. The methodology will employ three distinct phases; data collection, text processing, and network analysis. In the first phase a netnographic analysis will be conducted within online communities for each of two computer operating systems; Mac OSX and Ubuntu Linux. In phase two the transcripts of threaded discussions selected from these community forums will be preprocessed and analyzed using Automap, a semi-automated Network Text Analysis tool. In phase three a standard network analysis will compare and contrast these communities on the "actor" level as well as at the level of complete networks of links and relations. ORA, the social network analysis and visualization software that integrates with Automap, will map the relationships between text-based concepts and highlight potential structural similarities and differences between the structure of these two communities.

3:00 to 4:00

What You See Depends on How You Look: Global Governance Theory and Social Network Analysis

Annelies Kamran
akamran@gc.cuny.edu
Thomas G. Weiss

This paper presents a framework for moving toward a qualitative middle-range theory of global governance. To date, global governance is a largely descriptive label that encompasses the complex, heterogenous structures of world politics. Global governance can be studied by examining "slices" at different geographical, temporal, and issue junctures, or how the interrelationships between actors differ according to frame. After examining dominant theories and defining global governance, the main types of gaps to be found are discussed: knowledge, norms, policy, institutions, and compliance. The varying structures of gaps in global governance are illustrated by examining the social network created in response to the Indian Ocean tsunami of December 2004. The paper ends with a future research agenda to refine the technique of examining slices by applying game theory and thick description to formal network analyses.

A network approach to understanding coastal management and governance of small scale fisheries in the eastern Caribbean

Kemraj Parsram
kemraj.parsram@cavehill.uwi.edu

In the eastern Caribbean, many people depend on the good governance of fisheries and other marine resources for their livelihoods and for development to be sustainable. The governance of small-scale fisheries in the eastern Caribbean often lacks the interactions among stakeholders needed to sustain fisheries management. There is an urgent need to understand networks in the governance of these fisheries without claiming that they are necessarily good or bad. Small, low status government fisheries units have tenuous links to public sector policy and resource users. Other stakeholders, such as in tourism, may be more connected to policy, marginalizing small-scale fisheries even in the context of integrated coastal management. Network analysis has been applied to both social systems and ecological systems but seldom to combined social-ecological systems. In this paper, I demonstrate using the case of fisheries science networks in the Caribbean, the application of a network approach to understanding the governance of social-ecological systems such as that of the large pelagic and shallow reef fisheries of the eastern Caribbean.

Role of Social Network in Arsenic Mitigation Activities in India

Atanu Sarkar
contactatanu@yahoo.co.in

Arsenic contamination of groundwater in India has resulted in millions of people at risk. People are exposed to arsenic through drinking water and food chain. A number of measures have been taken by government and international agencies. But, no significant benefits have been noticed so far. Rather, there is more evidence of successful implementation of intervention program, where small NGOs are involved. These NGOs are essentially working with communities and establishing social network. The study critically analyzes the success factors and importance of social network to address the serious environmental health issue. Two NGOs, who have been involved in community based arsenic mitigation programs including promotion of arsenic safe water, awareness generation and sustainable watershed management - were selected. The survey has been conducted in their respective project areas. Field data were collected by focus group discussion, key respondents interview, transect walk, environmental analysis (water sample). Equal number of control villages (two) has been chosen, where there is no NGO, working on arsenic mitigation activities. Results show that prior networking with the affected communities has increased the demand of new service, and ensure sustainability by their active participation in management and financial support. Selection of right intervention through community consensus has resulted in marked improvement of quality of water supply. On the other hand, in control village, several mitigation strategies have collapsed soon after implementation due to lack of ownership.

3:30 to 4:30

Socio-Dynamic Discrete Choice on Networks

Elenna Dugundji
E.R.Dugundji@uva.nl

A model is considered where a commuter's choice of transportation mode is influenced by neighbors and peers' mode share, accounting for common unobserved attributes of choice alternatives in the error structure. Non-global interactions are addressed within different social and spatial network structures, combining advanced econometric estimation with computational techniques from multi-agent based simulation. Additional heterogeneity is introduced in the model through standard mechanisms, such as individual-specific socio-demographic characteristics of the agents, individual-specific attributes of the choice alternatives, and availability of alternatives. This paper extends earlier work by systematically exploring effects of sample size, initial conditions, geographic scale and systematic omitted links. Limitations of the present study are highlighted and recommendations for future work are made.

Social network proximity, social support and drug use

Danielle German
dgerman@jhsph.edu
Carl Latkin

The literature confirms spatial clustering of network ties and the effect of neighbor network characteristics on such outcomes as neighborhood satisfaction, yet a variety of questions remain about the relationship between network proximity and socialization. Little is known about how social network member role and function varies by proximity or the extent to which this may differ by drug use, a factor that may shape social interactions or experiences of place. Additionally, little is known about whether proximity of social support availability is associated with mental health outcomes among urban residents. Research aims were 1) to understand patterns of social network proximity among drug users and non-drug users, and 2) to examine the mental health implications of social support provision by neighborhood proximity and drug use. Data are from 703 participants enrolled in the SHIELD study in Baltimore, MD from February 2001 through September 2003 who reported detail about their social network members. Results show differences in interaction frequency and support provision by network member proximity, with unique patterns according to index drug-using status. The effect of network member and social support proximity on depression also varies by index drug use. Understanding the interplay between network proximity and role, function and interaction frequency may help to elucidate socialization patterns and sources of support among urban residents and the ways in which neighborhood networks are associated with mental health among both drug users and non-drug users.

Geographic and Social Space: Using Distance to Predict Network Ties among Administrators in both US Rural and Ugandan Schools

Julie M. Hite
julie_hite@byu.edu
Steven J. Hite
Christopher B. Mujimu
Bart A. Reynolds

Network theorists have begun to incorporate considerations of geographic space in their research (Barney, 2004; Entwisle, 2007; Faust & Skvoretz, 2002; Tita & Faust, 2005) reflecting Barney's recent call for a "a geographically embedded view of relations" (Barney, 2004, p. 325). While network literature often assumes relationships between geographical proximity and network ties, empirical examinations are sparse. Using geographic and network data, this paper examines whether geographic proximity similarly predicts network ties in two different networks. The first network—US rural school administrators—consists of interaction ties among 70 school administrators from six contiguous rural school districts. The second network—Ugandan school headmasters—consists of resource network ties among 69 secondary school headmasters in Mukono District, Uganda. Geographic locations were obtained for all schools in both networks. IUsing NetDraw and ArcGIS, the network maps of the school principal and the headteacher networks are illustrated in both social and geographic space. Using logit regression, findings indicated that geographical proximity did predict the existence of the network ties in both networks providing evidence of the intersection between geographical and social space and supporting the geographically-embedded view of social relations (Barney, 2004).

4:00 to 5:00   ## The Structure of Undergraduate Association Networks: A Quantitative Ethnography

Sean Clouston
sean.clouston@mcgill.ca
Ashton Verdery
Sara Amin
Robin Gauthier

The challenge of collecting complete associational networks has often restricted network studies to small datasets. To deal with larger processes, two general procedures have been developed: the use of indicators such as citation structures or the diffusion of innovations to model human interactions, and limiting the sample of associates' names. A body of theoretical and empirical work has identified several problems with these methods. We examine a unique solution to these problems - measuring online social networks of college students. Using the social networking website Facebook , we randomly sampled 264 undergraduate Facebook users at McGill University, constructed an 8152-actor sociomatrix containing their direct ties to campus peers, who were subsequently linked to another ~14000 on-campus users. Our data thus contain ~22000 on-campus Facebook users, as well as a potentially valuable enumeration (n=~50000) of direct and indirect off-campus ties. At each level, on-campus ties were coded on several attribute variables. Utilizing this original dataset, our goal in this presentation is two-fold: to demonstrate the feasibility and acceptability of this form of measurement, and to explore a substantive topic related to prestige and social structure. Our presentation will proceed in three parts: discussion of the estimation methods used, focusing specifically on their relevance to traditional survey methodology, network methodology, and studies of internet use; discussion of the applicability of our findings and whether online social networks accurately represent the off-line social world at McGill University; and, presentation of exploratory results of a substantive topic as a first step in utilizing the rich resource this dataset provides for understanding social relations.

An Examination of Ego-Centric Social Networks in a Culturally Heterogeneous Society: The Case of Singapore

George Barnett
gbarnett@buffalo.edu
Pauline Cheong
Kyounghee Kwon

Along the lines of the special edition of Social Networks edited by Barry Wellman, which described personal networks in different cultural settings, this paper examines ego-centric networks in a culturally diverse society, Singapore. Singapore's population is composed of three major ethnic groups, Chinese (76.8%), Malay (13.9%) and Indian (7.9%), as well as a number of expatriates from around the world. Likewise, the society is religiously and linguistically diverse. Special attention is paid to those individuals with personal ties to others from different ethnic groups. It is hypothesized that individuals whose personal networks that span cultural boundaries will have more radial networks than individuals with culturally homogeneous networks. Individuals in the latter groups will have denser interlocking personal networks. The research also examines their differences in media use and personal identity. It is expected that individuals with ethnically heterogeneous personal networks will have different cultural identities than individuals with homogeneous networks. Implications for contemporary cosmopoliteness and globalization in world cities are discussed.

Homeless Women's Personal Networks and Risk Behavior

David Kennedy
davidk@rand.org
Joan Tucker

Homeless women are more likely than other impoverished women to engage in substance abuse and sexual practices associated with HIV/AIDS. An understudied aspect of these behaviors by homeless women is the social context in which they occur. Gaining an understanding of the social networks of homeless women will likely prove fruitful in addressing these important health threats. In this exploratory study, we conducted 28 personal network interviews with women residing in homeless shelters in Los Angeles County, with the goal of describing the structure and composition of their extended personal networks. We elicited 25 network alters from these women and asked questions about their relationships with each of these alters (contact, length, emotional closeness, tangible support, conflict), and the alters' risky behavior (heavy drinking, drug use, risky sex, incarceration). We also asked women to rate the strength of ties among alters and used these ratings to measure network structure. We used pile sorting and Multi-dimensional scaling (MDS) to identify four distinct types of network structures. Family members were the most frequently mentioned type of alter and their network alters were diversely composed of both risky and non-risky members. Non-risky and high quality relationships were found to be tenuous (e.g., women interacted infrequently with family; relationships formed through religious organizations were short-term). Certain alter types (e.g., people met through non-religious organizations) that were associated with high-risk behavior are poorly understood and deserve further attention. Implications of these results for understanding risk behavior and developing novel approach to intervention will be discussed.

Saturday, Jan 26   Morning

9:00 to 10:00

Hollywood and the Development Network: The Role of Network Structure in Shaping Routinized Behavior in the Filmmaking Process

Bryan Greenberg

greenbergb@etown.edu

What shapes the choices that go into the filmmaking process? Some might argue it's the audience, with consumer demand driving content decisions. Others might look at it from the perspective of the industry, with content a reflection of the creativity of those working in Hollywood. In some respects both perspectives are valid, with the audience playing a key role through their purchase decisions and those in the industry ultimately making the decisions that shape the content that appears on the screen. But there is, as expected, much more to the story than this. For the role of the audience and those who work in the industry is in many ways illusory. It is the structure of the networks that form in Hollywood – the way that organizations align, the type of people that participate (and are prevented from participating), the way individuals and organizations interact – that in many ways drives content decisions. That's not to say that there isn't great creativity in Hollywood. Nor is it to say that the audience has no control over what it consumes. Instead, it refers to how it is these network structures that guide and shape decision making and lead to routinized behavior patterns. It is these structures that create institutional barriers to participation, resulting in little diversity both demographically and psychographically. And it is these structures that drive the development of relationships – both between organizations and individuals – that can define what is and isn't produced in Hollywood. This paper explores these issues. It results from the application of social network analysis to the field of media sociology, the study of what influences the creation and dissemination of media content. Specifically, this paper presents an in-depth analysis of two development networks to illustrate how the networks that form during the development phase of the filmmaking process play a role in shaping how and why decisions are made in Hollywood.

Are there similarities in the organizational network structures of state public health systems? Using network analysis to examine tobacco control and physical activity promotion programs across multiple states

Jenine Harris

harrisjk@slu.edu

Douglas Luke
Paula Ballew
Ross Brownson
According to the US Centers for Disease Control and Prevention, tobacco use and obesity are the leading causes of chronic disease and death in the United States. These problems are addressed primarily by state-level programs focused on tobacco control and physical activity promotion. We know about the resources that go into these programs, and we have some evidence of what they accomplish, however we know little about the organizational infrastructure that facilitates each program. Specifically, we have little information about the connections among agencies in these programs and whether there are organizational commonalities across states or issues. This study used network analysis to examine the structure of tobacco control programs in eight states and physical activity programs in four states. A total of 201 partners were identified, for an average of 16 key partners in each of the 12 state programs. Each partner was asked about contact and partnerships with all other key partners in their program. Using network analysis we identified similarities and differences among the programs. While network structures were different between programs in terms of density and centralization, blockmodeling showed patterns in the types of ties among agencies across programs. Based on these patterns we developed blueprints of typical state public health programs. These blueprints provide an organizational model for existing programs faced with changes in funding and political support and for newly developed programs. In addition, this study provides evidence on structures and linkages that may lead to more effective public health systems.

Networks as Strategies of Coordination for Organizations in Long-Term Care Services

Li-Wen Liu
lwliu@thu.edu.tw
Over the past few decades long-term care has presumed to be the most desirable objective for human service organizations. There has been a nationwide effort on the development of coordination between organizations across health and social service delivery systems in Taiwan. Specifically, developing a service network has become a promising way for organizations to provide integrated long-term care services for the elderly. Using network analytical techniques and data from ninety long-term care service providers, the author examines strategies of organizations in building a coordinated long term care service delivery system in Taiwan. It analyzes how the various types of organizations across both health and social service systems form collaborative networks. The results indicate that different patterns of coordination exist among organizations across health and social service delivery systems. Public agencies tend to develop the strongest linkages with various types of agencies. Specifically, hospital established in-home service agencies serve as bridges to long-term care coordination. However, the results indicate that a lack of coordination exists between the health and social service systems. Findings emphasized the need of enhancing provider-referral systems, stability of service network, and coordinating skills for organizations across health and social service organizations in developing an effective service network for long-term care services for the elderly. In addition, the issue of how to manage organizational resources needs to be addressed in promoting an effective service network. This paper also introduces how geographic information system can play a role to enhance resource management in the service delivery system.

9:30 to 10:30

Turning Network Traffic into Business Intelligence

Alan Schunemann
alan@etelemetry.com

Today, businesses rely on network-based applications for communications and information systems to run their enterprise. This network activity can be leveraged to open up a new world of real-time business information: Where are informal collaborative groups in your organization? Who are the real thought leaders? eTelemetry provides real-time Business Activity Monitoring (BAM) by analyzing employee network activity, enabling you to identify key employees, improve efficiency, and reduce risk. Schunemann will present the real-world applications of BAM and Social Network Analysis from the passive analysis of network traffic.

Towards an SNA-Based Framework for Educating Future Global Leaders

Peter Gloor
pgloor@mit.edu
Kai Fischbach
Francesca Grippa
Maria Paasivaara

This paper investigates social network analysis as a method to assess the performance of a community-based learning process for educating future global leaders. Our framework is based on a distributed course for optimizing online communication behavior through social network analysis, which has been taught repeatedly to computer science and MBA students. These students come from geographically distant universities with different languages and cultures. They never meet face to face, but form virtual interdisciplinary teams collaborating on a common task. The course teaches three goals: (1) Students become more innovative by experiencing the power of "swarm creativity". They form a collaborative innovation network (COIN) to engage in trusting and focused-collaboration in cyberteams to reach a shared goal. (2) Students improve communication skills in a virtual world by learning to make better use of electronic communication channels such as chat, skype, e-mail, wiki, and web-conferencing. (3) Students become better collaborators across different cultures and geographies by working together with peers from other countries and other mother tongues. Our study permitted us to obtain preliminary results on correlating temporal online communication patterns with team performance by collecting interaction data from e-mail, skype, web-conferencing, and face-to-face meetings. Performance is measured by correlating traditional network performance metrics such as betweenness and density, achievement of the course objectives through peer evaluation, and development of leadership personality characteristics. Our final goal is the development of guidelines to assess a learning organization focused on managerial competencies development.

10:30 to 11:30

Social and Cognitive Networks and Cognitive Maps of a Human Services Agency

Kenneth Tingey
ken.tingey@usu.edu
Michael Millington

This is a study of information systems legitimacy within a state human services agency in the United States based on various networked representations, including a mapping and operationalization of the Aldrich legitimacy model. Experts with high centrality and betweenness in the agency were identified using a networked system with sponsorship of agency administration based on social network analysis of expert and referent relationships among agency professionals. The object is to understand the cognitive networks and cognitive maps within the agency as verified by opinions and insights of these most respected experts. IRB arrangements allowed for two stages of informed consent. The first of these involved participation social network study. A second round of individual consent was directed at selected experts before their identities could be individually disclosed. Subsequent meetings with consenting experts were recorded, semantically coded, and evaluated using grounded theory. The result was a collection of cognitive maps of expert understanding and opinion on critical issues in the professional field in question. These linked maps of the cognitive requirements of the sector, built on a previous operationalization of the Aldrich legitimacy model, links cognitive legitimacy with knowledge fluidity within the agency and sociopolitical legitimacy with technology immersion and expands on that analysis. Knowledge

---

fluidity represents the cognitive requirements of the field in question while technology immersion considers benefits and disadvantages of technologies in support of such efforts.

10:00 to 11:00

Large-scale structure of production network and chain of firms bankruptcies in Japan

Yoshi Fujiwara

yfujiwar@atr.jp

Production network refers to a line of economic activities in which firms buy intermediate goods from upstream firms, put added-values, and sell productions to downstream firms, or consumers in the end of the line. The whole set of these processes of putting added-values in turn forms a giant network of production ranging from upstream to downstream, down to consumers. Net sum of added values in production network is basically the net total production, that is, GDP. Although production network, its structure and temporal change, are crucial in understanding macro-economic dynamics, little has been hitherto studied by real data. Here we study a nation-wide production network comprising one million firms and links among them in Japan. Also we point out that each link is usually a creditor-debtor relationship. If a firm goes into financial insolvency state or bankruptcy, then firms on its upstream can have secondary effect from the bankruptcy. By using the data of bankruptcies, we show that such network effect for bankruptcy is by no means negligible. In fact, nearly 20% of total debt is due to such effect. Moreover, the link effect dominates, in probability, other causes for bankruptcy, such as poor performance in business, for larger debt when bankrupted. We argue that the effect due to bankruptcy chain is considerable in its ripple effect due to the heavy-tailed degree distribution.

How Service Employees Learn Through Their Own Fellas?

Jianji HU

hjj@fudan.edu.cn

As nowadays customization has received more and more attention from both academic and practitioner communities, this paper tries to take a social network approach to explore the mechanism where effective customization takes place. Customization in a service context requires front-line customer contact employees to be adaptive in their roles. Though researches have gone as far as how role theory should be an illustrative basis for technical solutions as to how customization behaviors can encourage and what it means to be adaptive in real time service encounters, none effort has been made to look at the issue from a structural perspective, i.e., the question of how employees' social network can do about their effort to take the challenge of adapting to customers' need? Using social network analysis, as well as marketing, psychology, and organizational behavior literatures, the author try to define and empirically define structural factors of employees' social network that affect on their adaptive behavior, by taking into account control variables such as customer knowledge, personality traits, and other demographic data. Two levels of employee adaptive behavior are investigated for the structural influence of employee social network: i.e., interpersonal adaptive behavior and service-offering adaptive behavior. The research has implications for marketing segmentation, employee selection, training and other business administration areas.

Regional Labor Markets in Germany - Delineation and Structural Properties

Per Kropp
perkropp@web.de

After addressing the question of administrative versus functional delineations of economic regions several approaches to identify regional labor markets are discussed. In the third part some promising approaches are applied on data of commuters between municipalities in Germany. The properties of these different labor market delineations are compared and advantages and disadvantages are discussed. In part four the structural properties of the labor markets are investigated (e.g. monocentric vs. polycentric structures). This leads to identify labor markets with important substructures. The fifth part is about the mobility patterns between regional labor markets. These analyses show relatively strong interconnected and more isolated economic regions. Structural analyses in part four and five are conducted using methods of social network analysis, and therefore combining approaches of network analysis and geography. The results might help the researcher to decide which delineation method fits best to particular research questions. Finally, part six comprises the most important findings of this research and remaining research questions are addressed.

10:30 to 11:30

Bulls vs. Bears Online: The Diffusion and Evolution of Argument in an Online Discussion Network

Drew Margolin
dmargoli@usc.edu

This paper combines network analysis and rhetorical analysis to trace the diffusion and evolution of argument through a discussion network. A discussion network is constructed from entries and comments posted to an online discussion community regarding publicly traded securities. The diffusion and variation of argument strategies are traced through the network over time. The study relies on evolutionary theory as its theoretical perspective. It is hypothesized that advocates for particular securities (bulls) as well as critics of these securities (bears) will compete for credibility in the community by pitting their strongest arguments against one another. Thus, it is likely that the development of their arguments will reflect evolutionary processes of variation (as new arguments are tried), selection (as particular arguments are disconfirmed or de-legitimated) and retention (as some are re-used and imitated by others). Furthermore, these processes should occur in different localities of the network, modifying one another's influence as they diffuse through it. Data for the study come from Motley Fool's CAPS site. The CAPS site provides a space for users to comment on various securities as well as on the comments of other users. Users rate each other as well as the individual arguments they make. Three networks are constructed in this study: an agreement network (linked by supportive comments), a disagreement network (linked by disputing comments), and an affiliation network (comments on the same security). By viewing these competitions in their network contexts, it is possible to see how local adaptations (made in particular discussions) find their way through the larger network. The diffusion of these strategies can also be compared against the price of the stock over time.

Social Network Metrics of Simulated Tax Participants: an in-depth examination of the Construct simulation system

Eric Daimler
eric.daimler@west.cmu.edu
Brian Hirshman
Kathleen Carley

Recent modeling work (Hirshman and Carley, forthcoming) has sought to analyze tax scheme participation and educational interventions using a social network model. Construct (Carley 1995, Hirshman and Carley 2007) provides a convenient way to examine how educational interventions affect participation rates and how participation is affected by information and belief propagation. This paper expands the intervention model to understand whether and how participants cluster together, with an eye towards designing social-network-aware educational interventions. Results suggest that agents who decide to participate in tax schemes have common social network properties as well as similarities in their communication networks. Additionally, social network metrics can be used to understand various decisions made by the simulated taxpayers as well as to predict individual behavior in an individual simulation condition.

Changes in friend network systems of newly diagnosed breast cancer patients: a comparison between older and younger patients

Sato Ashida
ashidas@mail.nih.gov
Aunchalee Loscalzo
Karen Basen-Engquist
Laura Koehly

Socioemotional Selectivity Theory posits that people who perceive constraints in time become more selective about their social ties. Studies have shown that older people prefer to spend time with familiar ties, while younger people prefer newer ties. Cancer patients have been found to restrict their perceptions of future time after diagnosis. This process may be especially relevant to patients diagnosed at younger age (50 years or younger) who are more likely to have genetic predisposition for breast cancer that may lead to higher likelihood of recurrence. Changes in friend network systems of newly diagnosed breast cancer patients over 6 months and whether such changes differ between older and younger patients are evaluated. Because older individuals are likely to already have more familiar ties, more changes were expected to be seen in younger patients' networks after diagnosis. Information on 27 patients and 151 network ties were analyzed using multilevel modeling analyses. Results show that older patients had more family in their networks and were less likely to drop their ties at follow-up. Furthermore, older patients reported more increase in the degree of friendship, particularly with family members. Whether a friend participated in the interview and frequency of support at baseline were associated with increase in degree of friendship only among younger patients. These findings suggest the importance of family members for older cancer patients and ties that provide support for younger patients. Implications of the findings on health interventions to facilitate adaptation among newly diagnosed cancer patients will be discussed.

11:00 to 12:00

Using Network Analysis to Identify Problematic Health Care Utilization by Patients Experiencing Chronic Pain

Eleanor T. Lewis
eleanor_lewis@stanfordalumni.org
Martha Michel
Jodie Trafton

Patients with severe pain who take pain medications (opioids) can develop substance use problems associated with these medications. Substance use problems may lead patients to engage in problematic health care utilization patterns to obtain additional medications. While research has identified some health care utilization patterns associated with substance use problems (i.e. visiting an emergency room seeking an opioid prescription), current methods of identifying this population rely on chance and individual screenings. In this study, we use social network analysis of the egonets of individuals taking opioids for pain to identify problematic health care utilization patterns. The US Veterans Health Administration (VHA) provides health care to more than 5.5 million veterans. Half of the patients in a sample seen at the VHA were diagnosed with at least one type of chronic pain and approximately one-third of them were prescribed at least one opioid pain medication.. We will conduct individual assessments of a sample of veterans with an active opioid prescription to identify those with a potential substance use problem related to their opioid use. We will then use the VA electronic patient record system to compare the health care utilization patterns of patients with a potential problem and those without. For example, patients whose medical record indicates they visited multiple clinicians at the same pain clinic may be more likely to have a substance use problem. Eventually, the patterns we identify can be applied to pre-emptively screen for patients who may be having problems with their medications.

Social Network Attributes of Roles in Computer-Mediated Discussion Spaces

Eric Gleave
egleave@u.washington.edu
Howard T. Welser
Thomas Lento
Marc A Smith

We introduce several descriptions of roles performed within computer-mediated discussion environments in terms of their social network and individual attributes. Roles like Answer Person, Question Person, Discussion Person, Reply Magnet, Social Supporter, and Flamer can all be defined in terms of several social network attributes related to their pattern of connection and the nature of the entities (authors) to whom they connect. these models of activity lead to a broader project of creating an ecological model of computer-mediated interaction spaces in which the balance and patterns of interconnection of such role types is a central focus. These results point to a more systematic understanding of computer-mediated social behavior.

The Role of Social Relationships in Shaping Perceptions of Cancer Screening Efficacy and Screening Behaviors

Aunchalee E. Loscalzo
loscalzoa@mail.nih.gov
Sato Ashida
Karen Basen-Engquist
Laura M. Koehly

Social integration and close friendship ties with cancer patients have been shown to influence participation in screening and prevention programs. Social network methods can elucidate the social influence of relationships on individuals' perceptions of and adherence to screening guidelines for breast and cervical cancer. This paper describes the link between social network characteristics and individual perceptions of cancer screening effectiveness as well as reported cancer screening behaviors. Ego-centered friendship networks were obtained for 29 newly diagnosed breast cancer patients. Patients and their friends were asked how effective they thought mammography, clinical breast exam, and pap smear were for detecting cancer. They also reported how often they utilized each type of exam and provided reasons for having the screening. Patients and friends were asked to provide information on their personal and family history of breast cancer and if a familial risk of cancer influenced their decision to have each type of cancer screening examination. Characteristics describing the structure of patients' social networks in terms of degree of friendship, social support, and communication relations were constructed. Hierarchical level modeling was used to evaluate the association of social network constructs on individual perceptions of screening effectiveness and screening behaviors. Including qualitative data in the analysis of screening choices provides a richer understanding of the social influence process. The implications of a breast cancer patient's diagnosis and the structure of her friendship network on friends' attitudes and use of screening may inform the design of interventions that promote greater participation in cancer prevention screening.

VI Mesa Hispana para el análisis de redes sociales
23 de Enero – Horario: 13:00 a 17:00 h.

Comunicaciones presenciales

Las redes de conservación de la naturaleza en Los Andes. El caso de los sistemas regionales de áreas protegidas en Colombia

Dolly Cristina Palacio

Rafael Hurtado

Los sistemas regionales de áreas protegidas (SIRAP) en Colombia son una iniciativa que surge de la puesta en marcha de diferentes políticas conservacionistas nacionales e internacionales. Su objetivo es establecer conectividad entre las áreas protegidas (AP) de una región para lograr mayor impacto en la conservación de especies y ecosistemas estratégicos. Su proceso de implementación se analizó mediante la aplicación del ARS a la coparticipación de actores organizados en los proyectos y acciones de conservación de AP a escala regional, entre el 2000-2004, en dos SIRAP (Eje Cafetero y Altiplano Cundiboyacense). Los proyectos, como unidades de acción complejas, trazan vínculos fuertes y generan estructuras inter-organizacionales marcadas. Las acciones, como elementos informales, configuran vínculos débiles y estructuras sociales amplias con distintos niveles de participación y de acción social en la conservación de las AP a nivel regional. Se encuentra que las afiliaciones socio-espaciales evidencian la organización del sistema en torno al territorio, con identidades regionales definidas, que existen diferencias en cuanto a la magnitud, la profundidad y la densidad de los vínculos en las redes de actores de la conservación, según estén asociadas a proyectos o acciones, y que, en general, proyectos y acciones generan dinámicas distintas en las redes de actores de la conservación.

Caracterización de las tendencias del concepto de redes sociales: revisión epistemológica, teórica y metodológica

Gabriel Jaime Vélez Cuartas

Esta ponencia pretende presentar la problematización y metodologías a utilizar para realizar una amplia caracterización del concepto de redes sociales en sus principales corrientes actuales y algunos adelantos en Latino América y España. Esta revisión se plantea en la presentación de las diferentes tendencias de comprensión de estructura, las distintas derivaciones metodológicas y las teorías más visibles en torno al concepto de redes sociales. Las metodologías empleadas para el rastreo serán la epistemología genética (tomando algunos lineamientos de Piaget, pero especialmente de Luhmann, en la pretensión de construir una sociología de las redes sociales según sus planteamientos). Finalmente en el tratamiento de los

datos se aplicará el análisis de redes bibliométricas y genealógicas de los principales autores para conseguir los resultados esperados.

La percepción del riesgo y la apropiación de la información sobre la utilización de los plaguicidas en las plantaciones de plátanos de la comunidad de Shiroles en Costa Rica.

Rioux-Pelletier, M-E.; Saint-Charles, J.

En la pequeña comunidad de Shiroles en Costa Rica, las plantaciones de plátanos constituyen una de las fuentes de ingreso más importante. Sin embargo, esta actividad tiene un costo alto para la salud de las personas por causa del uso importante de plaguicidas en condiciones que no favorecen la protección de los trabajadores y trabajadoras y sus familias. Según los resultados preliminares de una investigación conducida por un equipo interdisciplinario sobre la salud de las familias de agricultores, hay variaciones en cuanto a los conocimientos que las personas tienen sobre los riesgos vinculados a los plaguicidas y en cuanto a las acciones que toman para disminuir estos riesgos. Partiendo del principio de que la difusión y la apropiación de los conocimientos se realizan por medio de las relaciones interpersonales y que solamente la apropiación de los conocimientos permite los cambios de comportamientos, utilizamos el enfoque de las redes (cualitativa y cuantitativa) para intentar comprender las divergencias de conocimientos y comportamientos entre las personas de la comunidad. En esta comunicación, presentamos los principales resultados de este estudio poniéndolos en contexto, entre otras cosas, respecto al aislamiento geográfico de la comunidad y a las diferencias vinculadas al sexo y a la etnia.

Comunicaciones no presenciales

Características de la red personal en un grupo de enfermos geriátricos

Margarita Terán Trillo

Los datos que se presentan corresponden al estudio realizado para identificar las redes personales en un grupo de enfermos atendidos en el servicio de geriatría de un hospital de la Ciudad de México, México. La población se ubica principalmente en el rango de 70-89 años de edad, un 74% son mujeres. Sus redes personales se integran por 382 elementos, distribuidos en 24 diferentes categorías; resultan funcionales, ya que la casi totalidad de elementos proporcionan afecto/confianza (f364); cuidados/compañía (f297) apoyo instrumental (f250), siendo menor el de tipo económico/material (f167). Alcanzan un promedio de 7.6 alters, que representan recursos relacionales importantes, basados principalmente en lazos fuertes de parentesco; estable y factible de ser fortalecidos. El apoyo proviene principalmente de mujeres, pero también existe una alta participación del otro género (42%); que involucra a 3 y 4 generaciones, principalmente hijas-hijos (39.8%) y nietas-nietos (21.5%). Se identifica una fusión de la red del enfermo (con tendencia a la refracción) y la del cuidador principal (apoya a éste en sus tareas). La red personal alcanza gran significado ante procesos de pérdida, crisis o

enfermedad; ejerce función protectora, contribuye al bienestar y la calidad de vida, aun cuando se trate de enfermos terminales.

El intercambio de bienes simbólicos: fundamento de los vínculos clientelares. El partido Unión Demócrata Independiente y los sectores populares en Chile.

Evelyn Arriagada Oyarzún

Con el retorno a la democracia el mapa de preferencias políticas del electorado chileno ha mostrado algunas transformaciones. En este nuevo escenario destaca el crecimiento experimentado por el partido de derecha Unión Demócrata Independiente (UDI) especialmente entre el "electorado popular". Con base a los resultados de una investigación etnográfica realizada en una comuna del Gran Santiago, en el presente trabajo se expondrán algunas reflexiones acerca de la relación entre estrategias populistas y redes clientelares para la conquista del voto de los sectores populares. El énfasis estará puesto en el análisis del carácter de los vínculos generados entre pobladores y dirigentes de la UDI. A través de estas redes circulan bienes y servicios, a cambio de lealtades políticas, en un proceso de intercambio mediado por un complejo entramado de significaciones. Estas significaciones y valoraciones son tal vez el elemento fundamental del apoyo que los sectores populares otorgan a este partido. En estas redes es de vital importancia la existencia de intermediadotes (brokers) políticos, dirigentes que mantienen relaciones cotidianas con los electores, redistribuyendo los recursos que vienen desde los niveles más altos de la estructura partidaria y canalizando hacia "arriba" las lealtades de los pobladores.

El impacto de las relaciones sociales en el Desarrollo Individual de las empresas organizadas en red

Edgar Reyes Junior

El tema de las redes interorganisacionales se ha desarrollado mucho en los últimos años, generalmente a partir de la premisa de que las redes de generan beneficios colectivos disponibilizados equitativamente entre las organizaciones miembros, sino que estas pueden o no los absorber. A partir de esta premisa y por medio de un enfoque social, este artículo tiene por objetivo presentar un modelo para la comprensión de las diferencias en el rendimiento individual de estas organizaciones en red. Este modelo se basa en el concepto de capital social individual de cada una de las organizaciones como factor determinante de su posición en la red social desarrollado desde la red institucionalizada, que en conjunto con las relaciones exteriores a la red que la organización mantiene, y moderada por su capacidad interna para absorción de estas ventajas competitivas que ofrece se explica por la naturaleza de las diferencias en el rendimiento de las organizaciones. Estas relaciones sociales pueden considerarse exclusivamente como confianza, que es un mecanismo para coordinar las expectativas de los actores sociales. Esta confianza puede basarse en el proceso, cuando la gente cree que el depositario de la confianza seguirá actuando del mismo modo, basada en

características, a través de un proceso de identificación de las personas en relación a un grupo, o basadas en las instituciones, cuando la confianza depende de la existencia de estructuras formales en la sociedad, independientemente de las preferencias momentáneas y acciones individuales.

Redes personales e inmigración Una tipología de "micro estructuras" transnacionales de peruanos en España.

Javier Ávila Molero

El análisis de las redes personales constituye una herramienta importante para el estudio de las prácticas de sociabilidad de las personas. En el caso de los inmigrantes, esto es importante porque permite comprender los procesos y las estrategias desarrolladas para insertarse en las sociedades receptoras. También para comprender los tipos de vínculos que mantienen con sus localidades de origen. La presente ponencia tiene como objetivo analizar las redes personales de 30 peruanos en Cataluña (España) y desarrollar una tipología preliminar tomando en cuenta sus propiedades de estructura y composición, y ver su relación con los tipos de "micro estructuras" transnacionales y discursos étnicos desarrollados por estos inmigrantes.

Oral Presentations

Wednesday, Jan. 23　Afternoon 1

Social Capital. Chair: Christine Avenarius

1:40 PM　Dimensions of social network position as predictors of employee performance

Paul Burton

PBurton3@hotmail.com

Research of social networks has revealed that certain components of network position can have an impact on organizational effectiveness, yet relatively little research has been conducted on network position and individual performance. A social network analysis was conducted within an Information Technology (IT) department at a major defense company to determine if a relationship exists between an employee's social network position and an individual's job performance. Network position was measured by centrality and constraint. Centrality was measured by 2StepReach, providing the percentage of the network which can be reached by an actor in two steps or less (UCINET). Constraint was based on Burt's (1992) standard formula. Performance was measured by annual appraisal ratings provided by the employee's supervisor. A hierarchical regression analysis was performed to determine relationships between the dependent variable (performance) and independent variables of centrality and constraint. Secondary variables also studied in relation to the model included education level, service years (tenure), job grade, and age. The overall model revealed 17% of variance explained, while primary predictors of network position (centrality and constraint), were not statistically significant predictors of performance ratings. Three variables (job grade, tenure and age) were found to be statistically significant predictors. Analysis of the research design is discussed, and further research is suggested to provide additional insight into the predictive value of these variables.

2:00 PM　Different Cultures, Different Strokes: Cultural Repertoire and Network Diversity in Ethnic Entrepreneurship

Wenhong Chen

wc43@soc.duke.edu

Sociologists of culture point out that cultural capital affects social capital because claims of network membership involve deliberate displays of cultural knowledge for purposes of distinction (Bourdieu 1986) or coordination (Erickson 1996). Besides class, ethnicity is an important source of cultural capital (Hall 1992). The need of claiming membership in multiple networks motivates minorities to engage in both mainstream and ethnic cultures (DiMaggio and Ostrower 1990). Yet, existing studies have focused more on the class (cultural snobs vs. omnivores) and less on the ethnic dimension of cultural capital and its implications for social capital. This paper explores the interplay of cultural and social capital along the fault lines of class and ethnicity. As multiple intersecting contexts often require greater agency (Emirbayer and Mische 1998), ethnic entrepreneurship provides a fertile ground to understand the interaction of structure and agency. Data was collected from Chinese Canadian entrepreneurs through mixed methods including ethnographic study, in-depth interviews, and a random sample survey. The qualitative data suggests that entrepreneurs accumulate and display a variety of cultural capital to gain legitimacy from their various constituencies. The survey data shows that cultural capital, measured as the diversity of cultural knowledge, is positively related to social capital. Moreover, there is a division of labour between mainstream and ethnic cultural capital, depending on the context and the purpose. Ethnic cultural capital expands the geographic outreach and the occupational diversity of networks. However, the ethnic diversity of networks is facilitated by mainstream cultural capital but impeded by ethnic cultural capital.

2:20 PM　Social capital's role in regional innovations: bonding and bridging

---

Dong-WonSohn
sohndw@inha.ac.kr
This paper examines the role of social capital in the regional innovations, with two interesting self-organized clusters, Ulsan and Gumi regions in Korea. Ulsan has developed an automobile cluster centered on the Hyundai Motors, while Gumi has clustered many cell phone SMEs centered on Samsung Electronics. The two regions have achieved self-organizing clusters thanks to the two large firms (Hyundai Motors and Samsung Electronics), but a new question arises whether the current governing system would be adequate for upgrading the clusters. Through social networks analysis of about 100 firms and policy institutions in each region (totally 200 actors in both clusters) using Pajek and UCINET, this study evaluated the role of social capital on regional governance structure in two regions for the purpose of upgrading current cluster's capability. Relying on the two dimensions of bonding and bridging social capital, we found a strong role of bonding social capital in two innovative regions, implying that Hyundai Motors and Samsung Electronics have worked as innovation glues and attractors for regional SMEs. But bridging social capital has not been fully accomplished in two regions, suggesting that new and fresh knowledge required for sustainable innovations must be offered from outside knowledge sources, such as prestigious universities and government-supported research institutes (GRIs) that the two specific regions do not have developed. Through the strong role of bonding social capital, we infer that two clusters have a high degree of dependence on the hub firms, and that their knowledge sufficiency would be limited without knowledge inflow beyond the cluster (networks) boundary. While Samsung Electronics and Hyundai Motors have a significant role in their own cluster development, findings suggest that clusters promoted by the large firm's initiative would require the knowledge inflow from outbound knowledge sources to improve the cluster's sustainability.

2:40 PM   The Social Capital of the Finance Director as Predictor of Career Advancement: A study of FTSE 100 companies

Caroline Wilson
cjwilson11@hotmail.com
Heather McGregor
This study examines the social capital of Finance Directors (FDs) of companies in the FTSE 100. The FDs are of interest and worthy subjects of study as evidence indicates that the future CEOs and chairmen often come from their ranks. This study has two goals: 1) to examine which factors are correlated with the social capital of the 2005 finance directors, and 2) to establish the role of social capital (defined as the non-executive directorships that the FDs hold in other companies) in the career advancement of the 1989 FTSE 100 finance directors. To address these issues, data was collected on the social capital of both current (2005) and past (1989) FDs, and on the career advancement of the 1989 directors, from company annual reports and other sources. The challenges encountered in the collection of data from a 'real' business archive and the methodologies employed to overcome them are documented. Results indicate that size of the company is the only correlate of social capital. Results from two logistic regressions on the career advancement of the directors indicate no role for social capital using its 'strong' tie definition. The study concludes that the 'strong' ties of FTSE 100 finance directors do not influence their career advancement, which suggests that an important area for future research is the impact of their 'weak' ties.

3:00 PM   Social capital and attitudes towards justice and fairness in an evolving legal system

Christine Avenarius
avenariusc@ecu.edu
Jeffrey Johnson
Xudong Zhao
Xin Qi

The establishment of the rule of law in China is perhaps one of the most sweeping social reforms in the history of the country. It has provided Chinese citizens with the option of settling civil disputes through formal adjudication by a judge at court in addition to local mediation based on the principles of reciprocity. However, few people actually take a case to court. While the majority of Chinese citizens are enthusiastic about the idea of independent judgments according to the rule of law, those who experienced court proceedings or know someone involved in adjudication at court find the actual implementation of the law either ineffective or unjust. Instead, reliance on guanxi, the rule of relationships, offers more predictability for legal actors. This paper presents findings from a larger ethnographic study including systematic interviews with 144 urban and 158 rural residents in Hebei province regarding the occupational prestige of the members of their social networks and cultural consensus data concerning justice and fairness. The paper investigates the effects of two of the four latent traits to analyze social capital proposed by Van der Gaag and Snijders (2005), namely prestige and education related social capital and political and financial skills social capital, on the formation of attitudes regarding institutional change in China. Based on the juxtaposition of access to people in influential legal or political positions and opinions about the fairness of dispute resolution strategies we want to answer the question: does who you know influence what you believe.

Social Networks and Health. Chair: Benjamin Cornwell

1:40 PM   Obesity in a social context: Physical activity, eating behaviors, and propensity for obesity within adolescent friendship networks

Kayla de la Haye
kayla.delahaye@csiro.au
Garry Robins
Philip Mohr
Carlene Wilson
Health behaviours may be facilitated or constrained within social networks as a result of social norms, behavioural modelling, or shared access to resources and information. The present study sought to explore weight status and obesity-related behaviours within adolescent friendship networks, because adolescent peers have been identified as being important to the development and maintenance of many health behaviours. It was hypothesized that close adolescent friends, defined as reciprocated friendship ties within a school grade level, would be similar with regards to self-reported behaviours (food consumption, physical activity and screen time), and weight category (non-overweight/ overweight). Respondents were year 8 and 9 students attending two co-educational metropolitan schools in Australia (N = 385). Interdependence between friendship ties and individual attributes was explored using exponential random graph (p*) models. Significant homophily effects were found for some of the physical activity and screen time measures, controlling for other structural and demographic factors shaping the network. Homophily effects differed across networks, highlighting the importance of local social processes and norms. Close friends were not found to be similar with regards to weight status, or on a number of high-calorie food consumption measures. Findings suggest that social processes occurring within adolescent friendship networks may be associated with some obesity-related behaviours.

2:00 PM   An ego network tool for counselling

Johanne Saint-Charles
saint-charles.johanne@uqam.ca
Pierre Mongeau
Jean-François Biron
Chevalier Serge

The main objective of this paper is to present and discuss a new network tool for counselling. In the midst of a collaborative research on communication, ego networks and compulsive gambling, our partners (counsellors in help centers) showed a strong interest in the network questionnaire we had created for this research. They expressed the wish that we modify this questionnaire such that it could become a "tool" they could use in their work. In this paper, we will present the tool we thus developed, the process that led to its creation and implementation, the training material that accompanies it, the context and manner in which it can be used from the viewpoint of practitioners, and a first evaluation of its impact in the process of helping compulsive gamblers. The tool allows for a better knowledge of an individual ego network and therefore leads to a better understanding of his or her social insertion and of his or her available social support.

2:20 PM   Social connectedness and sexual dysfunction

Ben Cornwell
cornwell@uchicago.edu
Edward Laumann
While most research on sexual dysfunction adopts a biomedical perspective, a growing body of work conceptualizes sexual function as a feature of the intimate dyadic context in which sexual relations occur. In this paper, we examine the implications of older adults' connectedness in larger social circles for their sexual function. We consider two dimensions of social connectedness: 1) the subjective sense of connectedness, as opposed to feelings of loneliness or detachment; and 2) objective levels of connectedness, in terms of network size, volume of contact with others, and community involvement. We conduct our examination using new data from the National Social Life, Health, and Aging Project (NSHAP), a nationally representative study of 3,005 Americans between the ages of 57 and 85. Results suggest that older adults who feel socially connected are less likely to experience several types of sexual dysfunction than people who feel isolated. Conversely, people who are more objectively connected have more problems with sexual dysfunction. We discuss potential explanations for these findings and their implications for future research on sexual dysfunction. We conclude that sexual relations between intimate partners are greatly influenced by the larger social networks in which individuals are embedded.

2:40 PM   Network composition and Internet use of people living with HIV/AIDS in Peru

Peter Busse
pbusse@asc.upenn.edu
Social support is especially important among individuals experiencing stigmatized diseases like HIV/AIDS (Davidson et al., 2000). It has been suggested that HIV positive people selectively disclose their disease to their network members, especially among close and supportive ties (Shelley et al., 1995). The concept of experiential similarity (Thoits, 1986) has been presented as a motivation for support seeking among individuals experiencing similar transitional or major negative events in life (Suitor et al., 1995; Suitor & Pillemer, 2000). In the context of health, the use of Internet appears as a platform to learn about diseases and to build contacts with others experiencing similar conditions (Murero and Rice, 2006). This paper reports a study on the network composition of close ties of HIV positive individiuals Peru. Survey data of 108 HIV positive individuals was collected in August 2007, in Lima, Peru. A subset of these data was used to test two hypotheses: (1) HIV+/high Internet users will report more close ties than HIV+/low Internet users; and (2) HIV+/high Internet users will report more ties with HIV+ alters than HIV+/ low Internet users. Preliminary results show that the number of times respondents use the internet in the prior week is associated with a higher number of close ties, but not with a higher proportion of HIV+ alters. The paper also reports on alters' demographics and the frequency of communication with up to nine close ties either face-to-face, telephone, or online channels.

Centrality Measures in Social Networks. Chair: John Light

1:40 PM Model-based estimation of the weighting of indirect ties in a family of network eigenvector centrality measures

John Light
jlight@ori.org

An eigenvector-based family of measures for social networks has been proposed (Bonacich, 1987) which is defined in terms of a single parameter: c(beta). When beta is positive, indirect ties add to c; when beta is maximal, c is equivalent to ordinary eigenvector centrality. When beta is negative, indirect ties detract from c. When it is zero, c is equivalent to direct ties only. We present a method for statistically estimating beta using MPlus software, in effect determining from data which value of beta gives rise to the "best" centrality measure for a particular model model containing c. For example, in a 7th grade friendship network one may determine the value of beta which allows the resulting c to best predict victimization in 9th grade. Other potentially interesting examples are given for applying this general approach.

The Nature of Networks: A Structural Census of Degree Centrality Across Multiple
2:00 PM Network Sizes and Edge Densities

Benjamin Elbirt
Sarq_6669@yahoo.com

This paper examines the mathematical properties of networks, specifically degree centrality at the actor (node) and group (network) level. An algorithm is presented for the creation of all possible edge, node, chain and group degree structures for a given network size and edge density. The census of networks size five through fifteen are used to investigate degree distributions, degrees of freedom and effects of size and density on actor and group degree. Variability (entropy) of information based on actor and network degree centrality structure variations are provided as insight into the complexity of networks. The results indicate an underlying autonomic structural influence irrelevant of context suggesting residual data as the contextual behavior element. Power law, fat tail and low density distributions are empirically produced through non-contextual network census suggesting the current behavioral models as structural influence rather than human influence. Finally, a general theory for autonomic structural influence is presented with implications for past, present and future research in this area.

Centrality Anomalies and Network Structure. Towards a Community-Oriented
2:20 PM Centrality Model

Peter Mutschke
peter.mutschke@gesis.org

Centrality measures in social network analysis are associated with particular conceptual premises. However, when analyzing global network structures, standard centrality models, such as betweenness, sometimes yield implausible results as regards the question of who is most central in the network. The critical point in such cases are inconsistent values of centrality across different centrality measures, indicating a lack of correspondence between basic concepts of centrality such as social activity, efficiency and control. Those anomalies are of important practical relevance, for instance in ranking contexts. This is particularly the case for degree-betweenness anomalies. The paper classifies elementary centrality anomalies and discusses the anomaly phenomenon on the background of the structural nature of networked systems. A main reason for centrality anomalies is seen in the fact that a fundamental property of social networks is not considered in common centrality models: community structure. Therefore, a community-oriented meta model of centrality is proposed that recursively evaluates centrality within the community structure of the network, that is - conceptually - within a certain "horizon of observability" (Friedkin). The aim of this approach is to minimize centrality anomalies without leaving standard centrality measures.

2:40 PM Visualization and Analysis of Germany's Top 100 Blogs

Stephan Baumann

stephan.baumann@dfki.de

Darko Obradovic

Weblogs are popular instruments for so-called citizen journalism, public online diaries or even corporate information delivery in closed intranets. From a social perspective their success reflects the need for personal management of identity, impression and relationships in a digitized world. By technical means the authors have rich possibilities to interact with their audience and contributors. Postings on weblogs contain most of the time links to original contributions, either to other postings or websites as well as any type of multimedia. Readers are invited to comment which may result in ongoing discussions between an unlimited amount of participants. Furthermore the authors are collecting outstanding sources they read and respect in an accessible list of links, the so-called blogroll, which is embedded into the weblog. Over the course of the time the resulting nested substructure within these nodes and links was given the name Blogosphere. From a mathematical point of view this biotope is an interesting playground to apply Social Network Analysis to identity hubs, authorities and other interesting network properties. We applied the well-known mathematical measures as well as an interactive visualization to a subset of the german Blogosphere. The Top100 Blogcharts are a popular trend barometer within the german blogger and blogreading community to find most valuable information sources. The Top100 are based on link analysis by Technorati –the well-known blog search engine- and manual postprocessing. In contrast to their rating our automatic analysis revealed interesting differences within the positions of hubs and authorities.

Online Social Networks. Chair: Cora Schaeffer

1:40 PM The Dynamics of Web-based Social Networks: Membership, Relationships, and Change

Jennifer Golbeck

jgolbeck@umd.edu

Social networks on the web are growing dramatically in size and number. The huge popularity of sites like MySpace, Facebook, and others has drawn in hundreds of millions of users, and the attention of scientists and the media. The public accessibility of web-based social networks offers great promise for researchers interested in studying the behavior of users and how to integrate social information into applications. However, to do that effectively, it is necessary to understand how networks grow and change. Over a two-year period we have collected data on every social network we could identify, and we also gathered daily membership and adjacency lists on thirteen networks over a forty-seven day period. These data sets have allowed us to see rates of overall growth in these networks, and to see patterns in how users add friends over time, when friendships are deleted, and the rate at which people join and leave the network. In this article, we present the first comprehensive survey of web-based social networks, followed by an analysis of membership and relationship dynamics within them. From our analysis of these data, we present several conclusions on how users behave in social networks, and what network features correlate with that behavior.

2:00 PM SONIVIS: Social networks in virtual information spaces – a wiki-approach

Claudia Mueller

cmueller@wi.uni-potsdam.de

Wikis are increasingly used for self-organized knowledge management in organizations supported by special knowledge processes. We are introducing an approach for dissecting these knowledge processes in corporate wikis based on dynamic network analyses. A wiki is a social information space. For this, a multi-perspective examination of this information space is applied. Especially a wiki specific collaboration network and a wiki-link network are being introduced. The collaboration network investigates the nature and the extent of collaboration between authors of wiki articles and the wiki-link network contains articles and their interrelatedness. Relationships in one of these networks usually imply relationships in another. Therefore, to understand knowledge processes in a wiki sufficiently, an analysis of these different network types is required. In contrast to the frequently applied analysis of communication networks like email or chats, analyzing wiki information spaces focuses on understanding the knowledge creation process and the knowledge flows in a virtual information space. Also, this investigation area reveals network specific roles which are responsible for a certain task in the knowledge process. The insights of this new approach are presented by using data from a corporate wiki project currently underway.

2:20 PM The Inner Digital Divide: How the Web Contributes (or not) to Political Equality
Sandra Gonzalez-Bailon
sandra.gonzalezbailon@nuffield.ox.ac.uk

This article claims that the digital divide is not the only source of inequality biasing the representativeness of the web. There is an inner, subtler form of divide that affects how visibility (measured in terms of centrality and of traffic flow) is distributed online. Economic resources and access to traditional media are significant forces in determining centrality on the web, a niche where the most central pages are the most transited by individuals looking for information. The analyses show that although visibility on the web is (slightly) less concentrated than in more traditional media, it still favours significantly the most resourceful agents. ERGMs are used to show that access to traditional media and economic resources both increase the probability that a site receives links. The political consequences of this gap, which challenges many assumptions about the democratising nature of the web, are assessed.

2:40 PM An empirical investigation of the motivations and usage patterns on social network sites
Cora Schaefer
schaefer@iism.uni-karlsruhe.de
Social network sites like LinkedIn or Facebook count millions of members. For a growing number of internet users, maintaining a profile on an sns is part of their everyday life today. Depending on the type of sns, they use it as entertainment, source of information or adress book. But what is really represented on a sns? Is it the complete display of real-life social networks of persons, only a specific part of it or something completely different with no overlap with one's face-to-face-life? Although the answer to this question apparently depends mainly on the purpose of the sns itself, variations in usage patterns and motivations are to be expected. Another commonly assumed benefit of sns is that they facilitate the meeting of new people fit¬ting with ones interests, business goals, etc. Most sns allow users to contact other unknown members in an uncomplicated way. It could be expected that most connection requests are answered positively because it involves no costs to add another to one's network. Assuming this to be true, do people really "get to know" new persons or are many connections just artefacts of the system? To investigate these questions a questionnaire study was conducted among the users of Xing, a business-focused sns. Participants were asked about their motivation and patterns of use of the sns, the composition of their social network, and how they perceived connections between others. Furthermore, the relationship between motivation of use and the size and composition of one's network was analyzed. The results of the study and implications for further research will be discussed.

3:00 PM Linkage over Visible Horizon in a Social Networking Site
Kikuo Yuta

yuta@crev.jp
Yoshi Fujiwara
Social networking sites (SNSs) are used by hundreds of millions of people as new communication infrastructures on the World Wide Web. We examine the mutually acknowledged friendship network of the largest Japanese SNS in its early phase of uniform growth, when the network consisted of 360,802 users and 1,904,641 friendship connections. In order to handle such a large scale network, we employed a community-extracting method recently developed by complex-network scientists. This community refers to a cohesive subgroup as used by these scientists, not to an on-line community. In this study, we discovered a unique feature of a "gap" in the community-size distribution. We tested several theoretical models proposed in literature to both reproduce the SNS topology and explain the gap, but none of them succeed. In order to overcome this issue, we focused on the fact that, whether or not people join to SNS, our friendship network has visibility limit of friends of one's friends like a horizon on the landscape. As a result, we constructed a simple model which consists of two processes of acquaintance, connecting nearest neighbors and linking over user's visible horizon. This model explains the presence of the gap. The present study demonstrates that the linkage over horizon is an essential feature of ongoing friendship development on any online social networks. Furthermore, the analysis of the gap was a fine example to show some properties of the community-extracting method used, and also to demonstrate the capability of the method for mesoscopic analysis.

Networks Mechanisms and Network Evolution. Chair: Patrick Doreian

1:40 PM Generating Hierarchy and Inequality in Football Leagues

Patrick Doreian
pitpat@pitt.edu

This paper examines the generation of dominance and inequality in a population and uses football (soccer) leagues as the context for studying the generating mechanisms involved. At the start of a season in a football league all of the teams start with hopes, dreams, ambitions and zero points. By the end of the season, there is a linear hierarchy where all of the teams are ranked and ordered. (There are tie breaking rules to ensure this.) Finishing at or near to top of the order (table) brings additional rewards, beyond realizing a successful location in the order, while finishing at or near the bottom means major losses stemming from relegation to a lower league and dashed dreams. Each team plays each other twice over the course of the season. While there are some dominant pairings where one team wins both games, there are non-dominant pairings. And while there are some transitive triples, there are also many intransitive triples. This paper looks at the some of the mechanisms that lead to this strict ordering of teams and the generation of inequality (in points earned) over the season while recognizing that dominance and transitivity may not be the main mechanisms. Data are taken from the four leagues in English football and a variety if modeling approaches are adopted to incorporate club resources, squad sizes, nationality of players, temporal chances of winning or losing, home field advantage and timing in the formation of hierarchies and their evolution based on network encounters.

2:00 PM How do animal dominance hierarchies develop their characteristic

Ivan Chase
Ichase@notes.cc.sunysb.edu

When small groups of animals of many species, including human children, are assembled, they quickly form what are known as linear dominance hierarchies. These are networks consisting of asymmetric ties between every pair and that are devoid of cyclical or intransitive relationships. Although we have known about these hierarchies for nearly a century, it is still not clear how they develop their structures. In this talk, we compare the main theoretical explanations for the formation of linear hierarchies: they are reflections of individual differences that the animals have prior to group formation, they are the result of differences in the probabilities of winning and losing encounters (winner and loser effects) that the animals develop during hierarchy formation, or they are generated by interaction processes based upon fairly sophisticated inferences about transitivity and intransitivity in relationships. Based upon the examination of a wide variety of experimental results, we argue for the interaction process theory. We support our conjecture by using a number of new techniques to analyze data records showing the act-by-act evolution of hierarchies over the course of two days in 14 groups of chickens.

2:20 PM Self-Organized Criticality in Social Networks
Peter Abell
P.Abell@lse.ac.uk

Social networks in communities, markets, and societies self-organize through the interactions of many individuals. In this paper we use a well-known mechanism of social interactions - the balance of sentiment in triadic relations - to model the evolution of social networks. Our model contrasts with many existing network models, in that people not only establish but also break up relations while the network evolves. The procedure generates several interesting network features such as a variety of degree distributions and degree correlations. The resulting network converges under certain conditions to a steady critical state where temporal disruptions in triangles follow a power-law distribution.

2:40 PM Arnout van de Rijt
Structural Assimilation of Immigrants to Canada
arnoutvanderijt@gmail.com

Structural assimilation is the process by which immigrants accumulate network ties with members of other ethnic groups. I argue that this process - which has been assumed "linear" - is instead accelerating. As a result, there exists not one inescapable outcome of the assimilation process, as early immigration scholarship posited and "neo-assimilationists" have recently echoed, but two. Not only long-term integration but also long-term segregation is a stable equilibrium in the network evolution of immigrants. I provide evidence in support of the hypothesis of accelerated structural assimilation using panel data from the Longitudinal Survey of Immigrants to Canada.

3:00 PM Pure Generalized Reciprocity
Wayne Baker
wayneb@umich.edu
Nathaniel Bulkley

Pure generalized reciprocity is a common form of indirect exchange in which there is no fixed structure of giving and receiving. Examples include helping a stranded motorist or reviewing journal articles for publication. We report empirical findings based on data collected with the Online Reciprocity Ring, a system that produces a continuous time-stamped record of requests and contributions to requests. In total, 125 participants made about 700 requests and 2,500 contributions during 14 weeks. Three of four contributions are not reciprocated and the evolving network appears almost structureless, consistent with the definition of pure generalized reciprocity. Over time, many participants became generous, due to learning, values, solidarity, positive emotions, or a combination of short-term altruism and long-term self interest.

Wednesday Jan. 23   Afternoon 2

International Networks. Chair: George Barnett

3:40 PM

Mapping International Agreement on Human Rights Treaties, 1980-2006: An Application of Network Analysis

Kyounghee Kwon

klee0520@gmail.com

Barnett A. George

As global norms, international human rights treaties have become the standards for human rights-related issues. The international human rights regime has grown with accrued party membership to treaties as well as with an increased number of treaties. Based on norm diffusion theory (Finnemore & Sikkink, 1998), this study addresses how the regime has developed over more than two decades, and which nations have been played the role of norm entrepreneur with the addition of new treaties. Based on a network analysis of national affiliations, the study first discusses how the human rights regime has been changed over time. The change in overall density and the change of degree centrality for each international treaty is examined. Second, the study discusses which nations played norm entrepreneurs by analyzing the most central countries at the time when new treaties were created and the centrality change of regional blocs over time. The results reveal that the regime network has become steadily denser despite the addition of new treaties. In particular, the early 1990s show rapid growth in agreement. In addition, the study finds that while Latin American and Caribbean countries were entrepreneurs during early 1980's, Eastern European and Balkan nations became more central since. The Northern European nations have continuously been entrepreneurs across time. Meanwhile, an Asian bloc shows the most sluggish increase of agreement during period examined.

4:00 PM

Globalisation or Regionalisation: Do Geographical, Political, Economic and Cultural Factors Impact on the International Ownership Network in Public Services?

Vladimir Popov

v.popov@gre.ac.uk

Globalisation is one of the key processes of the twenty first century and it affects almost everybody on the planet. Although many facets of globalisation have been explored, a lot more interesting dimensions need further research. There is a variety of theories of globalisation but they face problems with empirical testing. This paper focuses on two theories of globalisation - called regionalisation theory and globalisation theory. This research assesses the validity of these theories on the basis of empirical data describing the process of entering multinational corporations into national markets of providers of public services. In particular, this study aims to examine the significance of factors that might impact on the global ownership structure in the electricity industry and in the water sector. In this paper, the impact of geographical, political, economic and cultural factors on these two industries is examined. QAP and EI index are used as the main research techniques of this study. The results of this research imply that the geographical and cultural factors continue to make a considerable impact on ownership distribution in industries of public services, whereas the impact of economic and political factors is less significant. Data for this research are taken from the PSIRU data base including over 5000 companies.

4:20 PM

A multiple Network Analysis of regional integration in the East Asia

Jun Kanamitsu

kanamitsu@cc.kyoto-su.ac.jp

Yuji Morikawa

Regional integration toward the so-called "East Asian Community" is underway while the trend of globalization of our social life is irreversible. The long and winding processes of this integration are thoroughly researched by multiple network analyses over time (1980-2005). Our network data sets cover almost every field of social relationships among 19 East Asian countries consisting of ASEAN+3 (Japan, China, South Korea) as core players, Russia and the US as hegemonic players having been affecting the region. Economic network data are collected on trade, energy export, loan, currency swap agreement, and FDI; military data on visits of militaryofficers and export of conventional weapons; political data on bilateral treaty contracts, visits of high-rank officials; social data on human mobility, telecommunication traffic, internet backbone, air mail, air cargo and human transfer by air; and cultural data on scientific co-authorships, import of TV programs, export of movies, overseas students and international football matches. The main findings are: 1) increasing regional network cohesion with ASEAN member countries as its hub; 2) Japan's increasing isolation; 3) China's enlargement of interconnectedness; 4) Russia and Indo-China's deepening commitments to the regional configurations. Graphical modeling analyses of those multiple networks also indicate that the whole system of networks is becoming more connective, while the political/military domain is becoming more separated from the main component built around economic networks. This dynamism, characterized by eparation of political and non-political domains, is quite different from that of EU integration.

4:40 PM   A Network Analysis of Global International Migration
Miruna Petrescu-Prahova
mpetresc@uci.edu

Although international migration is one of the most important components of globalization, few studies have taken a global view of the patterns of international migration between countries and regions. In this paper we use a recently compiled database of bilateral migrant stocks to analyze these patterns (Parsons et al., 2007). The data is available for 226 countries, and consists of the foreign-born population in each of these countries, by country of origin, resulting in a 226 by 226 matrix of migrant stocks. We use both the original size data matrix and a matrix containing the data aggregated up into the 87 Global Trade Analysis Project regions. We first conduct an exploratory analysis of the data and then we study how international migration patterns can be explained by other relationships among countries, such as trade, colonial history, and geography (adjacency and distance).

Knowledge and learning networks. Chair: Kate Ehrlich

3:40 PM   What is effective social learning?
Miha Škerlavaj
miha.skerlavaj@ef.uni-lj.si
Vlado Dimovski
Emmanuel Lazega
Organizational learning leads to improved organizational performance (at least 20 empirical pieces of literature support that). Organizational learning is also a multi-level construct. It can be observed at individual, team, intra- and inter-organizational as well as relational levels. We call the latter level 'social learning'. Our research question is 'What actually leads to effective social learning?' In the following contribution we examine the impact of advice and friendship networks on social learning in organizations. The methodology used is Exponential random graph modeling. We use complete interper-sonal network data from learning, advice and friendship networks within a medium-sized IT company. By examining the intersections and differences of (1) learning and advice, and (2) learning and friendship networks, we establish the following. First, advice networks are very similar to learning networks. This supports the approach of the literature that uses advice networks as a proxy for social learning within organizations. Second, friendship network are very different from learning networks. For example, strong reciprocity of friendship relationships is not present in learning ties. Our temporary conclusion is therefore that, in this case, advice seeking leads to effective social learning much more than friendship ties.

4:00 PM **Many hands make light work: The role of a core-periphery structure in team communication**

Kate Ehrlich
katee@us.ibm.com
Inga Carboni

How should teams be structured for efficient communication and governance? Research and management practice has promoted the benefit of decentralized communication for greatest flexibility and responsiveness. But as teams evolve to be more loosely structured, we argue that team members may be best served by having a core-periphery structure consisting of a core group who maintain regular communication with each other and separate peripheral groups who are connected to a few people in the core but otherwise have little or no connection with each other. In an analysis of 50 sales teams we found a significant association between the degree to which a team had a core-periphery structure and the team's performance. Further, the more successful teams retained more of their high performers in the core than did the less successful teams. We argue that the benefit of a core-periphery structure is that it locates responsibility for integrating and coordinating information with a small group of talented people who also provide a locus for the persistence of organizational and work-related information. We discuss the implication of these findings for communities and other loosely structured groups made up of people with varying levels of tenure and dedication to the group.

4:20 PM **Structural Analysis of Legitimate Peripheral Participation in Answers Sites**

Minhyung Kang
woodstck@gmail.com
Peter Gloor

Legitimate peripheral participation (Lave and Wenger, 1991) provides a theoretical description of how newcomers get gradually established and eventually become core members within a social network. This paper empirically validates the existence of legitimate peripheral participation in answers sites and examines its patterns across different categories (Arts, Business, Entertainment, etc.) and different cultures (US and Korea) by social network analysis. To achieve this goal, we gathered social network data from "Yahoo! Answers" and "Naver Knowledge-iN." These sites are ranked top among the answers sites in their own countries and provide diverse social network data among askers and answerers such as questioning, answering, rating, voting, etc. In addition, we analyze the influence of legitimate peripheral participation on the community performance (e.g., quality/number of answers posted) along with other factors such as density because the rate of legitimate peripheral participation is critical to keep a community active by providing new core members. We think that our research contributes to the understanding of online social networks and also provides some guidelines to manage successful online sites.

4:40 PM **From new ideas to new products: detecting the learning patterns of a Virtual Community**

Marco De Maggio
marco.demaggio@ebms.unile.it
Peter A. Gloor

This study provides a methodology to observe and analyze the organizational learning patterns inside virtual communities. It integrates the representation of the structure and evolution of a community with a map of the content of the communication, to broaden the investigation from the "who" and "how" of the communication patterns to the "what" of the information and knowledge flows. The research is based on a case study analyzing an innovation and learning community at a consulting firm, which focused on developing consulting methodologies, services and products. The community was observed over 19 months through the lens of the combined e-mail archives of the practice leader and the practice coordinator. The community consisted of 1141 actors coming from 85 organizations. The analysis was conducted on two levels: "community structure" and subject matter of the "knowledge flows" were obtained through a SNA and a content analysis, applying the visualization software Condor to the community email database. The insights gained through the automatic analysis into community practices were verified through an interview with the leader of the consulting practice. The study provides empirical evidence of the organizational learning process inside the community, exploring each of its phases according to the community lifecycle. Moreover it gives a clear representation of the knowledge diffusion inside the community, tracking the organizational dynamics of the network and its adaptiveness over time to the community goals.

Centrality Measures in Social Networks. Chair: Martin Everett

3:40 PM   Its more blessed to give than to receive..centrality

Martin Everett
everett@uel.ac.uk
Steve Borgatti

Traditionally we have considered centrality as a property of the structural position of an actor in a network. This is manifest in the way we calculate an individual actor's centrality score. Actors in the network contribute to the centrality score, sometimes we use all the actors other measures only use a subset. For example in closeness we measure the distance from all the actors to the target actor so that each actor contributes a distance score to the centrality measure. The centrality score of an actor is therefore something they receive from other actors in the network. However we can also calculate how much centrality an actor gives to the other actors in the network. We call the traditional centrality measure the endogenous centrality and the centrality given to other actors exogenous centrality. We can then define total centrality as the sum of these two values. We explore these concepts using the traditional centrality measures available in Ucinet.

4:00 PM   Going The Wrong Way On A One Way Street: Centrality In Physics And Biology

Linton C. Freeman
lin@aris.ss.uci.edu

When ideas and tools move from one field to another, the movement is generally from the natural to the social sciences. In recent years, however, there has been a major movement in the opposite direction. The idea of centrality and the tools for its measurement were originally developed in the social science field of social network analysis. But in recent years the concept of centrality has been widely applied in physics and in biology. This paper examines how that "wrong way" movement developed, its extent and some of the possible bases for its development.

4:20 PM   Equicentrality for directed graphs

Soong Moon Kang
kang@stanford.edu

Equicentrality is a graph-level index that measures how similar two connected nodes in a network are based on their centrality measures, and so far, it has been defined for undirected graphs only. This paper extends the notion of equicentrality to directed graphs, and in particular, it discusses some conceptual issues using patent citations as an example.

Online Social Networks. Chair: Paul Di Gangi

3:40 PM

The co-evolution of social networks and success in Massive Multiplayer Online Games

Marius Cramer
croydon@croydon.de
Peter A. Gloor
Johannes Putzke
Kai Fischbach

During the last decade, competitive gaming (electronic sports) has developed as a new industry. Particularly in South-Korea, famous players have similar status like pop stars. Consequently, Massive Multiplayer Online Games (MMOG) increasingly attract the attention of players, enterprises and researchers. However, not much is yet known about the dynamic co-evolution of the cooperation- and communication network of players participating in MMOGs, and players' performance in the game. As a basis for our investigation we use data from the German MMOG "Ocean-Control" that was collected over a period of eight month. We have full access to all data including all messages exchanged between players in the game, buddy lists, diplomatic relations, trade relations, alliance membership, taxes paid for alliance membership, several success measures, as well as the real players' demographic characteristics. Besides the data from the game a survey was conducted, that asked all players in the monitored period about factors leading to success in "Ocean Control". Employing several methods such as regression analysis and simulation investigation for empirical network analysis (SIENA), we examine the dynamic co-evolution of the players' social network and different success measures. Furthermore, we include several demographic characteristics as covariates. In summary, our research identifies factors leading to cooperation and success in virtual worlds. We answer two questions: (1) which factors determine the players' success in MMOGs? (2) Which factors lead to cooperation amongst players?

4:00 PM

Following the Leader: Predicting User Innovations from Structural Social Capital in an Open Innovation Community

Paul Di Gangi
pmd06c@fsu.edu

Open business models have become common in an organization's innovation process and are increasingly incorporating end users into their internal innovation process. Information communications and technology environments have been incorporated into this process through the use of electronic user innovation communities where individuals participate in the innovation process regardless of their location, temporal consideration, and organizational affiliation. When an organization incorporates an open innovation model into its strategy, it does so without knowing the number of potential contributors. This unknown quantity of innovation providers introduces new issues for how an organization chooses to adopt innovations; specifically, including end users tests the strength of an organization's absorptive capacity to effectively and efficiently identify and adopt user innovations. This study examines how organizations can reduce the possibility of exceeding their absorptive capacity by identifying and adopting user innovations through a social capital perspective. Using social network analysis of lead user and idea embeddedness within the user innovation community, hypotheses are proposed based on three different types of individual centralities to determine whether lead users in one time period can be used to predict the adoption decision in another time period. The results and implications for future research and practitioners are discussed focusing on how organizations can leverage a social capital perspective when engaging an unknown pool of users in its innovation process. Open innovation models, when managed correctly, can provide organizations with additional resources for innovation and still maintain its absorptive capacity to evaluate and assimilate new ideas into its business portfolio.

4:20 PM

Blogosphere networks: Structure of voluntary ties and its impact on users behaviour

Jan Zajac
jan.zajac@psych.uw.edu.pl

Kamil Rakocy

Andrzej Nowak

In this paper we address the problem of interaction of social networks structures and social processes shaped by these structures. We focus on relations between structure of voluntary interpersonal ties and human behaviour. The object of our study are networks of weblogs, their authors and readers. Blogosphere is nowadays a lively social space, having impact on various areas of life, from politcs and marketing till collective actions. Hyperlink ties among blog reflect voluntary choices made by bloggers and influence users behaviour as browsing, reading and commenting certain blogs. We use data regarding whole population of blogs within a large Polish blogging service (about 128.000 of blogs), matched with longitudinal data on users behaviour extracted from site-centric traffic statistics and with an additional survey research. We show that despite some specific online processes, the blogosphere network generally displays features typical for social networks (e.g. high tendency towards transitivity and reciprocity, short paths). Position in the network of hyperlinks is related to blogs' popularity, especially after controlling of rare events. Moreover, to a certain extend we are able to predict flows visits and blogs popularity from its network position. Concluding, we show possibilities to investigate social influence on networks using blogosphere.

4:40 PM Longitudinal network and genre emergence in an online new media community

Jonathan Warren

jowarren@indiana.edu

Preeti Hariharan

Research of online communities has recently indicated that mixed-methods approaches, particularly SNA plus content analysis or virtual ethnography, are more appropriate for capturing semantic indicators and social capital dynamics in these communities than is network modeling alone. The present study seeks to combine longitudinal network modeling of one of the oldest online new media communities with qualitative evidence to answer the question: is change in this type of community related to the genres of new media that its users produce? We do so by examining seven years of Flash animation review data on Newgrounds.com, one of the few large new media portals older than two years. A snowball sample of some 2,000,000 timestamped reviews is subjected to SNA and hierarchical clustering in order to construct sociograms at roughly yearly intervals, which we interpret in light of our other past and ongoing atemporal research projects studying the site. Research shown at Sunbelt XXVI indicated that a related atemporal network is multi-core, with each core being associated with a clique of authors who use distinctive animation forms to communicate with other network members. The current results show how linkage strength between the groups, as well as group size, change over time. This allows us to discuss the coordination and growth, schism and reformation, and conflict and support of both individual user groups and genres overall.

Networks Mechanisms and Network Evolution. Chair: Emily Erikson

3:40 PM Beliefs, Perceived Similarity and Selection: Tie generation mechanisms in an evolving social network.

Vanina Torlò

vtorlo@luiss.it

Pietro Panzarasa

Research has long emphasised the role that social interaction has in the modification of individuals' mental attitudes. For example, a number of empirical studies have shown that, through social interaction, individuals tend to converge on the adoption of the same beliefs. However, the impact that people's mental attitudes have on the generation of new ties has often been overlooked. Mental attitudes are not only the outcome of social interaction, but they can also motivate the generation of new social ties. For example, people may select each other because they share the same belief or because they have similar goals. In this paper, we take a step towards this direction, and attempt to investigate the extent to which belief similarity affects tie generation. Our study is based on a longitudinal dataset collected at three points in time across the overall period of an M.B.A. program at one of the Italian leading Business Schools. In addition to the demographic characteristics of the nodes (e.g., students' gender, age, academic background, nationality), we collected data on five types of ties, based on perceived similarity, communication, friendship, advice, and esteem. The evolution of students' beliefs was recorded by asking them, through questionnaires, to express their views on a number of statements. Preliminary results show that the extent to which belief similarity contributes to tie generation depends on relational content. We also tested the role played by perceived similarity in mediating the effects of belief similarity on tie generation.

Mechanisms of Network Dynamics: Theoretical Framework and Methodological Considerations

4:00 PM

Tore Opsahl
t.opsahl@qmul.ac.uk
Pietro Panzarasa

We propose an actor-oriented framework for analysing different growth mechanisms that underpin tie creation in networks where the exact sequence of ties is known. Examples of such networks are the email, phone and instant messaging communication networks. In these networks, the time at which each message or call is received can be recorded. Possible mechanisms of tie formation that can be analysed within our framework include reciprocity, cumulative advantage, homophily, focus constraint, and transitive closure. By drawing on the exact sequence in which ties are formed, the analysis of network growth mechanisms can overcome the endogeneity problems that are typically experienced by empirical studies of static networks. Moreover, the main advantage of our framework lies in its ability to make direct comparison between the different growth mechanisms. This allows the researcher to study the relative strength of the mechanisms and how they combine and influence each other. We test the framework by using a set of random networks and a real-world network based on an online community at the University of California, Irvine. We discuss the implications of our findings, and assess the differences between our framework and other existing models of network dynamics.

4:20 PM **The Impacts of Social Space on Network Space:Propinquity and Homophily effect**

Chyi-In Wu
sss1ciw@gate.sinica.edu.tw
Ming-Yi Chang

How to model the formation of friendship network and the interaction effects among social space, dyadic covariates, and individual attributes on the processes of friendship formation is one of the critical research issue concerned by social network researchers. To join this trend, we conducted a special survey to collect adolescent's friendship network transition data. This unusual friendship network data, which constructed by nomination processes, were collected by a 1-year follow-up survey with a total of 8 observations. Among these observations, once for every two weeks for the first four observations and once for two months for the last three observations were conducted. Right after the targeted subjects attending their high school, this study collected these adolescent students' friendship network data of four classes. These data was used to answer the following questions: first, how high school students make friends? Second, how did high school students' friendship networks develop and change over time? Controlling for network endogenetic effect, we will first delineate the evolution process of friendship network structure in later adolescence and then try to clarify how the two important factors, propinquity, indicated as the opportunity for contact, and homophily, indicated

as the preference of individuals to associate with others who are similar to them, influence the processes of adolescent friendship formation, SIENA will be employed to test our research hypothesis.

4:40 PM Information Dynamics and the Emergence of Social Networks in Overseas Trade: The English East India Company, 1600-1835
Emily Erikson
erikson@soc.umass.edu
This paper explores the use of informal and decentralized information in the construction of an evolving trade network. The data is a continuous time record of the emergence of the English East India Company trade network over 235 years, from 1601 to 1835. The analysis proceeds in two stages. The first stage is an examination of whether informally gathered information had an effect on the construction of the network: did captains use this information to make decisions about which port they would travel to next. Personal experience and information available through social networks are examined. The second stage is an examination of what triggers the use of informal information. I find that personal experience plays a large role in shaping the trade network and that social networks are a late development in the history of this trading firm. When networks do develop, they partially eclipse the role of personal experience. Finally, the rise of organizational control reduces the importance of information gathered through social networks. The findings indicate that social network development is a long process with uncertain results. In this case, the social network is quickly centralized, leading to the reproduction of existing knowledge, rather than the introduction new information. There is a brief period in which social networks assist exploration and expansion.

Thursday Jan. 24   Morning 1

Innovation and Diffusion. Chair: Thomas Valente

8:40 AM Diffusion of Innovation on the Internet
Yutaka Hamaoka
hamaoka@fbc.keio.ac.jp

Diffusion of innovation attracted many researchers. However, diffusion of innovation on the Internet is not well investigated. This research examines diffusion of open source software on the Internet. Bass model is fitted to trend data of the number of download of software. Estimated parameters, p: innovation, q: imitation, and m: market size, are related with social network indexes of open source software community. We also examined characteristics of early adopters and contributors.

9:00 AM Network Effects on Physician Adoption of a New Drug
Thomas Valente
tvalente@usc.edu
Raghuram Iyengar
John Eichert
Christophe Van den Bulte

Research on the diffusion innovations has shown that peer exposure to behaviors is often associated with adoption of those behaviors. Network exposure models have been applied in many settings and event history analysis used to estimate the likelihood adoption is a function peer adoption. We expand on this tradition by developing a network exposure model that estimates network effects for a sample of physicians. Network data were obtained via a community survey and adoption data were obtained via prescription records. Four exposure models were compared: (1) discussion and referral networks, by (2) binary and prescription volume. Results showed that adoption was predicted most strongly by referral networks weighted by prescription volume. Physicians who refer patients to high prescribing colleagues have a greater likelihood of becoming adopters than those who refer patients to low- or none-prescribing colleagues. The results are robust when including overall (community) prescription volume in the model. We discuss the implications of these finding for marketing new products as well as modeling the diffusion of innovations.

THE SOCIAL STRUCTURE OF AMERICAN LEGAL INSTITUTIONS AND THE DIFFUSION OF WRONGFUL-DISCHARGE LAWS, 1978-99

9:20 AM

Donald Smythe
DSmythe@cwsl.edu

This article uses social network theory and hazard analysis to evaluate how the social structure of American legal institutions influenced the diffusion of wrongful-discharge laws over the period from 1978-1999 and to assess whether economic or political variables influenced the diffusion process. The results are surprising and quite striking. Precedents by other courts within the same federal circuit region were generally more influential in the diffusion process than precedents by courts in neighboring states or by courts within the same census or West legal reporting region, even though the precedents were on matters of state law rather than federal law and the decisions were usually made by state courts rather than federal courts. There is some evidence that political variables may also have been a factor, but economic variables did not appear to be particularly important, even though the new employment laws may have had important economic consequences.

The Longitudinal Effects of Exposure in Network Diffusion of Enterprise Resource Systems

9:40 AM

Pierre-Majorique Leger
pierre-majorique.leger@hec.ca
Gilbert Babin
Robert Pellerin
Jean-Francois Dubois

Enterprise Resource Planning (ERP) systems are commercial software packages that enable the integration of transaction-oriented data and business processes throughout an organization. ERP systems display significant network externalities as their usefulness depends on the number of adopters. This paper investigates the longitudinal diffusion of enterprise systems in business networks. Specifically, we study how being directly and indirectly exposed in a network to ERP adopters may influence the decision to adopt an ERP. Using public data sources, network data have been collected for all years between 1994 and 2005 for the 50 largest firms in the auto sector in North America. Network data includes operational (supply chain) and strategic (interlocks) ties. Firm-specific data related to the adoption of enterprise system was also collected. Specifically, we gather evidence on the software adopted by each firm and the year of adoption of this software package. One specificity of this research is that it presumes that firms may adopt more than one module from different software packages and that firms may choose to change to another software provider over time. Empirical evidence suggests that direct and indirect exposure positively influence the adoption behavior of enterprise systems. Furthermore, we observe a longitudinal effect of this influence.

10:00 AM Analyzing the impact of social networks in the adoption of modern seed technologies: The case of hybrid wheat and pearl millet in India

Ira Matuschke

ira_matuschke@hotmail.com

Matin Qaim

The aim of this paper is to provide further evidence of the impact of social networks on the adoption of modern seed technologies among smallholder farmers in developing countries. The analysis centers on the adoption of hybrid wheat and pearl millet in India, both of which are cultivated mainly as subsistence crops in the study area, the state of Maharashtra. Focusing on these two crops allows for analyzing the impact of social networks at different technology diffusion stages; while hybrid wheat was introduced in the Indian market only in 2001, hybrid pearl millet was launched already in 1965. The analysis is based on two household survey data sets, which were collected in 2004: 284 wheat and 266 pearl millet farmers were interviewed, respectively; and comprehensive information on farmer characteristics and social interactions was collected. This permits for an empirical analysis of social networks that improves upon previous approaches, which mainly employed village level variables as proxies for network effects. Using probit and Tobit models, we find that social networks indeed play an important role for technology adoption decisions. While village level variables may be used as suitable proxies at later diffusion stages, they tend to underestimate the role of network effects in early phases of adoption. In the final sections of the paper, we outline empirical estimation problems and discuss further research requirements for combining econometric and social network analysis tools in one coherent analytical framework.

Inter-Organizational Networks. Chair: Silke Retzer

8:40 AM Using Social Network Analysis for Evaluating 360-Degree Feedback Results

Pedro Lemos

pcml@ist.utl.pt

Miguel Mira da Silva

In a knowledge-driven economy, it's more valuable to effectively manage human capital than to efficiently manage finance and physical assets. To obtain returns in human capital, management must go beyond notions of productivity and cost effectiveness and develop new approaches to tap knowledge, creativity and other skills. A tool to capture employees' behaviors and competences in order to promote awareness is a necessity nowadays. The answer is 360-Degree Feedback, a highly effective tool by which an individual receives aggregated feedback about behaviors, skills and competences. For evaluation data visualization and analysis, we gathered the state-of-the-art of Social Network Analysis and selected the adequate software packages, achieving interoperability by developing a conversion application that applies data transformation techniques. The work was validated by applying the evaluation framework in a real-world case study, conducting an evaluation with the participation of all collaborators of an organization and assessing its impact.

9:00 AM Dynamics of social exchange in a production market: cooperation processes and reciprocity phenomena among a French restaurant industry

Eloire Fabien

eloire.fabien@wanadoo.fr

Based on our empirical study of Lille's (a French town) restaurant industry, we use H.C. White's mathematical model to identify three types of markets (paradox, ordinary, advanced) in this industry. All have both economic and social meaning. We examine the relational structure of this "milieu" through two kinds of networks: a network of discussions about the economic situation and a network of more specific information sharing. We observe, on the one hand, large individual differences between the market actors' networks, and on the other hand, some homophilous relationships between members in the same type of market. This result is consistent with our empirical and theoretical hypotheses about selection processes of social relationships. Moreover, our exploration, with ERG models, of triadic sub-structures of generalized exchange in these networks confirms that cooperation between competitors remains broadly political and strategic, and that social niches tend to emerge between market members who are not exclusively competitors. Finally, by testing other attributes, such as the quality ranking and the size of the restaurant, or the number of restaurants owned by an actor, we show that market members are more likely to collaborate within social niches with people facing the same problems.

9:20 AM SOCIAL PROCESSES IN A NEW FINANCIAL MARKET

Penalva Elise

elise.penalva@wanadoo.fr

This papers aims to understand the social dimension of a French new financial market. This market has not yet accomplished its own institutionalization. It is an original one in the way that it selects assets considering financial and extra-financial criteria: ethical, social and environmental ones. It is known as Socially Responsible Investments (SRI). This new kind of investments appeared, in France, by the late 90's. Unlike other countries, like United State of America, its roots are not ethic. SRI in France try to manage assets in harmony with Sustainable Development principles. Doing so, actors of French SRI believe in generating new sources of performance in order to create a French pension funds industry. Trying to invest "responsibly" creates a high uncertainty. The qualification of what are "responsible" investments is the main question, to which actors must answer to institutionalize that new market. Answering this question goes trough a regulatory process. Uncertainty can be diminished through an intense social life and very heterogeneous actors. Those actors have to find a consensus in order to stabilize the market. It can be found between cooperation and a social form of competition. Indeed, very dense and interconnected links between actors like asset managers, analysts, NGO, unions… are knitted. But this form of cooperation does not exclude some kind of informal gates at the market entrance. For example, friendship is used to make relationships more efficient or to leave apart specific actors. Finally and thanks to a mainstream rule of SRI, a regulatory process concerning an enlargement of financial principles to time and space is highlighted.

9:40 AM Interorganisational knowledge transfer and ICT support in and among social networks in an R&D network in New Zealand

Silke Retzer

silke.retzer@vuw.ac.nz

Pak Yoong

This research in progress paper reports on an investigation into the nature of knowledge transfer among organisations in an R&D network in New Zealand. The study aims to identify and analyse knowledge transfer structures and processes in and between interorganisational social networks, such as Communities of Practice, which are embedded in the larger R&D network. Knowledge transfer structures are represented by diverse types of knowledge transfer in social relationships, for example, dependent on the type of knowledge being transferred and purposes for knowledge transfer. Social relationships in this context refer to relationships between informal key roles in the knowledge management context, such as boundary spanner and subject matter specialist. Moreover, knowledge transfer processes that embed these structures are investigated. From these findings, the overarching goal is to identify where information and communication technology (ICT) could be utilised for continuous online knowledge transfer. Therefore, this research study aims to develop a framework that links various knowledge transfer scenarios to facilitating ICT. This paper presents some interim results of a pilot study using a mixed method approach of case research and social

network analysis. The pilot study investigates knowledge transfer in one interorganisational social network embedded in the larger R&D network. The underlying research process includes an initial observation of workshop participants. This workshop offers knowledge transfer on a specific R&D topic to the public and is provided by one organisation in the network. Consecutive interviews are conducted with some of these workshop participants from diverse organisations, who then help to identify other members of the same social network. A final follow-up questionnaire provides the data for analysing this social network.

10:00 AM A tale of two networks: Heterogeneous firm linkages and differential knowledge flows

Adam Tatarynowicz

adam@tatarynowicz.com

An established sociological result is that people occupying positions of brokerage in their social networks enjoy greater access to diverse and novel information than people embedded in dense clusters who mostly exchange known or redundant knowledge. The current paper extends this argument to networks of organizations. While I expect that two firms sharing a mutual tie are more likely to exchange knowledge than unconnected firms, I argue that the existence of a social linkage does not fully account for the differential patterns of knowledge flows between differently connected firms. Specifically, I propose that a local tie within a cohesive cluster fosters the exchange of similar, technologically related knowledge whereas a bridging tie between otherwise disjoint clusters facilities broader informational search, thus leading firms to access and share distinct, technologically unrelated knowledge. Further, I argue that this framework involves an important dynamic element, wherein over time firms tend to engage less in localized exchange within clusters and more in distant exchange between clusters. To test these hypotheses, I collected evidence from two co-evolving networks over 1985-1999 – the network of strategic interfirm partnerships in the global computer industry and the network of patent citations among them. While the results are broadly supportive of my theory about relational outcomes of dyads, I also discuss their implications for the study of individual outcomes of firms, such as innovation.

Social Capital. Chair: Ray-May Hsung

8:40 AM Your Body Knows Who You Know: Social Capital and Wellbeing in the United States

Lijun Song

lsong@soc.duke.edu

A rich literature confirms the positive role that social capital, the resources embedded in social relationships, has on individual economic well-being. However, there has been relatively little attention focused on social capital's more salubrious effects. This article examines the social capital hypothesis on two outcomes of noneconomic wellbeing, depressive symptoms and marriage satisfaction. It uses a cross-sectional data set based on a national sample of the US population collected in 2005. The data set is from the research project "Social Capital: Its Origins and Consequences". Results show that social capital, measured through the position generator, exerts direct effect on depression and marriage satisfaction net of demographic and socioeconomic variables. These findings confirm predictions of social capital theory and its methodology in explaining wellbeing inequality.

9:00 AM Cultural competence and Network Activation: cultural capital as an enabling factor in the instrumental use of social ties

Omar Lizardo
olizardo@nd.edu

Recent research in the sociology of culture has argued and provided empirical evidence for the general proposition that culture consumption should be connected to networks of larger size, and that cultural variety is associated with the individual possession of social ties that span relatively larger distances in social space. A different strand of network theory focuses not only on relative differences in the size and density of individual networks but also on the relative opportunities and resources that are made available to individuals by virtue of having those ties or "social capital" (Lin 2001). In this paper, I draw a link between cultural capital, in the form of a command of a variety of cultural resources and the instrumental use of social ties. I build on the general link between culture consumption and sociability which has been the focus of recent research in the sociology of culture to propose a model in which the possession of cultural resources leads to a higher likelihood of activation of networks ties. The results show that net of other individual predictors, as the cultural variety of the individuals' repertoire of tastes increases, there is 1) a higher likelihood of activating social ties to obtain information about jobs, and 2) a higher likelihood that the tie activation is through a weak, rather than a strong tie.

9:20 AM Institutional Constraints and Social Capital of Individuals in the Labor Markets: Comparison among the United States, China, and Taiwan

Joonmo Son
joonmo@soc.duke.edu

Employing the unique Social Capital Project surveys conducted in the United States, China, and Taiwan having at least 3,000 respondents in each country, I found that institutional constraints played critical roles in determining the amount of accessed social capital and the degree of usage of mobilized social capital in the labor markets of the three societies. Applying the Structural Equation Modeling to the identical position-generator measures in the three data sets, I identified that China under the institutional constraints of socialist political economy and Confucius culture retained the least amount of accessed social capital in comparison with the other two capitalist countries, the United States and Taiwan. In regard to actual usage of social resources, I found that mobilized social capital was effective in status attainment processes in all the three target societies. However, the significant portion of the mobilized social capital effect was moderated by the institutional constraints of gender and/or ascribed status of origin in the two East Asian societies, whereas the effect of social capital hinged upon the institutional constraint of race in the United States.

9:40 AM Relation-specific Prestige Scores and their Explanation: Comparison among Taiwan, China and United States

Ray-May Hsung
hsung@nccu.edu.tw
Ronald Breiger

Our study reports some preliminary findings from a 3-country (China, Taiwan, US) set of nationally representative surveys of position-generated networks. We show how to calculate reflected prestige scores for each contact type, on the basis of positions it accesses. There are some similarities among the countries in the kinds of tie used to access positions. For example, in each society, sibling, current colleague, good friend, and general friend are the major ties used to access occupational positions. However, there are also important differences among the societies. For example, people in Taiwan tend to use "other relatives" to access positions. Both East Asian societies use more school and teacher ties to access positions, in comparison to the US. In fact, the prestige scores of accessed resources vary with the kind of relational channel used. The prestige score of positions accessed through "teacher" and "current boss" are consistently first- and second-highest among the three countries, and prestige scores of positions accessed through kin ties are relatively lower in each country. Likewise, prestige scores of positions accessed through previous colleagues are higher than those accessed through current colleagues, and prestige scores of positions accessed through good friends are higher than those accessed through general friends. We go on to use personal and tie characteristics to explain the prestige scores of positions accessed through the major types of relational ties. The individual characteristics include gender, age, marital status, size of household, years of schooling, employment status, and daily contacts. The tie characteristics include percentage of males using the tie, the average year, and the average degree of closeness among accessed ties, specified by relationship type. We find that years of schooling is the most important variable in predicting relation-specific prestige. Gender and the percentage of males among specific accessed ties have interaction effects. Relation-specific prestige scores tend to be higher for ties to males, ties of shorter duration, and ties that are less close ("weak ties").

10:00 AM **From Potential to Realization: The Mobilization of Social Capital by Chinese Job Seekers**

Yanjie Bian
Bianx001@umn.edu
Huang Xianbi

Nan Lin's theory of social capital points to a two-stage process of accessibility and mobilization. In this paper, we develop empirical implications of this process for two groups of Chinese job seekers: job holders who watch out for alternative positions and laid-off workers who are desperate for immediate wage work. The long-term and short-term rationalities of these two groups are expected to bring variations to how social capital is mobilized and utilized for obtaining jobs. In a general population sample and a laid-off worker sample from Chinese cities, we found that as compared to job holders, laid-off workers have a lower level of social capital potential, but their urgency and extraordinary efforts lead to a greater mobilization from their relatively weaker social capital reserve. Common to both groups, network size does not matter much for how much social capital can be mobilized, but lower density and higher resource stock of one's networks result in the mobilization of a greater amount of social capital. The effect of social capital on the quality of obtained jobs does not significantly differ between the two groups, and laid-off workers tend to obtain less desirable jobs because of their lower levels in both human and social capitals. These findings are discussed to contribute to a view that social capital is the joint outcome of social structure and human agency.

Methods and Statistics. Chair: John Skvoretz

9:00 AM Community identification in social networks : a comparative survey

Céline Rozenblat
Celine.Rozenblat@unil.ch
Romain Bourqui
David Auber
Guy Melançon

Several approaches have been proposed to identify communities in social networks, on the intuitive notion of intracluster density versus intercluster sparsity. These approaches essentially use three different ingredients. The first ingredient is a metric corresponding to how much edges/nodes contribute to the exchange of information in the network, basically reflecting how much edges act as bottleneck routes – edge betweenness (Brandes, Newman), edge strength (Auber et al.) or edge constraint (Burt) are examples we focused on. Second, this edge metric either is exploited to aggregate nodes into a hierarchy of clusters, or dually, recursively divide the graph into smaller clusters. Finally, an objective function can be used to pilot the choice of edges when aggregating or dividing clusters – or simply to assess of the overall quality of the obtained clustering. We ran a comparative study of several variations of this clustering scheme, either using betweeness centralities or edge strength as edge metric, or Newman's Q and Mancoridis' MQ modularity quality. We surveyed these clustering approaches running the various combinations on the air passenger traffic as a benchmark test. Preliminary results indicate that agglomerative approaches appear to be more efficient (with respect to the modularity quality being used).

9:20 AM **A Theoretical Space for the Triad Census**
Katherine Faust
kfaust@uci.edu

I characterize the theoretical space spanned by triad census probabilities under the uniform random graph distribution, conditional on the dyad census (U|MAN). I then use this space as a backdrop within which structural tendencies in triad censuses from empirical social networks can be assessed. Results show that triad censuses from 162 empirical social networks, representing a heterogeneous collection of social relations and animal species, are well fit in the theoretical space. Moreover, many empirical triad censuses occupy distinctive regions of the theoretical space, consistent with their distinctive structural signatures.

9:40 AM **Graph Theoretic Convexity**
Carter Butts
buttsc@uci.edu

Convexity is a well-known property of geometrically endowed sets. Here, we describe the application of this notion to vertex sets within a graph. Convex sets are shown to satisfy a "no-brokerage" condition, which is related to (but distinct from) traditional notions of cohesive subgroups. A convexity index is shown, which provides a measure of the extent of graph-theoretic convexity exhibited by a particular vertex set. An algorithm for computing this index is provided, as is a non-parametric null-hypothesis test for tendencies towards or away from convexity. The use of the convexity index (and associated test) are demonstrated for several empirical contexts, including collaboration among organizations and friendship among adolescents.

10:00 AM **Respondent-Driven Sampling: Network and Statistical Perspectives**
Mark S. Handcock
handcock@stat.washington.edu
Krista Gile
Respondent Driven Sampling (RDS) leverages network structure to sample from hidden populations, then uses statistical techniques and assumptions to make inference from those samples. This paper begins by introducing RDS from a network perspective, and describing the relationship between RDS and Social Network Analysis. It then examines the assumptions of RDS in terms of the statistical analysis of social networks.Although both rely on relational structures, RDS and network analysis come from very different perspectives. Social network analysis focuses on scientific questions about relational structures. For RDS, relational structures are a tool for sampling information to make inference about population proportions. RDS is powerful at gaining access to hard-to-reach populations. Analysis based on RDS data, relies on assumptions of reciprocity, homophily, random sampling among partners, self-reported degree, a small sample proportion, and many waves of

sampling.

Online Social Networks

8:40 AM Advice Seeking in Online Discussions: Network Characteristics as Cues of Information Trustworthiness

Matthew Weber

matthesw@usc.edu

Andrea Hollingshead

This paper examines the characteristics of online information exchange and social cues that lead an individual to trust advice received from interaction in online discussion groups. To identify trusted information we explored the characteristics that identify a discussant as an expert, and as a reliable source of information. Previous literature has examined trust in online discussion groups as a function of descriptive characteristics such as frequency of posting, clarity of information and use of confident language. We extend this research and examine trust as a function of both network position and the content of information transmitted. In terms of network characteristics, we build on Burt's notion that triadic closure is a precondition for trust in networks. In online environments, however, rapid information exchange suggests a simpler mechanism. Through our analysis we suggest that basic network cues such as centrality and organizational cues such as title play a defining role in identifying trusted information. Utilizing social network analysis techniques and qualitative content analysis, interaction in an online discussion forum was tracked and analyzed. Sample data was drawn from a database tracking three years of conversation in an online forum of pediatric physicians discussing treatment and sharing medical advice for patient care. For this study a subset of data was analyzed to examine the correlation between structural roles including centrality and brokerage in a network, and the identification of trusted information and advice. Trustworthiness of information was identified based on feedback from forum participants and an analysis of discussions.

9:00 AM Longitudinal social network relations in an online multiplayer game

John Paolillo

paolillo@indiana.edu

Online multiplayer games are a relatively new entertainment form in which players synchronously connect over the Internet to central servers in order to play a game. An increasing number of computer games are played partly or entirely online, meaning that increasing numbers of people engage in a type of sustained social interaction whose nature is not well understood. What is the strength of social tie that is formed in such a context, and how does it evolve over time? To address this question, I conducted a longitudinal social network analysis of BZFlag, an online multiplayer game in which each player controls the actions of a tank. BZFlag is organized as a free and open source service, has approximately 11,000 registered users, and is played on more than two hundred servers, worldwide. A comprehensive collection of user-server sessions sampled at five minute intervals since November 2007 was analyzed, where a shared five-minute period on a given server is taken as a tie between players. Preliminary results indicate that players fall into groups shaped partly by geographic or time-zone proximity, but that there is considerable short-term fluctuation from server management and Internet hosting issues, as well as long-term fluctuation influenced by school terms. In addition, there is a committed core of players who log large numbers of hours online, at all times of

day. These players form a recruitment pool for server management and other game organizing functions.

9:20 AM **Entering the Student Space: Using Facebook To Foster In Class Discussion**
Shawn Kildea
skildea@rider.edu

Using asynchronous online discussion groups can foster richer in-class communication and student discourse. The spatial and temporal separation of students and instructors allows for reflective, critical thinking. Stripping out nonverbal cues may lower student inhibition, which could increase student participation. This paper examines the effect on classroom discussion when using a popular online social network, Facebook, to communicate with students and assign coursework. A focus group interview showed that students rejected the idea of using Facebook for coursework primarily because they considered it a "student space". Courseware products such as Blackboard and WebCT were determined by students to be much better solutions as virtual learning environments. However, after implementing Facebook as a part of a Communication Theory course students responded very positively to the benefits and the high levels of teacher immediacy and social presence amongst peers and the professor. Entering this student sphere in a blended class may help professors to more effectively stimulate discussion among students with diverse learning strengths. Potential pitfalls to this style of teaching and to entering a student social sphere are also addressed.

Thursday, Jan. 24   Morning 2

Networks in Political Science (NIPS I)

10:40 AM **Regional Integration of Trade and Intergovernmental Administrative Networks: Comparing OLS-Regression, Spatially Lagged Models, and Spatial Error Models**
Paul Thurner
paul.thurner@mzes.uni-mannheim.de
Frank Arndt

Is politico-administrative embedding a prerequisite for regional trade flows? The EU is the world's most integrated regional system of states. Nevertheless, bilateral trade flows differ markedly between dyads. The well-known gravity model argues that the size of flows between dyads is a function of their mass (GDP, population size) and geographic distance. Recent literature argues, that the strength of economic relations is also related to political affinities. In our study we investigate EU directed dyadic trade flows and relate them to informal administrative communication networks between member states. Their differential impact is assessed by comparing simple OLS, spatially lagged models and spatial error models.

11:00 AM **Informed Decisions and War: How the Networked Structure of Governments Shapes Their Behavior Regarding Threats and War**

Wayne Thornton
thornton@fas.harvard.edu

By modeling governments as a network, my paper offers a new perspective on governmental decision-making. I treat all types of governments as an institutionalized decision-making process and model institutional actors as nodes in a network. The model characterizes each actor (node) by the degree to which it is informed and the degree to which it informs the decision process. The model combines these measures using Boolean algebra, resulting in a highly non-linear statistical model that generates composite measures of the propensity to make informed decisions. I apply the model to analyze empirical data and show how the structure of governments shapes states' behavior regarding threats and war.

Inter-Organizational Networks. Chair: Johannes Boshuizen

10:40 AM Horizontal Federalism: Interstate Partnership Networks in Response to Disasters

Vener Garayev
vgarayev@mail.ucf.edu
Naim Kapucu

Partnerships are essential to the American system of disaster management and will become more important as the world confronts new kinds of threats. In responding to large scale disasters, both horizontal and vertical coordination is necessary. Loosely coupled or flexible networks as a decentralized system provides varying forms of partnerships among federal, state, and local governments with specialized roles for the private sector. The Federal government focuses on regional and state cooperations and collaborations as a system to ensure better emergency response and preparedness and better use of resources. The horizontal partnership formation among states solving common problems, such as dealing with disasters, presents new challenges for public managers. Networks and interstate relations for public service have been studied by public administration scholars. This paper studies Emergency Management Assistance Compact (EMAC)'s response to the catastrophic disasters Hurricanes Katrina and Rita in order to address the significant need for state level analysis of emergency management. A content analysis of news report, government documents, and after-action reports was performed to examine the EMAC's performance and its coordination in response to catastrophic disasters. A network analysis using the NEMA 2005 Hurricane After-Action Report with the UCINET social network analysis software program assessed the relationships among the organizations involved in the emergency response operations. This study shows how loosely coupled networks are energized to act in response to catastrophic disasters. The paper finds significant difference between EMAC response in Mississippi and Louisiana.

11:00 AM Organizational Learning under Repeated Threats of Disasters: A Network Perspective

Naim Kapucu
nkapucu@mail.ucf.edu
Tolga Arslan

One can expect that people will learn from disasters. We also do expect 'metaphorically' that organizations will learn as well. However, organizations do not have the cognitive capacity to learn. Organizations learn through their members (i.e. leaders, managers). Yet, the scope and complexity of emergency response operations require a flexible learning approach that engages each of the emergency management agencies in adjusting their performance. Social scientists have studied the resilience of organizations under stress and the collapse of sensemaking in organizations under threat. Disasters produce unique combinations of choices, actions, and reasoning that could not be predicted. The creation and usage of useful knowledge require human connections. Consequentially, researchers are now examining the relational components of knowledge transfer and the conditions under which knowledge is transferred to assist organizations in becoming learning organizations. The historically unique case of the four hurricanes of 2004 in Florida – Charley, Frances, Ivan, and Jeanne – is used to assess organizational learning under conditions of repeated threats of disasters. Data collected from the three sources were analyzed using the UCINET 6.0 social network analysis program. The findings suggest that pre-season planning, open communication among emergency managers and elected officials, and the use of technology all proved to significantly impact the preparedness and response. The repeated threat scenario suggests that emergency managers must vigilantly work to keep the public agencies and individual citizens informed and apprised of the seriousness of the situation.

11:20 AM **Regional affiliation networks and the success of clustered high tech firms**
Johannes Boshuizen
J.Boshuizen@utwente.nl
Triggered by the economic and intellectual power of high-tech regions all over the world, spatial clusters gain increasing interest from researchers and policy makers. Key is that firms inside a spatial cluster perform better due to local inter-firm networks. This is especially true for knowledge-intensive firms, where spatial proximity fosters knowledge exchange because it makes face-to-face contact easier, facilitates trust, and keeps transaction costs low. Although the amount of research on spatial clusters and their externalities has increased, empirical research on the micro mechanism behind agglomeration dynamics is scarce. The same holds for research on inter-organizational networks. Inter-organizational network methods and theory have developed swiftly over the last few years, and researchers recognize them as a promising way to investigate actual flows among firms. Besides direct contacts, indirect contacts and network characteristics (such as Structural holes) influence firm performance. Despite the increasing number of inter-organizational network theories, the number of empirical studies in this field also remains small. In our study we both use agglomeration theories and network methods and theory. Therefore we test the specialisation- (Marshall) and diversification- (Jacobs) hypothesis from agglomeration theory. Moreover, we test whether network position influences performance of firms. We use a multilevel regression analysis on data from all Dutch high-tech firms in selected sectors, regional characteristics, together with regional characteristics, and affiliation-network data for firms in a selection of these regions. Testing these hypotheses on empirical data contributes to understanding inter-organizational networks and spatial agglomerations, providing relevant information to policy makers.

11:40 PM **The role of social capital in inter-organisational collaboration: empirical findings on bonding, bridging and linking connections**
Tjip De Jong
tdejong@kessels-smit.nl

This paper presents empirical findings on the relationship between social capital, social networks and knowledge productivity within inter-organisational networks. In our knowledge economy, the competitive advantage of organisations relies on the capability to adapt to the changing environment by the continuous generation and application of new knowledge (Harrison & Kessels, 2004). This specific capability is described as knowledge productivity. This paper presents empirical findings that social capital has an overlap with a strong learning environment in which knowledge productivity can take place. In this paper the concept of social capital is further operationalised and studied as three forms of connections and ties (Field 2005; Van Der Sluis & De Jong 2007): - Bonding connections, which brings together individuals form a very similar background in close ties, such as teams or departments; - Bridging ties, which bring together individuals from rather similar backgrounds within an organisations, but more loosely, such as individuals from different teams or projectgroups; - Linking ties, which bring together individuals from dissimilar backgrounds from different organisations. In this paper social network analyses is used to analyse inter-organisational collaboration that facilitates knowledge productivity. The data is collected through multiple egocentric social network analyses added with multiple in depth-interviews of the actors within the social networks. The empirical findings are described anonymously and are gathered in a large inter-organisational infrastructure project in the Netherlands, Europe. Based on this analyses characteristics of social capital that facilitate and inhibits the productivity of bonding, bridging and linking connections are presented. In doing so, this paper uses social capital theory within the context of Human Resource Development, more specifically via previous findings of Kessels and De Jong (2007): social capital can be described as the network of connections between individuals, based on trust, respect, appreciation, integrity, transparency, and shared norms and values.

Network Dynamics. Chair: Terrill Frantz

10:40 AM Merging networks: Exploring organizational integration
Terrill Frantz
terrill@org-sim.com
Kathleen Carley

This research takes a look at the early evolution and dynamics of newly formed social networks, which are created as a result of a merger event involving two previously independent organizations. We explore how common, graph and node-level, social network measures adjust as the network participants evolve into a single organizational entity. We commence a research process for exploring the phenomena of organization merger integration by introducing various approaches to investigating the dynamics of new network evolution and how descriptive social network measures change in the process.

11:00 AM Brokerage and firm network evolution: The complementary roles of architectural and functional broker
Joanne Jin Zhang
j.j.zhang@city.ac.uk
Charles Baden-Fuller

The existing brokering literature mainly focuses on bridging structure holes across spatial or domain boundary (Simmel, 1950; Burt, 1992; Obstfeld, 2005). Although scholars have noted that broker plays a key role in network construction, evolution and dissolution (Lorenzoni & Baden-Fuller, 1995; Human & Provan, 2000; Pollock, Porac & Wade, 2004;Uzzi & Spiro, 2005), few has looked at how the brokering process changes as the firm and its network changes. This is of salient importance to emerging organizations as their networks evolve to adapt to changing knowledge needs at different development stages (Hite & Hesterly, 2001; Maurer& Ebers, 2006). In this paper, we hypothesize that there are two types of brokers that a firm needs in building and re-building its networks over time: Architectural broker (Architect) and Functional Broker (Functionalist). Drawing upon 229 brokering instances involving 12 UK high-tech start-ups over 32 months period, we show that such a classification is empirically valid. The two types of brokers co-exist and interact with each other in the firm network construction process. But they have complementary roles in that they differ in their knowledge, social capital and visions. Architect helps to build a firm's network by bridging structural holes across different stages of organization life cycle whilst Functionalist helps to bridge structural holes at a single development stage. Moreover, we found that broker's entry time plays a key role in their brokering activities; if they arrive too late or too early they cannot operate effectively. This paper contributes to a dynamic view of brokerage.

DYNAMICS AND CO- EVOLUTION OF SOCIAL NETWORKS AND ORGANIZATIONAL BEHAVIOR. LONGITUDINAL ANALYSIS OF MERGERS AND ACQUISITIONS IN THE INTERNATIONAL ELECTRICITY INDUSTRY

11:20 AM

Mohamed Boukhris
mohamed.boukhris@lu.unisi.ch

Nowadays, one of the main reasons influencing the large change in the whole economic scale is occurring through the deletion of boundaries between corporate economic actors. In this paper we chose the electricity industry because of its capacity -brought by its broad expansion and perpetual moving environment- to give a more understanding of the behavior of business firms, industries and national economies across multiple levels of analysis. The aim of this paper is to give more insights and highlight the dynamics of mergers and acquisition in the international electricity industry during the period 1997-2004. The nodes in our networks are represented by individual countries and the edges by foreign investment flows among countries induced by acquisition activities among companies. The actor-oriented model which is specified in this paper is described as a longitudinal strategy for examining the co-evolution of social networks and organizational behaviors given that these models provide advantages over conventional approaches due to their ability to account for inherent dependencies between organizations embedded in a social network (i.e., reciprocity, transitivity) and model interdependencies between network and behavioral dynamics. The parameter estimates, model specification and selection procedures which are implemented in SIENA are well described and explained in this paper.

11:40 PM The Structure of Buzz: Modeling Rumor Diffusion in Dynamic Social Networks

Juergen Pfeffer
pfeffer@reflex.at
Michael Zerr
Martin Eichner
Markus Schwehm

Rumors can reach many people within little time. On first sight, the diffusion of rumors is similar to the spread of infectious diseases during epidemics, but significant differences can be found when looking more closely. Firstly, rumors are intangible; therefore, they can be passed on to any number of people without latency. Secondly, their dissemination is controlled by social rules and usually occurs intentionally. Thirdly, passing on rumors does not require physical contact. Rumor transduction occurs within social interaction networks. We assume that these networks combine properties of scale-free (Barabasi) and small world networks (Watts/Strogatz). Our paper tries to answer the following questions: What factors determine the passing on of rumors? When and why do rumors stop spreading? Is there a threshold for the number of "infected" individuals which determines rumor persistence? Are there patterns in rumor dissemination depending on network structure (like homogeneity, density)? What is the contribution of clusters to dissemination? Where is the best place to start a rumor? How do different types of social networks (in terms of homogeneity or heterogeneity) influence rumor persistence and rumor dissemination? Another essential issue is the validity of rumors and how each rumor's verification alters the structure of the social network in which it was passed on. Our paper also shows the outcome of simulated modeling experiments and their social interpretation. 5. Author: Thomas Zorbach, vm-people, Berlin

Network dynamics: models and findings. Chair: Alessandro Lomi

10:40 AM The Dynamics of Young Children's Peer Networks

David Schaefer
david.schaefer@asu.edu
John M. Light
Richard A. Fabes
Laura D. Hanish
Carol Lynn Martin
This research examines the evolution of children's peer relations in 11 preschool classes. Focusing on children at this developmental stage provides unique insight into the origin of social networks and their early dynamics: Children aged 3 to 5 are only beginning to acquire social skills and moving from primarily solitary or parallel play to dyadic and larger group interactions. Moreover, for many children, preschool is their first prolonged exposure to non-kin peers, thereby providing the earliest opportunity to negotiate relationships with large groups of unfamiliar peers and exercise choice in forming relationships. We use longitudinal observational data to develop multilevel models within SIENA. Our analysis begins by examining endogenous network effects and selection effects based upon homophily on child and family characteristics and individual demographic variation. We proceed to consider behavioral changes in factors related to school readiness and classroom behavior. Our goal is to disentangle the recursive relationship between peer selection, influence, and children's readiness to begin school. We find evidence of specific forms of triadic closure, homophily on several dimensions, and individual demographic variation. Results also indicate consistent patterns of selection and influence, but for different types of behavior.

11:00 AM Physical Growth and Friendship Network Evolution in Adolescence

Hsieh-Hua Yang
yangsnow@mail.cjcu.edu.tw
Chyi-in Wu

Friendships are important for the social well-being of individuals. Most friendship theories stress that it's similarity of behavior and invisible characteristics, rather than physical and other visible characteristics which executed the influence on friendship development. A friendship between two people can be only emerged when they have opportunity to meet with each other. Once two people meet, whether they become friends depends on many factors. A friendship is more likely to generate if each individual perceives the other as similar in variety of ways, especially the easy to look out characteristics. Adolescents experience dramatic physical growth and development during puberty. The appearance of boy's facial hair and the occurrence of girl's menarche are the significantly visible characteristics. We, thus, suppose that there is significant sex difference for these characteristics to influence adolescent's friendship network evolution. A panel data came from a study conducted during 1996-1998 by the Institute of Sociology, Academia Sinica. The subjects are a random sample of 1,434 junior high school students that was collected from 44 classes of 33 schools in Taipei Metropolitan Area. Of these data, 32 classes composed of boys and girls were involved in the analysis. Questionnaires were applied to collect data once every year in a consecutive three year period. Name generator was used to collect the sociometric data. The subjects were asked whether they had beard or menstruation for boys and girls respectively. Using the representative data, the program SIENA is applied to examine the association of adolescent social network evolution and physical growth. The results showed that having beard and menarche would have similarity effect on friendship network evolution. Furthermore, the sexual mature boys and girls are far more popular.

11:20 AM The analysis of longitudinal social networks with valued tie data

Christian Steglich
c.e.g.steglich@rug.nl
Tom A.B. Snijders

The analysis of longitudinal social network data by means of actor-driven modeling has thus far been restricted to the case of binary networks. This paper introduces extensions of these models to relational data measured on an ordinal scale. Two alternative extensions are proposed, one based on Freeman's (1992) model for distinguishing weak from strong ties, the other based on considerations of network flow. The models are explored by fitting them to two data sets that - qua design - resonate more with one model or the other: an adolescents' friendship network, where values indicate intensity / quality of the friendship, and an intra-organizational communication network, where values indicate communication volume.

11:40 PM The Network Dynamics Of Organizational Populations: Inter-Firm Mobility Among Dutch Professional Service Firm, 1880-1986

Alessandro Lomi
alx@economia.unibo.it
Christian Steglich
Fabiana Visentin
Filippo Carlo Wezel

How environments affect organizations is perhaps the defining question of contemporary theories of organizations. Answers to this question vary around a number of shared narratives. One of these narratives involves the idea that organizations need to consume resources in order to survive. Given the scarcity of resources relative to their possible uses and allocations, patterns of resource consumption trigger competitive interdependence within and among organizational populations. Recent research has argued that organizations not only consume, but also produce resources that other organizations may find useful. When this happen "environments" and "organizations" can no longer be clearly distinguished. The partial endogeneity of resources makes relations of mutual constitution – rather than competition per se – the main driver of the ecological dynamics of organizational populations and communities. In this paper we explore some of the possible empirical implications of this view in the context of the population of Dutch professional service firms. We reconstruct the environment of these organizations in terms of patterns of exchange and dependence emerging from inter-firm mobility of consultants – the core resource that these organizations

simultaneously consume and produce. Our analysis concentrates on how a variety of network-based process induced by inter-firm mobility affects organizational survival.

Network Mechanisms and Network Evolution. Chair: Diederik van Liere

NETWORK FRACTURE: HOW CONFLICT CASCADES REGULATE NETWORK DENSITY

10:40 AM

Erin O'Grady

eogrady@gmail.com

Social networks are a product of dynamic processes, thus the ties people make affect the topology of a network and the form of a network affects the ties people make. Social network structure therefore evolves in a path-dependent manner, and method of network evolution cannot be divorced from the resulting topology. Most researchers have concentrated on the generative processes of network creation. We consider destructive processes, such as tie extinction and outright conflict, as an equally important influence of network topology. In this paper we explore the effects of introducing conflict into an evolving social network and address the following questions: How does conflict percolate through a social network? At what point is conflict able to cascade through a social network? Does a social network have a critical density threshold? Our research suggests that as networks grow they undergo two phase changes: first, a rapid acceleration of network growth; second, a stabilization of network density around some critical point. We believe that destructive processes act as a stabilizing force which prevents the network from growing too dense and creates a topology that strongly resembles a small world network. In this paper, we demonstrate that our simulation builds socially realistic networks by comparison to empirical data. The resulting network has strong small-worlds features, yet is derived from a socially justifiable process. We demonstrate that conflict is strongly localized and the scope of its propagation is Power Law distributed. Finally, we show that critical network density is invariant of network size, rate at which the network grows and rate at which conflict occurs. We show a simple parameterization that affects where phase transitions occur -- and demonstrate that parameterization is necessary and sufficient to achieve all possible configurations. Thus, the model we demonstrate provides a simple and parsimonious description of network evolution processes.

11:00 AM   WHY DO BRIDGING POSITIONS WEAKEN?

Diederik van Liere

dliere@rsm.nl

Otto Koppius

The fact that bridging positions are valuable to firms raises questions about the sustainability of that advantage, as competitors will try to take actions to nullify their disadvantage. We therefore analyze partner firm factors that may weaken the bridging position of the focal firm. We argue that the more valuable the bridging position is for the focal firm the greater the incentive is for the bridged firms to establish new ties that improve their network position possibly at the expense of the bridging position of the focal firm. In particular, we focus on resource dependence and resource similarity as two important factors that contribute to the weakening of the bridging position of the focal firm: partner firms with similar resources compared to other partner firms of the bridging party as well as partner firms that are highly dependent on the bridging firm, are more likely to shift their network position by establishing new interfirm ties that weaken the information and control benefits of the focal firm. To test our hypotheses, we adopt a multi-method research design. First, we employ network experiments and second, we conduct a longitudinal field study in the Dutch insurance industry. Results from both studies show support for our hypotheses, thus indicating that resource dependence as well as resource similarity of the partner firms are important factors that lead to the weakening of the bridging position of the focal firm.

PREFERENTIAL ATTACHMENT AND ORGANIZATIONAL SCIENCE: TOWARD A DYNAMIC THEORY OF SOCIAL NETWORK EMERGENCE

11:20 AM

Roopa Raman
roopa_raman@bus.emory.edu
Michael Prietula

Although much is known about how network structures impact organizational outcomes, the mechanisms by which social networks emerge and evolve are relatively less well-understood. Consequently, causal mechanisms by which network structures lead to organizational outcomes remain a black-box. In this study, we consider social networks as the dependent variable and develop a theory explaining the dynamic emergence of these networks. An evolutionary mechanism that has received considerable attention in the literature is preferential attachment (Barabasi and Albert, 1999), which is the general concept describing network growth (or connection) that follows nonrandom patterns. Seemingly universal mechanisms of growth and preferential attachment have been found to explain the emergence of varied complex networks, with distinctive scale-free structures and power-law degree distributions, in physical, biological and even select sociological contexts. From an organization science perspective, the notion of preferential attachment has intuitive appeal that embodies a distinct component of choice. However, social science applications have largely superposed natural science-based notions of growth and preferential attachment on social interaction contexts, which are inadequate, given what we understand about social behavior. Therefore, in this study, we draw on social science theories to modify the natural-science model of preferential attachment in socially-relevant ways, incorporating social theoretical principles of homophily, reorganization of relationships over time, and bounded rationality in network emergence mechanisms. Through a series of agent-based modeling experiments we find that these modifications significantly change the network structures that emerge. A dynamic theory of social network emergence, based on interpreting preferential attachment in terms of social science theories, is developed.

The Changes of Firm's Network Configuration Influence Its Strategic Actions and Firm Performance

11:40 AM

YI-JU LO
yl102@duke.edu

Within the literature on networks, it is generally recognized that the actions taken by firms and their subsequent performance depend upon their network structure. This perspective, however, fails to capture the continuing development of networks and the structural changes that occur over time. It would be important to find the ways in which a firm's actions may change in response to such structural changes so as ensure future performance. That is, it has to be delineated how a firm facing growth challenges can take advantage of different network configurations along with the changes. Nonetheless, there is scant literature exploring such dynamics and the subsequent impact on firm performance. In an attempt to bridge this gap, this study uses socio-metric techniques to investigate the ways in which network configuration influences the strategic actions of firms, examining how the strategic context moderates the association between network configuration and strategic actions amongst manufacturers in Taiwan. This study collected the top management team of each sampled companies as the composition and configuration of the network. Our results show that a highly cohesive network configuration has a significant negative effect on strategic actions, and that strategic context has a significant moderating effect on the strategic actions of firms configuring their networks with different levels of cohesiveness.

Thursday, Jan. 24   Afternoon 1

Networks Collective Action and Social Movements. Chair: Marije Boekkooi

1:40 PM   Mapping political conflicts. Ad-hoc coalitions and preexisting networks

Sebastian Haunss

haunss@sozialwiss.uni-hamburg.de

Lars Kohlmorgen

Decision making processes in Europe are usually embedded in rather complex networks of actors who are trying to influence them on the various levels of the European multi-level governance system. Traditional research often assumes that the ability of an actor to exert influence depends mainly on its financial and personal resourcefulness, on its ability to provide expert knowledge and on its economic and/or political power. This perspective can be characterized as actor-resource-centered in so far as it assumes that certain (relatively static) properties of an actor determine its influence. Social network analysis, on the other hand, focuses on relational characteristics, and therefore often looks for network properties like centrality, brokerage or structural holes to explain an actor's potential influence; it can be characterized as actor-network-centered. Our research on two recent policy conflicts in Europe suggests that, besides these two explanations, another factor may be central to explain the outcome of theses conflicts. Drawing on data about two recent policy conflicts about European directives in the field of intellectual property politics, we claim that not the properties of individual actors but of actor coalitions can explain their policy influence. To be more precise: the question whether these networks have been established during the conflict as issue specific mobilization networks or have already existed as more general coalitions or membership networks determines their ability to successfully influence the respective policy process. Drawing on our network data we will discuss the distinguishing features of ad-hoc coalitions and preexisting coalition networks and show that issue specific ad-hoc coalition can increase the influence of actors.

2:00 PM   Who's doing the Talking? Leadership and Role Differentiation in Civil Society Organizations

Christopher Weare

weare@usc.edu

Network structure and the network position of particular organizations are important determinants of the performance of civil society organizations. These effects include an organization's access to information (Granovetter 1973), recruitment of resources (Knoke 1990), and influence through collective action (Oztas and Weare 2004; Galaskiewicz 1979). On a broader scale, networks structures play an central role of the integration of civil society (Baldassarri and Mario, 2007). These group level network characteristics, however, are simply the sum of the individual members networks

and thus, depend on the characteristics and behaviors of members. This dependency is particularly strong for voluntary civil society organizations given their low levels of formalization. This paper examines the network positions and roles that are associated with effective civil society organizations. We hypothesize that effectiveness results from one of two structures. The first is a leadership model in which one or a few core members dominate the internal and external relationships while the periphery of the organization plays a more supportive role. The second is a role differentiation model in which members specialize on specific internal and external communication roles. In contrast, we hypothesize that organizations that lack either of these structures will be less effective. We test these hypotheses on social network data from 86 neighborhood councils in Los Angeles. These data include individuals' networks with other board members, with city departments, and community stakeholders and indicators of organizational success. We will conduct positional and role analysis on each board and then compare the range of observed structures for high and low performing boards.

2:20 PM **A network analysis of the participatory process in the formulation and implementation of public policies.**

Renata Tavora
renata.tavora@gmail.com
Frédéric Mertens
Maria da Graça
Luderitz Hoefel

The Brazilian Node of the Community of Practice on Ecohealth research to reduce Toxic exposure in Latin America and the Caribbean (CoPEH-TLAC) collaborates with the Ministry of Health of Brazil to promote the formulation and implementation of public policies adapted to the diversity of occupational and environmental health problems of this continental country. Dialogue and collaboration between civil society and members of municipal, state and federal governmental organizations, who are collectively referred to as "Social Control", is essential to ensure effective local actions responsive to population health priorities. We present results of a network analysis of contact and collaboration relationships between members of the National Environmental and Occupational Health Network (NEOH Network) whose objectives are to facilitate information exchanges and experience sharing between members of the "Social Control". Network data were collected, using questionnaires, for 174 NEOH network members in 2006. Robustness analysis shows network fragmentation as a consequence of the removal of only a few of the individuals with the highest betweeness centrality. Furthermore, the removal of the set of individuals who are no longer involved in the NEOH network in June of 2007 reveals that the vulnerability of the network structure is mainly associated to the high levels of turn-over of the members of governmental organizations due to political instability. Discussion focus on the relationships between the continuous involvement of key network actors at the local, regional and national levels and the sustainability of participatory process of the implementation of health public policies. This work is financially supported by the International Development Research Centre (IDRC) of Canada and the Ministry of Health of Brazil.

2:40 PM **Networks and motivations of participants in political protest**

Marije Boekkooi
ME.Boekkooi@fsw.vu.nl

Many studies have shown that networks play an important role in mobilizing people to participate in collective action. Specifically, being a member of an organization or subculture that was involved in organizing the event or being embedded in the personal network of one of the members, increases the likelihood of participating. However, exactly how networks work, and which quality of networks is important for recruitment remains unclear. In this paper I will focus on the question of how networks impact on people's motivations to participate in a demonstration. Motivations to participate can be instrumental, ideological, emotional or identity based. These motives are additive, can compensate for each other and interact. I expect first, that the stronger the bonds that people have with the organizers, the stronger they will be motivated to participate. Second, I expect that the strength of the bonds also impacts the motivations people have to participate. More specifically, I expect that people with weak or no bonds, will mainly hold instrumental and emotional motivations, while people with strong bonds will also have identity and ideological motivations. Last, I expect that people located in different areas of the network might also have different motivational constellations. I will test these hypotheses with survey data I collected at an anti-war, and an anti-government demonstration in the Netherlands, the anti-G8 protests of last summer in Germany, and data I (and others) will collect in different cities in the US and Europe at climate change protests this fall.

3:00 PM Perceptions of Advice and Friendship Networks in US Army Infantry Platoons

Daniel Horn
dan.horn@us.army.mil
Elizabeth Conjar

US Army infantry platoons are hierarchically structured organizations embedded at the base of a vast hierarchically structured Army. They regularly engage in highly risky, life or death missions that rely on the ability of the platoon members to communicate, anticipate, and synchronize their actions while fluidly adapting to the situation around them. The effectiveness of such organizations is tied to the extent to which team members share an understanding of the group's dynamics, and can be thought of as a component of shared situational understanding. In an effort to understand how infantry platoon members perceive the networks in which they are embedded, we conducted a cognitive social structures analysis of three different infantry platoons prior to their deployment to Iraq. Each Soldier reported his perceptions of the advice and friendship networks among the approximately 35 members of his platoon (a total of over 2,300 possible dyadic relationships across both networks) as well as his perception of each platoon member's leadership ability. Among our findings is the discovery that formal and emergent leaders are more accurate than non-leaders in perceiving platoon advice (but not friendship) networks. Additionally, perceptual accuracy, and inter-rater perceptual congruence are predicted by a variety of demographic, psychological, and structural attributes. Further, differences between the networks generated through Krackhardt's (1987) consensus and locally aggregated structure techniques allow us to detect Soldiers' schemas regarding the formal hierarchy of platoons. These data shed light on the processes that underlie platoon and Soldier performance.

Inter-Organizational Networks. Chair: Emmanuel Lazega

1:40 PM Catching up with Big Fish in the Big Pond? Further explorations in multi-level network analysis through linked design

Germain Barré
barre.germain@gmail.com
Marie Jourda
Emmanuel Lazega

This paper combines Burt's (2005) brokerage and closure explanations of performance, as measured at the individual level, with a multi-level approach combining intra- and inter-organizational sources of variations. Intra-organizationnal measurements of brokerage and closure are shown to have different meanings in large and central organizations (in the inter-organizational network) and in small and peripheral organizations. We look at the reasons for these differences and illustrate them with further explorations of a linked design approach. We use an empirical study examining performance variations within the "elite" of French cancer researchers in 1999.

2:00 PM   The Transformation of Technological Collaboration Networks in Taiwan Semiconductor Industry

Yi-Jr Lin
yijrlin@gmail.com
Ray-May Hsung

Since 2000, the technological collaboration networks have experienced rapid changes and upgraded the technological level in Taiwan semiconductor industry. The technological paths of late-developed country, such as Taiwan, include transferring the OEM technology of package industry at the first stage, building the technology of manufacturing processes, and upgrading the IC design technology. This research collected the contracts of technological collaboration for semiconductor industry in 2001, 2003, 2005. In the early time, there were more collaborative ties of technological transferring from global benchmark company. The OEM technology has been the core technology in Taiwan semiconductor industry, so the collaborative ties of technology transfer has been dominant and persistent. After 2001, the technology of semiconductor industry has attained the mature stage, so more research and development collaborative ties occurred and the technological diffusion among local semiconductor companies is quite often as well. There are major findings on the changes of technological collaborative networks from 2001 to 2005 as it follows: (1) there are more technological transfer ties in 2001, more research development collaborative ties in 2003, and more technological diffusion ties in 2005 respectively. The fact that technological transfer ties have been persistently high in three years indicates that the technological dependence on global companies has become the strong path dependence of technological development paths in Taiwan semiconductor industry. The upstream companies have more technological diffusion ties, the foundry companies have more research and development ties, and the down stream package companies have more technological transfer ties. (2) The diversity of technological collaboration has increased rapidly between 2001 and 2003 in order to deal with the global competition. The large core companies in the non-OEM technological collaborative networks seem to play the brokerage role increasingly. However, The core companies in OEM technological networks tend to decrease their autonomy.

2:20 PM   Across Town Ties: A Comparison of Regional Collaboration Networks

Christine A. Bevc
Christine.Bevc@Colorado.edu
Ashly Barlau
Jeannette Sutton
Erica Kuligowski
Alexandra Jordan

In the wake of September 11, 2001, the U.S. government provided funding to major, "high-target" urban areas across the United States. In the past four years, the government has distributed funds to the six largest metropolitan areas in the United States as well as dozens of high-risk regions across the United States to help assist them with terrorism prevention. However, the funding came with the stipulation that the money be distributed across the region, or the area in and around these metropolitan regions. As a result, local and county government agencies within the urban areas had to work together to prepare and mitigate the threat of terrorism. Previous examination of these regional collaborative networks have identified a high density among the strong tie between these organizations, along with a high degree of mutuality among dyads and a large percentage of 210 and 300 isomorphic triad classes. This paper extends this previous work on network comparisons by examining the attributes of the regional network actors and their spatial relationship to each other. This study includes a comparison of four regional networks and more than 400 actors. The analysis uses correspondence analysis and a p* model to determine the correlation of these variables and the extent of their influence. Results will provide researchers with a better understanding of how inter-organizational collaboration varies across these regional urban areas.

2:40 PM **Interdisciplinarity and Research Performance: Evidence from a Scientific Collaborative Network between Academic Departments**
Pietro Panzarasa
p.panzarasa@qmul.ac.uk
Tore Opsahl
This study examines how collaboration across organisational boundaries and scientific disciplines contributes to scientific knowledge creation. By using data from the 2001 Research Assessment Exercise in the UK, we constructed a collaboration network between publicly funded academic departments conducting research in a wide range of scientific disciplines. The nodes of the network are the departments, whereas ties between two departments are established when scientists from both departments have co-authored a paper. We investigate whether departments' performance was affected by their network position. Results indicate that there are benefits associated with departments' ability to reach others along short path-lengths. We found that collaborations across multiple disciplines have a negative impact on performance. Results also show that departments spanning structural holes between two otherwise disconnected departments do not have a better performance than departments with no such brokerage opportunities. However, preliminary results show that brokerage between departments conducting research in different disciplines has positive effects on performance. Spanning structural holes between otherwise disconnected disciplines create linkages across distinct scientific communities that offer more knowledge brokerage opportunities for novel recombination of ideas. We discuss the implications of our findings for effective knowledge transfer and policies for inter-organisational scientific collaborations.

3:00 PM **The Risk and Protection of Context: Relationships between Characteristics of The Social Environment and Adolescent Cigarette Smoking**
Cynthia Lakon
cynthialakon@yahoo.com

Drug use among youth may be amplified by the social spaces in which it occurs. Theoretical guidance from ecological models of health suggests that behavior is influenced by social processes at multiple levels, including the individual, social network, and neighborhood context. Moreover, some social spaces may be health enhancing while others have the potential to be risk promotive with respect to health behavior. The current study investigates relationships between individual level network characteristics (e.g., centrality, density), school level network characteristics (e.g., mutuality index, group salience), and characteristics of the neighborhood social context (e.g., dispersion in race composition, dispersion in household type) in relation to a prevalent substance use risk behavior among youth, cigarette smoking. To examine which contexts are risk promotive, interactions between network characteristics and other social contextual variables will be tested. This study is a secondary analysis of data from the Add Health study, which examines the substance use behaviors of youth in a nationally representative sample of students in grades 7 through 12. Findings relevant to how characteristics of the individual, school, and neighborhood contexts relate to smoking among youth in this sample are presented and implications for informing theory related to adolescent substance use will be discussed.

Network Dynamics. Chair: Ian McCulloh

1:40 PM World Cities and the Nation Urban System: The Case of China

xiulian ma
xiulian.ma@soc.utah.edu
Michael Timberlake

World Cities and the Nation Urban System: The Case of China (Abstract) Xiulian Ma Xiulian.ma@soc.utah.edu Michael Timberlake timber@soc.utah.edu Sociology Department, the University of Utah Salt Lake City, UT As one discourse on globalization, world city research challenges our established views city-state relationships, i.e., the subordination of the city as a territorial unit within the nation state (Friedmann 1986, 1995; Sassen 1991, 2000). It argues that key cities around the world, as basing points in the global space of capital accumulation, have come to constitute a somewhat autonomous system, and as they strengthen their ties with each other, their linkage with their national hinterland, including the national urban system will weaken (Sassen 2000: 55). However, such claims are founded on scattered and unsystematic evidence. This paper aims to begin to test these claims more systematically. To examine the hypothesis, we use China as a case, employing longitudinal inter-city airline passenger flow data on both national (for 1992, 1995, 2000, and 2003) and international (for 1990, 1995, 2000, and 2005) levels. There are about 40 cities in the Chinese flight-generated city network, and about 400 cities in the international city network. We will first compare world cities of focal interest in both their national and global urban system by examining the change of degree, i.e., sending or receiving ties, in both networks across time. Next, we will employ a longitudinal network model to examine whether it is true that global cities became less likely to establish ties with cities in their national urban system (or whether the strength of these ties declines as a city becomes more integrated into the global system of cities). This analysis will be brought to bear on our understanding the world city-state relationship in the processes of world city formation and globalization.

2:00 PM The evolution of the HIV/AIDS hyperlink network

Michelle Shumate
shumate@uiuc.edu

The growing sector of nonprofit, nongovernmental organizations (NGOs) has gained recent attention among organizational, international relations, communication, and political science scholars. Networks of NGOs have been proposed as alternatives to bureaucratic governance and a form of civic regulation for businesses. However, little is known about what factors influence which NGOs choose to collaborate with one another other. One form of collaboration with relatively low cost is hyperlinking. Hyperlinking among like-NGOs is suggested to be a form of collective action. As such, a hyperlink network is a connective public good that lacks formal structure. Unlike other types of public goods, contributions to connective public goods are governed by two decisions: how much to hyperlink and to which NGO to hyperlink. In order to understand the varied influences on these decisions, this research examines the evolution of a HIV/AIDS NGO hyperlink network over one year. Using longitudinal network analysis, this paper examines the role of both structures and attributes on the HIV/AIDS NGO hyperlink network. In particular, this research examines the influence of structural parameters including reciprocity and alters' popularity, common self-descriptions of NGOs on their websites, common NGO location, NGOs commonly headquartered in global cities, and receiving ties from government/corporate websites.

2:20 PM Evolution of Residential Segregation Using Agent-based Models
Jiayin Zhang
zjy624@gmail.com
Richard Boland
Jar-Der Luo
Residential segregation is an important phenomenon that is seen throughout the world in both developed and developing countries. Much theoretical and empirical analysis has sought to investigate the sources of residential segregation; however, traditional models focus heavily on income inequity as a primary source of segregation. In this paper, we construct an agent-based model in which immigration, social networks and capital growth are evaluated as factors leading to residential segregation. An agent in our model represents a household that makes the decision to move or not according to its desire, wealth and social networks. The value of a plot of land is determined at any given time as a linear combination of its natural value and a proportion of the average richness of the surrounding nearest neighbors. Both the household's financial and social capital will change when the household moves, and the value of relative lands will change correspondingly. We find that not only do immigration probability, social network characteristics and capital growth rate cause substantial residential segregation, but also they can lead to higher levels of residential segregation when compared to a reference model based mainly on income distribution. Moreover, we discuss the dynamic interaction between the accumulation of both individual and group social capital and the formation of city districts. These factors merit further study for empirical investigation and eventual policy recommendation with respect to identifying and mitigating residential segregation.

2:40 PM The inter-organizational basis of globalization
Lei Wang
Lei.Wang@lu.unisi.ch
Alessandro Lomi
Erik Larsen

Studies of globalization are typically based on assumptions about how aggregate patterns of trade flows influence variables that may be of interest to economic, social or business policy. Where do these patterns come from? In this study we address this orienting question in the context of the international electricity industry. We select the electricity industry because it provides a clear illustration of how dyadic network ties among companies induce global network structures that enable and constrain the behavior of business firms, industries and national economies across multiple levels of analysis. We focus on cross-border mergers and acquisitions events among electricity companies because we are interested in understanding how patterns of globalization emerge from the micro-relational activities among industry participants. We analyze data that we have collected on relations among 44 countries established through cross-border mergers and acquisition activity among companies during the period 1997-2004. We find that the global structure of the industry is characterized by a complex system of local dependencies among countries. We explore ways in which technological, institutional and economic differences among national electricity industries affect the selection of target countries. We report evidence that electricity prices at the same time affect and are affected by network-based processes induced by dyadic foreign direct investments flows among countries.

3:00 PM Specific Communication Network Measure Distribution Estimation

Dan Baller
Daniel.Baller@usma.edu
Anthony N. Johnson
Ian McCulloh
Kathleen M. Carley
Craig Schrieber

A new method is proposed to estimate the probability distribution of specific communication network measures.   Real world communication networks are dynamic and vary based on an underlying social network, thus reliably estimating network measures is challenging.   Two individuals that are socially connected, may communicate several times one day, and not at all on another, yet their basic relationship remains unchanged. In this situation, estimates of network measures, such as density, degree centrality and others may be severely affected by the occurrence or absence of observed communication ties between individuals. The communication network of a group of mid-career Army officers is modeled from empirical data using the network probability matrix (NPM) proposed by McCulloh and Lospinoso (2008). The NPM provides a framework to model a communication network by estimating the edge probabilities between two individuals in a network. This framework can model a specific social group regardless of their network topology: random, small-world, scale-free, cellular, etc. Monte Carlo simulation is used with the NPM to generate 100,000 instances of the communication network. A statistical distribution is fit to the density measure. Using this probability distribution, statistically significant changes in density can be detected.

Methods and Statistics. Chair: Noshir Contractor

1:40 PM Approximate and exact Bayesian goodness of fit for ERGMs (p*)

Johan Koskinen
johank@unimelb.edu.au
Peng Wang
Dean Lusher
Garry Robins

The scope for using traditional statistical methods for assessing the goodness of fit is limited in the case of the exponential family random graph models because of the complicated dependence structure of observations. The interdependencies make it hard to determine the complexity of a model and judge the amount of information as a function of the number of observations. In the literature it has been suggested that the fit of a model to data may be assessed by investigating how well the fitted model (conditional on the MLEs) manages to replicate features of the data that were not explicitly modelled. If these features are not extreme in the distribution implied by the fitted model there is some evidence for this being a plausible generating mechanism. The interpretation of the "test" when data is extreme is complicated by the fact that the distribution conditions on point estimates. Conditioning on point estimates neglects uncertainty regarding the estimates, which suggests that the test is somewhat too conservative. We propose an alternative that relies on posterior predictive p-values, where the distribution to which data is compared is conditioned only on the model specification. This is more in line with a test of the model specification and is generally less conservative than a test that conditions on the MLE. In this paper we use approximate as well as "exact" Bayesian inference for obtaining (a sample from) the posterior distribution, from which the posterior predictive distribution is derived (sampled from). The approximate procedure is a straightforward extension of methods already available and is implemented in PNet. The comparisons with the "exact" procedure do however warrant some cautionary remarks.

2:00 PM   Network effects in multilevel analysis
Mark Tranmer
mark.tranmer@manchester.ac.uk
Johan Koskinen
Network effects in multilevel analysis Mark Tranmer (1) and Johan Koskinen (2) (1) School of Social Sciences, University of Manchester, UK (2) Department of Psychology, University of Melbourne, Australia Multilevel analysis reflects the fact that outcomes of respondents belonging to the same geographical areas, or other groups, cannot realistically be treated as independent. However, interdependencies that arise via social interaction between respondents are rarely acknowledged. The network may therefore be regarded as a missing level in many multilevel analyses. The effects of missing levels are known in a geographical context, but less is known about the effects of leaving out information on networks. Empirical studies of the effect of peer influence and social interaction on various outcomes may be found in the social science literature. However, these studies typically do not treat the network ties as additional levels of dependence. More useful for conceptualising network interdependencies is the notion of social influence processes - especially network effects models and social influence models. There have also been attempts to investigate these effects through network autocorrelation, using indices borrowed from spatial statistics. To carry out a full multilevel study of individual, group and network variations on social outcomes, the complete dataset would ideally contain individual outcomes, a group identifier – e.g. geographical area - and the relational ties within the networks, and we would require a viable model of network dependence. In most cases in social statistics this network information will be absent or aggregated. Here we primarily aim to study network effects as a nuisance in multilevel analysis, and, secondly, to determine whether we can measure and take into account network effects, even when the information on networks is restricted. This is achieved by comparing results from multilevel analyses of complete data with various situations where the network information is restricted. We use simulations that are based on real data structures.

2:20 PM   Spectral Approaches for Detecting Communities in Social Networks
Mengxiao Zhu
mzhu@northwestern.edu
Dengyong Zhou
Noshir Contractor

There is a growing interest in the detection of communities within social networks. Communities are usually defined as aggregations of actors with similar properties. Structure-based community detection methods try to identify closely connected subgroups in the network by maximizing connections inside the same communities and minimizing connections between different communities. This is a counterpart to the graph partition problem in machine learning. Optimization of different connection measures correspond to community detection processes with certain preferences. In this paper, we introduce different optimization measures and a series of spectral approaches from machine learning to solve these optimization problems. We also point out the intrinsic connections between the Newman's (2006 a,b) "modularity" measure and one of these spectral approaches. Finally, we generalize these approaches from undirected networks to directed networks by using Markov random walks.

2:40 PM Latent class models for longitudinal network data

Michael Schweinberger

msch@stat.washington.edu

Latent class models for longitudinal network data are proposed, assuming that the set of nodes is partitioned into subsets (called classes, blocks, subpopulations, etc.). Conditional on the partition of the set of nodes, the probability law that governs changes of links between nodes depends on the classes to which the nodes belong, and governs changes of links within and between classes. The case is considered where the partition of the set of nodes is unobserved, and where, conditional on the partition of the set of nodes, the probability law governing changes of links between nodes satisfies the Markov property. Bayesian estimation is proposed, and the issue of non-identifiable parameters, arising from the invariance of the likelihood function - and the posterior distribution under invariant prior distributions - to permutations of the class labels, is solved by defining a loss function and minimizing the posterior expected loss. The usefulness of the methods is demonstrated by applications to longitudinal network data.

Academic and Scientific Networks. Chair: Scott Feld

1:40 PM Meaningfulness of centrality in citation networks

Jeffrey Demaine

jeffrey.demaine@nrc-cnrc.gc.ca

This paper investigates the usefulness of social network analysis techniques in describing the published literature of science. In particular, the validity of summarizing a citation network by its most central articles is examined by measuring the authorship in the network. The premise underlying this experiment is that an author's name represents the ideas s/he has published. By retaining articles by prolific authors, a concise sample of a research field can be obtained that is faithful to the range of ideas in that field. Given an article of interest, a citation network is generated and analyzed to identify its most central articles. The authors of the top ten articles ranked by three measures of centrality are then matched against the authors in the remainder of the network. It was found that highly central articles are written by researchers who have published three times the average number of papers. This suggests that if a citation network is reduced to its most central articles one can be confident that the most prolific authors (and by extension their ideas) will be retained. Building on this finding, the use of path-analysis techniques as a digital-library navigation tool is explored.

2:00 PM A Network Approach to the Prestige of Interest Sections in Sociology Reveals the Gendered Organization of Sociology

Scott Feld

sfeld@purdue.edu

Min Yim

There are two different relations between graduate Sociology departments and their faculty: a faculty member receives a degree from one department and is currently employed by another. These relations can be concatenated to create a one-mode valued network among departments indicating the numbers of faculty at each department whose degrees come from each other department. As previously recognized, that network clearly indicates a robust prestige ordering among the departments. These same faculty also have ties with the American Sociological Association sections. We suggest that the prestige of these sections is indicated by the average prestige of the departments of the section members. We then analyze characteristics of the 38 sections of the ASA in 1997. We find that sections with more members tend to have higher prestige members. Although there is no association between the gender of faculty and the prestige of their departments, further analysis indicates that the prestige of sections is especially strongly associated with the number of male PhD department members of the sections. The number of female members is not associated with the overall prestige of the members of the sections. The female members in each section come from just as prestigious departments as the male members, but males are more likely to belong to the sections whose male and female members come from higher prestige departments. We discuss various possible interpretations of this gendered organization of prestige of interest areas within Sociology, and consider some implications.

2:20 PM Networks of European Science in the 18th Century

Lothar Krempel

krempel@mpi-fg-koeln.mpg.de

Science historians have detailed and large databases on letters sent between researchers of the 18th century. Their research groups are typically concerned with communications of single well known researchers. The talk presents results of a collaboration with various research groups which allows to reconstuct the overall topology of the trans-european "Gelehrtenrepublik" based on written communications. An international science community that existed long before any modern means of communication. Combining sources from different research teams allows to answers various questions: What are the scientific centers of transnational communication in the 18th century ? Who are the actors, who linked the centers and prominent scientists over time and space ? The analysis is a prototype of how the relational analysis of large data bodies provides new insights into available information.

2:40 PM Dynamic Social Network Analysis of Scientific Collaboration Networks in Turkey

Bulent Ozel

bulento@bilgi.edu.tr

Having a relatively thorough picture of scientific collaboration, human resources, research interests and activities internal to national research and educational institutes can help solve problems, foster research performance and quality, and provide a competitive advantage. Barriers such as not knowing that researchers with the desired knowledge exist within national scientific community or knowing they exist but not knowing what expertise they hold is still a form of information barrier. Studies in organization science literature shows that the use of knowledge repositories within organizations helps the transfer of knowledge and connects members who were not previously connected (Constant et.al., 1996). This fact has motivated many contemporary organizations to implement specific databases as a mean to form knowledge oriented interactions among its members (Schreiber and Carley, 2004). This research applies a smilar approach to study scientific collaboration networks in Turkey. As such the type of collected data has gone beyond traditional scientific collaboration network studies where co-authorships or citation indexes are used to collect, to form and to investigate scientific collaboration networks(Newman, 2001). The research collects data about academicians such as papers co-authored, projects collaborated, scientific meetings co-organized, scientific or commercial projects co-advised, common grants used; current and previously affiliated research/educational institutes, specific research fields of each actor and their masters/doctorate or docent thesis advisor(s). The aim of the study is three fold. First, it presents a longitudinal data for the

years 1994-2006. There are two disjoint sets of network data one from the field of computer or related sciences and the other is from the fields of political sciences. The data is drawn through several channels: from a national database called ARBIS, which is developed and maintained by Turkish National Science Foundation; from various scientific databases accessible via Internet; university and personal web pages; and nation wide conducted surveys and interviews. Second, based upon the collected data it explores and investigates academic collaboration structure, 'style', culture, trends, drawbacks, performance, and effectiveness. In this paper we will focus more on the presence and evolution of clustering. Third, a number of apparent differences in the evolution pattern of collaborations in between the two fields is examined. Keywords: Social Network Analysis (SNA), Dynamic Network Analysis (DNA), Scientific Collaboration Networks, Multi-agent Simulation.

3:00 PM   Research Groups Evolution Unveiled

Matteo Vignoli

m.vignoli@unibo.it

Recent work has started to study the global structure of large‐scale collaboration networks in the natural sciences (Newman, 2001; 2003) but little work has been done in order to explain the features and the evolution of such networks with respect to scientific practice. In fact the exchange of ideas, research questions, methods and tacit knowledge is only possible in structurally cohesive networks like research groups in an organizational setting (Moody, 2004). In previous works (Vignoli, 2007) performed on a Management and a Language department it was shown that performance is a significant variable to explain research group evolution. The analysis showed also tendency toward network closure, meaning that researchers tend to organize themselves in stable groups. Regarding network evolution the selection mechanism was present but low, while the influence was the main effect in the behavior dynamics, meaning that researchers tend to reach the performances other researchers have in the group. In fact these results can have several implications, firstly for policy‐makers, which nowadays, are trying to push researcher to move from one academic institution to another every few years unhinging the influence mechanism; secondly for heads of department, that could support high performance research schools by giving funds to groups; lastly for researchers that could operate in a way to better perform as a group. This study is focused on designing, building and testing a tool that visually allows the unveiling and the understanding of the department's research evolution, including groups' and researchers' network and performance.

Thursday, Jan. 24   Afternoon 2

Network Mechanisms and Network Evolution. Chair: Peter Collings

3:40 PM   The influence of family networks on the educational attitude of elementary school children

Marina Hennig

mhennig@rz.hu-berlin.de

Marcel Helbig

In comparison to educational institutions, family networks play a decisive role for educational attainment. Empirical educational science faces the basic problem, that education is primarily defined through institutional characteristics, which are related to systemic educational processes. This neglects the significance of the life world ("Lebenswelt") and the realm of experiences, through which adolescents acquire the knowledge and competencies they need in order to be able to cope with every day life. These educational- and learning processes are facilitated by the family. For within the family and its intergenerational relationships an understanding of reciprocity is formed through social relations, solidarity and reliability. The adaptations of life-relevant practical and procedural knowledge are significantly influenced by (social)- milieu-specific experiences and opportunity structure. In this presentation we will show how socio-specific experiences within the family influence children's educational attitude in school. We will mainly focus on the social and cultural resources available to the family of origin, which includes: The parent's educational attainment, their socioeconomic endowment and their social contacts in terms of social networks. The results of the conducted study, which included 60 students and their parents from Berlin, show that in addition to the socioeconomic status, both the size and the composition of social networks are potent for explaining the development of reading- and math-competencies of elementary school children. These factors clearly have a greater influence than parent's cultural capital or factors within the school, such as school- or class climate.

4:00 PM Food Sharing Networks of Inuit Hunters in Ulukhaktok, NT, Canada

Peter Collings

collings@anthro.ufl.edu

This paper examines personal food sharing networks among Inuit hunters in Ulukhaktok, NT, Canada. Using the program Egonet, Inuit were asked to report on networks of exchanges with other households in the community. Of particular interest were exchanges of country (hunted) food, sharing of meals, exchanges of money, and exchanges of store food. Preliminary analysis of these food and resource networks in the community suggests some important changes over time in the construction and maintenance of sharing relationships between households in the community. The most significant of these changes is the decline of the "traditional" Copper Eskimo pattern. This traditional pattern emphasized the primacy of social and economic ties with members of one's own age cohort, at the expense of ties with households in the parental generation. The pattern that exists today is more characteristic of the Eastern Arctic, where food and resource exchanges tend to be restricted within nuclear-family household groups, with an older households acting as the nexus of social relations in the community. Why this apparent change has occurred is of interest here, and the paper examines contemporary network patterns in the context of the significant social-structural changes to the community that have occurred over the past three decades.

4:20 PM Boundary spanners, close collaborators and old friends: an exploratory analysis of distributed workers individual social networks

John W Bakke

john-willy.bakke@telenor.com

Organizational changes towards distributed work make the individual social network of professional relations increasingly important. Yet, the opportunities to develop and foster such networks are challenged by lower degrees of proximity and few mechanisms to develop social relations and communities. This paper present findings from a study of 50 distributed workers individual networks of close collaborators, exploiting ego-network analysis as well as individual interviews. Based on 11 different relational qualities, a cluster analysis of the distributed workers ego-networks was applied to classify the distributed workers in some typical categories. The findings suggests that distributed knowledge workers tend to develop their individual social networks in three different directions; labelled boundary spanners, close collaborators and old friends is proposed. The study suggests that each category faces different potentials and challenges, and that organizations implementing distributed work schemes should recognize the interdependencies between them. Based on the qualitative data (interviews), challenges and opportunities related to these positions are further discussed.

4:40 PM   Capturing university students' travel behaviour by exploring their social network: The developing country experience

Grace Padayhag
gupadayhag@plan.cv.titech.ac.jp
Daisuke Fukuda

The context of social network has drawn not much attention to be integrated in the realm of transportation planning making it less significant; though, this social network could lead to an extensive effect on the growing possibility of being mobile. The data were collected from the university students with the hope of acquiring fertile social network data. The study aims to investigate the activity-travel behaviour by exploring the ego's social network. As hypothesized in this study that with larger social network would mean higher possibility of making trips. Based on the results, an ego can make several trips within short radius vicinity with their colleagues. Furthermore, for the purposes of this current research, a social network comprises four categories of friends. These four categories of friends exemplify the strength of ties, which was performed by means of name generator, an ego-centered approach. The results identified that friends with stronger ties play a major composition of the social network for the university students. Willingness to travel was employed as a tool to examine how an individual extends his motivation to travel, if a friend sends a short message service (SMS) requiring the recipient to visit him. The results showed that majority of individuals were only willing to travel for half of an hour just to see a friend while only a few were unwilling to travel. Another set of survey is intended for the follow up interviews.

Thurs - Jan 24th - PM

Networks Economics and Markets. Chair: Jason Owen-Smith

3:40 PM   "Know when to fold 'em": Multiple networks, market uncertainty and IPO withdrawals

Jason Owen-Smith
jdos@umich.edu

Every gambler knows the secret to survival is knowing what to throw away and knowing what to keep Kenny Rogers Like Kenny Roger's gambler, venture financiers make their livings by placing high risk bets in uncertain conditions. Their decisions are informed not only by knowledge of what their "hand" contains, the characteristics of a portfolio company, but also by appeal to external signals about the market potential of their offerings. A growing body of work in sociology, management, and finance, examines how venture capitalists' (VC) positions in private equity syndication networks influences market outcomes for the start-up companies in which they invest. These efforts have demonstrated that VC networks can have salutary effects on, for instance, the speed with which new firms move to their initial public offering (IPO) as well as on first day price gains of stock and the eventual market capitalization of issuers. Nevertheless, little systematic attention has been paid to another key component of the gambler's strategy, knowing when to cut risks by "folding" and withdrawing a potential offering. We begin to address this question using a unique dataset that traces the fortunes of firms that filed S-1 forms (a declaration of the intention to IPO) with the Securities and Exchange Commission. We focus our attention on high technology companies and on two years, 1999 and 2000, that vary dramatically in the level of uncertainty faced by potential entrants to the public issue market. In 1999, which saw dramatic acceleration in what has come to be know as the "dot com bubble," 270 firms announced their attention to IPO and nearly 85% of them actually did. In 2000, a year that saw the high water mark and decline of the technology market, 293 firms announced an intention to IPO and just less than 58% actually issued stock. We seek to explain the likelihood and timing of those withdrawals. We argue that a firm at the cusp of an IPO is embedded in two distinct types of networks that can offer signals about potential returns to a public offering. First, IPO firms are financed by venture capitalists whose syndication networks represent formal, contractual efforts to spread risk across multiple private equity players. The position a firm's financiers holds in those networks situates it in one of the key social structures defining the private equity market and can serve as rich sources of information unavailable from other sources. At the same time, IPO firms are managed and governed by executive officers and directors whose recent career histories and

interlocking appointments provide more informal, social, channels into the world of bankers, institutional investors, and publicly traded corporations. An IPO represents a transition from private to public equity markets as well as a potentially lucrative liquidity event. We thus expect these two networks (one formal, contractual, and centered on the private side of the market, the other informal, social, and oriented toward the public side) to exert different influences on the decision to withdraw an IPO. We also argue that the role these networks play depends on the degree and character of uncertainty faced by a potential offering. We thus capitalize on the differences between 1999 and 2000 to examine the direct and moderating effects rising and falling markets exert on these decisions. In addition to offering new insights into the contextual and institutional features of economically oriented networks, our work examines a key financial decision and carries implications for our understanding of speculative financial bubbles more generally.

4:00 PM   The Disciplining of Creativity: Structural Dynamics of the Global Fashion System

Frederic Godart

fcg2102@columbia.edu

Social scientists usually represent artistic and creative realms as sets of artists or creative organizations clustered around geographic locations, schools of thought or positions in status scales. Generally, they do not attend to the macro-structural features of such realms and their historical transformations. Using a dataset of 675 fashion designers and 695 fashion houses over 60 years (1945-2005), constructed using both primary and secondary sources and a thorough selection process, this article aims at understanding the structural characteristics and dynamics of a specific creative network, the fashion system. The fashion system displays a simple and stable structure, at least after 1955. This structure is a core/periphery partition. From a dynamic point of view, the widely spread cliché that the fashion system is an "explosive" market needs to be mitigated by a closer comparison with the growth of the global economy. Similarly, a shift of power from France to other countries—first the United States, then Italy and the United Kingdom—can be observed. However, this shift in power, as well as a decoupling of production of clothing from the definition of designs and styles, does not affect the simplicity and stability of the fashion system. This simplicity and stability "discipline" the fashion system and enable it to survive despite an increased uncertainty in its environment.

4:20 PM   n Exploratory Study on Employee Social Network's Structural Influence on Internal Marketing

Tao Zhu

taozhu@fudan.edu.cn

This paper tries to find out the relationship between employees' social network structural factors and internal marketing (IM) mechanism. The purpose of this paper, therefore, is threefold: (1) to prove the effect of social network on IM; (2) to find out the leverage therein; (3) and an IM conceptual model based upon social network structural analysis by means of empirical method. In this research, organizational commitment, a key element in IM, are found to be negatively related with affective and communication dimensions in the employees' social network. The logic is when employees are engaged in their own society and grow more enthusiastic about their own social interactions, their organizational involvement will be weakened; as their sense of their independence become more certain with such intensification of collective structural positions in their own social network, their will lose their alignment with organization objective and well-being, hence detrimental to internal marketing. Another interesting finding is that there seems to have no relationship between commitment and word of mouth behavior. Key words: network structure, internal marketing, WoM, social network analysis

4:40 PM   Simulating European Labor Market: A Meta-Matrix Approach for Skill Dynamics and Innovation

Vehbi Tunalioglu
vst@bilgi.edu.tr
Bulent Ozel
Mehmet Gencer
Kaan Erkan

A European Union(EU) consortium, so called EURACE(www.eurace.org), which consists of a number of EU research institutes works on different kinds of artificial market models, i.e., models of the goods, financial and credit market, and a model of a labour market. An agent-based models of innovation dynamics is studied extensively towards an economic policy design applied to the EU economy. After having a brief review of the findings by the consortium, this work further focuses on and extends the analysis at labour markets. A variety of sub-networks exist within labour market. We apply a meta-matrix approach(Carley, 2003) as the networks connecting the four key labour market entities - workers, firms, tasks, and skills. Various aspects of labour market is characterized in terms of these networks. For example, employment structure can be defined in terms of the interaction network connecting workers to firms. Qualification structure can be defined in terms of the skills network – the connections of workers to skills. As such, we form, workers x firms, workers x skills, firms x tasks, workers x tasks, and tasks x skills networks within labour market. A change in any one of the five networks can potentially result in a cascade of changes in the others. For example, when workers acquire a new skill that invokes a change in the other networks. As another example, when new employers are hired they may bring new knowledge/skill with them. From an optimization perspective, we will simulate the set of changes that results in a cascade that meets the market efficiency

Thurs - Jan 24th - PM

Infectious Diseases and Social Networks. Chair: Devon Brewer

3:40 PM Egocentric Friendship-Based Social Networks and HIV Sexual Risk: Prevention Trials in Russia and Bulgaria

Yuri Amirkhanian
yuri@mcw.edu

Being structural units of a community, egocentric networks establish environments for trusted communication, economic support, and social influence. These networks are particularly important in socially-disadvantaged communities and in world regions with the recent massive socioeconomic transition. Social networks are also an important source for trusted health advice. Two randomized, controlled intervention trials were carried out, one with members of Roma (Gypsy)—and the other with MSM—egocentric social networks in Eastern Europe. Bulgarian Roma living in Sofia (n=286, 52 networks) and young MSM in Sofia and St. Petersburg, Russia (n=276, 52 networks) were participants. Networks were randomized to experimental (intervention) or control conditions. Experimental sociometric network leaders attended 9-session intervention program and systematically conducted HIV prevention conversations tailored with each member. At baseline and 3- and 12-month followup, all network members completed HIV risk behavior assessments. Individual-level HIV risk predictors—peer norms, condom use attitudes, and intentions—in both the MSM and Roma cohorts predicted very modest variance of risk. However, the network to which an individual belonged predicted 15-27% of variance. At 3-month followup, risk levels declined sharply in both the MSM and Roma experimental networks. At 12-month followup, these effects became attenuated among MSM, although remained among participants with multiple recent partners, the most vulnerable group. In Roma, risk reduction effects at 12-month followup became even stronger. Egocentric networks are suitable for health behavior change interventions designed for hard-to-reach vulnerable groups. Future research is needed to examine whether sociocentric network approach contributes to longer-term sustainability of intervention effects.

4:00 PM How to generate realistic close-contact networks for the simulation of droplet transmitted diseases

Timo Smieszek
timo.smieszek@env.ethz.ch

Michael Balmer

It is well-known that the homogeneous-mixing assumption underlying the widely-used compartmental models of disease spread is inadequate for most diseases. Accordingly, there is a need for more realistic, network-based models to simulate the spread of contagious diseases and the effect of intervention measures. However, for many transmission pathways and particularly for the airborne and droplet route, it is difficult to measure such networks in vivo, especially if they shall be large enough for simulation purposes. We introduce an approach to construct large close-contact networks based on measured activity and network data. In particular, we present the generation of close-contact networks for ~1.6 million individuals living within or commuting into the greater Zurich area based on census, enterprise census and transportation microcensus data. We state that an inevitable precondition for droplet transmission is that two individuals in question are at the same place at the same time. Relying on this, we utilize MATSim-T (Multi-Agent Transport SIMulation Toolkit) which assigns an activity schedule to every individual informing about type, location and time of each activity. Activities labeled home, work, education, shop and leisure are distinguished and contacts are assigned to persons performing the same activity at the same place and time. Furthermore, home activities are narrowed down to households, work activities to facilities and workgroups and education activities to classes. Contact generation is optimized regarding known marginal distributions. Such a generated, but realistic close-contact network is suitable for the simulation of disease spread and related intervention measures such as social distancing.

4:20 PM Reliability of Reported Sexual Partnership Dates and Measures of Concurrency

Devon Brewer

dbrewer@interscientific.net

The timing of sexual partnerships constrains the flow of sexually transmitted infections (STI) through a sexual network. We analyzed the test-retest reliability of reported partnership dates and measures of concurrency, using data from two studies in Seattle and routine STI contact tracing in Colorado Springs. Seattle respondents were men who have sex with men, injection drug users, prostitutes, and others at risk for STI who recalled their sex partners during the prior 1 or 2 years. Seattle respondents participated in two interviews separated by either two weeks or three months. Colorado Springs respondents were adolescents and young adults diagnosed with an STI on multiple occasions who reported partners in contact tracing interviews. Intervals between their interviews varied substantially. Respondents displayed fairly good reliability of reported partnership timing. Dates of last sex were reported more reliably than dates of first sex, and heaping in the differences in reported dates corresponded to the temporal units (week, month, year) often used in reporting dates. We found modest forward telescoping in Colorado Springs' respondents reports, which was likely induced by the temporal boundary of their sexual debuts; we detected no telescoping in the Seattle studies. Respondents showed moderate to high reliability in reported partnership ordering and duration, and the reliability of different concurrency measures also ranged from moderate to high. Most results are consistent with our research on the agreement between partners on their partnership dates (STD, 2006). Reported data on partnership timing seems sufficiently reliable for disease control activities and deeper analysis of time-ordered sexual networks.

4:40 PM Simulating infectious diseases using network and individual-based models

Matthew Vernon

m.c.vernon@warwick.ac.uk

Matt Keeling

The availability of data on the movement of cattle within the United Kingdom has inspired a substantial number of models of infectious disease dynamics; a proportion of these models use techniques based upon network analysis, and have been deployed to investigate economically significant diseases such as bovine tuberculosis and foot and mouth disease. We model the movements of UK cattle as a directed network, with animal holdings as nodes, and movements of animals as edges. Within this framework, a range of models may be considered, from a simple static network based upon all movements (sampled from a fixed number of days), to a more realistic and more complex dynamic model where the network changes every day. Whilst the former may be analysed with a far broader range of techniques, we demonstrate using stochastic simulation that they fail to adequately capture the aspects of network structure that drive the dynamics of disease processes. As a contrast to these network models of disease transmission, we also simulate the spread of disease, but modelling the dynamics at the level of individual cattle, rather than farms - hence providing a more detailed picture of disease spread. Comparing the output of these individual-based models to the output of network-based models is challenging (since the latter do not account for the disease status of individuals, and the former do not neatly describe the disease status of holdings); we discuss some approaches to making this comparison, and show how it may aid the interpretation of network-based models of animal diseases.

Thurs - Jan 24th - PM

Network dynamics: models and findings. Chair: Tom Snijders

3:40 PM

A longitudinal investigation of peer influence, peer selection and adolescent smoking in UK schools

Philip Sinclair
sinclairp@cardiff.ac.uk
Jo Holliday
Christian Steglich
Laurence Moore

Smoking in adolescence is strongly associated with friends' smoking behaviour. This relationship is not straightforward to understand, and there is inconsistent evidence from social network studies regarding the relative importance of peer influence (effect of friends on behaviour) and peer selection (effect of behaviour on friendship). The inconsistencies are in part due to difficulties in the statistical analysis because of the inherent dependencies between individuals in social networks. A promising advancement in the effort to disentangle the mechanisms that lead to peer group behavioural homogeneity in friendship networks is the stochastic actor oriented model, as implemented in SIENA. To date, few studies have used SIENA to examine influence and selection processes in adolescent smoking. In this presentation, we apply the SIENA methodology to data collected through A Stop Smoking in Schools Trial (ASSIST) to assess the extent to which influence and selection contribute to homogeneity of smoking behaviour in peer groups. ASSIST collected three waves of behavioural data (including own smoking behaviour, and other behavioural attributes) and social network data (students named up to six friends) on a yearly basis from over 10,000 students in 59 schools and will thus also allow investigation of variation in network-behaviour relationships across schools. This paper uses data from over six hundred 12-13 year old students in three schools. The findings of these analyses will be presented and their implications for the future of smoking prevention interventions discussed.

4:00 PM

Dynamics of Friendship Networks: How Durable Are First Impressions?

Otto Koppius
okoppius@rsm.nl

The popular saying holds that "you only get one chance to make a first impression", which would suggest that initial interactions are crucial for the development of friendship relations. An alternative explanation would be that friendship relations develop based on recent experiences with that person, such as interaction in task-related ties. To separate these effects empirically, we analyze the dynamics of friendship networks of a group of 38 students joining a Master's program, who had virtually no prior interaction before joining. We measure their friendship networks prior to and directly after an intensive integration week, their interaction during the integration week as a measure of first impressions, as well as the composition of the teams for the various Master courses to measure task-related interactions. We then measure their friendship networks after the first block of courses (7 weeks into the program) and the second block of courses (14 weeks into the program) to analyze whether the dynamics of their friendship networks are driven primarily by the networks created in the integration week or the task-related networks created during the courses and look at the potentially moderating roles of team performance and team identification.

4:20 PM   Investigating Network Dynamics: Structures Found and Advice for Model Specification

Tom Snijders
tom.snijders@nuffield.ox.ac.uk

The development of actor-oriented models for the statistical analysis of longitudinal network data has led to the possibility of detecting many different kinds of pattern in network dynamics. In most studies, the focus has been on a small number of basic network effects such as reciprocity and transitivity. However, the available possibilities for model specification in the SIENA software allow the investigation of many other patterns. Results are presented of an investigation of a number of longitudinal network data sets, searching for patterns that may be present in network dynamics in many cases but were previously undetected because nobody looked for them. The investigated network data are mainly about friendship and collaboration. One result is that we often find negative three-cycle effects, i.e., the number of three-cycle triplet configurations decreases more strongly, or increases less strongly, than would be expected by chance under models representing only tendencies toward reciprocity of choice and network closure. Another result is that often actors with higher outdegrees change their ties more rapidly, and failing to account for this may bias results about other investigated effects. A third set of results is about the differences between creating and terminating ties. Reciprocity often works differently for creating than against termination of ties; transitivity often works much more strongly for creation than against termination of ties. Finally, the consequences of these findings are discussed for the specification of longitudinal network models.

4:40 PM   Moving Up in The Game: Status and Attention-Getting in Hip Hop Music

Dan Halgin
dhalgin@gmail.com
Steve Borgatti
Zhi Huang

In this paper we investigate non-traditional ties to extend work on attention-getting and status contagion. We begin with a discussion of the consequences of having reciprocal public relationships with high status actors, drawing upon social capital literature, affiliation literature, and status literature. We contend that reciprocal public interactions between a high status and low status actor will benefit the low status actor and potentially harm the high status actor. Specifically, we analyze the phenomenon of "diss songs" among rappers in hip hop music. A diss song is a song in which the performing rapper makes derogatory comments about another rapper. In response to receiving a diss, the targeted rapper has the option to record a "response diss" directed at the original performing rapper. Both forms of diss songs are released on mixtape albums and often receive radio play. We analyze 746 directed disses among 218 rappers over 20 points in time. Of these 746 directed disses, 117 received responses. Findings suggest that having reciprocal "dissing" relationships with others improves future performance (sales) highlighting the importance of attention-getting behavior. We also find that the industry status structure mediates this relationship.

Networks Collective Action and Social Movements. Chair: Javier Simonovich

3:40 PM Does Contention Spread? How? Influence and Diffusion in Late Nineteenth-Century American Labor Conflict

Benjamin Lind

blind@uci.edu

Scholars of collective action have often considered and analyzed the effect of protest diffusion in predicting the advent of future events. While this field generally argues for the role of social networks and relationships between realized and potential events, seldom do these studies offer competing influence mechanisms. What are the hypothetical ways this relational phenomenon could unfold and which of these is the most empirically effective in producing--or dissuading--future events? Using late-nineteenth century American labor conflicts as a case, this paper raises two interdependent questions. First, do labor conflicts indeed influence the occurrence--or absence--of future conflicts? And second, how do these events--or non-events--influence each other? Theoretical implications for collective action and diffusion literatures is discussed.

4:00 PM A Longitudinal Statistical Network Analysis of the Environmental Alliances in the United States, 1970-2001

Hyung Sam Park

h3.park@unlv.edu

This study investigates the structural dynamics of the inter-organizational alliances in the environmental movement sector in the United States, 1970-2001. Particularly, it focuses on the alliance ties between the environmental movement organizations (EMOs) and explaining the processes by which the contemporary inter-EMO structure has emerged over time. The methods used in analysis include structural partitioning, p-star logit, and categorical data analysis. The data analyzed were collected from various sources including LexisNexis and Guide Star and include both organizational attributes and relations. To explicate the dynamic processes by which the contemporary inter-EMO structure has emerged, this study investigates the formation of dyadic, triadic, and network structure with regard to alliance ties. Selected fundamental models of network dynamics such as strategic actor models help explain the empirical inter-organizational alliance ties. The theoretical and empirical findings help better understand the structural and dynamic issues in the study of the environment, social movement, complex organizations, and network evolution.

4:20 PM What goes around comes around: Structural origins of collective actions in Georgia

Koba Turmanidze

kturmanidze@ucss.ge

Since its independence no Georgian government has ever completed its constitutions term; short evolutionary phases of political development have been interrupted by mass collective actions, whether peaceful or violent. This paper aims at finding structural explanation of mass collective actions in Georgia on the example of so called "Rose Revolution" (2003) that resulted in a peaceful regime change. This research will be primarily focused on the micromobilization process as a driving force of successful collective actions. My working hypothesis is that overlapping networks between the political and civil society groups were the main factors for mobilizing critical masses of protestors in both cases. The absence of such overlapping networks in earlier similar events in Georgia or in other post-socialist states (such as Armenia and Belarus for instance) resulted in limited exchange of material and symbolic resources that would have been crucial for successful mobilization. Primary data for this research will be extracted from the databases of the two major non-profit foundations in Georgia that have supporting civil society building since the beginning of 1990s. To track the interactions among the civil society organizations the data is collected about all projects funded by

these foundations before 2003. Furthermore, two- mode matrix will result in two separate one-mode matrices: organization-by- organization and project participant-by-project participants. These matrices make it possible to analyze structural features of actors such as density, centrality, structural autonomy, degree of transitivity, isolation, etc. It is hypothesized that these structural properties of the key institutional and individual actors can provide a key for explaining success in the process of micromobilization.

4:40 PM   Weak Ties for Weaker Populations": Teaching the Use of Social Networks for Employment to Low Socio-Economic Populations

Javier Simonovich
javier@research.haifa.ac.il
In most modern societies jobs are usually found through social networks. Within those societies using social networks may mean the difference of getting your foot in door or getting left outside a good working place. People from lower socio-economic populations are disadvantaged when using social networks to achieve better and uprising employment due to the fact that they have little or no knowledge of using Granovetter's "weak ties" in order to obtain good employment. In a case study in Israel low income groups of unemployed populations were taught job seeking skills based on social networks with mixed success. The results have strengthened our assumption that educating people in the use of social networks for finding employment is beneficiary, and that efforts should be worked out to achieve this as a way to improve income and employment.

5:30 PM
Awards Announcement:
Simmel Award, Freeman Award, Visible Path Award

5:45 PM
Keynote: Steve Borgatti
Network Reasoning

7:15-9:00 PM
Banquet and Cash Bar

8:30 PM
Memorial for William Richards
The memorial for Bill Richards will be held at the end of the banquet. Everyone is invited to attend, including colleagues who have not registered for the banquet.

Friday, Jan. 25   Morning 1

Viszards Session - Web of Science. Chair: Ulrik Brandes

The Viszards session started at Sunbelt XXII and has been repeated each year with a different theme. Rather than a series of contributions on related subjects, this session features a single, joint presentation by all contributors. Our aim is to demonstrate the richness and power of network analysis, in particular when supported by visualization. We present a multi-perspective analysis of a single data set, utilizing a broad range of visualization methods. This year we will analyze Web of Science networks - http://portal.isiknowledge.com/ .

8:40 AM   Vladimir Batagelj
Katy Borner, Bruce Herr
Ulrik Brandes, Juergen Lerner
Seok-Hee Hong
Jeffrey C. Johnson
Lothar Krempel
Andrej Mrvar
Jurgen Pfeffer

Inter-Organizational Networks. Chair: Rebeca Eun Young Hwang

8:40 AM   Predicting Homophilous Dyads in the Interorganizational Collaboration Network of the Hurricane Katrina Response

Ryan M. Acton
racton@uci.edu

This paper analyzes the propensity for homophilous tie formation using data that reconstructs the dynamic network of interorganizational interaction in response to Hurricane Katrina in 2005. Organizational collaboration during Katrina could have occurred in one of three ways: organizations essentially form ties with random others, organizations form ties with others different on certain dimensions for reasons of complementarity, or organizations form homophilous ties with others for reasons like shared expertise and domain. Adding to previous literature on homophily in organizational collaboration, dyads of organizations homophilous in organizational type and in scale of operations are predicted to occur more frequently than chance alone. Using two means of assessing homophilous tie propensities in the data (counts of raw frequencies and exponential random graph (ERG) modeling), this paper finds that the two predicted types of homophily occur more frequently than chance. This line of research presents not only an application of ERG modeling on dynamic network data, but also yields possible organizational interventions for practitioners involved in emergency management operations during a disaster like Katrina.

9:00 AM   Network Analysis of the Care of Critically Ill Patients

Theodore Iwashyna
iwashyna@alumni.Princeton.edu

Some hospitals provide better outcomes to their critically ill patients than others. One approach to such variation is to transfer critically patients from low-quality to high quality centers. We use network analysis to examine the existing system of patient transfers and the relationships between hospitals those transfers reflect. In particular, we examine critical care transfers in the 2005 Medicare administrative data. We map the network of critical care transfers, and examine the overlap between the networks of surgical vs. medical vs. cardiac critical care. Further, using all-payer data for the state of Pennsylvania (PHC4), we examine the generalizability of Medicare data. We argue that these tools are of practical value (a) improving use of existing capacity; (b) addressing issues of regionalization; (c) as a quality improvement target; and (d) preparing for epidemics and disasters.

9:20 AM   Interrelated Development of Cognitive Connectivity and Inter-Organizational Relationships of Young Enterprises: Insights from an Agent-Based Simulation

Michael Beier
beier@wiso.uni-koeln.de
Young enterprises often need to rely on external resources and capabilities. Therefore, they have to cooperate with diverse external partners from domains different to their own. Adequate levels of shared languages and systems of meaning are a precondition for long-lasting and beneficial inter-organizational relationships. On the other hand, experiences with different partners have a strong influence on the development of a founding team's cognitive connectivity. Founding team members often feature a high similarity of their identities and cognitive schemata, which is beneficial in early stages of founding, but can evolve to a cognitive lock-in limiting the connectivity to potential external partners. Therefore, it is a crucial but difficult task for young enterprises to balance the efficient development of cognitive connectivity to respective target groups and internal cognitive similarity. So far, little is known about the factors and mechanisms influencing the interrelated development of cognitive connectivity and networks of inter-organizational relations over time. To investigate the research field systematically, a comprehensive model is formulated and formalized; integrating relevant processes and parameters identified in recent theoretical and empirical research. The formal model is implemented in an agent-based computer simulation and selected parameter spaces are computed in simulation experiments. The results show the influence of different degrees of team homogeneity, external and internal interaction rates, specialization of relationship management, and task requirements as well as different heuristics of partner selection and cognition properties on the mutual dependent development paths of cognitive connectivity and inter-organizational relationships of founding teams.

9:40 AM   How does network structure affect performance?

Rebeca Eun Young Hwang
rebex@stanford.edu
In many urban areas in the developing world, the problem of delivering potable water to the poor has proven to be intractable for public agencies, private companies, and NGOs. In some urban districts, the poor have gained access to drinking water by organizing themselves into cooperatives, voluntary membership organizations that are democratic and member controlled. This research investigates the role of network structure on the performance of 440 Argentine cooperative organizations delivering domestic water supply. These cooperatives are a particularly interesting organizational form to study because they are mandated by national law to have an explicit social goal in addition to the traditional operational and financial performance goals necessary for an organization's survival. These goals are often in conflict. As a result, some cooperatives seem to more frequently emulate for-profit practices and others to adopt nonprofit values and principles. In this study, we investigate how the structures of a water cooperative's networks affect its choice and ability to reach social, operational, and financial performance goals. We collected the following network data for 440 organizations: 1. affiliation of the cooperative with second degree networks ("federations", "confederations" and trade associations) 2. formal partnerships and agreements with other relevant institutions (e.g., municipality, local regulatory body, research institutions); and 3. formal or informal bilateral interactions among cooperatives in the

same region, categorized as: 1. information exchange 2. service exchange 3. resource sharing (including sharing legal, accounting services and equipment) Performance was measured both in terms of the financial health of the organization and the access to water offered to low-income households in the cooperative's coverage area. This presentation will report preliminary results that link the structure of the network, and the social and economic performance of water cooperatives in Argentina.

10:00 AM **So Everyone's at the Table, What's Next? Understanding the Leadership of Aging-Focused Community Partnerships**

Todd Honeycutt
thoneycutt@mathematica-mpr.com
Judith Wooldridge
Community partnerships with key leaders engaged in coherent campaigns to address partnership goals are more likely to be successful. Network analysis is an ideal approach to observe the operation of a partnership's leadership. This paper provides the initial results of an evaluation of the leadership at eight community partnerships whose overarching goals are to increase awareness of elder issues, improve the long-term care system, and advocate for policy changes to benefit seniors. Interagency partnerships are useful ways for communities to approach the complex issues facing older adults by encouraging cooperation among aging providers, bringing in consumer and non-traditional organization perspectives to aging issues, and organizing efforts to improve broad outcomes such as changing the long-term care system. We surveyed 201 leaders during the first year of a four-year implementation grant, with site-level response rates ranging from 63 percent to 100 percent. We asked leaders about their knowledge of partnership priorities, their relationships with other leaders, and their assessments of the partnership's effectiveness. We present preliminary findings on who participated in the partnership leadership, the leadership structure, and how the diversity within the leadership affects its structure. Using network analysis, we examine communication and other relationships among leaders to determine who plays important roles, and we look across sites to determine patterns of participation and structure. Finally, we explore the association between leadership relationships and leader perceptions of partnership outcomes.

Fri - Jan 25th - AM **Social Capital. Chair: Robert Boutilier**

8:40 AM Social capital and resources in inter-organizational networks: Interactions of homophily and heterophily

Junki Kim
jkkim@snu.ac.kr
Bok-gyo Jonathan Jeong

The key question addressed in this study is what motives promote purposive actions of organizations in social networks. This study defines social capital as resources embedded in social networks that are accessed and/or mobilized in purposive actions (Lin 2001). This research intends to extend the scope of application of this network-embedded social capital theory, from individual to organization level. More specifically, this study investigates the motives for obtaining resources boost homophilous or heterophilous interactions in inter-organizational networks. In addition, this study examines the strength-of-weak-tie proposition that ego will have better social capital for instrumental action through weaker tie. This study takes the case of inter-organizational networks surrounding nonprofit social service organizations for children in impoverished neighborhoods in Seoul. This research classifies organizational resources into four categories: information resources, human resources, financial or physical resources, and clients. This study observes the frequencies of contacts sending and receiving of each type of resources, This study encompasses 46 organizations in complete network analysis, and takes a further step by delving into ego-centric networks of 179 organizations ranging various types embracing local nonprofit organizations, governmental organizations, religious groups, and private companies.

9:00 AM How social network analysis might reduce world poverty: Identifying common patterns of social capital in firm-stakeholder networks

Robert Boutilier
boutilier@sfu.ca
###

9:20 AM The Role of Social Capital in Perceived Performance of Water Cooperatives

Nicolas Cha
rebex@stanford.edu
Rebeca Eun Young Hwang
This study tests the relationship between social capital measures and the 'perceived' performance of water cooperatives in Argentina, where 440 small-scale water cooperatives provide water in metropolitan and remote rural areas. In the Buenos Aires metropolis alone, there are 9 water cooperatives that present different results of performance measured in terms of economic solvency, efficiency and self-declared coverage in low-income areas. Ortolano and Hwang have investigated the role of network structure to the performance of water cooperatives, measured by analyzing self-reported data regarding financial, social and technical performance. Results from Ortolano and Hwang's study are compared to 'perceived' performance measures of a sample taken from the same database. This sample was selected from the Buenos Aires metropolitan area. We conducted qualitative interviews to: 1) measure social capital of the community that the water cooperative served, and to 2) measure the performance of the cooperative as perceived by the community. The social capital data was collected by a standard questionnaire formerly used by the World Bank. 'Perceived' performance was assessed by interviewing a small sample of households from the community. In this paper, self-reported performance data is compared to perceived data from the community. Moreover, we present some hypotheses on the relation between levels of social capital and both self-reported and perceived performance. Finally, we derive some observations regarding the role of social capital on the type of inter-organizational network structure to which the cooperative belongs. Collectively, the results can inform policies intended to enhance the availability of water services for the urban poor. [Note: This research project is complementary to the abstract presented by Hwang and Ortolano to this conference]

9:40 AM Why Withhold Job Finding Assistance? Comparing and Contrasting Motives of the Black Poor's Labor Market Intermediaries

Sandra Susan Smith
sandra_smith@berkeley.edu

I examine the process of finding work among the black poor from the perspective of the poor's labor market intermediaries. Drawing from in-depth interviews of job-holders (personal social capital) and job center staff (institutional social capital), I show that the mobilization of social capital for job-finding is frustrated by intermediaries' pervasive distrust and noncooperation. I relate the dynamics between black, poor job-seekers and their personal and institutional intermediaries to four key factors--the lack of resources to effectively facilitate job-finding; the dominant discourses of joblessness that define the problem of joblessness and provide a guide to addressing it, quite often inadequately; the tenuousness of intermediaries' own labor market positions; and the behaviors of the poor and jobless.

10:00 AM A Comparison of Social Capital Assessment Instruments in Two Geographically Dispersed Firms

Marlene Biseda
mbiseda@earthlink.net
One of tools used to measure individual social capital is the position generator, which relies on the hierarchical structure of an organization to assess an individual's access to social capital. Research using the position generator has focused on entities with numerous levels in the hierarchy, as does Lin's study of Chinese society, which identifies 13 levels (Lin, 2001, p.112). Firms in the private sector, however, have decreased the number of levels in their hierarchies while increasing team-based project work across organizational boundaries; the position generator may not be a viable instrument in these environments. When Subramaniam and Youndt (2005) studied intellectual capital and organizational innovation, they developed a five-item scale to measure social capital by combining ideas from social structure and knowledge management. This paper discusses a case study using both the position generator and an adapted version of the Subramaniam and Youndt social capital assessment instrument in two geographically dispersed organizations: a regional practice (in the United States) of a "Big 4" auditing firm, and a global business unit (in Europe and the United States) of a technology company. After I interviewed the 31 study participants, they completed a questionnaire to assess their levels of social capital using both tools. The results generated by the instruments are presented and assessed for their practicability in the given context.

Fri - Jan 25th - AM **Social networks and health. Chair: Valerie Haines**

8:40 AM Neighborhood Norms of Reciprocity, Network Social Capital and Depressive Symptoms

Valerie Haines
haines@ucalgary.ca
John Beggs
Jeanne Hurlbert
The concept of social capital has rapidly become part of the working lexicon of researchers studying the effects of social context on healthBeven though there is no consensus on how to conceptualize or measure social capital. Because most of these studies follow Putnam and treat social capital as an ecological construct measured by characteristics of places, they have not explored fully the role of network social capital. To address this gap, we investigated relationships among depressive symptoms, neighborhood norms of reciprocity, and network social capital, understood as personal network structures and the resources embedded in these structures. Our multilevel modeling analysis showed that neighborhood norms of reciprocity exert a contextual effect on depressive symptoms. We also found significant effects of the structure and resource elements of network social capital on depressive symptoms, net of neighborhood levels of reciprocity and characteristics of residents. Notably, including network social capital in our analysis rendered the effect of neighborhood norms of reciprocity statistically non-significant. This finding suggests that neighborhood differences in depressive symptoms are not due to this form of neighborhood social capital. Instead, they arise from structural characteristics of the personal networks of the people who live in these neighborhoods and the resources embedded in these personal networks. We conclude with a discussion of how our

findings advance the empirical literature on social capital and health.

9:00 AM Concordant perceptions of descriptive and injunctive norms as a mediator of the relationship between mass media program exposure on contraceptive adoption in Nepal

Marc Boulay
mboulay@jhuccp.org
Normative effects on behavior are often strongest when individuals' perceive that the behavior is both common in their community (i.e. favorable descriptive norms) and encouraged by their personal network (i.e. favorable injunctive norms). This paper examined whether exposure to a family planning radio program in Nepal was associated with increased concordance between women's perceptions of descriptive and injunctive norms related to family planning and whether this concordance was associated with contraceptive adoption. Data were collected from 1,679 married women living in 79 rural communities in southern Nepal. The survey included items measuring their exposure to the radio program, their perceptions of the prevalence of contraceptive use in their community, and egocentric data identifying their personal network and the level of encouragement to use family planning within their personal network. A contraceptive calendar measured adoption of a modern family planning method in the past year. Controlling for background characteristics, program exposure was associated with increased concordance between the perceived level of contraceptive use in one's community and with the perceived encouragement to use family planning within one's personal network. Concordance between these two norms was associated with increased levels of contraceptive adoption within the past year. These findings provide further support of the interactive nature of mass mediated and interpersonal influences on behavior.

9:20 AM Social Network Analysis in Evaluating Health Promoting Schools in Thailand

Kwanmuang Kaeodumkoeng
km_kaeo@yahoo.co.th
There has so far only been little research attention given to how network actively engage in health promoting schools. The purpose of this research was to study health promoting in schools with particular focus on networking and how to success. This paper sets out a conceptual model for studies the factors affecting to determine which of the most account for the differences in the average score profiles of health promoting schools and describe the interconnectedness of participants in the health promoting schools process and to explore their capabilities to influence health development. 2 Case studies were retrieved from schools which participated the health promoting schools project in Thailand. Purposive selection the success case and non-success case for network analysis. For each case, we identified a range of stakeholder and mapping relevant actors, their positions and connections in networks. In addition, we compare the schools networking that provides us with insight into their capacity to participate and contribute to both policy makers and administrators to established the appropriate healthy school strategy and to make judgments about process, to shape the next developments, and contribute to the sustainability of quality practices and health products for student.

9:40 AM   Social Network Types, Intimacy and Healthy Longevity Among the Chinese Elderly

Qiushi Feng
qiushi_feng@hotmail.com

The significant association between social networks and health and mortality at old ages is well-documented in western societies. However, similar research from developing countries, especially among long-lived persons, is rare due to data unavailability. Using the Chinese Longitudinal Healthy Longevity Survey (CLHLS), a unique specially designed nationwide survey with a sample of 15,232 community-residing Chinese elders, this paper examines the associations between social relationships and subsequent healthy longevity from 2002 to 2005 within a multi-level context. Our analyses show that compared to the isolated elders, elders in socially integrated networks had up to a 35% reduction in odds of mortality over a 3-year period, although such protection was diminished after controlling for baseline health. Elders in family-oriented networks, on the other hand, had up to a 51% increase in odds of mortality over the 3-year period independent of baseline health. Compared to those who did not have an intimate network alter, those whose most frequent talking-person were friends/neighbors or spouse had 15-50% decreased odds of death in presence of various confounders including baseline health. Socially integrated networks reduce the likelihood of poor health by up to 60% in terms of cognitive impairment, ADL /IADL disability, poor self-rated health, chronic diseases, and frailty index. Similar results were found for having friends/neighbors as the source of intimacy. This result suggests that the protective effects of network types and source of intimacy on healthy longevity still exist at advanced ages in China.

Fri - Jan 25th - AM   **Academic and Scientific Networks. Chair: Victoria Hill**

8:40 AM   Who works with whom? Collaborative tie strength in distributed interdisciplinary projects

Jonathon N. Cummings
jonathon.cummings@duke.edu
Sara Kiesler

In this paper, we illustrate why prior experience working together is critical for collaborations that cross geographic and disciplinary boundaries. In the organizational literature, strong ties are characterized by greater frequency of communication and emotional closeness compared with weak ties. For scientists and engineers on research projects, we introduce the concept of 'collaborative tie strength' to emphasize the level of joint intellectual effort. In the context of science and engineering, collaborative strong ties work directly together on a research project and publish together, whereas collaborative weak ties are on a research project together, but do not work directly together or publish together. Using data from 3911 pairs of senior personnel working on 475 research projects funded through the National Science Foundation (NSF), our analyses suggest that prior experience matters to subsequent collaboration, not only because it is a strong predictor of collaborative tie strength, but also because it moderates the relationship between geographic and disciplinary boundaries and collaborative tie strength. That is, the negative impact of geographic and disciplinary boundaries on collaborative tie strength is reduced when prior experience is greater. We discuss implications for e-social science, which often relies on researchers from different universities and disciplines working together.

9:00 AM   A Model of Preferential Attachment for Emerging Scientific Subfields

Walid Sharabati
wsharaba@gmu.edu

In this paper, I suggest a model of preferential attachment in coauthorship social networks. The process of one actor attaching to another actor (author) and strengthening the tie over time is a stochastic random process based on the distributions of tie-strength and clique size among actors. I will use empirical data to obtain the distributions. The proposed model will be utilized to predict emerging scientic subelds by observing the evolution of the coauthorship network over time. Further, I will examine the distribution of tie-strength of some prominent scholars to investigate the style of coauthorship. Finally, I present an example of a simulated coauthorship network generated randomly to compare with the real- world network.

9:20 AM **Collaboration in an Academic Setting – Does the Network Structure Matter?**

Victoria Hill

vhill@cmu.edu

What forms of collaboration result in the most benefit to individuals who are in the business of creating new knowledge? We approach this question by examining patterns of collaboration among university faculty members with the objective of determining what types of collaborative relationships are most likely to result in innovative ideas and knowledge creation. By drawing on the toolkits of Social and Dynamic Network Analysis, we measure different structural positions of the network of actors based on this collaborative behavior. The dataset used in this study contains publication and collaboration data from 1995-2006 for each of 61 tenure or research track faculty members in the computer science department of a major U.S. university. Publication data was used as a proxy for knowledge creation. Co-authorship of publications and inter-departmental collaborations on projects, grants and students were used in calculating several network metrics including the E-I Index. These metrics along with relevant control variables are subsequently used in a multivariate regression model to estimate their significance on total publication rates of faculty members. Results indicate that innovation and new knowledge creation are facilitated by new inter-departmental partnerships for a specific cohort of faculty members.

9:40 AM **Self-Organizing Maps and Self-Organizing Social Systems: Content, Structural Coherence and Growth of Scientific Specialties in Nanotechnology**

Lynne Zucker

zucker@nicco.sscnet.ucla.edu

Recent work links the structure of collaboration networks to the idea spaces formed from scientific communities characterized by core groups of scientists that collaborate with each other to generate new ideas, suggesting that the central scientists within the cores of these networks would be highly-cited. Further, the "hot," successful areas are identified by relative growth rates. We use two methods to identify research specialties within nanotechnology: one human-generated by experts in the field (www.vjnano.org), and one generated by terms and phrases in computer-based Self-Organized Mapping (SOM). We show that network centrality measures are a significant predictor of highly-cited status, and that areas with more highly-cited also grow at a higher rate. We find in both sets of analyses that the SOM grouping shows coherence through strong and significant patterns of results, but the human categories from VJN do not.

10:00 AM **Inclusion of a Document Retrieval System as an Actor in a Social Network**

Janet Macpherson

jrm03@charter.net

Traditionally, social network analysis techniques enable the examination of relationships and the flow of information within networks comprised of human members or groups of humans in organizations. In an effort to extend the ideas commonly considered to comprise the field of social network analysis, Kilduff and Tsai (2003) suggest in "Social Networks and Organizations" that the interaction between humans and nonhumans within networks needs attention. This study extended traditional social network analysis to include a nonhuman group member, specifically a document retrieval system. The importance of document retrieval systems as information sources to groups of people, the changes in business environments that necessitates the use of information and communication technologies, and the attempts to make computer systems more life-like, provide the reasons for considering the document retrieval system as a group member. The methodology of this study included distribution of social network analysis surveys to two small businesses that used the same document retrieval system, followed by semi-structures interviews of selected group members, which allowed elaboration on the survey findings. The group members rated each other and the system on four interaction criteria relating to four social networks of interest, including awareness, access, information flow, and problem solving. Traditional measures of social networks provided insight into the positioning of the nonhuman member within the social group while the interviews allowed clarification of the human feelings about the document retrieval system.

Friday, Jan. 25   Morning 2

Fri - Jan
25th - AM

Interlocking Directorates. Gregory Koger

10:40 AM PARTISAN WEBS: INFORMATION EXCHANGE AND PARTY NETWORKS

Gregory Koger
gkoger@miami.edu
Seth Masket
Hans Noel
We can better understand the scope and influence of political parties in America by studying their alliances with interest groups and media outlets. Toward this end, this exploratory study uses an innovative approach to identify links between formal party organizations and informal networks of interest groups, media, and 527s. We trace exchanges of donor and subscriber names between organizations and we use social network analysis (SNA) to reveal the communities that drive modern politics.

11:00 AM The Political Leadership of Business

Nicholas Harrigan
mert1919@herald.ox.ac.uk
This paper examines the economic, social and political characteristics of the political leadership of business. Using a social influence social network model and a dataset composed of the largest 2,000 corporations in Australia and their 7,500 directors, this paper asks "What types of corporations tend to have directors recruited to political leadership positions?" Eight types of business political leadership are examined, including directors of 350 government owned enterprises, the executives of the major business associations, and the directors of conservative think tanks. The main finding is that there is a 'core corporate political leadership' drawn from the large, publicly listed corporations and closely allied law and accounting firms. These corporations tend to be based in highly regulated industries, and tend to have high levels of social and political capital in the form of directors serving on the boards of other major companies and in the form of making donations to both major parties. In contrast to the 'core corporate leadership', business leaderships representing smaller corporations and business leaderships allied with the conservative (Liberal and National) political parties are marginalised from the centres of political power and are idiosyncratic in their recruitment patterns.

11:20 AM Political and Corporate Networks: An examination of relations between political parties and companies in Poland

Dominik Batorski

db@uw.edu.pl

This research focuses on the relationship between political parties and state-owned as well as private companies in Poland. Therefore, here we study a three-mode network of people, parties and firms. The state control over a large number of companies in post-communist countries creates an opportunity for parties in power to secure various assets which might become useful in political campaigns. Members of supervisory boards of state-owned companies are appointed by the minister of treasury, and they, in turn, select the executive boards, creating bonds between political parties and companies. Using data on all firms controlled by the ministry of treasury (over 1400) and all stock market companies (almost 300), we investigate how often former politicians are members of boards of directors of those firms. We also verify how appointments for the supervisory boards of state-owned companies in the past years (2004-2007) depended on party affiliations and whether directors of those firms contributed to parties electoral campaigns. We argue that the functioning and role of "party representatives" in supervisory boards of state-owned companies is likely to be different than the role of former politicians in boards of private firms. The first ones might serve political parties as a tool to control the economy, whereas the latter serve rather as a tool for private firms to influence political decisions on concessions, regulations, or public contracts.

11:40 PM Elite status groups and corporate political behaviour in Britain

Matthew Bond

M.Bond@kent.ac.uk

The political organisation of large business is a central question in political sociology. What factors mobilise and factionalise business organisations and their leaders? Much recent scholarship has emphasised industrial, market based and bureaucratic factors. In this paper, I will present evidence that elite status groups, with interests that extend beyond the individual corporation, play a prominent role in shaping business political behaviour in Britain. In particular, I focus on the role elite status groups have in business funding of political parties and in forming business pressure groups. I will conclude that one gets a clearer understanding of business political behaviour by taking into account the extent to which the British business community is embedded in other historically specific national identities.

Fri - Jan 25th - AM **Inter-Organizational Networks. Chair: Mary Still**

10:40 AM Elite Managerial Networks in the United States, 1985-2001

Mary Still

mcs19@cornell.edu

Network and organizational theory have prospered from the insights of research on board interlock, which helps explains much of the uniformity in the actions of linked companies. This paper approaches the study of organizations from a vantage point lower in the firm -- from the view of senior managers. It develops firm interlocks based on the moves of top 10 managers between companies in the American Fortune 100 over 17 years. The paper argues that the linkages forged through executive migration are crucial for understanding decisions and actions of firms that are decided on by leaders within the firm rather than by the board. The paper constructs networks between 226 firms through the career histories of more than 8,000 managers, and describes which firms are most central, as well as which are largely "importers" or "exporters." It also considers the network as a dynamic system with important changes over time.

11:00 AM Designing Adaptive Systems for Disaster Mitigation and Response

Namkyung Oh
nao2@pitt.edu
Tobin Im
Ilchul Moon

The ability to respond effectively to disasters is a responsibility for government. Since 9/11/2001, the US Government has committed significant resources, attention, and time to improve security. Yet, DHS's ineffectiveness in responding to the 2005 hurricanes led to wide public criticism of its performance, and further efforts to redesign a new national system. The major criticism was the structure of disaster management system. Many insist that the traditional hierarchical system prevented the critical information sharing and delayed the timely delivery of government services. If the current system is really hierarchical one and it's not appropriate structure for the effective response, we need new types of knowledge and analytical skills to design a new system. This study will try to answer following research questions. First, we will check the structure of current network, 1) how are social structures formed from smaller components, and what factors influence their formation? 2) What organizations are structurally important in these emerging networks? 3) Which actors play key network roles and why? Secondly, we will try to build 'structural holes' as a facilitator in information sharing and will address 4) in what ways does network structure create opportunities or obstacles for the collaboration among organizations? Finally, I will simulate the current network with parameters change and see how it evolves. This paper will analyze the cases of Hurricanes Katrina. Two types of data: 1) content analysis of newspaper articles; 2) official situation reports. Using these data, I will evaluate the relationship among federal, state, local organizations

11:20 AM   Networked Organizational Identities in Social Movements

Janet Fulk
fulk@usc.edu
Bettina Heiss
Jingfang Liu
Drew Margolin

International nongovernmental organizations (INGOs) depend upon networks as contextual resources for mobilization and as vehicles for negotiating and diffusing of collective action frames. Most analyses of INGO partnering use the term network in a more metaphorical than a technical sense (the work of Mario Diani is an important exception.) This paper develops a series of propositions on how NGOs use networks as resources, how partners are selected, which partnerships tend to survive, and what factors lead specific organizations to occupy specific roles and positions within a network. The propositions are based in literature on the mechanisms by which INGOs exert influence: mobilization, seizing political opportunities, and framing issues. Furthermore, organizational identity dynamics in INGO networks are taken into account, tying INGO theory to neoinstitutional theory. Identities are the "glue" that holds INGOs together as they seek to partner with organizations that share their framing of relevant issues,, thus providing identity amplification (McAdam, 2003) for their partners. For example, INGO networks are stratified in relation to identity into network specialists with narrow identities and specialized frames versus network generalists with broad identities and diverse frames. These differences have important implications for using brokerage as a networking strategy. Networking possibilities in the Children's Rights INGO community illustrate how the set of 15 propositions collectively can be employed in research on the network forms and patterns associated with success at both the level of the individual INGO and the network as a whole.

11:40 PM   R&D partnerships as social exchange

Catherine COMET
catherine.comet@univ-lille1.fr
Emmanuel Lazega
Marion Selz

R&D partnerships generate many uncertainties due to the specificity of the assets exchanged and to the risks related to partners' opportunism. As a result, firms may try to strengthen their control over the process of innovation and of knowledge diffusion. This presentation focuses on the social and organizational means that they use to achieve this control. To transaction cost economists, contracts represent an efficient solution, one that alleviates the uncertainties weighing on transactions. However knowledge exchanges raise many uncertainties that cannot be easily dispelled with contracts. In a neostructural perspective, we argue that firms rather use structural solutions to tackle the problems raised by R&D partnerships. To test this argument, we analyze mutual exchanges within R&D partnerships using a national survey on interfirm relationships conducted in France in 2002. These exchanges consist of personal (staff, knowledge) as well as impersonal (raw material, equipment, buildings) resources. We systematically compare the combination of these multiple resources according to various factors: belonging to a business group, type of partners (public laboratory, technical center, R&D or non-R&D firm, association or consortium), specialization of ego (industry or services), and type of partnership (joint research, subcontract, multipartnership, creation of a joint venture). The analysis shows that the most significant discriminating factor is the specialization of ego. R&D partnerships between firms in Services appear sharply both more knowledge intensive and multiplex than those in industrial firms.

Fri - Jan 25th - AM

Mathematical Models. Chair: Phillip Bonacich

10:40 AM The stability and efficiency of supply chain networks in terms of preferential attachment

Yang Zhang
zynapoleon@gmail.cn
In this paper, we employ a classical newsvendor model integrated with the spirit of preferential attachment to study the stability and efficiency of supply chain network. The preferential coefficient, an indicator of preferential attachment, is introduced to the utility function, which is written concerning the shortage penalty and the salvage value. The model fits appropriately for the setting of newsvendor network, at the same time it deals with the condition on which rational players always reap more benefits from links to those whose utilities are at higher levels. Based on this model, we extend the notions of pairwise stability and strong efficiency (both were originally proposed by Jackson and Wolinsky) into the scenario of supply chain network. Our contributions mainly include: (1)the proposition of stability and efficiency, that is to say, the prerequisite of a stable or efficient supply chain network (2)remarks on the stability and efficiency of typical structures of supply chain network such as the complete, the star, the empty, and the line network. We also discuss about probable extensions of the model under different assumptions in future researches.

11:00 AM A threshold model of network influence and selection: Simulations over three opinions

Moses Boudourides
mboudour@upatras.gr

Consider a social network in which each actor holds one of three opinions about an issue: either a positive or a negative or a neutral one. Actors are inclined to change their opinions and to be influenced by their neighbors according to what opinion(s) the majority of their neighbors holds. However, for each actor there is a threshold opinion, depending on both the actor's and the locally majoritarian opinion(s), which controls whether the actor will switch opinions or not. For instance, a neutral opinion might more easily change to a positive or a negative opinion (and vice versa) than a positive opinion might change to a negative opinion (and vice versa). In the social influence model, each actor is randomly selected to decide whether to change opinions according to these rules. From the mathematical point of view, this is a sort of a threshold three-type voter model, exhibiting interesting results over infinite Euclidean lattices. Here, for an arbitrary (finite) social network with an arbitrary distribution of opinions over actors, we are using a simulation to follow possible changes in opinions. At equilibrium, there are two possible outcomes: clustering (when all actors possess the same opinion) or fixation (when actors are divided in more than two opinions). In the social selection model, each actor is randomly selected to decide whether to change a link (sever or/and add one) according to certain rules related to the local distribution of opinions. Now, at equilibrium, besides clustering and fixation, another possible outcome is fragmentation in disconnected regions (clustered or fixated). Through a number of simulation experiments, we are trying to manifest different equilibrium configurations and to explore the complex interdependencies between local network structures and opinion allocations.

11:20 AM Negative Influence in Groups

Phillip Bonacich

bonacich@soc.ucla.edu

A continuous version of the Friedkin-Johnsen model is proposed that easily permits the introduction of negative relations and allows for the possibility of group division and polarization in attitudes. What I want to propose is a continuous version of this model in which negative relations, producing repulsion of attitudes rather than attraction, can naturally be introduced. The advantage is that true group polarization can be modeled. The network conditions under which the members of groups converge or diverge can be studied, at first theoretically and then experimentally..

11:40 PM Reciprocity, Multiplexity, and Exchange: Biased Net Models

John Skvoretz

skvoretz@cas.usf.edu

Filip Agneessens

We introduce statistical models based in biased net theory for multi-relational networks. The models incorporate dyadic effects only, specifically, reciprocity, multiplexity, and exchange. Although biased net theory has a long history in the study of social networks, beginning with its introduction by Rapoport and others in the 1950s, multiplexity and exchange in the context of reciprocity have not been investigated. Reciprocity refers to the greater than chance tendency for directed ties of a particular type sent from node x to node y to be reciprocated by a tie of the same time, e.g, friendship among high school youth. Multiplexity refers to the greater than chance tendency for a directed tie of one type from x to y to be accompanied by a directed tie of a second type from x to y, e.g., friendship and seeking advice among coworkers. Exchange refers to the greater than chance tendency for a directed tie of one type from x to y to be returned by a directed tie of second type from y to x, e.g., advice returned by respect. Models are presented for two levels of analysis, the pair and the dyad. Pair models are the simpler of the two, but rely on pseudolikelihood estimation while the more complicated dyad models that fully endogenize the dyadic effects rely on likelihood estimation. Applications to some standard data sets demonstrate the differences between the two levels of analysis.

Fri - Jan 25th - AM   **Networks in Political Science (NIPS II). Chair: Larissa Adler-Lomnitz**

10:40 AM Cosponsorship in the U.S. Senate: A Multilevel Model for Detecting the Influence of Social Factors on Legislative Behavior

Justin Gross

jhgross@andrew.cmu.edu

Why do members of the United States Congress choose to cosponsor legislation proposed by their colleagues and what can we learn from their patterns of cosponsorship? These are questions that have attracted increasing interest among legislative scholars over the past several years, and are, fundamentally, questions about relationships. Unfortunately, most methods of statistical inference with which researchers, even methodologists, are likely to be familiar tend to be ill-suited for the analysis of relational data, in which observations are heavily interdependent. Previous empirical research on cosponsorshipin the House and Senate has suffered from two principal limitations. First, it has used statistical tools that ignore the systematic clustering of observations. Second, it places too much emphasis on large-scale influences such as party and state or region at the expense of more subtle social factors that operate at a lower order of magnitude. Here, we show how carefully chosen random effects might be incorporated within a generalized linear model in order to better handle network-type patterns of dependence. By explicitly modeling the multilevel structure of the data, we can more confidently investigate whether various dyadic properties help explain senators' tendency to support one another's proposals. In addition to being better suited to a network setting, this approach grants us enormous flexibility in the choice of covariates we may incorporate and the degree to which we pool observations from different levels of analysis. To illustrate, we examine whether a number of potential social factors, capturing homophily, proximity, and role are associated with varying odds of cosponsorship among senators. Since bills are quite heterogeneous, we model outcomes (support/non-support) at the bill level, with random effects included for committee of jurisdiction. In addition to fitting a single mixed effects model for all bills in the 108th Senate, I fit four separate models for the various permutations of party membership for sponsor and cosponsor, investigating which determinants of cosponsorship are consistent regardless of party dynamics.

11:00 AM Horizontal and vertical networks and the political structure of Mexico

Larissa Adler-Lomnitz

larissa@servidor.unam.mx

The social structure of Mexico contains formal institutions and informal networks, the last ones can be horizontal or vertical and be also contained in formal institutions. Vertical networks determine the verticality and brokerage between levels of the system (clientelism), while horizontal networks often guarantee physical or social survival of the diferent sectors of society. Ethnographic examples will be presented.

11:20 AM Kinship, marriage and loyalty ties: The power network of Mexico.

Narda Alcantara

narda19645@hotmail.com

A model of the Mexican power network (NetMex) is submitted as an empirical tool for network analysis. The goal is to test the contention that actors of at least four sectors of Mexico—public, private, military and intellectual—are related through kinship, marriage and loyalty ties, and that these networks have had an impact in the decision-making processes of Mexico at the national level. The model submitted of the Mexican Power Network is enriched with anthropological techniques archival data collection and kinship analysis. The research intends to show a systemic dimension of the networks of actors that ruled in Mexico from 1920 through 1982, departing from the classical aggregationist (individualistic or holistic) definitions of elite in two ways. First, political systems are not seen here as sets of individuals existing apart from other sectors in a social formation. Second, the study is not concerned with the analysis of individual attributes of particular actors. Instead, with the help of suitable software, it explores patterns of network overlapping and sub-network formation within social network (micro) and historical (macro) constraints.

11:40 PM "Collective Action and the Development of Policy Networks: Solving Coordination and Cooperation Problems"

John Scholz
john.scholz@fsu.edu

We apply Snijder's (2001) actor-oriented model of network formation to analyze policy networks in fragmented policy systems. We hypothesize that individual incentives to form policy networks depend on whether the dominant problem involves a need for coordination or credible commitments against defection: actors will prefer ties to central coordinators or to open, nonredundant networks when low-risk coordination problems dominate, but will prefer reciprocal, transitive, redundant networks when credible commitments pose the greater problem. We analyze network dynamics in 10 estuaries in the U.S., based on two waves of survey observations from 1999 and 2001. Using both cross-sectional and longitudinal analyses in SIENA, we find that organizations prefer ties that link them to central actors with a strong coordinating role in the policy arena. We also find that general trust among actors is influenced by network partners, but surprisingly plays no role in selecting network partners. Snijders, Tom A.B. 2001. "The Statistical Evaluation of Social Network Dynamics." Sociological Methodology 31: 361-95.

Fri - Jan 25th - AM

International Networks

10:40 AM The City System and the Nation-State System: Exploring from a Network Perspective

Michael Timberlake
timber@soc.utah.edu
Xiulian Ma
David A. Smith

The City System and the Nation-State System: Exploring from a Network Perspective Xiulian Ma xiulian.ma@soc.utah.edu Michael Timberlake timber@soc.utah.edu Sociology Department, the University of Utah Salt Lake City, Utah David A. Smith dasmith@uci.edu Department of Sociology, University of California, Irvine Some strands of world city research challenge our established views by proposing that global cities ensconced in a world city system are becoming increasingly free and autonomous from their own nations. Major theorists like Peter Taylor (2004) now provocatively claim that these leading cities, rather than nation states, now are central loci in global accumulation processes and are becoming the crucial players in global political economy. This makes it all the more imperative to understand and "map" this hierarchical world network of cities. We also need to understand changes over time, both to the overall contour of this world city network and the relatively rapid re-ordering of particular cities within it. Perhaps this reshuffling finally will give rise to a new urban hierarchy which may ultimately transcend the logic of the established state system (Sassen 1991, 2000; Friedmann 1995; Alderson and Beckfield 2004). This hypothesis, however, has not been adequately tested yet (with the partial exception of Alderson and Beckfield 2004). Especially needed is research that examines the world city system based on multiple relations among cities, rather than just a single network relationship. Indeed the most satisfying research efforts on social networks are generally based on multiple relations (Faust and Wasserman 1994: 350; White, Boorman and Breiger 1976). This paper aims to conduct such an analysis. In our analysis, we combine multiple data sets and measures of some key dimensions of the world city system. In particular, we combine information on corporate geography that directly operationalizes the world city concepts of economic and financial "command and control," with data on transportation linkages and flows that tap into the infrastructural capacity of world cities. To do this, we combine data on multinational headquarter and subsidiaries networks, the producer service network, and international inter-city flight network. We present network analysis that maps out the structure of the world city system using measures of regular equivalence ("blockmodeling") and core/periphery patterns to map out structure of the world city system. Then we conduct a logistic regression to assess the extent to which the derived world city system hierarchy

corresponds to the previous measures of world system structure of nation-states.

11:00 AM Ben Franklin and his Social Networks

Abhijit Roy

roya2@scranton.edu

Nearly three centuries ago, with limited capabilities for communication systems and no advancements in technology, when the average person living in the colonies of America rarely traveled more than thirty miles from home, Benjamin Franklin built a myriad of global and domestic social networks to leverage his personal, professional and political interests. Using the historical method, we delineate his various social networks, e.g. personal (civic, junto etc.), professional (science, medicine, technology, printing, and publishing), and political (Unions, Associations), and illustrate how many of them were integrated with each other, and how they created synergy to fashion a holistic system of transatlantic and intercontinental social networks. Further evidence is also provided about how these social networks influenced Franklin's contributions to innovations in physical and distribution networks (e.g. development of the US postal system, franchising his printing business, charting the Gulf Stream, improving material handling capabilities in canals, etc.). The promise of using historical methods in social networks and applications for future research is finally discussed.

11:20 PM The International Structure of Non-Government-Organization Activity

Seung-Joon Jun

sjjun@buffalo.edu

This study examined the global structure of international non-government organization (NGO) activity. Using international event data provided by a Harvard University international project, the Integrated Data for Event Analysis (IDEA), which analyzed an international news database of the Reuters Business Briefing (RBB), this study conducted an international network analysis to examine how 136 countries are connected by international NGO activities for the past 5 years between 2000 and 2004. The determinants of the network structure were examined using autocorrelation matrices used in an international economic study. The results of the network analysis demonstrated that the U.S. occupied the most central position in all 5-year networks. Its power was increasing during the past 5 years. The UK and the Switzerland were playing as a bridge in connecting the U.S. and some countries in the peripheral. The QAP multiple regression analysis showed that past ally relationship, economic trade, and colonial relationship had positive effects, but physical distance and defense treaty among countries had negative effects on international NGO activities. Cultural variables such as linguistic and religious similarities did not explain the network structure of international NGO activity.

11:40 PM The Influence of External and Internal Networks on the Outcomes of Strategic Change in Organizations

Alexander Alexiev

AAlexiev@rsm.nl
Decisions to change the strategic orientation of the organization occur not in isolation, but embedded in structures of relationships. Strategic orientation may be altered as a sequence from exploitation to exploration, from exploration to exploitation, or from exploitation to both exploration and exploitation. This often disruptive process of change in a networked world deserves special investigation for the benefit of research and practice. A multi-method methodology is proposed, combining in-depth case studies and longitudinal network surveys at organizations undergoing such transitions.

Friday, Jan. 25   Noon-1:30 PM.
Research & Funding opportunities for advancing Network Science
Panel coordinator: Noshir Contractor

Opportunities for network research in understanding and enabling virtual organizations created by cyberinfrastructure.

Diana Rhoten, Office of Cyberinfrastructure, NSF

The challenges of understanding the dynamics of large scale online networks like Second Life and World of Warcraft.

William Bainbridge, Computing and Information Sciences Engineering Directorate, NSF

Opportunities for developing measurement and analytic techniques t+B1517o address questions of interest to network scientists.

Cheryl Eavey, Social and Behavioral Sciences Directorate, NSF

Friday, Jan. 25   Afternoon 1

Interlocking Directorates. Chair: Jeffrey Kentor

1:40 PM   The Integration and Specialization of Global Cities: A Brokerage Analysis

Jeffrey Kentor
kentor@soc.utah.edu
Robert Hanneman
This paper considers the spatial and economic integration and specialization of the world's 98 largest cities by examining the interlocking corporate directorates of Fortune 500 firms located in these cities. First, we describe the extent to which global cities are connected by interlocking corporate directorates. We contrast the view of the locations of the global 500 form a world city system that is a single hierarchy with the view that the system displays a highly regional character. We find that there are strong spatial components. Brokerage analysis is utilized to explore the different network roles that given cities perform in the spatial network, particularly to understand the extent to which the "global cities" pattern proposed by Sassen is present. Next we perform a two mode analysis that examines the distribution of industries within and across these cities. We determine that industries of the global 500, and the cities that are containers for these companies can be jointly typologized to describe the industrial and urban ecology of the global production system.

2:00 PM   The Changing roles of Social Clubs in the Global Network of Corporate Interlocks

Roy Barnes
rcbarnes@umflint.edu
William Carroll

During the last half of the 20th Century, there has been a tremendous shift in the roles of social clubs among corporate directors in countries such as the United States and Canada as the level of self-reported membership in exclusive social clubs has experienced a relative decline. At the same time, with the internationalization of capital, a transnational elite network of corporate directors has been developing. This paper investigates whether and how social clubs are contributing to the formation of a global corporate elite by furnishing sites within national or global civil societies for the maintenence and deepening of trust and solidarity among corporate directors. The study compares the global network of corporate and club-affiliations at two points in time: year end 1996 and year end 2006. Besides reporting generic indicators of social integration, we map the pattern of corporate-club relations with attention to its spatiality. Do clubs pull together corporate directors from different regions of the world system (a pattern consistent with the formation of a global corporate elite or transnational capitalist class), or do they socially solidify the elite on national and regional bases? What, in short, is the contribution of club affiliations to the social organization of corporate elites, globally, regionally and nationally?

2:20 PM Family Business and Formation of Corporate Social Capital

Zong-Rong Lee

zlee@sinica.edu.tw

Family-controlled business involves specific kind of ownership arrangement and management practice. Its wide prevalence and persistence have been reported both in Western economies and in emerging markets. While current research has started to reveal its beneficial features and resilient adaptability in various aspects, little is explored about how the organization characteristics of family-controlled business may be related to formation of its network resources and strategic linkages. In this paper, I argue that family-controlled business is endogenously favorable to establishing and accumulating general resources of social capital. I substantiate this argument through the development of a theoretical framework that looks at three distinct dimensions of family business that I consider generative to social capital: authority structure, temporal dimension of succession, and kinship networks. This conceptual framework is operationalized and tested with data of intercorporate networks in Taiwan where familism is deemed as one cardinal rule underlying most of business practices. I report results from examinations on interlocking directorates, board ties of the chair, and equity alliance networks at firm and business-group level. Implications for literature on social capital and family business research are discussed.

2:40 PM Isomorphic Effects of Managerial and Directoral Career Paths

Bruce Cronin

b.cronin@greenwich.ac.uk

The extensive array of interlocking directorate research remains near-exclusively cross-sectional or comparative cross-sectional in nature. While this has been fruitful in identifying persistent structures of inter-organisational relationships evidence of the impact of these structures on organisational performance or activity has been more limited. This should not be surprising because, by their nature, relationships have strong longitudinal and dynamic qualities that are likely to be difficult to isolate through cross-sectional approaches. Clearly, managerial practice is inevitably strongly conditioned by the specific contingencies of the time and the information available through networks of colleagues and advisers (particularly at board level) at the time. But managerial and directoral capabilities and mental sets are also developed over time, particularly through previous experiences in these roles and the formation of long-lasting 'strong' and 'weak' relationships. This paper tests the influence of three longitudinal dimensions of managers and directors' relationships on a set of indicators of financial performance, drawing from a large dataset of detailing historic board membership of UK firms. It finds evidence of isomorphic processes through these channels and establishes that the longitudinal design considerably enhances the detection of performance effects from directorate interlocks. More broadly, the research has implications for the conception of collective action and the constitution of 'community'.

Inter-Organizational Networks. Chair: Nienke Moolenaar

1:40 PM Monitoring Corporate Password Sharing Using Social Network Analysis

Andrew Patrick
Andrew.Patrick@nrc-cnrc.gc.ca

Corporations are facing increasing demands to monitor their compliance with policies and regulations, and they are turning to automated tools that can assist in tracking data and processes. If authentication information (such as passwords) is shared among employees, for example, then any access control measures will fail and the corporation can loose control over their assets and fail compliance audits. Using the Enron email corpus as an example of corporate communications, this project explored methods to identify instances of password sharing, a practice that should be a security concern to any organization. Social network analysis was able to identify key creators and sharers of passwords, and an analysis of the passwords themselves showed that quality was clearly a problem. The research uncovered cases of possible policy violations, such as the sharing of internal and external accounts. The network analysis was also able to reveal interesting communication patterns, such as sharing passwords with external accounts owned by the same person, which can server as useful indicators of problems in corporate systems or practices. In addition, one case of possible insider collusion was found in a pattern of sharing password-protected documents. The research demonstrates that social network analysis can provide a valuable tool for corporations interested in monitoring their security and privacy practices.

2:00 PM Space Matters! How the Physical and Lived World Influence Intra-Organisational Networks

Kerstin Sailer
k.sailer@ucl.ac.uk
Andrew Budgen
Nathan Lonsdale
Alan Penn

It is often proposed that the design of the physical workplace influences social interaction, yet only few publications exist that make a link between a profound spatial and social network analysis. This paper provides evidence from various case studies conducted within the last years that physical space (i.e. materiality and design of physical structures) and lived space (i.e. usage and appropriation of spatial givenness) can be identified as an influence on the formation and structure of intra-organisational networks. The examples presented cover different organisational settings – a university, a research organisation, and corporate organisations in the media industry in the UK and Germany as well as diverse spatial constitutions. A multilayered methodological approach was chosen including qualitative short and long interviews, a social network analysis (SNA) based on questionnaires and a Space Syntax analysis. The results suggest that three main spatial features unfold an influence on social networks: firstly, sharing offices can result in the sharing of knowledge across groups and teams. Secondly, subdivision and spatial separation e.g. on different floors of a building weakens network bonds within an organisation. Thirdly, proximity has a clear effect on densities of networks if analysed group-wise, as well as on the size of ego-networks of individuals. To conclude it can be shown that in the practice of everyday life in an organisation, space operates as a "field of probabilistic encounter" as proposed by Hillier. Space in general and workplace environments in particular hardly ever force people to behave in a certain way; rather are spatial configurations found to ease the formation and structuring of a corresponding social network.

2:20 PM The Constraining Nature of Structured Foci Networking: Career-Related Network-Building Behaviors, Range Social Capital and Promotion

Joe Labianca
joelabianca@gmail.com

We studied 459 Ukrainian civil servants to determine how their career network-building behaviors were related to their range social capital — the diversity of network ties individuals maintain outside of their organizational units — and how that affected their career success. We identify two main approaches to networking: a) networking within structured groups organized around activities (structured foci) and b) informal unstructured networking. In our study, informal unstructured networking led to greater range social capital, while structured foci networking had a negative curvilinear effect, suggesting that over-committing to meeting people through formal groups lead to the higher costs of generating range social capital. We also found a positive interaction effect between structured foci and informal unstructured networking on range social capital, suggesting that the combination of networking approaches allows individuals to lower the costs of building range social capital as compared to the pursuit of these two approaches to networking in isolation.

2:40 PM **Social networks as organizational characteristics**
Nienke Moolenaar
n.m.moolenaar@uva.nl
A common way to study social networks in the context of organizations is an individual-level approach. Until now, research adopting a group-level approach to studying networks is rare, partly because of the large number of networks needed to conduct the analyses. The goal of this study was to examine the utility of social networks as a group-level construct for research in organizations, and its relationships to organizational characteristics. We wondered whether it is possible to create typologies of networks, based on team and organizational characteristics. This study was conducted in the context of elementary school organizations. There are several reasons for choosing social networks of school team members, most of them facilitating the interpretation of organizational social networks. Data were gathered at 62 elementary schools, yielding many complete small networks. We asked eight network questions concerning friendship at work, friendship outside work, giving advice and asking for advice, and collaboration. This extensive approach led to various types of multilevel networks. First, we analyze these social networks to find typologies of teams and assess the utility of social networks as a group-level construct for research in organizations. Second, we report on the relationship between social networks as organizational-level characteristics and various organizational features.

3:00 PM **Organizational Kinship in the Hurricane Katrina Multi-Organizational Response Network**
Christopher Marcum
cmarcum@uci.edu
Edges in kinship networks have long been observed at the individual level. The literature is sparse, however, on the structure and effects of kinship ties at different levels of analysis, such as in the case of parent-child organization relationships. In this paper, I extend the kinship model to organizations. Specifically, I evaluate the role of kinship on interorganizational collaboration in the 2005 Hurricane Katrina Emergent Multi-organizational Network (EMON). Such a contribution is important because it offers a novel way of theorizing kinship edges, insofar that it recognizes that edges can be drawn from observed or implicit relationships. This distinction may have important implications for edge definitions and block partitioning.

Analyzing Network Data (Methods). Chair: David Dekker
1:40 PM Detecting Change in Social Networks with Statistical Process Control
Ian McCulloh
ian.mcculloh@usma.edu

Statistical process control (SPC), commonly used in manufacturing processes is effectively applied to social network analysis to detect changes in the network over time. This newly proposed social network change detection algorithm is demonstrated on two real world networks: the email network of 24 Army officers in a one year graduate program and the communication network of Al-Qaeda. SPC is shown to provide practical, timely, and useful network information; allowing faster real-time detection and identification of changes in a network, while minimizing the probability of false alarms. Results from this study could be used to provide actionable intelligence when modeling insurgent networks or provide a means of identifying potential improvements in friendly command and control networks.

2:00 PM   Brokerage roles within cliques: a secondary clique analysis

Elisa Bellotti
elisa.bellotti@unicatt.it

A common goal when analyzing a social network is to try and determine the cohesive subgroup structure of the network. Some techniques result in complex overlapping structures such as cliques or k-plexes whereas others either partition the network or place actors into unique groups, for example factions or components. A standard method implemented in ucinet uses the overlapping structure to construct a proximity matrix which can be submitted to a clustering routine to find non-overlapping groups. Once the groups have been determined many analysts relate these to observations they have made involving their data. There are few techniques that take the groups as a starting point for additional analysis with the exception of Krackhardt's work on Simmelian ties. In this paper we examine the roles the actors play in the cohesive structure using the brokerage ideas of Gould and Fernandez (1989). The method is demonstrated on an original dataset, that was collected in 2006 on 100 social services based in a suburb area of Milan, Italy. The dataset has two matrices: the first contains directed data collected by asking the spokesperson of every social service if he/she knows the other services listed (the list of services has been previously compiled using several sources) the second contains directed data collected by asking them if they have ever collaborated with each other; together with attribute information. These matrices were analyzed using the clique analysis techniques in UCINET to find non-overlapping groups and the results submitted to the brokerage routine and visualized in netdraw. This analysis offers a new insight into the data, as it is possible to identify what actors play important roles (and which kind of role) in bridging the gaps between the cohesive subgroups.

2:20 PM   A new latent structure model for binary network analysis

Jing-Shiang Hwang
hwang@sinica.edu.tw
Wei-chung Liu

A new latent structure model is proposed for directly modeling the dependence between tie variables in a binary network with directed relation. The tie variable is determined by three binary variables representing respectively the productivity of the sender, the attractiveness of the receiver, and the chance of successful contact between them. Another binary variable is also included to specify the noise unexplained by the available covariates. The proposed model allows us to easily present the interdependence between ties. The parameters within the latent variables are further linked with actor attributes and other actor-to-actor-relations. The likelihood function for attribute-related parameters can be expressed in a closed but complex form. We propose a fully Bayesian method that uses Markov chain Monte Carlo sampling technique to make inferences on the parameters and predictions. The feasibility of practical applications of the proposed model is explored by using available network data.

2:40 PM   Factorial Analysis to visualize metric and semantic spaces in Social Networks

Maria Prosperina Vitale
mvitale@unisa.it

Giuseppe Giordano
Michelangelo Misuraca
Multidimensional Data Analysis (MDA) and Social Network Analysis (SNA) represent two different approaches to deal with data structure. On the one hand, the techniques of MDA focus on statistical units (individual characteristics) to obtain factorial synthesis and clustering of units. On the other hand, SNA focuses on ties among interacting units (dyad, triad and subgroups) to describe the pattern of the social relationships. Usually, different techniques of MDA have been used to visualize and explore the relationships in the net. The aim of the present paper is to bring together the exploratory analysis tools of MDA and the techniques of SNA. We analyse the role of the actors on the net according both to the characteristics of individuals and the presence of a contiguity structure. Typically, the location of vertices in the common representation of a net is irrelevant. We stress that difference in the position could be used to highlight important structural patterns in relational data. We propose to locate the vertices in a metric space (map) according to a suitable proximity criteria. For instance, in our approach, through the use of peculiar Factorial Analysis, we will define a metric and semantic space where the vertices are located according to the shared vocabulary and to the net's structural indices.

3:00 PM **Meta-testing Social Network Data**

David Dekker
david.dekker@gmail.com
David Krackhardt

In this paper we propose an approach for meta-testing in statistical analyses of network data. Different types of tests in statistical network analyses can be shown to be biased under specific conditions, such as autocorrelation, collinearity and skewness. Through extensive simulations a broad range of such conditions have been explored for MRQAP tests. It is important to realize that in empirical settings still other conditions may present themselves that cause unstable results. Also, other tests may become unstable, especially in cases where there is a combination of conditions (which often occurs in network data). Choosing an appropriate test in empirical work requires an evaluation of different tests. The meta-testing proposed in this paper offers an approach to evaluate different tests. We demonstrate through extensive simulations that relative simple data structures or model misspecifications create conditions that lead to biased tests. Furthermore, we show conditions under which different tests are robust.

Sex Drugs and Social Networks. Chair V. Anna Gyarmathy

1:40 PM Consumption, Congregation, and Capital in the Sexual Relationships of Vancouver Clubbers: A Qualitative Theoretical Analysis and Prototype for Examination of Network Structure

Kate Phipps
kphipps@alumni.sfu.ca

This study examines the role that the nightclub plays in the formation of sexual networks amongst individuals in middle youth and young adulthood (aged 19-30). In particular, it addresses three fundamental questions: 1.) To what extent do young people use nightclubs to recruit new sexual partners? 2.) What aspects of the nightclub experience make it particularly conducive to the formation of new sexual relationships between young people? 3.) Could further analysis of network structure provide insight into the role that nightclubs play in the spread of sexually transmitted infections? In order to answer these questions, a series of interviews (n=25) were conducted with young people who frequent nightclubs in Vancouver, British Columbia, Canada. Club-goers were asked to discuss their experiences in nightclubs, particularly their experiences forming new sexual relationships. The results indicate that many youth do use nightclubs as a site for meeting new sexual partners, and the nightclub is framed as a particularly attractive site for sexual partner recruitment. In particular, the dynamic interaction between the clubber, the club, and a potential partner allow for the display of cultural and social capital through which new sexual relationships can be negotiated in a relatively

short period of time. The evidence also suggests that a small number of people use nightclubs to recruit a large number of sexual partners. The presence of "connecting" individuals suggests a scale-free network topology, and indicates that an analysis of network structure could provide more insight into the spread of sexually transmitted infections amongst club-goers. A discussion of an initial attempt at analysis of the network is then provided, followed by a second prototype for an analysis of network structure.

2:00 PM Injecting equipment sharing among Russian drug injecting dyads

V. Anna Gyarmathy
vgyarmat@jhsph.edu
Nan Li
Karin E. Tobin
Irving F. Hoffman
Andrei P. Kozlov
Carl A. Latkin

We examine in the injecting partnerships (dyads) of IDUs in St Petersburg, Russia (December 2004-July 2007; N=570, dyad N=1692), the correlates of unsafe injecting, more specifically, sharing cookers (SC), receptive syringe sharing (RSS) and distributive syringe sharing (DSS), on three levels: individual attributes (demographics and drug use characteristics), network characteristics (network exposure: the number of injecting equipment sharing partners, the number of advice givers), and dyad characteristics (being a sex partner, trust, personal exposure, and dependence on resources). On the individual level, female gender and speedball use was associated with CS, and younger age with both RSS and DSS. On the network level, network exposure was associated with all three sharing variables (higher number of sharing partners with CS, RSS and DSS; and lower number of advice givers with RSS and DSS). On the dyad level, being a sex partner was associated with RSS and DSS; and trust, personal exposure (hanging out with network member [NM], seeing NM daily, living with NM, NM's sharing injecting equipment with others), and dependence on resources (relying on each other for drugs when withdrawal, financially supporting each other) were associated with all three sharing variables. In the injecting dyads of Russian IDUs there is a combined risk of unsafe injecting and unsafe sexual behaviors. Injection and sexual risk, and their combination need to be addressed in interventions that target the injecting partnerships of IDUs. Interventions should also aim at reducing the number of injecting partners and the number of sharing partners, increase social support, and address the issue of trust.

2:20 PM Who is more important my friends or the "popular" kids: Early evidence for distinct diffusion processes for substance use behaviors and skills among adolescents.

Scott Clair
clair@iastate.edu
Cleve Redmond
Max Guyll

There has been a growing body of literature describing how substance use might be diffused among adolescents. More recently, some have theorized about how prevention interventions may diffuse beyond those directly attending the programs. The current study looks at data from a longitudinal efficacy study of a universal family-focused preventive intervention conducted in 11 schools. As an initial step to determine the feasibility of this diffusion process at the microlevel we wanted to assess what impact those that attended the family intervention program had on their schoolmates. Specifically, we were interested in three key questions: 1) who has the most impact on an adolescent their friends or those they rate as popular, 2) which is more important the number or percent of network members that attended the family program, and 3) does this vary for intervention targeted behaviors as opposed to substance use more generally. To address these questions we looked at the number and percent of intervention attendees the participants listed as friends they hung out with in school, outside of school, or as popular and how this related to six different targeted skills (e.g. assertiveness) and four different behaviors (ever used alcohol, cigarettes, marijuana, other drugs). Initial results suggest that there appear to be two distinct processes at work with the number of friends attending the program having the biggest effect on targeted skills, but the percent of popular kids attending the program having the biggest effect on behaviors.

2:40 PM Cohesive Subgroups, Acquired Sub-culture and Endurance of Heroine User Networks in Dhaka City, Bangladesh

Kaberi Gayen
ka.gayen@napier.ac.uk
Tarun Gayen
Robert Raeside

How subculture that evolves within cohesive subgroups of heroine users help endure these small groups has been explored in this paper. Data were collected using both a structured questionnaire and in-depth interviews of around 24 small groups [n=150] in central Dhaka, where the HIV prevalence rate among the drug users, especially injecting drug user [IDU], is highest in Bangladesh. Analysing social network data along with socio-economic and demographic data it was found that the heroine users who had been using heroine for a long time, they essentially belonged to cohesive subgroups, and developed sub-culture within the groups which is supported by physical settings of drug using that keeps 'drug use ritual' of heroin smoking uninterrupted. From the qualitative data we also found a common pattern of a set of key factors in almost all these groups. Mutual benefits like cost sharing, getting the access to substance even at the withdrawal phase due to lack of money, helping each other when law enforcement agencies intervene, geographical proximity of living arrangements of the users, mutual trust and socioeconomic similarity are the important common binding factors those not only guide their drug using behaviour but also their life pattern. These factors might answer the puzzle of managing a moderate functional life of these heroine users when use of narcotic drugs normally outcast the users from the mainstream life.

3:00 PM SEX, DRUGS AND ROCK AND ROLL NETWORKS

Josep Rodriguez
jarodriguez@ub.edu
Anna Ramon

In this paper we continue the analysis of networks of the night by focusing on the types of networks built and used by youth with the purpose of engaging on some behavior related to sex, drugs or music. We are interested as well on the combinations and relations between the different types of networks. Our goal is first to single out differences and similarities between the networks associated to the different activities and second to ascertain which structural elements and forms favor or prevent behaviors related to sex, drugs and music. We use survey data from the 2006 IREFREA project (Recreational culture as a tool to prevent risk behavior) carried out in nine European countries containing both social capital and relational information.

Innovation and Diffusion. Chair: David Obstfeld

1:40 PM Inter-organizational system in supply chains networks : The impact of network structure on adoption behaviour

Luc Cassivi
cassivi.luc@uqam.ca
Pierre Hadaya

This study investigates the use of inter-organizational systems (IOS) in supply chain networks. Previous studies have identified the critical role of the supply chain structure when predicting the firms' adoption and use of information systems, notably electronic collaboration mechanisms during supply chain relationships. Using a two-modal network approach, the firm's role in its network is analyzed according to its influence on the use of IOS in the supply chain. Using data collected from a sample of 74 Canadian and Finnish firms in the information and communication technologies (ICT) sector, this study shows the extent to which the use of inter-organizational systems varies according to the supply chain tier they are involved in, and according to the supply chain network's characteristics.

2:00 PM Community networks and sustainability of the adoption process to reduce mercury exposure in the Brazilian Amazon

Frédéric Mertens
fmertens@unb.br
Johanne Saint-Charles
Carlos José Sousa Passos
Myriam Fillion
Donna Mergler

Villagers from Brasilia Legal, a small village located on the left shore of the Tapajós river in the Brazilian Amazon, are exposed to mercury, a toxic substance, through fish consumption. A participatory intervention based at promoting new fish diet behaviours to reduce mercury exposure was initiated in 1995. Here, we present results of a longitudinal study, focusing on the involvement of the villagers in discussion about mercury issues and the evolution in the participatory process associated to the building of solutions to reduce exposure. Data were collected at four different time points (1995, 2000, 2004 and 2006), regarding diet components associated to mercury exposure, hair mercury levels, awareness of critical information about mercury issues, adoption of new fish diet behaviour to reduce exposure and network partners regarding discussion on mercury and health. From 1995 to 2006, hair mercury levels decrease consistently in the population and there exist extensive discussion networks associated to increasing levels of awareness. However, two distinct phases emerge: 1. the intervention phase, before 2001, where many activities around mercury were carried out by the researchers and where mercury discussion is associated to adoption of the new fish diet behaviours and 2. the sustainability phase, from 2001 to 2006, with fewer research activities around mercury, where participation in mercury discussion network is associated to the process of continuous adaptation of the villagers to social and environmental regional changes in order to adopt new and diverse solutions to maintain decrease in exposure. This work is financially supported by the International Development Research Centre (IDRC) and the Social Sciences and Humanities Research Council (SSHRC) of Canada.

2:20 PM The effect of Computer-Mediated Communication on the Collaborative Network and Scientific Productivity

Hsin-i Huang
connie.huang@gatech.edu
Shu-Fen Tseng

The widespread adoption of computer mediated communication (CMC) has facilitated the increase of team-based collaboration. Scholars like Cohen (1995), Walsh and Roselle (1999) and Russell (2001) suggested the use of CMC facilitates information and knowledge exchanges, increase scientific collaboration, and thus might enhance academic productivity. However, there is no consensus on whether the increase of collaborative productivity results from high density strong ties in the network as Podolny and Baron (1997) or Ahuja (2000) suggested, or from the loosely coupled networks' weak ties suggested by Granovetter (1973), Burt (1992) and Wellman (1996). This paper addresses the productivity debates by examining relationships among the use of email, collaboration structures, and academic productivity. This study examines scientific productivity via email in the collaboration group of scientific community across three disciplines (physics, environmental engineering and agriculture). A survey of 229 scholars in Taiwan was conducted during a four months period. The findings suggest email mode of communication reinforce face-to-face contact. It has added to the amount of communication between scholars rather than shifting communication away from face-to-face contact. In addition, the results report a higher use of email increase co-authored and international collaboration publication. However, the effect of empowerment hypothesis that suggest CMC might help geographic separated, junior, and female scholars overcome some of the interaction barriers and benefit from the team collaboration is not found in this study. In terms of network structure, this study didn't find significant association between network size, heterogeneity, centrality, dispersion and scientific productivity. The only network variable that relates to collaborative productivity is institutional heterogeneity.

2:40 PM **Consumption interdependences in social networks**

Daniel Birke

mail@daniel-birke.com

This paper uses a unique dataset which contains social network data based on call records from a large European mobile phone operator to approximate a consumer's social network and estimate consumption interdependences in the mobile telecommunications market. This makes it possible to analyse a network containing millions of individual consumers. I developed a model of interdependent consumer decisions, which can be applied to a subscriber's decisions to switch operators. A consumer's decision to switch operator is modelled as driven by both individual characteristics and by the structure of her social network. The model is estimated using survival analysis with data that is updated on a daily basis over a period of 120 days. Results show that economic network effects have an important impact on consumers' switching decisions: Subscribers with a high percentage of off-net calls have a higher likelihood to switch operators than subscribers with less off-net calls. Furthermore, switching decisions are interdependent between consumers who interact with each other. In other words, if a subscriber switches operators, she is also affecting the switching probabilities of other individuals in her social circle. Besides contributing to a burgeoning literature on interdependent consumer decisions, this also has direct implications for consumer marketing in mobile telecommunications and other industries (like the Internet) where electronic records can be used to get away from treating consumers as atomistic self-contained decision units and instead to take interdependence of consumer decisions directly into account.

3:00 PM **Brokerage is a Process, Not a Structure: A Clarification of Social Network Language**

David Obstfeld
dobstfel@uci.edu
Steve Borgatti

A long research tradition has explored the consequences for ego of having relatively sparse or dense ego networks. Sparse networks, often described as abundant in structural holes, are said to afford actors access to novel information and control, and empirical work often documents the advantages of such networks in terms of promotional success and other performance variables. Dense or cohesive networks, often described as having closure, are said to afford actors access to efficient exchange of knowledge, social support, and trust. This paper examines the practice in recent social network research of referring to ego networks with abundant structural holes as brokerage. Brokerage generally refers to active and strategic linking of others, or to playing alters off each other. We note that brokerage and structural holes are not synonyms; rather, structural holes represent an opportunity structure within which brokerage often takes place. Brokerage, may also take place in dense networks, or "mixed" networks of dense and sparse ties. The recent conflation of structural holes and brokerage prevents a more sophisticated theoretical and empirical exploration of brokerage, its relationship to structure, and its impact on organizational performance. This paper will clarify the nature of brokerage, summarize different research equating structural holes and brokerage, and detail the theoretical cost of such a terminological conflation.

Friday, Jan. 25   Afternoon 2

Fri - Jan
25th - PM

Networks in Political Science (NIPS III). Chair: Ines Mergel

4:00 PM   Partisan Joiners: Associational Membership and Political Polarization in American Society.
Delia Baldassarri
dbalda@princeton.edu
Associational life may favor political integration or amplify division, depending on how individuals partition themselves into groups and the web of overlapping membership they generate. Using GSS data (1972-2004) on affiliations to 16 types of groups, I look at the intercalation between trends in associational membership and ideological polarization, in order to assess to what extent political polarization has translated into civil society associational patterns. While confirming the decline in group membership `lamented' by other scholars, the analysis shows that such decline affects only few types of groups and only the category of single-group members. Moreover, the density of the network of overlapping membership has remained stable and there are no real changes in the patterns of shared members between groups, nor Republicans and Democrats differ in their patterns of preferential affiliation. While group types are not becoming more partisan, group joiners are becoming more so: group members have grown consistently more extreme in their political identities, and group types are becoming more ideologically heterogeneous. This rises the hypothesis that civil society polarization is occurring at the level of actual groups, and not group types.

4:20 PM   Cross-state knowledge sharing in the public health sector
Ines Mergel
ines_mergel@harvard.edu
David Lazer

We examine the network among State Health Officials (SHOs) in the United States. SHOs are the chief executive officials in each state in charge of health related policy. We surveyed and interviewed +90% of current SHOs, focusing on the patterns of knowledge sharing within this community. We also assessed the impact of an attempt to intervene to increase the density and use of inter-state networks: the State Health Leadership Initiative (SHLI). Our preliminary analysis suggests that the networks of SHOs are fairly parochial: focused on political ties within their state, and relatively little on other SHOs (even former SHOs within their own state). To the extent that knowledge is shared among SHOs, the network is largely regional, and focused on a few "knowledge hubs"—experienced SHOs who have developed large networks. We are still examining the data to dissect these patterns, but clearly the limited tenure of SHOs (typically 2-3 years) plays an important role, as well as attitudes around what are potentially valuable sources of information.

4:40 PM   Impact of networks on the success of community water projects in Nepal: An Initial Exploration

Manoj Shrestha
ms03h@fsu.edu
John Scholz

The role of informal organizations in affecting the performance of formal organization is well discussed in organizational literature. What lacks is enough empirical evidence to establish a link between the two within a formal authority structure. We explore the role of informal networks in the selection and implementation of community water supply schemes in Nepal to investigate this phenomenon. Community water supply schemes in Nepal executed by an autonomous Rural Water Supply and Sanitation Fund Board (RWSSFB) are demand-driven and community-led. The Fund Board provides fund and technical supports to the communities through support organizations and service agencies. The program aims to improve the accessibility of drinking water and to increase the productive use of time-saving. Communities face various challenges in the selection and implementation of schemes. Social capital literature implies that communities develop informal networks to meet these challenges. The network theory suggests that, in a formal project environment, broader networks and contacts with more centralized actors help determine the success. Here, selection of schemes and efficiency in completing project development activities are considered success. We have measured community contacts with external actors through extensive field interview with both selected and unselected scheme communities. This will allow us to construct network measures to test our theoretical expectation controlling for community characteristics.

Fri - Jan 25th - PM   **Personal (Egocentric) Networks. Chair: Joseph Galaskiewicz**

3:40 PM   Evaluating Proxies of Ego-centered Networks with Yearlong Contact Diaries
Yang-chih Fu
fuyc@sinica.edu.tw

In the absence of baseline data, network proxies have been widely used for the study of ego-centered networks. For the exact same reason, however, these proxies are seldom evaluated against actual networks. Using contact diaries that yield yearlong active and comprehensive personal networks, this paper evaluates network proxies such as name generator, position generator, a crude estimate of the size of global personal network, and the estimate of each network subset by the type of relations. Data were drawn from self-administered questionnaires, telephone survey, 54 three-month contact diaries that recorded all contacts with all kinds of people (n=103,000 contacts), and 12 extended diaries that helped add up to yearlong contact diaries (n=5197 ties). According to the yearlong diaries, the size of active networks averaged 305 for the first 3 months, and increased to 433 for the whole year. While the average recorded yearlong network matches well the average of all personal ties that the informants estimated before they started keeping the diaries (456), the variation is substantial, ranging from 176 to 1034. Based on key indices of the contacted persons and the dyadic ties between them and the informants, the paper aims to reveal important features of such yearlong active networks, in addition to identifying some strengths and weaknesses of the network proxies.

4:00 PM Do you have and Alter-Ego?

Robert Wilson-Town

rwilson-town@dstl.gov.uk

'Do you have an Alter-Ego?' Robert Wilson-Town. Social network analysis traditionally employs mathematical techniques whilst implicitly drawing upon social sciences to produce detailed information on individuals within their social context. There remains a need to better understand and measure the psychological, sociological and human-geographical aspects of an individual's social network. A novel method of analyzing individuals within their social context is presented, utilizing ego-net metrics and a range of psychological scales. This method aims to understand better the processes of social influence within an individual's ego-net, how an ego is influenced by his alters, the effects of social interaction upon the ego and how individual differences impact upon the ego-net's influence and power dynamics within the social context. From this further concepts can be drawn into the fold by the consideration of how our ego changes in different network contexts and in different social spatialities. This paper acts as the introduction to a study where we will explore the relationships between these ego-net metrics and social scientific factors.

4:20 PM The Development of Personal Friendship Networks

Zhigang Wang

wzhg67@hotmail.com

This exploratory research focused on how and why students develop their personal friendship networks during the transition to university. 56 first year university students participated in a longitudinal study. They were asked to complete questionnaires three times and to be interviewed twice during the first academic year. Results show that, although the sizes of students' personal friendship networks increased during the transition to university, the proportion of student's close friends in their personal friendship networks remained relatively stable at about 20%, suggesting a natural limit on the proportion of close friends students have. Both situational and psychological factors influence the development of students' personal friendship networks. Surprisingly, results also show that only a few students reported dropping old friends, suggesting that students develop two kinds of friendships within their personal friendship networks: active friendships and inactive friendships. Based on the findings of this research, a model of the development of personal friendship networks during a major life vent was proposed for future research.

4:40 PM Who can you trust? A study explaining trust in youth services in the Phoenix metropolitan area

Joseph Galaskiewicz

galaskie@email.arizona.edu

George Hobor

Beth Duckles

We examine the decision to entrust to explain why people engage in transactions with partners they do not believe to be fully trustworthy. For Coleman (1990), how individuals calculated the elements of uncertainty, especially the probability of others acting in a trustworthy manner, determined their decisions on when and who to trust. We argue that one's relationships and social networks are employed to assess a partner's trustworthiness. In our study of 1,036 children and their activities on Saturday in the Phoenix-Mesa region of Arizona, we found that many parents entrusted their children to providers they did not completely trust. We found parents were more likely to use less trustworthy providers if the losses associated with transactions were small(e.g., the child is shopping or eating out), they do not have prior contacts with the provider, they lack family or friends in the metropolitan community, or they or their spouse did not work full-time.

Small World Research. Chair: Ray Reagans

3:40 PM   Probability Mechanics in Communication Networks

Joshua Lospinoso
Joshua.Lospinoso@usma.edu
Ian McCulloh

A new model for a random graph is proposed that can be constructed from empirical data and has some desirable properties compared to scale-free graphs for certain applications. The newly proposed random graph maintains the same "small world" properties of the scale-free graph, while allowing mathematical modeling of the relationships that make up the random graph. E-mail communication data was collected on a group of 24 mid-career Army officers in a one-year graduate program to validate necessary assumptions for this new class of random graphs. Statistical distributions on graph level measures are then approximated using Monte Carlo simulation and used to detect change in a graph over time.

4:00 PM   'Express' Transmission in Social Networks – How to more successfully locate the target actor in an artificial small world experiment?

Yen-Sheng Chiang
yen506@yahoo.com

"Six degree of separation" has been known to the public since the small world experiment. We know on average the shortest path between two randomly chosen nodes in a large-scale network is unexpectedly short, but we know little about how people successfully reach the assigned target in the small world experiment. Do subjects achieve the task simply by chance (such that the observation of six-degree of separation is a consequence of randomness)? If not, then what causes subjects to more successfully locate the assigned target than others? I develop an artificial small world experiment via simulation to probe the question. Actors are assigned attributes along numerous dimensions. A series of hypothetical social networks are built based on how similar (or dissimilar) actors' attributes are between actors and their neighbors in networks. Actors are then asked to participate in the small world experiment—sending a note to the target actor through their social contacts, given limited information about the target. We are interested in what kinds of strategies actors use, based on the similarity of attributes, would yield the highest rate of success and use the shortest paths to reach the target actor.

4:20 PM   The Short Cut to Inequality: The Small but Stratified World

Ray Reagans
rreagans@andrew.cmu.edu
Ezra Zuckerman

Social structures characterized by "small world" properties have recently gained much attention due to their capacity for facilitating highly efficient information-flow despite the considerable clustering observed in most real-world structures. Such efficiency results from the presence of "short cuts" that dramatically lower the path-lengths between actors in the system. We show, however, that the appeal of such structures is sensitive to the assumption that actors freely transmit the valued resources in their possession without expecting anything in return. Once this assumption is relaxed, it becomes clear that the efficiency achieved by small world structures comes at the risk of considerable inequality since short cuts can act as middlemen, earning profits from serving as unique brokers between otherwise disconnected actors. We demonstrate this trade-off by applying the information-exchange models developed by Reagans and Zuckerman (2007) to systems that vary in their degree of clustering and minimum path-length. This analysis shows that the increases in efficiency achieved by small worlds are accompanied by heightened stratification in structural power, which can lead to significant inequality. Moreover, alternative assumptions about the nature of exchange show that even the efficiency advantages can be limited when actors do not freely transmit valuable resources without receiving something valuable in return.

Infectious Diseases and Social Networks. Chair: Charles Latkin

4:00 PM Modelling the diffusion of epidemic considering change in behaviour: The case study of Poland

Kamil Rakocy
kamil.rakocy@uw.edu.pl
Jan Zajac
Andrzej Nowak

The existing models of infectious diseases emphasize inevitability of pandemics (Pastor-Satorras, Vespignani 2001), yet they do not take into consideration the dynamic nature of social behaviour. Hereby we examine how the classical SIR (Susceptible, Infective, Removed; Bailey, 1975) model of epidemics changes when effects of media coverage are considered. The latter influence behaviour such as social contacts, internal migration and fleeing and in consequence modifying the probability of contact and infection. Transport network (e.g. air transport – Colizza, Barrat, Barthelemy & Vespignani, 2006) is often used as a basis for network on which both people and epidemics move. In our model high granularity data on commuting and travelling in the whole country gathered by road transport authorities are included. Moreover, the SIR model is validated by medical statistics on number of influenza cases in each county. Additionally, data concerning change of behaviour as effect of exposure on information about pandemic was collected in 2 surveys (national representative survey, CAPI, N=10000; and more specific Web survey, N=3000). We take a class of small-world networks as a basis for modeling to create data driven model (Morris 1995). We build on work of Ball, Mollison and Scalla-Tomba (1997), yet we improve it enabling modifications of transport networks (evolution of weighted network) and therefore flows of people between locations as the epidemics spreads. This mix of network and survey data enable us to test influence of different strategies of prevention and mass media communication on epidemic spread.

4:20 PM Social Norms, Social Networks, and HIV risk behaviors

Carl Latkin
clatkin@jhsph.edu

Social norms are a key component of several common theories of health behaviors. Norms have been found to be associated with numerous health behaviors, including smoking, alcohol consumption, exercise, dietary practices, substance use, and adolescent sexual behaviors. In this study, we examined how social norms of HIV risk behaviors are structured within social networks and how these norms may be linked to behaviors. We examined the relationship between norms promoting HIV risk behaviors and network structure among 857 injectors who had been recruited for an HIV prevention intervention in Baltimore, Maryland. We found that size of daily drug user network was significantly associated with norms that favored sharing of injection equipment. The results of this study suggest that norms are clustered by social network and may help explain the heterogeneity of risk behaviors within a community.

Fri - Jan 25th - PM **Networks Economics and Markets. Chair: Olga Mayorova**

3:40 PM An Analysis of Interaction Styles at European Labor Market

Kaan Erkan
kaan.erkan@uekae.tubitak.gov.tr
Mehmet Gencer
Vehbi Tunalioglu
Bulent Ozel

This paper first reviews, x-agents, a multi-agent approach towards computational intensive economic modelling framework for European economy. The framework is adopted and extended by a EU consortium, so called EURACE(www.eurace.org), which consists of a number of EU research institutes. X-agents are modeled as X-machines, which are automata with an internal memory (Holcombe et al. 2006; Coakley and Kiran, 2007). An important aspect of EURACE project is to model how those agents come to form the interaction networks. Deriving upon the work by EURACE, in this study, we focus on formation of interactions at employment network, that is the network of firms x workers. We further embody a multi-agent model of group interaction borrowed from Construct-TM (Carley and Schreiber, 2002), where the memory space of existing x-agents is extended to accommodate the actual and cognitive knowledge (transactive memory) of the labour market. As such, x-agents can communicate, learn, and make decisions in a continuous cycle while forming ties with other x-agents. We characterize and simulate worker-firm interaction patterns in labour market based on (a) relative similarity between particular firms and potential workers; (b) relative expertise, skill seeking; and (c) a mixture of both. The relative similarity interaction style calculates the probability of interaction based on the similarity of the workers and firms. For example, workers with a similar culture, demographics and geographical proximity will have high probabilities of interaction. The skill seeking style calculates interaction solely based on skill asymmetry so that workers with differing skills, those required for available positions, will have high probabilities of interaction and vice verse. The mixture style uses both the relative similarity and relative expertise styles based on a probability for how often each is used. The analysis of the separate interaction styles will allow us for the determination of which style is most predictive of actual employment patterns.

4:00 PM **Inter-industry patterns of alliance networks**

Michal Bojanowski

m.j.bojanowski@fss.uu.nl

Existing theoretical contributions to understanding formation of inter-firm relations provide a collection of explanations why firms start to cooperate with each other. One of the main factors that build-up incentives to cooperate is the existence of complementarities between firms. These complementaries arise, among other things, through firm specialization as well as increasing complexity of products. Simultaneously to theoretical developments, empirical studies frequently report that the industry sector to which the firm belongs is one of the most important factors for predicting the alliance creation activities as well as the type of the future alliance partners. In this research we build theoretical arguments that establish a link between macroeconomic interrelatedness of industry sectors on the one hand, and the incentives for firms to collaborate with each other. We argue that the structure of the "value chains" that link the industry sectors differentiates cooperation opportunities for firms. From the developed theories a set of hypotheses is derived regarding the pattern and dynamics of the network of inter-firm collaborations. The hypotheses are then confronted against empirical data that come in two forms. First, the data on inter-firm partnerships come from the Thomson SDC Platinum: a large inventory of information on inter-firm relations collected by Thomson Financial. Second, macroeconomic relations between industrial sectors are measured based on data published by the U.S. Bureau of Economic Analysis.

4:20 PM **Job Search and Macroeconomic Conditions**

Olga Mayorova

ovm@email.arizona.edu

Social capital studies rarely examine how conditions of the local economies influence its operation in the labor markets. Research on social networks in Russia tends to see the use of networks in job search as a legacy of the old economic and political system; I, however, argue that macro-level changes in the economy are responsible for the growing significance of personal ties in the Russian labor market. Since 1992, Russian economy experienced deep recession which began to slow down only in 1999. It also experienced disruption of the institutional order at work place, growth of unemployment levels, and growth of the private and small business sector. All these macro-level actors might have motivated employers to search for workers through personal ties and ease the burdens of hiring process. Using 1985-2001 job history data from the Survey of Stratification and Migration Dynamics in Russia and Goskomstat's data on Russian regions, I run hierarchical logistic regressions to test a set of competing hypotheses pertaining to how macro-level factors influence individual's chances of finding a job through social networks. Results show that controlling for a variety of individual-level characteristics and time, individual's chances of finding a job through networks are higher in regions with poorly performing economies and with greater size of the private and small business sectors. Higher economic growth rates reduce one's chances of finding a job through networks, while private sector growth rates have a curvilinear U-shaped effect.

4:40 PM **What do cultural industries teach us about trade policy in general? Evidence from transitivity in world trade patterns and implicatinos for economic development**

Jesse Chu-Shore

jccs@mit.edu

Cultural goods are typically omitted from free trade agreements because it is thought that trade leads to homogenization in these industries. This is in stark contrast to the ordinary economic reasoning that trade leads to specialization for goods in general. I develop a network-based test of these contrasting hypotheses. I analyze international trade flow networks for cultural goods and commodities and compare the results. Cultural goods are best described by the "homogenization" logic and commodities by the "specialization" logic. I go on to analyze trade flows for a range of manufactured goods and find that trade patterns exhibit a marked similarity to cultural goods, which is unexpected according to received theory. I conclude by discussing the implications for economic development policy.

Saturday, Jan 26   Morning 1

Sat - Jan 26th - AM **Network Theory. Chair: Christian Stegbauer**

8:40 AM Structural Factors in Social Change: The Effect of Transitivity and Asymmetricity on Triad Stability

Philip Lu

enfo@ucla.edu

Balance theory posits that certain micro-level social configurations may be more unstable than others. In addition to existing concepts such as transitivity, I offer new conditions that generate triad instability. Along with using logistic regression, I investigate my claims through a new model that predicts the frequencies in the cells of a triad transition matrix. Using the Newcomb fraternity dataset, I find that when an actor gives an unreciprocated positive evaluation of another actor, and a third actor gives a positive evalution of the first actor, then the configuration becomes a significant predictor of triad instability across all contexts. This effect is independent of the inherent instability in an asymmetric dyad. I also find that the amount of transitive triples in a triad is a significant predictor of stability in weak-tie networks, while the amount of intransitive triples is a significant predictor of stability in strong-tie networks. I also demonstrate that a model that decomposes a triad type into my proposed conditions is more efficient than a saturated model that contains dummy variables for all 16 triad types.

9:00 AM **The Relevance of the Positional System: Network and Participation Explained by the Example of Wikipedia**

Christian Stegbauer
stegbauer@soz.uni-frankfurt.de
Alexander Rausch

Positional analysis is a well known method in the field of social network analysis. It is often associated with blockmodels. But in our opinion the term 'position' should characterise more than just a cluster or 'block' of structural equivalent actors. We regard positions as fundamental entities in social networks and we believe, that this concept will prove rewarding not only in social network analysis but also in social network theory. It is fruitful for both quantitative and qualitative analysis. In our view positions emerge whenever actors refer upon each other. Positions themselves are often mutually dependent in the framework of a positional system; a system which is often organised in different levels and segments. The affiliation of actors to positions evolves over time and changes as they come in contact with the different positions of the positional system. In our presentation we will exemplify the power of the concept by the example of Wikipedia; especially within the framework of qualitative SNA. We describe the emergence of positions in different contexts. We show how some of the positions in Wikipedia depend on each other. Positions are often provided with competencies on the one side and with duties on the other. They result from power differentiations within the informal organisation. Some of the attributes of positions may be transferred from one area to another. The behavioural code belonging to a position is the result of negotiation processes within the positional system. Numerous rules remain implicit, they emerge behind the back of the actors and are accepted without being questioned. In other situations rules become explicit, e.g. in connection with the election of administrators. In an informal organisation like Wikipedia there is a high chance that new positions are "invented" in order to bridge organisational gaps. We show that the affiliation to positions exerts a large influence on the actions of the participants.

9:20 AM **Network Awareness and the Information View of Knowledge Management**

Don Steiny
steiny@steiny.com

Knowledge Management (KM) has survived for a number of years in Information Science departments in a number of universities and as a slot in the org charts of many corporations. The overall problem, which is that the value provided by the organization lies in the people in the organization, is compelling. However, much of the literature on the subject is grounded in rhetoric that reifies knowledge, treats it as data. Network models and relational models provide a way to talk about knowledge in a way that has empirical grounding. This paper reviews standard KM and the philosophical and technical background, and then discusses how pragmatic philosophy and the network sociology can be applied to the same problems in a more productive way. This has implications for organizational innovation as well.

9:40 AM Social psychology and social networks: Individuals and social systems
Garry Robins
garrylr@unimelb.edu.au
Yoshi Kashima
All too often the research disciplines of social psychology and social networks talk past each other. The distance between the two disciplines is sustained by the application of different analytic methods, but more fundamentally by attention to different aspects of human sociality. Social psychology – especially through the rich vein of results dealing with social cognition – often concentrates on individual perceptions of social situations and behavioral responses to such perceptions, while social network research studies the more systemic elements of human social and relational structure. Social psychologists typically have richly endowed theories of individual social cognition but poorly described theories of social context; while social network researchers have powerful techniques for dealing with context but often under-theorized accounts of individuals. We argue that social psychological and social network research complement each other, rather than contradict, in ways that have yet to be fully exploited. We believe that a richer account of human sociality demands an integration of individual and systemic perspectives. We review some important themes in the history of social psychology and of social network theory; and illustrate how some recent research that combines both perspectives has provided new insights.

Sat - Jan 26th - AM

Social Connectivity. Chair: Peter Marsden

8:40 AM Social Connectivity in the Virtual and Real Worlds: A Longitudinal Analysis
Hua Wang
wanghua@usc.edu
Barry Wellman
Has the Internet dramatically changed the way people connect to their social ties? Will individual social networks look different depending on whether or not people use the Internet, how long they have been using the Internet, how heavily they use the Internet, and what kind of activities they engage on- and off-line? We attempt to answer these questions by doing longitudinal analysis of the World Internet Project's American data from 2002, 2005, and 2007. Each year's sample included over 2,000 randomly selected households across the United States, including roughly 1,500 Internet users. All respondents were asked about their time spent with family and friends, their social activities on and off the Internet, such as participating in clubs or voluntary organizations. Additionally, all Internet users were asked about their contact with close ties and the interplay of their virtual and real worlds. Only cross-sectional data are used for the year-to-year comparisons. We identify trends related to social connectivity for each year and similarities as well as differences between the three selected years of study. Further comparisons are made between Internet users and non-users, new users and experienced users, and heavy users and moderate users. Implications of the Internet's role in American people's everyday social life will be discussed.

9:00 AM A comparison of the role of distance in affecting the frequency of contact, pre- and post-Internet
Diana Mok
dmok3@uwo.ca
Juan A. Carrasco

The present study is part of the Connected Lives study, which examines information technology and personal networks. Specifically, this paper measures the effect of distance on the frequency of contact in personal networks and compares the results with those obtained from a previous pre-Internet sample (the Second East York study) from the same neighborhood of East York, Toronto. The results show that the mean frequency of face-to-face and phone contact among various role relationships have hardly changed between the 1970s and the 2000s. They are also similarly sensitive to distance, pre- and post-Internet. The results from both studies show a marked drop in the frequency of face-to-face contact at about five miles. The frequency of contact continues to decrease steadily further away, with substantial declines happening at about 50 miles and 100 miles. The frequency of phone contact shows a marked drop only at about 100 miles. The study concludes that technology has not substantially altered the way people maintain their relationships.

9:20 AM   Staying Connected by All Means: Personal Networks and the Personal Communication System

Jeffrey Boase
jeff.boase@gmail.com
Barry Wellman

This paper addresses an ongoing debate about the extent to which communication technology is used to maintain contact with strong and weak ties. Our analysis is based on data from the random-sample, US national sample of the Pew Social Ties Survey, with a large sample size of 2,200. We examine the extent to which the use of email, telephone, cell phone, and in-person contact – taken together and separately – varies by personal network size and diversity. When the associations between each medium and these personal network attributes are compared using a series of zero-inflated negative binomial count models, we find that people draw on different kinds of media to connect with different kinds of social ties. For example, email is used to connect with large and diverse personal networks, while cell phones are used to connect with dense and homogenous personal networks. Yet, when the ensemble of communication media are taken together, cluster analysis shows that people rarely draw on just one or two of these media. Rather, they use all of them in tandem with each other. There is a strong association between the complexity of personal communication systems and the complexity of personal networks. We conclude by arguing that a substantial portion of the American population draws on multiple communication media to maintain complex personal networks that have both dense and homogenous cores, as well as large and diverse peripheries.

9:40 AM   What Kind of Tie is the Internet? The Role of Internet Based Technologies in Social Support Seeking.

Kristen Berg
kristen.berg@utoronto.ca

This paper examines social support acquisition and suggests that social network composition in addition to other modes of analysis builds an understanding of where individuals gather information and emotional connection for health concerns. Data analysis is based on survey, interview and network data gathered during the 2004/2005 Connected Lives Project, in Toronto. Although the population self-identifies as healthy -- with lifestyle-oriented health concerns, and robust networks -- some people have serious health concerns and limited social networks. When health information is sought in times of need or to supplement to medical advice, it provides the benefits of social support. Online health information can be a confidential source of research, and can alleviate medical concerns. People seek health information online and offline in ways that both reflect and ignore their health status and network composition. Many interviewees regard the Internet as a trusted network member, offering information-based comfort while buffering against the negative health consequences associated with an absence of social support. How people use the Internet affects their acquisition of social support more than does the characteristics of their networks.

10:00 AM Trends in Informal Social Participation, 1974-2006

Peter V Marsden
pvm@wjh.harvard.edu

This paper investigates trends in the frequency with which U.S. adults report spending "social evenings" with kin, with friends, and with neighbors over a 30-year period. Data are drawn from the General Social Survey. An age-period-cohort decomposition indicates that (1) informal socializing (other than neighboring) declines with age; (2) more recent birth cohorts are more social active, especially with friends; and (3) socializing with nonkin (friends and neighbors) has fallen in recent periods. The extent to which compositional changes can account for these trends is examined. The results are compared to trends in the availability of confidantes estimated using network data obtained via name generator instruments.

Sat - Jan 26th - AM **Intra- and Inter-Organizational Networks. Chair: Tiziana Casciaro**

8:40 AM The Bridge over the Faultline. How crisscrossing actors prevent network segregation in diverse work teams

Michael Maes
m.maes@rug.nl
Andreas Flache
Károly Takács

Lau and Murnighan argued recently that demographic diversity at the workplace may hamper team performance only if there is a strong demographic faultline in a team, that is: if demographic differences between group members are correlated across various dimensions. The argument of their faultline theory is that interaction takes place mainly within and rarely between largely dissimilar subgroups, due to homophily. This, in turn, makes conflicts likely. Using a formal computational model of the social mechanisms they assume, we show that their reasoning is inconsistent with the notion that crisscrossing actors importantly contribute to social integration. Crisscrossing actors share at least some demographic attribute with most of the team members and therefore likely occupy bridging positions in the network and establish indirect communication between subgroups. Our computational analyses show that, even teams with strong faultlines always arrive at consensus and social integration. The reason is that except for a maximally strong faultline, a team always contains crisscrossing actors. Further computational experiments reveal how the conflicting intuitions of faultline theory and crisscrossing actors can be reconciled. We propose the factor time as a crucial moderating condition. In the short run, a strong faultline increases the likelihood of group splits, consistently with faultline theory. In the long run, however, crisscrossing actors bring the subgroups together again and consensus arises. We also derive a counterintuitive consequence of faultline strength. Teams with a stronger faultline reach consensus faster. This happens because crisscrossing actors efficiently coordinate opinion exchange between subgroups.

9:00 AM COOPERATION, COMPETITION, OR CO-OPETITION? AN EXPLORATIVE ANALYSIS IN HEALTH CARE

Daniele Mascia
dmascia@rm.unicatt.it
Francesca Pallotti

In the last few decades, the cooperation-competition dualism among organizations has attracted remarkable attention in different social contexts (Bengtsson and Powell, 2004; Oliver, 2004). Unlike what many may believe, these two concepts are not mutually exclusive (Bengtsson and Kock, 2000). In fact collaboration and competition coexist in interorganizational relationships across many industries (Wiewel and Hunter, 1985; Scott et al., 2000; Plochg et al., 2006). In light of this paradox our paper investigates two key issues not yet fully examined in the current literature: 1) To what extent is this coexistence of collaboration and competition found? 2) What factors encourage organizations to collaborate in highly competitive environments? To explore these issues, we review key literature on collaboration and competition, and empirically test the theory of co-opetition within the context of the Italian health care system. While the introduction of managerialism and quasi-markets mechanisms have gradually enhanced competition among organizations, the institutional environment in which health care organizations are embedded strongly requires collaboration towards the common goal of providing high-quality services for the community (Barretta, 2007; Provan and Milward, 1995). Our sample comprises more than 100 public and private hospitals in the Lazio region, and we employ both primary data, collected through structured online questionnaires, and secondary data provided by the Public Health Agency of Lazio. From each provider we also collected attributive and relational data, these latter used for the analysis of cooperation and competition. Attributive data includes number of beds, specialties, case mix, technologies employed and intangible assets such as human resources. Relational data refer to patient exchange among health care organizations as a proxy for cooperation (Levin and White, 1961; Van de Ven and Walker, 1984) and overlap in provider patient pools for each pair of hospitals is used for measuring competition for market share (Sohn, 2002). Employing a multiple-regression analysis with dyadic data to investigate the factors contributing to cooperation between competing organizations, our model is estimated using QAP tests (Hubert, 1987). Preliminary results indicate that both geographical proximity and intangible assets play a significant role in explaining interorganizational co-opetitive behaviors.

9:20 AM   **Interpersonal Affect and Task-Related Ties: An Multi-Method Analysis of Causality**
Tiziana Casciaro
t.casciaro@utoronto.ca
Miguel Sousa Lobo
Psychologists and sociologists alike agree that failures and successes in task interaction elicit affective reactions toward an interaction partner. What is less clear is the extent to which the reverse is true: do affective reactions toward someone shape the choice of task partners? Is interpersonal affect a bona fide determinant of task networks, or simply a byproduct of them? Using data from a longitudinal network study of a luxury goods distribution company, supplemented by a laboratory experiment, we find that interpersonal affect predicts task interaction consistently more strongly than task interaction predicts affect. Such manifestations of affective primacy in the formation of task-related networks point to the relevance of affect in structural theories of organizational behavior.

9:40 AM   **Groups and hierarchies and their effect on the evolution of informal networks at work**
Susan Lynch
slynch@london.edu

Formal organizations are managed by strutures - groups and hierarchies - that cluster the interaction of employees. This paper considers how these formal struturing devices shape the evolution of patterns of interaction inside an organization. To deal with problems of network endogeneity, I conside how unexpected changes in formal structure affect the evolution of intraorganizational networks over a 6-month period. I show how a set of top-down changes that altered the sub-group membership and/or the hierachical reporting lines of employees inside an organization changes the informal network of relationships between employees and affects the pattern of new ties. I control for the pre-existing informal network by simultaneously considering transitivity effects of prior relationships between employees. New and past formal affiliations and reporting relationships create opportunities for interaction and increase preferences to form ties. At the same time, these structural shifts decrease the formal structural alignment between the informal networks and the formal position of moved employees. This can create role ambiguity and conflicting organizational identity as formal changes and embeddedness interact to reduce the rate of tie formation. To test my arguments, I use a two-period panel of data on employee relationships in the customer services division of a financial services provider. Results show evidence of competing formal and informal structures on new tie formation.

10:00 AM **Intersecting Involvement: Multi-Relational Centrality and Individual Performance**

Neha Shah

neha.shah.2009@anderson.ucla.edu

Organizational network scholars have found that individuals' performance is enhanced and suffers from membership in informal workplace networks. Informal networks in which individuals exchange work-related information are called instrumental, while those in which individuals exchange social support are called expressive. Negative network ties, such as avoidance, inhibit exchange of any kind. Scholars suggest instrumental and expressive network centrality benefits performance, while centrality in negative networks has the opposite effect. These findings are based on studies that associate an individual's network position with individual performance, one network at a time. However, the literature does not consider the performance effects of individuals' simultaneous positions in multiple networks. Viewing the current findings through a multi-relational lens would suggest that the person who has high instrumental and high expressive and low negative centrality is among the highest performers. However, one could argue that the office expert who is also the "social chair" and never avoided by others faces time demands that could detract from his or her own performance. Therefore, to resolve the ambiguity in how informal relationships affect performance, we need to assess the effects of employees' involvement in multiple networks simultaneously. To this end, I study the individual performance effects of 250 fully employed MBA students' simultaneous positions in instrumental, expressive, and negative networks. Consideration for individuals' involvement in multiple networks will extend our understanding of the integral role informal relationships play in organizations.

Sat - Jan 26th - AM **Mixed Methods Network Studies. Chair: Betina Hollstein**

8:40 AM Revealing Social Networks in Your Qualitative Data

Willie McKether

willie.mckether@utoledo.edu

The purpose of this paper is to describe how social network analysis was used as part of a mixed method data analysis strategy in the examination of qualitative and quantitative data collected for a migration study. The first part of this paper demonstrates the power of network analysis by using five sample interviews to show how narrative interview data was converted into numerical network data and consequently into individual and whole network maps. The second part of the paper combines the network maps with narrative interview data as well as census and union data, news articles, data from residential and business directories, and demonstrates how the network maps were not only used to reveal relationships embedded in the narrative interview data, but also when combined with other types of data, allowed a single data set to be examined from multiple perspectives and layers.

9:00 AM Efficiently collecting and analyzing fertility-relevant ego-centered social networks. A mixed-methods approach.

Sylvia Keim
Keim@demogr.mpg.de
Andreas Klärner
Laura Bernardi

Network boundaries are hard to define. Establishing which actors should be included and excluded from the definition of ego's social network is often left to the occurrence of concrete exchanges between ego and alter or common sense a priori assumptions on the importance of specific alters. In this paper, we aim at defining ego-centered networks that are likely to affect ego's decisions about childbearing timing. We adopt a mixed-method approach at the level of data collection and analysis. Using a combination of standardized tools and narrative interviews with the same respondents, we are able to capture basic measures of network structure and composition as well as detailed information about the content of the relationship and the exchanges between ego and alters. Our dataset consists of 119 interviews conducted in western and eastern Germany between 2004 and 2005. Results suggest the existence of fertility relevant social networks whose effect can be measured in standardized surveys. We propose an innovative network module which integrates a name generator and a global generator approach to this purpose.

9:20 AM Multi-Method Analysis of Social Interaction on Online Social

Zeynep Tufekci
zeynep@umbc.edu

In the past few years, we have witnessed an explosion of online social networking websites. These sites feature egocentric entries anchored by a public or semi-public profile, linked to alters, other profiles, called "friends," and often public or semi-public records of interactions between the profiles in the form of comments, photographs, and other forms of contact. These websites offer opportunities for both cross-sectional and longitudinal analysis of social interactions and networks of large numbers of people. However, it is important to understand that the technologically-mediated sociality in these networks occurs in a cultural context specific to each online environment. For example, Facebook users in college often use their real name and indicate their true gender, as that environment is closely linked to the physical world of its student population, whereas Myspace has no such delineation of particular networks (people in school x, town y). Consequently, on Myspace, basic indicators and demographic attributes often tend to be false, inside jokes, or playful. This has important implications for the analysis of data. For example, an examination of number of friends by gender or age would be quite unproductive in Myspace as neither age nor gender are reliable fields. Such attributes tend to align more closely with the identity of the ego in Facebook, with the implicit assumption of face-to-face contact within the college. Research using the datasets generated by these networks would benefit from a multi-method approach, integrating qualitative analysis including interviews and online ethnography, as well as quantitative analysis including surveys and social network analysis.

9:40 AM Use of Social Networks in Everyday Information Seeking and Use: A Study of International Chinese Graduate Students in the United States

Yang Lu
yanglu@ucla.edu

Social networks are critical in everyone's information world, especially for people who are in a transitional period of their lives when large amounts of information is needed to smooth over unforeseeable difficulties. International Chinese graduate students pursuing higher education in the U.S. are such a group. The goal of this research is to produce a holistic description and analysis of the dialectical relationship between Chinese graduate students' information seeking behavior and their social networks and social capital. The overarching research questions are: what are the characteristics and structure of international Chinese graduate students' social networks in the U.S., and how do these characteristics influence their everyday information seeking and use? A qualitative research approach is used that includes structured network interviews and semi-structured qualitative interviews with a selected sample of 36 Chinese graduate students in a southern California university. This research extends the everyday life information seeking scholarship in LIS into a new substantive area with an approach that is more social and holistic. It will help to bridge the knowledge gap concerning the overall information needs and difficulties of international students in the U.S. Moreover, it will set up exemplary methods and offer baseline data to build up similar research to further study other international student bodies or other populations in the future. The research result will be an in-depth analysis of how social networks and capital constrain or facilitate students' day-to-day behavior related to information, targeted to a readership of students and researchers in LIS, information professionals, policy makers, university administrators, and educators.

10:00 AM Network, Structure and Meaning. Georg Simmel's contribution to Social Network Research

Betina Hollstein
betina.hollstein@sowi.hu-berlin.de

The question of agency of networks and the integration of structural and more actor-oriented approaches are current challenges in network research. The proposed paper elaborates on the contributions of Georg Simmel to such questions. The first part of the paper presents a conception of informal social relationships and networks following Simmel's form-content distinction. This conception enables an accounting of certain structural aspects of social relationships, which result from the different actors' interactions, as well as of the actors' individual orientations and the interplay of these factors. In the second part, the conception is illustrated by an empirical study, in which changes in informal networks following the death of the spouse were investigated. In a mixed-method-design both open techniques (narrative interviews) and more standardized instruments, such as exchange networks and Kahn/Antonucci's network questionnaire were combined.

Sat - Jan 26th - AM **Mathematical Models. Chair: Olaf Rank**

8:40 AM Network Structure with Individual performance and Organizational Climate: Correlations and Statistical Models

Yu Zhao
yzha@unimelb.edu.au
Garry Robins

A frequently used method to examine the association between network structure and a continuous node-level measure is to correlate the measure with centrality scores. This approach, however, ignores dependencies among the nodes due to the network structure and we show by empirical example that these dependencies may affect the correlation. In a case study of network structure with individual performance and organizational climate, we compare this correlational analysis with an Exponential Random Graph Model (ERGM) incorporating the individual performance and organizational climate measures as actor attributes. In these analyses we study work-difficulty, trust, and advice networks respectively. For organizational climate, the correlational analyses and univariate ERGMs show consistent and significant associations for work-difficulty and trust networks, such that perceptions of organizational climate are associated with network activity and popularity in unexpected ways within this organization. However, in regard to the advice network and individual performance, the correlational analysis and a univariate ERGM produce different results. According to the simple correlations there is a significant association between advice network activity and supervisor-rated individual performance, but there is no significant sender effect in the univariate ERGM. The individual performance effects disappear when network structural effects are appropriately taken into account. The results suggest that simple correlations with centrality scores may indicate some major effects, but inferences need to be made with considerable caution.

9:00 AM   Modeling Contact Tracing Data
Krista Gile
kgile@u.washington.edu
Mark S. Handcock
Contact Tracing is often used as an intervention to find and treat infected people and to head off a potential epidemic. Persons presenting with a reportable disease are asked to name others with whom they have had contact. In the course of this intervention, data are collected on the network structure in the population under study. This paper considers treating these data as a network sample and using them, and other data incidental to the contact tracing process, to make inference about network structure, disease transmissibility, and ultimately, epidemic potential. This work is most applicable to sexually transmitted diseases and sexual networks, where networks are sparse and relations fairly well-defined. We also consider the information benefits of extensions to current contact tracing protocols. We present a joint model for contact and disease structure, and demonstrate computational strategies for fitting the model in the presence of large amounts of unobserved data.

9:20 AM   Statistical Models for Sexual Networks on Likoma Island, Malawi: Implications for Sexual Behavior and HIV Control
James H. Jones
jhj1@stanford.edu
Stéphane Helleringer
Hans-Peter Kohler

Despite its importance, little research has addressed structural factors of sexual networks contributing to the generalized epidemic in Sub-Saharan Africa. We use sociocentric network data derived from a population-based survey of sexual partnerships conducted in Likoma Island, Malawi and fit exponential random graph models (ERGMs) to a three-year sexual network, comprising over 2000 individuals, from Likoma Island. The network is sparse, with a network density of 0.001. A simple ERGM incorporating the structural covariates of edge effects and dyad-wise shared partnerships (DSPs) indicates that the log-odds of observing a new tie in the network are approximately -5.296, reflecting the sparseness of the observed network. Also significant is the coefficient on the DSP(1) term, with a log-odds of a new tie creating a DSP(1) of -0.964, indicating that a tie added to the sexual network is less likely to create a shared partnership than tie added to a random graph. In addition to the two structural covariates, village identity and compound type both have significant effects on the probability of a tie. Village matching increases the odds of a tie in the sociomatrix by 1.150, while compound matching increases the odds of a tie by 0.859. Not surprisingly, two individuals are more likely to engage in sexual relations if they inhabit the same village. Compound type is a measure of socioeconomic status, and compound type matching indicates a modest amount of SES homophily in sexual partnerships. These results have important implications for the formation of sexual networks on Likoma and suggest possible interventions.

9:40 AM The Relationship between Network Structure and Network Performance

Olaf Rank
rank@imu.unibe.ch
Philippa Pattison
Garry Robins

This study investigates the relationship between the structural characteristics of collaborative organizational networks and network performance. Applying a multilevel framework we analyze the performance-related effects of different structural patterns for the exchange of information and job-related advice at the dyadic and the group level. Moreover, two actor level characteristics are considered that may influence the structure-performance relationship: gender and job tenure. A comparative case study is used for the empirical investigation and data has been gathered from six sales teams in two companies: a Central European postal service company as well as a major insurance company. To analyze the data a class of multivariate exponential random graph (p*) models is applied. The results reveal that the the information and advice networks of high performing units exhibit different structural patterns as compared to the respective configurations of low performing units. High performing units are characterized by a medium degree of centralization as far as the distribution of information and task-related advice is concerned as well as a low level of reciprocation. Moreover, cooperation in these units is not obstructed by differences in gender or job tenure. In contrast, low performing units are characterized either by lacking or by extensive centralization, and cooperation is impeded substantially by gender differences.

Saturday, Jan. 26   Morning 2

Sat - Jan 26th - AM   **Network dynamics: models and findings. Chair Berno Büchel**

10:40 AM Stable Networks in the (Freeman) Centrality Game

Berno Buechel
berno@wiwi.uni-bielefeld.de
Vincent Buskens

The evolution of social networks is driven by multiple factors. Among them is the actors' deliberate attempt to be "well-connected". We study a model of strategic network formation, where every agent tries to optimize her/his centrality. Using a game-theoretic framework, we let the linking decisions be based on three aspects: individual degree, individual closeness and individual betweenness (see Freeman 79, SN). How such behavior affects the network structure is studied by analytical means and by computer simulation. As a first result, we observe that closeness incentives typically lead to networks that are tree graphs, while betweenness incentives typically lead to complete bipartite networks. If both incentives are present, then a new class of stable networks emerges. Moreover, we describe how context formalized as the weight of the different incentives - affects the emerging networks in terms of various structural properties (e.g. density, diameter or centralization). For instance, it turns out that centrality incentives eliminate patterns of cliques and clustering.

11:00 AM   Blowing Away Preferential Attachment: Organizational Response in Hurricane Katrina

Lorien Jasny
ljasny@uci.edu

Many researchers have argued that preferential attachment is the basic genesis of network growth. Power law degree distributions are often cited as evidence of association following this model of preferential attachment. In this research, we examine the network of collaboration in organizational response to Hurricane Katrina. The combined degree network from the first week of response indeed has a power law distribution. However, separating the data into daily increases over the first week of response, we demonstrate that preferential attachment cannot be the mechanism responsible for the growth of this network.

11:20 AM   C-Group: A Visual Tool for Understanding Pairwise Dynamic Group Membership

Hyunmo Kang
getoor@cs.umd.edu
Lise Getoor
Lisa Singh

C-Group is a tool for analyzing dynamic group membership in temporal social networks over time. Unlike most network visualization tools, which show the group structure within an entire network, or the group membership for a single actor, C-Group allows users to focus their analysis on a pair of individuals. While C-Group allows for viewing the addition and deletion of nodes (actors) and edges (relationships) over time, its major contribution is its focus on changing group memberships over time. By doing so, users can investigate the context of temporal group memberships for the pair. C-Group provides users with a flexible interface for defining (and redefining) groups interactively, and supports two novel visual representations of the evolving group memberships. This flexibility gives users alternate views that are appropriate for different network sizes and provides users with different insights into the grouping behavior.

11:40 AM   Anytime - Anywhere Methodologies for Effective Dynamic and Large-Scale Social Network Analysis

Eunice E. Santos
santos@cs.vt.edu
Long Pan
Dustin Arendt

The field of Social Network Analysis has made great strides in designing and developing relevant and useful methodologies and metrics. However, there are a number of issues which need to be more fully addressed. This includes the fact that much of the work provided deals with static analysis. This is a serious weakness in approaching design and analysis. Another key issue is that there is significant interest in analyzing social networks that are large in size and scope. Clearly, there are many comprehensive tools which have successfully provided profound insights for fine-grain interactions or small domain spaces. However, these tools are not suitable for analyzing large graphs. In order to address these two critical issues, we will present a new and novel approach which we call anytime-anywhere methodologies for social networks analysis. These are actually two methodologies in one. In essence, an anytime methodology is one which will provide solutions between the time the analyses begins to the time it ends. The solution quality will increase until the final solution is provided. Furthermore, an anywhere methodology is one in which the social network can change in the midst of the analyses run (and can do so continuously during the run) and the methodology will incorporate the change as it computes/analyzes the social network. We have been able to show how anytime-anywhere methodologies can be designed and used on social networks for key measurements such as centrality measurement and maximal clique detection.

Sat - Jan 26th - AM **Adolescent Friendship Networks. Chair: Michael Pearson**

10:40 AM Teacher Perceptions of Classroom Friendship Networks: A Case of Cognitive Social Structure

Matthew Pittinsky
mp2055@columbia.edu
Brian Carolan

Researchers of social networks commonly distinguish between "behavioral" and "cognitive" social structure. In a classroom context, for example, a teacher's perceptions of student friendship ties, not necessarily actual friendship relations, can influence teacher behavior. Revisiting early work in the field of social networks, we assess the level of agreement between teacher perceptions and student reports of within-classroom friendship ties. Using data from four classes of students taught by the same middle school teacher (n=108), our study analyzes agreement over time and across classroom social contexts for the ~1,400 potential dyads, holding the teacher-perceiver constant. As well, we explore patterns that might explain cases of disagreement. We find that the teacher's perceptions and students' reports of reciprocated friendship ties were significantly correlated. However, we further find that when only tied dyads are analyzed – either teacher-perceived or student-reported as tied -- they disagreed 60% to 80% of the time. In nearly all such cases, students reported reciprocated friendships unperceived by the teacher; the teacher rarely perceived friendships unreported by the students. More than three-quarters of teacher-"missed" friendships involved a dyad comprised of students who differed by race and gender. Interestingly, the level of agreement observed varied across classes (despite the teacher-perceiver remaining the same) and generally increased across classes over time. Findings reinforce the importance of treating behavioral and cognitive classroom friendship networks as distinct, and analyzing social structure data that are carefully aligned with the social process hypothesized.

11:00 AM Can the best friend sometime be the worst enemy?
Yu-Ting Huang
onions@ms24.hinet.net

As our previous research findings have concluded that dyadic friendship network displays some crucial friendship characteristics, such as changing, dynamic and instable over time (Hsieh, Wu, & Lei,2006; Wu, Chen, & Chang,2007). Of them, one significant and lately result has implied a phenomenon that may exist in friendship interaction, indicating that the process of trajectory of friendship network somehow follows a forward-backward or an intimate-solitary course. We then attempt to further question under such research condition and argument, inquiring several extended points, for instance, does a friend mean a friend forever? If so, will the friendship contain two facets, that one is friend and the other is enemy, and may friendship in real life just show an overlapping network, which representing a shift and coexistence of competition and support? This research expects to react to a slang vocabulary, viz "frenemy", to put into an empirical practice, trying to figure out this type of friendship network which is combined both with "friend" and "enemy" elements, and that friendship network sometimes is mutually beneficial and at times is rival while competition. Gender issue will also be conducted properly in order to investigate whether male and female treat acquaintanceship differently. And high school students' friendship network will be our major concerns. As for analysis, SIENA(Simulation Investigation for Empirical Network Analysis), is implemented to testify the research arguments proposed.

11:20 AM **Cross-Sex Friendship Development and Segregation in School Class:The Dynamic Development of Friendship among Adolescent**

Yeu-Sheng Hsieh
ysh@ntu.edu.tw
I-CHIEN CHEN

It is one of intensive concerns among sociologists regarding the effect of school context on friendship development among adolescents. "School Class" is a salient context for adolescents to grow up over time. And, "Sex" is an important individual attribution and socialization agent for adolescents. Does cross-sex segregation of adolescents' friendship exist in the initial year? And, does it gradually attenuate over time? In this study, we try to examine that how the dynamic trajectory of cross-sex friendship segregation develops in a school class among the Taiwanese adolescents. This study uses the longitudinal social network data of adolescents for three years in junior high school to elucidate the changes of cross-sex friendship segregation and shed light on the sex difference in dynamic trajectory of cross-sex friendship. The data for this study are obtained from Taiwan Youth Project (TYP) with 2500 adolescents in 81 school classes of three different urbanized districts. Multilevel analysis has been utilized to analyze the data. The results show that cross-sex friendship segregation among Taiwanese adolescents does exist in the initial year and attenuate gradually over time. It also shows that cross-sex friendship segregations are different in three urbanized districts. Finally, individual's cross-sex friendship development trajectory varies by the sex of adolescents in Taiwan.

11:40 AM **Stages of Social Network Development**

Michael Pearson
m.pearson@napier.ac.uk

Stages of Social Network Development Just as there are thought to be stages of an individual's cognitive and moral development we propose stages in social network development whereby individuals make choices about the type of network structure they occupy. The stages include: a reluctance to make friendship ties; only choosing friends who reciprocate; choosing friends who are popular/seeking popularity; choosing friend's who are friends of my friends; not choosing enemies of my friends; choosing friends who are enemies of my enemies; making friendship gestures towards perceived enemies. Our hypothesis is based on the work of Heider and others involved in classic balance theory. According to this theory a homogeneous balance across the network is implied. We propose heterogeneity in balance processes either because of individual preference or because of social position or social role. We test the above hypothesis by identifying individual measures of balance, reciprocity and popularity through orientation to a local network structure rather than to the overall balance within a global network. We interpret such effects with reference to studies carried out of adolescent behaviour in the West of Scotland. We look at specific network structures and hypothesise concerning stages of network development in the context of both gender and time.

Michael Pearson, Napier University, Edinburgh

Personal (Egocentric) Networks:. Chair: Markku Lonkila

10:40 AM Testing Weak Tie Hypothesis with Actual Personal Networks—Evidence from
Contact Diaries

Hwai-Chung Ho

hcho@stat.sinica.edu.tw

The purpose of this paper is to use the information contained in actual personal networks to test weak tie hypothesis quantitatively. The data is extracted from individual contact diaries recorded by 54 Taiwanese adults during a period of three months in 2004. For every subject in the survey the ratio of the number of important contacts to the total number of contacts made on each day is computed. Then we take the average of all the ratios over the sampling period for the set of weak ties and strong ties separately. The difference between the two averages obtained is then used as the desired statistics to test weak tie hypothesis. Our results show that while the hypothesis holds in general among the egos included in the survey, a good proportion of them exhibit that their contacts made through strong ties are relatively more effective than those with weak ties.

11:00 AM Personal network as an informal social institution in Russia. A study of the networks of ICT managers in St. Petersburg

Markku Lonkila

markku.lonkila@helsinki.fi

Personal network is a useful notion and tool for researchers, allowing to grasp certain aspects of social reality better than through categorical´ concepts. Based on my field studies in the Russian Federation during the 1990s and 2000s I propose a hypothesis according to which in Russia personal network is, however, not only a researcher´s tool, but an informal social institution in its own right. This institution is commonly recognized by Russians and is of a comparable social importance as, say, the nuclear family in Western countries. The functioning of this informal social institution is illustrated in the field of economic life through the examples of my recent qualitative network study among ICT managers in St. Petersburg.

11:20 AM Professional Associations/Professional Networks

Pamela Popielarz

pamela@uic.edu

How do demographic and institutional changes in the professions affect the social networks of individual professionals? I develop a series of general propositions about the effects of organizational dynamics on the composition and structural characteristics of the personal networks of their members. Organizational dynamics include membership growth, decline and turnover, as well as niche expansion, contraction, and shift. The network traits of interest include size, density, average strength and multiplexity, as well as homophily. Additional propositions cover the network effects of membership in combinations of organizations with similar or different dynamic profiles. I then apply these general propositions to the specific arena of professional associations and professional networks. Of particular interest are such common recent trends as the narrowing and proliferation of professional domains, campaigns for increased demographic diversity in the professions, and increasing state regulation of the professions. Each of these trends has implications for the field of professional associations: there are more of them, they address narrower specializations and constituencies, and they are increasingly institutionalized. By applying the general propositions to these more specific circumstances, I can approach my ultimate aim of evaluating and predicting the network advantages of membership in various (combinations of) professional associations.

11:40 AM   Exploring variation in active network size
Sam Roberts
sam.roberts@anthro.ox.ac.uk
Robin Dunbar
Studies of the egocentric 'active' network – the alters ego actively makes a conscious effort to keep in contact with – have thus far focused on determining effective methods for estimating its size. Unlike at the inner layers of egocentric networks, the factors explaining variation in active network size have been largely unexamined. This study had two key aims. First, to examine what ego characteristics can explain the range of active network sizes. Second, to examine the structural properties of networks of differing sizes. We gathered information on the active networks of 251 females, aged 18 to 65 years old, using a Social Network Questionnaire which asked participants directly to list all the alters in their active social network. As with previous studies on active networks, we found a large range of network sizes (10 to 279). For unrelated alters, larger networks had both more strong ties and more weak ties than smaller networks. In contrast for related alters, larger networks had disproportionately more weak ties than smaller networks. Variation in network size was related both to ego characteristics (whether ego had a partner, owned a house, was working, had a higher education) and to structural characteristics of the network (mean emotional closeness between ego and alter, ratio of male to female friends). This study highlights some of the factors important in influencing variation in active network size, and some of the constraints operating that may limit active network size.

Sat - Jan 26th - AM   **Collecting Network Data (Methods): Chair Caroline Haythornthwaite**

10:40 AM   Automated Discovery and Analysis of Social Networks from Threaded Discussions
Anatoliy Gruzd
agruzd2@uiuc.edu
Caroline Haythornthwaite

To gain greater insight into the operation of online social networks, we are applying Natural Language Processing (NLP) techniques to text-based communication to identify and describe underlying social structures in online communities. This paper presents our approach and preliminary evaluation for content-based, automated discovery of social networks. Our research question is: What syntactic and semantic features of messages in threaded discussions help uncover implicit ties between class members, and which provide a reliable estimate of the strengths of interpersonal ties among the class members? For our test case, we use the archive of threaded discussions collected over eight iterations of a semester-long online graduate class; one iteration is hand-coded. We first associate personal names and nicknames mentioned in the messages with class participants. Next we analyze the context in which each name occurs in the messages to determine whether or not there is an interpersonal tie between a sender of the message and a person mentioned in it. Because information exchange is a key factor in the operation and success of a learning community, we estimate and assign weights to the ties by measuring the amount of information exchanged between each pair of the nodes; information in this case is operationalized as counts of important concept terms in the messages as derived through the NLP analyses. Finally, we compare the resulting network(s) against the who-to-whom data derived from message sequences (e.g., whose messages follow whose), and the sample of hand-coded data. In this comparison, we evaluate what is gained in understanding network processes using our more elaborate NLP-based analyses.

11:00 AM   Social Networks across the Lifecourse and the Development of the Niakhar Social Networks Survey Instrument

John Sandberg
john.sandberg@mcgill.ca
Steven Rytina
Lalou Richard
Valerie Delaunay

Network analysis, specifically ego-centered network analysis, has recently been thought to hold tremendous promise for understanding the influence of social interaction on demographic behaviors and outcomes. This paper describes an innovative social network project carried out in conjunction with the Niakhar, Senegal Demographic Surveillance System (DSS). Maintained by L'Institut de recherche pour le développement (IRD), Senegal, the Niakhar DSS has maintained a prospective database concerning a wide variety of demographic and epidemiological behaviors and outcomes for all members of a contiguous population of over 30,000 people in a rural area of the country for over 24 years. The Niakhar Social Networks Project uses this advantageous setting to address a number of previously intractable problems in the demographic network research literature. These include biases stemming from collection of alter characteristics from respondents, the extremely limited number of alters concerning from whom data can be collected and the limited number and type of domains of interaction operationalized in name generators. In the first phase of the project, extensive qualitative research in the study area drew on the broader sociological network literature to pose questions designed to ascertain the breadth of social networks in this context and thus facilitate the development of an efficient survey instrument to accurately capture these networks. This qualitative work is described in depth here, as is the development and structure of the survey instrument and the process of linking named alters in the instrument to the Niakhar DSS database.

11:20 AM   Mind Over Matter? E-mail and Survey as Representations of Observed and Perceived Networks

Eric Quintane
quintane@wharton.upenn.edu
Adam Kleinbaum

In spite of the rapid development of new methods for network analysis – relying on electronic data sources and sophisticated computational analysis, organizational scholars continue to rely largely on more traditional survey-based methods. We believe that organizational researchers have been slow to adopt these new methods in part because there is no empirical evidence that guides the interpretation of the "ties" that exist in electronic data. In this paper, we employ the quadratic assignment procedure (QAP) and exponential random graph models (ERG or p* models) to analyze both a survey-based and an e-mail-based network describing relations among the same group of individuals in the same organization. We demonstrate that the network obtained via e-mail is substantially similar to the network obtained via survey and so should be trusted as informative. These two networks are also systematically different in particular, predictable ways. The results showed that social desirability and recall biases are some of the factors that explain the differences between the observed network of communication (e-mail) and the perceived network of communication (survey). We conclude by proposing that e-mail is better suited than survey for research conducted at a sociocentric level in large groups or organizations.

11:40 PM Sensible Organizations: Discovering Social Networks using Sociometric Badges

Benjamin Waber

bwaber@media.mit.edu

Alex Pentland

We discuss the deployment of a wearable computing research platform for measuring and analyzing human behavior in three unique, naturalistic, organizational settings. This Sociometric badge is capable of automatically measuring the amount of face-to-face interaction, conversational time, physical proximity to other people, and physical activity levels using social signals derived from vocal features, body motion, and relative location to capture individual and collective patterns of behavior. Our goal is to be able to understand how patterns of behavior shape individuals and organizations. We discuss the quantitative and qualitative results of following three experiments: 1) We deployed this research platform in a group of 22 employees working in a German bank's marketing division for one month and we were able to compare their e-mail activity with face-to-face interaction activity 2) We gave the badges to 30 employees in a Chicago data server configuration firm and were able to find strong correlations between interpersonal proximity and objective employee productivity 3) We used the badges in an international student workshop with 45 participants, giving them feedback on their behavior and social network in real time.

Sat - Jan 26th - AM   **Communication Networks. Chair: Kenneth Riopelle**

10:40 AM   Applying Structual Holes Logic to Researcher-Practitioner Relationships

J. David Johnson

jdj@uky.edu

The importance of structural hole logic in building effective researcher-practitioner relationships (RPR) is examined here by focusing on an interesting consortium of cancer control researchers and practitioners, who formed a coalition to implement trials related to three major cancer control projects. The difficulties in forming RPR are well known. Many are associated with the natural structural hole between these two parties. Bridging the relational gap between them thus presents a great opportunity for individuals who possess unique combinations of characteristics. However, the competitive pressures associated with the maintenance of these structural positions often reveal the 'dark side' of networks. The implications of the emergence of these network relations, and how they eventually become formalized, will determine if the many compelling benefits of researcher-practitioner relationships are ever realized.

11:00 AM   Worldwide Buzz: Planetary-Scale Views on an Instant-Messaging Network

Jure Leskovec
jure@cs.cmu.edu
Eric Horvitz
We present a study of anonymized data capturing high-level communication activities within the Microsoft Instant Messenger network. We analyze properties of the communication network defined by user interactions and demographics, as reported and as derived from one month of data collected in June 2006. The compressed dataset occupies 4.5 terabytes, composed from 1 billion conversations per day (150 gigabytes) over one month of logging. The dataset contains more than 30 billion conversations among 240 million people. The network is the largest social network analyzed up to date. We focus on analyses of high-level characteristics and patterns that emerge from the collective dynamics of large numbers of people,rather than the actions and characteristics of individuals. Analyses center on numbers and durations of conversations; the content of communications was neither available nor pursued. From the data we construct a communication graph with 190 million nodes and 1.3 billion undirected edges. We find that the graph is well connected, with an effective diameter of 7.8, and is highly clustered, with a clustering coefficient decaying slowly with exponent -0.4. We also find strong influences of homophily in activities, where people with similar characteristics overall tend to communicate more with one another, with the exception of gender, where we find cross-gender conversations are both more frequent and of longer duration than conversations with the same gender.

11:20 AM **Organizational Hierarchy Predictors of Symmetric and Asymmetric Dyad and Triad Distributions in a Large Global Organization**

Kenneth Riopelle
riopelle@teamcci.com
James Danowski
Julia Gluesing

Davis and Lienhardt (1972) reported support across 427 datasets for Homans' (1950) propositions that voluntary human groups organize into cliques based on mutuality of relations, while ranked features are based on differences in status, yet other triads are "forbidden." They tested 16 triad isomorphisms, which saw extensive research over the next 55 years. Recently Faust (2007) using 82 human and other animal social networks examined lower-order structural features: network density, node indegree and outdegree, and MAN dyad census distributions to see if they constrain triad distributions. One finding of note is that dyad profiles explain 88% of triad profiles. She concludes: "Open questions remain concerning exactly how, and to what extent, triadic processes and properties vary across different kinds of social relations (p. 245)." The current research examines dyads and triads in a large network with an imposed hierarchy, a global automobile manufacturing organization. Network data are from who sends email to whom. Questions addressed are: Does the organizational chain-of-command reproduce asymmetric dyad and triad profiles, while peers reproduce more symmetrical dyads and triads? Are hierarchical effects on these network structures uniform across all levels of the organization? Does organizational context allow for reproduction of more forbidden triads? Richards' and Seary's (2007) MultiNet was modified through the authors' collaboration with them to incorporate efficient ways to code, graphically display, and statistically analyze hierarchical relations in a network.

11:40 AM **Stability of communication networks in time**

Pawel Kucharski
p.kucharski@desk.pl
Dominik Batorski

Here we examine the communication networks among over 6 millions of users of the most popular Instant Messenger in Poland (i.e. over 15% of country population). The main goal of our research was to identify structural patterns of communication in a large network, their stability and change in time as well as within different time scales. Using the whole network data on intensity of communication between users we analyze how main network properties are changing in time. We consider differences of stability of global characteristics of large networks such as small world (i.e. short average path lengths, clustering) degree distribution, components structure as well as patterns of communication within personal networks. Moreover we study how those characteristics depend on selection of time scales, i.e. whether we obtain different results analyzing communication from one day (also taking into consideration variation on different weekdays), several days, one week, or one month. The results of this study should provide recommendations for selection of time scales in future studies of communication networks.

Saturday, Jan. 26   Noon-1:30 PM.
INSNA Business Meeting

Saturday, Jan. 26   Afternoon 1

Communication Coordination and Congruence. Chair: Marcelo Cataldo

1:40 PM   Understanding Communication, Coordination, and Congruence at an Individual Level By Harnessing Baseball Statistics

Patrick Wagstrom
pwagstro@andrew.cmu.edu
Mary Helander
Kate Ehrlich
Clay Williams

In multi-modal networks containing a set of individuals, tasks, and linkages between tasks and individuals, one can derive a new coordination requirements network indicating which individuals should be in communication to accomplish their tasks. The congruence measure, which is positively associated with productivity, can be calculated by comparing observed networks such as communication, formal organizational structure, or worker co-location with the coordination requirements. However, congruence is typically calculated at the network level, providing little insight to individuals about how their personal communications affect the congruence of the network. This work builds on the network-level congruence metric to identify a set of proposed individual congruence metrics. In particular, we utilize an analogy to baseball, where congruent communications are ``hits'', and coordination requirements without communication are ``strikeouts'' to develop these new metrics. These metrics are then used as predictor measures for individual and group performance measures. Finally, we compare these new individualized results with network level results address situations in which the individualized metrics may be more appropriate.

2:00 PM   Assessing the impact of socio-technical congruence

Marcelo Cataldo
mcataldo@andrew.cmu.edu
James D. Herbsleb
Kathleen M. Carley

The identification and management of dependencies is a fundamental problem in non-routine technical tasks, such that software development, that has serious consequences on productivity and product quality. Socio-technical congruence is an emergent research area that attempts to understand and measure the match between the detailed structure of technical work dependencies and the structure and communication patterns of organizations doing technical work. In this work, we propose a measure of socio-technical congruence that builds on elements from organizational theory and social network analysis. We empirically evaluated the measure in the context of geographically distributed software development organizations and our study examined the relationship between congruence and productivity and product quality. The results suggest that development productivity and quality increase when engineers coordinate their work more congruently to their coordination needs. Moreover, high performing engineers showed more effective patterns of coordination than less productive developers.

2:20 PM **A graph theoretical way to identify coordination gaps and its implications for improving communication**
Mary Helander
helandm@us.ibm.com
Kate Ehrlich
Giuseppe Valetto
Clay Williams
Stephen Davies
Tim Klinger
In software development projects, dependencies between software artifacts establish the need for developers to coordinate their work. Research by Cataldo, Wagstrom, Herbsleb and Carley used network analysis and showed that congruence between coordination requirements and coordination activities reduced development time. We have extended and generalized the earlier work by using graph theoretical algorithms to identify congruence instances as well as gaps in the communication network. These instances and gaps are ranked, in terms of their contribution to the congruence measurement for the whole system. This is useful for isolating the most important social network links to promote while attempting to avoid "communication overload," We have applied our method to historical data from a software development project. Preliminary analysis reveals that the distribution of gaps across the project follows a power law implying that a small percentage of links have the most impact on congruence. We also analyzed the data for colocated and non-colocated pairs of people and found that distributed pairs had more communication gaps as well as more instances of non-coordination communication. Along with the earlier research, this establishes a method for systematically linking communication networks to dependencies in the task domain.

2:40 PM **The Congruence between the Functional and Organizational Structure of a Standards System: The Case of the Internet Standards**
Mo-Han Hsieh
mohan76@alum.mit.edu
We report on a study of a set of standards as a system and examine the congruence between the functional structure of the standards and the organizational structure of the standards' developers. We provide empirical evidence that the sub-organizations of the standards development organization are formed to coordinate between standards that have strong technical interaction. By using the standards developed by the Internet Engineering Task Force (IETF), we construct a citation network of the standards and a coauthor network of the standards' developers. We demonstrate that the Working Groups of the IETF and the functional divisions of the Internet standards are well aligned. By studying the IETF standards over time, we also demonstrate the gradual increase of the congruence between the organizational structure of the IETF and the technical structure of the Internet standards.

3:00 PM Sexual Mixing and STI Discordance within Sexual Partnerships among a High-risk Sample in Brooklyn, NY

Maria Khan
maria_khan@unc.edu
Melissa Bolyard
Pedro Mateu-Gelabert
Milagros Sandoval
Carey Maslow
Samuel R Friedman

This study investigated sexual mixing among participants of a risk network study performed in a Brooklyn, NY neighborhood characterized by high levels of poverty and substance use (Friedman et al. Aids and Behavior 2006). A total of 465 respondents were interviewed, including initial respondents and their named sexual contacts. We analyzed data on sexual dyads (N=334 two-person sexual partnerships) to measure differences in risk factors for sexually transmitted infection (STI) and biologically-confirmed STI discordance, defined as STI infection in one and only one partner of the dyad. In substantial proportions of dyads, partners differed on socio-demographic and risk behavior characteristics including age (a 5 year age difference or greater in 52% of dyads); race/ethnicity defined as Latino, black, white, or other (28%); neighborhood of residence (21%); high school graduation (47%); employment status (25%); injecting drug use (26%); and sexual risk, indicated by multiple sexual partnerships in the past 3 months (42%) and participation in group sex (38%). Among the dyads, STI discordance was alarmingly high for HSV-2 (42% of relationships), followed by HIV (13%), chlamydia (13%), syphilis (4%), and gonorrhea (1%). Infection could spread within discordant partnerships in which unsafe sex takes place. High levels of sexual mixing or concurrency could contribute to transmission within the community, even among individuals with low risk sexual and drug use behaviors.

Networks in Political Science (NIPS IV). Chair: John Padgett

1:40 PM Elections in Renaissance Florence

John Padgett
jpadgett@uchicago.edu

Changing role of marriage, economic, and factional networks in elections of Florentine citizens to city council, over two century period of 1282 to 1493.

2:00 PM Networks of Competition and Cooperation: The Structure of Economic Development Cooperation in Central Florida

Richard Feiock
rfeiock@fsu.edu

In-Won Lee

Keon-Hyung Lee

Hyung Jun Park

This paper investigates choices of collaborative partners by local government economic development agencies in the central Florida. The data comes from a survey from 46 local governments and development agencies in the Orlando Florida metropolitan area. Explanatory variables include the spatial structure of governments, the network structure of competition relationships among jurisdictions and communication networks among both local government administrators and elected officials. The attributes of each jurisdiction that are examined include population, land use patterns, socio-economic status, political institutions, and development policies. These factors operationalize a model of institutional collective action (ICA) proposed by Feiock and Scholz (2007) that links governmental policy collaborations to embedded social and political structures. Hypotheses derived from the ICA approach predict whether a jurisdiction will perceive others jurisdictions as collaborative partners in pursuing economic development. The empirical analysis employs P* analysis to test these hypotheses.

2:20 PM   Influence in the Policy Process: A Classroom quasi-experiment

Stephen Bird

sbird@bu.edu

This paper presents the results of a quasi-experimental policy learning analysis and survey in a large university lecture class. The project attempts to determine the independent causal effect of network structure on policy learning and policy preference. In a large lecture class (n=150), students respond to test surveys (t1, t2, t3) to ascertain student's preferences concerning a controversial public policy (the adoption of electricity restructuring). Given a policy briefing with pro and con arguments, students will be encouraged to participate in policy learning (i.e. breaking students into discussion groups of their own choosing concerning the policy, assigning interactive homework assignments, etc.). It is expected that the experiment will demonstrate that certain network characteristics correlate strongly with change in policy attitude (i.e. policy "leaders" will have greater centrality and brokerage measurements). My hypothesis is that structural characteristics of socially based policy networks mediate political preferences that stimulate policy decisions. Specifically, the ways in which key policymakers interact with one another, and the resulting structure of that interaction, should influence their policy preferences. Central "brokers" should have more opportunity to control information and agendas than less "connected" policymakers. This research will be focused in large part on establishing causality and overcoming endogeneity concerns. Skeptics argue that networks may be a reflection, rather than a cause, of underlying power structures and/or policy outcomes. Specific aspects of this research design will attempt to address this issue.

2:40 PM   Ideology and Power as Drivers of Network Cohesion: The Case of Regional Planning

Adam Henry

adam_henry@ksg.harvard.edu

What determines the structure of policy networks? Although institutional arrangements influence patterns of interaction in policy-making processes, networks also tend to self-organize based on the predilictions and biases of individual network actors. This paper tests two hypotheses of how policy networks change endogenously. The first hypothesis is derived from the Advocacy Coalition Frameowrk (ACF), which asserts that actors collaborate primarily with others who share their policy-relevant beliefs and values. The second hypothesis is derived from "tempered preferential attachment," an elaboration of the classic preferential attachment model of network growth. This approach suggests that network actors are primarily interested in positioning themselves as close as possible to groups that are politically influential. Empirical data used in testing these hypotheses are collected, via online survey, from policy elites in five regional land use and transportation planning processes in California (N = 752). Hypotheses are testing using p*, a relatively new but powerful method of predicting network structures based on observed properties of network actors and their interrelationships.

3:00 PM Should I Stay? Simulating the Effects of Perceptual Diffusion on Retention of Women in Work Organizations

Barbara Lawrence
barbara.lawrence@anderson.ucla.edu
Jim Blythe
Cathleen McGrath

Increasing the number of women in high-level jobs is an enduring organizational problem. One common solution proposes a pipeline. If organizations hire more women in careers leading to high-level jobs, these women will get promoted, and their numbers in high-level jobs will increase. However, despite increasing numbers of women entering high-profile careers, the number at high levels remains meager. An unpublished simulation suggests that retention provides greater leverage than hiring. When the pipeline leaks, change becomes difficult without dramatic hiring increases. We develop an individual-level simulation modeling beliefs and influence. A key feature is that employees begin with perceptions of probable success. These perceptions influence their affective commitment to the organization, probability of staying as well as evaluations of and decisions about other employees. Our question is: How do employees' perceptions of probable success diffuse through an organization and influence retention? The simulation begins with organizational data that define the population of work groups and a sample of organizational reference groups. We explore how influence networks and methods of diffusion impact retention rates. We compared two models of diffusion: Friedkin and Johnsen's social influence model and Krackhardt's viscosity model. In both models, we find that diffusion of perceptions dramatically alters retention rates when only a few individuals change their views. However, the structure of the influence network exerts different effects in the two models. We further discuss how other diffusion models such as cascade and percolation, which assume a binary belief, can be applied to this problem.

Analyzing Network Data (Methods)

1:40 PM Detecting Possible Missing Relations in Network Data

Kathleen Carley
kathleen.carley@cs.cmu.edu

Network data, particularly when it is connected from open source media such as newspapers, tends to be uncertain. Missing data and errors of various sorts exist. Analysis can benefit from correcting these errors and inferring missing data, when possible. Herein a set of procedures for inferring missing data, based on utilization of information in other "networks", possible evolutionary principles, and common patterns of activity are described. Cautions and possible biases that might results from such missing data inferences are discussed.

2:00 PM The myth of internationality – international congresses regarded as weighted bimodal networks

Alexandre Rausch
rausch@rz.uni-frankfurt.de
Christian Stegbauer

We are pursuing two goals with our study: on the one hand we want to present a new method for the analysis of weighted bimodal networks; on the other hand we want to show that world congresses lead to less international contacts among the contributors than is generally assumed. At international congresses, one can often see that discussions and get-togethers mostly occur within groupings of people who come from the same country or who at least share a common mother-tongue. In our study we will show that this tendency to endogamy can be observed in the contributors of international congresses, too. For this purpose we analyse two world congresses in the field of sociology: the world congress of the IIS in Stockholm (2005) and the world congress of the ISA in Durban (2006). We start from data about the home countries of the contributors in the diverse sessions and build a weighted bimodal network by noting down the number of contributors from all different countries of origin for each session. The analysis of this network represents the focus of our study. In this context we are especially interested in the maximum amount of (possible) relationships of attendees from one and the same country respectively. We subject these quantities to a statistical analysis by comparing them to analogously calculated quantities obtained from 1000 randomly drawn bimodal networks with the same marginals as the observed one. We find that the homogeneity of the geographical origin of the contributors within the sessions of an international congress is much bigger than one would expect by chance. This remains true even if we consider the fact that co-authors often come from the same country. We explain this result by the variety of intellectual academic styles between different countries (Galtung). Furthermore theoretical approaches are subject to different theory traditions (Ekeh). Depending on the appreciation of the social and societal themes not all scientific topics are considered as equally interesting in each country. On the other hand we assume that for the session coordinators pre-existing ties established in their country of origin limit their capacity to include people from other countries.

2:20 PM   Visualizing Tendency and Dispersion in Collections of Attributed Networks

Juergen Lerner
lerner@inf.uni-konstanz.de

Social network data often comprise several networks whose actor sets may be disjoint. Instances include collections of personal networks obtained by interviewing several respondents or collections of socio-centric networks associated to different institutions, companies, departments, or schools. Given such a data set, a natural task is to assess differences and similarities among several networks, e.g., to compare the average network composition and structure between male and female respondents or to assess whether networks among school children in public schools differ from those among pupils in private schools. In this talk we present a very simple but effective method to visualize the tendency (statistical average) and dispersion (statistical variability) in collections of networks. Our method exploits given attributes of the network actors to define clusters that can be compared across networks. As a specific application we visually explore a collection of several hundred personal networks of migrants. In particular, we assess how average network composition and structure relates to various characteristics of the respondents, such as country of origin, years of residence, skin color, smoking behavior, or depression level. This is joint work with Ulrik Brandes, Miranda J. Lubbers, Chris McCarty, and Jose Luis Molina.

2:40 PM   Network Effects in Blau Space

Miller McPherson
mcphersn@soc.duke.edu
Jeff Smith
James Cook

We develop a method of imputing the characteristics of the network alters of respondents in probability samples of individuals. This imputed network variable employs the homophily principle to construct measures that estimate the proportion of a respondent's core discussion network that possess any given social characteristic. We use General Social Survey data to demonstrate that the imputed network characteristics show substantial effects on individual level measures such as attitudes, beliefs, and other variables typical of survey analysis. In some cases, the imputed network variable completely eliminates the effects of standard sociodemographic variables such as age and education. We argue that the imputed network variable captures many of the aspects of social context that been at the core of sociological analysis for decades.

3:00 PM   **Hierarchical Clustering in Large Networks**
Vladimir Batagelj
vladimir.batagelj@fmf.uni-lj.si
Anuška Ferligoj
Andrej Mrvar
In the paper, an adaptation of the hierarchical clustering with relational constraints approach (Ferligoj & Batagelj, 1982, 1983) to large data sets is presented. To obtain an efficient algorithm for large networks, we: - compute the dissimilarities between units (vertices of network) only for endpoints of existing links (of constraining relation); - define the dissimilarities between clusters based only on the dissimilarities of the corresponding links and derive the update relations. We also show that for selected dissimilarities between clusters, the Bruynooghe (1977) reducibility property holds. This allows us to speed-up the hierarchical clustering procedure by using the RNN (reciprocal nearest neighbors) approach. The developed algorithms are implemented in Pajek - a program for analysis and visualization of large networks. The proposed approach will be illustrated by analyses of some large networks (such as clustering of US counties).

Friendship networks. Chair: Shanhui Wu

1:40 PM   Geographic Mobility and Social Networks
Shanhui Wu
sw20@duke.edu
Literature on the relationship of geographic mobility and social networks generally view geographic mobility as a destructive force for migrants' social networks. This conclusion is limited for some theoretical and empirical reasons. First, it is exclusively based on adolescents, a social group that is most susceptible to geographic mobility. Second, the studies only examined the effect of geographic mobility in a short period, normally right after the migrant moved. Third, they focused only part of the migrants' networks. That is, their network connections with people in the new places. All these exaggerate the negative impacts of geographic mobility. My study investigates the long-term effects of geographic mobility on mobile adults' entire social networks. I argue that geographic mobility provides opportunities to meet new people. After a short period of adjustment and adaptation, migrants are able to build social networks quickly in the new places. Moreover, advanced communication and transportation systems enable migrants to maintained social associations in their origins. Therefore, mobile individuals tend to have networks with bigger size, higher diversity, more embedded resources, and even more close friends. The analysis on 2004 national survey data in the US and China suggests that, in a long run, geographic mobility is positively related to migrants' social networks. Specially, frequency of cross-city mobility helps individuals to have better social networks, though this positive relation is nonlinear. Age at the moving also has a positive and nonlinear relationship with social networks. Moving to a big city, however, harms migrants' social networks.

2:00 PM   Elucidating the relational dependence in triples of relation types by using a non-parametric approach
Wei-chung Liu

---

wliu56@gate.sinica.edu.tw
Jun-Hong Chen
Zong-Rong Lee
Jing-Shiang Hwang

A social network study often has several relational measurements on one set of actors. One of the major interests of sociologists is to determine the factors contributing to the observed network pattern under one relation measurement. A relation can be modelled as the compound relation resulting from the multiplication of several relation types. In this presentation we focus on triples of relation types, and for each combination we ask how likely a tie of a given relation type from one actor to another is dependent on the multiplication of two other relation types via a third actor. Similarity between the observed network of a given relation type and that obtained from a relation model can be quantified, and the statistical significance of such a similarity can be tested using a simple non-parametric approach. Here, we use Sampson's monastery data to demonstrate our approach and test the feasibility of all relation models by considering all triples of relation types.

2:20 PM ## An Economic Model of Friendship: Homophily, Minorities and Segregation

Matthew Jackson
jacksonm@stanford.edu

We examine homophily patterns in the ``Add Health'' data set of friendships among high school students, with a focus on patterns of friendships across races and how that depends on the relative size of a racial group within a school. We first show that beyond the usual tendency of majority groups to form more same-race friendships and fewer cross-race ties than minority groups, that larger groups also form significantly more ties per capita, with the largest groups forming almost double the number of ties compared to smaller groups. We also show that almost all groups exhibit inbreeding homophily, so that their friendships are biased towards same-race relative to demographics. In particular, we show a statistically significant pattern of the most extreme inbreeding bias coming from middle-sized groups, with very large and small racial groups exhibiting nearly no inbreeding homophily. Beyond the statistical work, we develop a new measure designed to identify inbreeding homophily, and we also develop a model of friendship formation that sheds light on homophily and segregation patterns observed in social networks. We trace each of the empirical observations to specific properties of the model and highlight the role of choice and chance in generating homophilous behavior. Finally we discuss welfare and policy implications of the model.

2:40 PM ## Sense of well-being after a residential move: The importance of social ties

Irina Shklovski
ias@cmu.edu

Social relationships are important for health and psychological well-being because people rely on their relationships both for support with daily living and in times of great need. Social relationships can often be a source of support and a basis for developing a sense of security. Advances in transportation and communication technologies of the previous century have expanded the range of relationships people can maintain in their lifetime. Many have argued that these technological advances have also helped to reduce, if not nullify, effects of distance on people's ability to draw on their social relationships for support. Using longitudinal survey data of recent movers from shortly after the residential move and again 9-12 and 18-22 months later, we investigated how local and long distance friendships differ in their contribution to perceived social support after a residential move. We found that geographically distant friendships tended to be stronger, more intimate relationships that could be relied on for help with big problems. In fact, just having these friends, not necessarily actively interacting with them, was associated with greater perceived social support. In cases where proximity was not required, close long distant friends could be relied on for dispensing advice, connecting movers to people in other places, or providing the kind of support and companionship available over the phone or via email. In terms of support with day-to-day living, long distance ties were likely to be more of a pleasant theoretical concept than something more practically useful. Thus ties in the new location were important when the pre-move network is geographically distant and their value became

more evident with time. Even though new ties had not achieved the level of intimacy that comes with time and investment of effort, their easy availability at a moments notice made them invaluable to movers' perceived social support. Despite developments in communication and transportation technologies over the course of the last century, physical proximity still matters for feeling secure and supported in daily life.

3:00 PM What is a Close Friend? The effect of organizational context on friendship among mothers in daycares

Mario Small

mariosmall@uchicago.edu

Since at least the time of Simmel, sociologists have argued that people have the capacity to form domain-specific friendships, relationships (such as "sports friends") limited in conversation and activity to a particular domain. Many scholars have argued that ties of this nature are likely to be weak, either because the parties do not interact enough to sustain a strong friendship or because only weak ties fail to cross into multiple personal domains. But friendships do not just depend on the personal circumstances of the two parties; they also respond to the social or organizational context in which the parties interact, contexts too often ignored in the study of the strength or weakness of ties. Based on in-depth interviews with approximately 60 mothers whose children were enrolled in childcare centers, I examine how the centers' organizational contexts—including the number and nature of the opportunities and inducements they provided for parents to interact (through PTAs, fundraisers, and the like)—shaped the ensuing friendships among mothers. I find that mothers developed relationships that on the one hand strictly remained within the domain of children and the family while on the other attaining significant depth within that domain. Neither "strong" nor "weak" ties in the conventional sense, these were "compartmental intimates," relationships that became surprisingly effective sources of support, information, and other social resources among a time-constrained population. Findings suggest that to understand the resources available through social ties we must understand the context of social interaction.

Qualitative Network Studies. Chair: Sylvia Dominguez

1:40 PM Debe cuidarse en la calle: Perceived social network norms and their influence on sexual behavior among the male clients of female sex workers in La Romana, Dominican Republic

Clare Barrington

cbarring@gwm.sc.edu

Luis Moreno

Deanna Kerrigan

The Dominican Republic has a long history of innovative HIV prevention work in the female sex industry. Such efforts have achieved significant increases in condom use and declines in sexually transmitted infections among female sex workers (FSW). However, little is known about how these efforts may have influenced the behavior of male clients. The aim of this study was to explore perceived norms around sexual behavior within the social networks of male clients of FSW in La Romana, Dominican Republic, and how men articulate links between these norms and their own behavior. Multiple in-depth interviews were conducted with eleven male clients regarding social network composition, communication patterns, and perceived norms. Participants' stories reveal a shared perception that they should always use condoms with FSW. Other perceived norms address how men should select and develop relationships with FSW. Study participants also describe an ongoing exchange of advice between social network contacts, which serves as a channel for communicating and reinforcing norms. However, a recurring theme throughout the narratives is that advice providing new information about whether or not to have sex with a particular woman may be more influential than advice about condom use, which generally states what men already know. Based on these findings, the social networks of male clients appear to provide an outlet for communicating and reinforcing norms related to sexual behavior with FSW. While social network approaches could be an effective tool for HIV prevention among male clients, such efforts will need to provide new information and options regarding HIV protective behaviors.

2:00 PM **The Resilience of Dark Networks: how Networks sustain Shocks and Attacks**

Joerg Raab
j.raab@uvt.nl
René Bakker

Dark networks, networks which are both covert and illegal, tend to display a remarkable level of resilience when faced with shocks to and attacks on their structure. Network resilience is conceptualized in this paper as a network's ability to either remain operational in the midst of shocks or attacks on its structure ('robustness capacity') or its capacity to bounce back from untoward events by transforming itself over time ('rebounding capacity'). Thus, the focus of this study is on how networks sustain shocks. We propose a conceptual model of dark network resilience and a way of operationalizing the latent resilience construct through the observed level of operational activity. Using the case study method proposed by Eisenhardt (1989), we test the usefulness of our model against actual cases. Qualitative data from a myriad of sources were coded and analyzed using NVivo. From subsequent rich descriptions of three cases, Umkhonto we Sizwe (MK, the armed wing of the ANC in South Africa during apartheid), Fuerzas Armadas Revolucionarias de Colombia (FARC) and the radical Islamic Hofstad network in Holland, we demonstrate distinct patterns of dark network resilience. Our model centres attention to the way shocks impact on secondary (uncertainty, resources, legitimacy) and primary (actors, linkages) network dynamics and how these affect the network's observed level of operational activity over time. This allows to – partly – open the black box surrounding the resilience of dark networks.

2:20 PM **Studying University Alumni Networks**

Myra Norton
mnorton@comlytics.com
Steven Reese

Many universities struggle to engage their alumni because they do not understand how these individuals are connected. By understanding the social networks that exist between alumni, universities are able to leverage existing relationships to improve their events, increase participation, and drive donations. Community Analytics worked with a well-known University to better understand these networks; this paper offers a summary of the data collection methodology and analysis of the results. University alumni from across the country were contacted and surveyed using a mixed-method approach of telephone and email communication. Respondents were surveyed on the people they continue to remain in contact with from college. All alumni named in the study were matched against the University's database to gather attributional information to be used in the network analysis. Networks revealed from this research were analyzed on a series of attributes, including class year, geography, major, and donor information. The results were alarming to the University in that many of the most well-connected and influential alumni were not currently being targeted or engaged by the school. Network analysis was overlaid with alumni satisfaction responses to give university officials a detailed plan of action to better engage the alumni community.

2:40 PM Transnational Ties as Tools for Negotiating Poverty and Identity: Latin-American Women in Public Housing

Silvia Dominguez

s.dominguez@neu.edu

This study uses ethnographic data to examine the nature and functions of transnational relationships of low-income Latin-American immigrant women who have immigrated to the United States and are living in public housing. We utilize a theoretical framework that distinguishes support relationships into those which affect women individually and those that affect them as mothers. We examine the need these women have for the maintenance of transnational ties though participant observation and semi-structured interviews. Findings indicate that mothers have transnational support ties which alleviate what would otherwise be considered social isolation. In addition, we find that transnational ties are maintained in an effort to reinforce ethnic identity for mothers and their children. These ties are used to remove the children from problem neighborhoods during school vacations. Lastly, we found that mothers maintain these transnational ties by sacrificing their standard of living through frugal consumption. These relationships are both supportive and draining at the same time.

3:00 PM From Rural to Urban: The Dynamic Changes of Chinese Migrant Workers' Social Network

Jie Wang

jenny.wang@nokia.com

Jyri Salomaa

Undergoing the huge migrant tide, China has more than 150 million internal migrant workers moving from rural to urban areas currently and another 150 million surplus rural work force are potentially going to fuel the flow in the future. Mobility in space also brings great changes for the migrant workers' social networks. In this paper, we present an ethnographic study on this changing process and analyze the implications of these social network changes for migrant workers' city life. We found that before migrant workers came to the cities, most of their social networks are in the village and these social networks are simple and stable in a long time. But after they came to the cities, their social networks became much more complex and dynamic than before. The integrated social support system in rural area also became differentiated when they came to the cities. Mobile phone is becoming more and more commonly used by most migrant workers in recent years and it's also playing an important role in connecting migrant workers' differentiated social support networks during this changing process. We also explore the implicaitons and future trends of mobile phone for migrant workers' social network development.

Saturday, Jan. 26   Afternoon 2

Mathematical Models. Chair: Anne McCranie

3:40 PM Social networks and space
Galina Daraganova
gda@unimelb.edu.au
Pip Pattison
Bill Mitchell
Scott Baum

This paper examines external spatial constraints on network processes, generalising the exponential random graph class of network models. We develop a hierarchical set of nested models for social networks embedded spatially, in which an interaction function between tie probability and Euclidian distance between nodes is introduced. Using a simulation approach based on the Metropolis algorithm, we explore spatial embeddings of graphs with different global features of network structure (random graphs and graphs with small–world properties) in order to demonstrate the way in which individuals' geographical locations and endogenous network clustering processes combine to structure patterns in social networks. The models are illustrated by an empirical example, designed to examine the potential role of social networks and individual level factors in understanding persistent patterns of spatial clustering in unemployment in Australia. The models allow us to assess geographical variations in social networks, and hence address a number of hypotheses about the possible network bases for spatial clustering in unemployment.

4:00 PM ERGM (p* models) for multiplex two mode networks: identifying local patterns in the proposal and cosponsorship of bills in the US senate
Filip Agneessens
filip.agneessens@ugent.be
John Skvoretz

Affiliation data (or bipartite data) generally take the form of two mode networks in which ties connect nodes in one mode to nodes in the other mode. In two mode networks, one mode is generally referred to as actors and the other as events. Actors are linked to one another indirectly through the events they co-attend and events are linked indirectly to one another through the actors that attend both. One particularly interesting aspect of such affiliation networks is their local structures. In the last decade ERG models (p* models) have been proposed to deal with such models (e.g. Skvoretz and Faust, 1999; Faust and Skvoretz, 2002; Agneessens et al., 2004). However, these models focus on 2 mode networks where the connections can only consist of one type of tie. Yet, a number of situation exist where one (or a number of) particular actor(s) might have a very different relation to an event than most others. E.g. one person might host the event that others take part in; one person might chairs the meeting that others attend; one senator proposes a bill, that others co-sponsor, etc. Such special positions of one actor (or a limited number of actors among those attending the event) can be considered as a second type of tie, and therefore might give rise to many more complex local configurations than those that have been proposed so far. Moreover the specific attribute(s) of the actors with the special status can be as important for other actors to be linked to that event as the characteristics of the events itself. In this paper we propose specific local patterns to capture this complexity and illustrate the application using the sponsorship-behavior of bills among senators in the US congres. We categories the bills according to type and the senators according to party/ideology.

4:20 PM Alternative to Preferential Attachment: Toward Socially Realistic Scale-Free Networks
Maksim Tsvetovat
mtsvetov@gmu.edu

Scale-free networks - networks with a Power Law distribution of degrees - have been observed in many contexts ranging from networks of airline traffic to sexual networks and Web link patterns. The leading algorithm for generating synthetic scale-free networks has been preferential attachment, or the BA Method. Graphs generated by the BA Method produce a network that consists of a single, tightly connected, core-periphery structure, and a power-law distribution of node degrees. However, this method generates graphs that are structurally very different from networks that occur in nature. In BA-generated structure, a small number of high-degree hubs are tightly linked to each other and are surrounded by a considerably less dense periphery and finally a layer of "pendant" nodes only attached to one or two locations in the main network. However, while the power-law distribution and its slope match the real-world networks, nodes with extremely high degrees rarely occur in human networks. The reason for that is simple - while WWW links (from which the notion of scale-free networks originated) are costless, creation and maintenance of human connection carries a monetary, time or opportunity cost. In this paper, I'd like to propose a simple alternative to the preferential attachment algorithm that reliably produces networks with (a) a scale-free distribution of degrees, (b) a multi-core structure similar to that of online social networks, and (c) a more realistic maximum node degrees.

4:40 PM Race, Gender, and Status Stratification in Work Networks: An ERG/p* Approach

Ann McCranie
amccrani@indiana.edu
Stanley Wasserman
Bernice Pescosolido

Using data from the Indianapolis Network Mental Health Study, this paper uses p* to model structural and attribute characteristics of two different workplaces: a public psychiatric ward (N=91) and a private psychiatric ward (N=94). Modeling the effects of both structure and actor attribute makes visible the effect of race and gender stratification in these networks, net of the effect of differing locations on the occupational status hierarchy. Model parameters show a consistent pattern of gender and racial stratification and homophily in advice-seeking behavior in data collected in two workplace settings, and across multiple network relationships. These patterns differ in important ways between the two workplaces, reflecting different cultural influences on the wards. In addition to presenting an example of multiple attributes parameters in a p* application, this paper will also discuss recently proposed Markov Chain Monte Carlo techniques for maximum likelihood estimates that allowed these models to converge and avoid degeneracy.

Adolescent Friendship Networks. Chair: Lauren Molloy

3:40 PM Clarifying the peer experiences of aggressive and non-aggressive youth:A social network analysis of status within peer groups

Kelly Rulison
klr250@psu.edu
Scott Gest

There has been considerable debate about the social experiences of aggressive youth. Early research emphasized that aggressive youth were rejected, isolated, and formed weak social ties. Later research emphasized that aggressive youth had friends, but that they mostly affiliated with other aggressive peers. In light of this debate, we apply social network analysis to address three research questions: 1) What are the patterns of aggressive youths' social ties in their classroom networks? 2) Are relationship ties in aggressive groups weaker and less cohesive? 3) What are the patterns of aggressive youths' social ties within their own peer groups? Teacher-, peer- and self-reports were obtained in Fall and Spring of 5th grade and 7th grade for three consecutive cohorts of students (initial N = 410). Each student's friendship, "liked most," and "liked least" nominations were obtained. Interaction-based groups were identified from aggregated peer reports of classmates who "hang around together a lot." Results for 5th grade students indicated that friendship and liked most in-degree and eigenvector centrality were similar for aggressive and non-aggressive youth, but aggressive youth had higher liked least in-degree. Aggressive and non-aggressive groups had similar density, transitivity, and reciprocity for friendship and liked most nominations, but the density of liked least nominations was higher within aggressive groups. Aggressive youth in heterogeneous low aggressive groups (1-50% aggressive members) had lower friendship and liked most in-degree. Overall, results suggested that aggressive youth were well-integrated within their overall social networks, but that aggressive youth in low aggression groups were less central.

4:00 PM Homophily and Heterophobia in School Classes

Tobias Stark
t.h.stark@rug.nl
Michael Mäs
Andreas Flache

SNA has provided ample evidence that similarity of people is associated with mutual liking in various contexts. This has been attributed to "homophily", the tendency of people to like those more similar to them. However, the empirical association of similarity and liking might also be caused by "heterophobia", the tendency that dissimilar people dislike each other. We argue in this paper that it is important to distinguish empirically between the two mechanisms. We then propose and test methods how do this with network data. In the theoretical part of the paper we show that the two mechanisms may have strikingly different consequences for the integration of culturally diverse groups. For instance, contact between students with different ethnic backgrounds in schools has been argued to lead to intergroup integration. Due to homophily, similarities on dimensions like opinions, interests and other demographic characteristics may become more important for liking relationships than the ethnic background. However, if heterophobia is the underlying mechanism, easily visible cultural markers may entail strong initial disliking between ethnic groups. Similarities on other dimensions would then not suffice to establish intergroup liking. This could explain the finding of persistent ethnic segregation in ethnically mixed schools. In the methodological part of the paper, we elaborate and compare methods to test the two mechanisms. We use data about the networks, opinions and demographic characteristics of pupils in Dutch primary schools. Based on our analysis, we discuss problems that the currently available statistical network models have to discriminate between both effects.

4:20 PM Peer Influence Processes and Academic Outcomes in Early Adolescence

Lauren Molloy
lmolloy@psu.edu

Past research suggests that children's academic achievement-related outcomes may be partly shaped by processes of influence within their social networks. In the present study, we simultaneously examine the relative contributions of three distinct peer network processes (socialization, social comparison, and academic reputation among peers) on three distinct aspects of academic adjustment (self-concept, effort, and skill) from the fall to spring of 5th grade and 7th grade. Data are drawn from a five-year longitudinal study of 427 children attending a northeastern United States school district. Hierarchical linear regression models for each academic outcome were run with all peer effects entered simultaneously. Socialization processes are inferred from a main effect of friends' academic skills and effort on change in children's own academic outcomes. In addition, results indicate an additive effect of peer academic reputation (i.e., in-degree centrality for peer nominations as a good student) on within-year changes in skills and effort. Finally, a significant child academic skill by friends' academic skill interaction term for academic self concept suggested that low-achieving students with high-achieving friends may be engaging in unfavorable social comparison processes. Overall, results are consistent with the hypothesis that changes in academic attitudes and behaviors in early adolescence are influenced by children's peer networks through multiple theoretically distinct influence processes involving the characteristics of one's friends (i.e., influence, social comparison) as well as broader evaluative peer feedback (i.e., peer academic reputation).

4:40 PM **Separate and combined contributions of friendship and interaction frequency to relationship stability and peer influence in early adolescence**
Scott Gest
gest@psu.edu
The goal of this paper is to evaluate the separate and combined effects of two types of social ties in early adolescent peer networks: friendship and interaction frequency. Friendship ties are invisible and affective in nature: developmental theorists emphasize the importance of mutual or reciprocated friendships that entail a "climate of agreement" that motivates mutual accommodation. In contrast, interactional ties are visible to others: theorists who focus on behavioral contingencies (e.g. operant conditioning) place emphasize these ties. Most empirical studies of adolescent networks focus on one or the other type of tie, even though theories suggest that the two types of ties may tap distinct yet complementary influence processes. Data are analyzed from a 5-year longitudinal study of 427 youth from 3rd grade through 7th grade. Self-, peer- and teacher-reports of academic and behavioral adjustment were obtained in the Fall and Spring of each school year. Self-reported friendships and peer reports of classmates who "hang around together a lot" were used to describe all dyads in terms of the presence or absence of mutual friendship and the frequency of peer-nominated interaction. Preliminary analyses suggest that the two types of ties combine to affect relationship stability (e.g., friends who also interacted frequently were more likely to remain friends) and homophily (e.g., appreciable only among peers sharing both friendships and frequent interaction). Results are discussed in terms of potential strategies for incorporating both directed friendship nominations and non-directed, valued interaction frequencies in analyses of adolescent peer networks.

Knowledge and learning networks. Chair: Jeffrey C. Johnson

3:40 PM Using collaborative work in virtual networks to improve mathematical problem solving skills: An exploratory study
Luis Pinzón
lpinzon@uniandes.edu.co
Roberto Zarama

This article discusses an exploratory study of the use of collaborative learning in virtual networks to improve mathematical problem solving skills. 75 primary school students participated in the study. The article begins by describing the design of a virtual network integrated by primary school students, their parents, their mathematics teachers and a group of university researchers. The aforementioned network promotes discussions of mathematical problems among its members, providing a context of collaborative work that aims at improving the students' mathematical problem solving skills. Thereafter, the authors use social network theory, mathematical tests, and qualitative analysis to explore how the structure of the network affects the students' problem solving skills, their beliefs and attitudes towards mathematical problem solving, their collaborative work, and their use of the Internet. Finally, we discuss the methods used for analyzing the data and the current knowledge on social networks may contribute to the design of new collaborative learning networks.

4:00 PM **Where to Get Information in the Workplace? A Multi-theoretical and Multidimensional Network Analysis on Information Retrieval from Team Members and Digital Knowledge Repositories**

Chunke Su

chunkesu@uta.edu

The goal of this study was to theorize and empirically test network models of organizational member's information retrieval from their colleagues (human actors) and digital knowledge repositories (nonhuman actors). Based on the Multi-theoretical Multilevel (MTML) framework (Contractor, Wasserman & Faust, 2006; Monge & Contractor, 2003), this study applied and extended three social science theories (transactive memory, public goods, and social contagion) to examine the structures of team members' information retrieval networks from both human and digital information sources. In addition, this study explored how team members' tendency to retrieve information from human versus digital information sources could be influenced by the properties of a specific knowledge domain, such as complexity and codifiability. To test the hypotheses, empirical network data were collected from nine organizational work teams in Western Europe. A multidimensional and multivariate Exponential Random Graph Modeling/p* analysis was conducted. The network models were estimated using the Monte Carlo Markov chain (MCMC) maximum likelihood method in XPNet, a computer program from the PNet family developed at the University of Melbourne (Wang, Robins, & Pattison, 2006). The results found support for the multiplexity effect of team members' information retrieval and their perceptions of other members' expertise and accessibility level. In addition, team members' information retrieval from digital knowledge repositories was greatly influenced by social contagion effects. This study also found that knowledge complexity impeded individuals from retrieving information from digital knowledge repositories, whereas knowledge codifiability increased their tendency to go to digital knowledge sources for information.

4:20 PM **Why "good" networks sometimes lead to bad outcomes: lab experiments on parallel problem solving groups**

David Lazer

david_lazer@harvard.edu

This paper will present the results of experiments on "parallel problem solving" groups—where a set of informationally interconnected subjects are given a problem to solve. Each subject is given an identical problem to solve, and can see some subset of the rest of the group. In these experiments, the groups are of size five, and the problem is a version of the traveling salesman problem. The payoffs of individuals are not directly interdependent—that is, a good or bad performance by someone in a subject's group has no impact on their own performance. Individuals are informationally interdependent, however, where there are two treatment conditions and a control: (1) a group where individuals are arranged in a line (A and B see each other, B and C see each other, etc); (2) all channel, where all individuals see all other individuals; (3) no channel, where no one can see anyone else. The key theoretical question is how the network structure affects the average performance of the group. This paper builds on simulation models (Lazer and Friedman, forthcoming), which found that denser networks performed better in the short run, but worse in the long run, than sparser networks. The objective of this experiment is to replicate this paradoxical "better networks lead to worse outcomes" result with humans.

4:40 PM   Variation in Cultural Ecological Knowledge, Knowledge Reputation and Subsistence Talk among Inupiaq Hunters and Fishers of the Northern Kotzebue Sound

Jeffrey Johnson
johnsonje@ecu.edu
Terry Reynolds
David Griffith
Lisa Clough
This paper examines variation in cultural ecological knowledge across several domains (marine mammal behavior, climate and climate change, fish behavior, food webs) as it relates to native hunter's and fisher's reputation as ecologically knowledgeable (knowledge networks) and their networks of communication about subsistence activities of various types (bearded seal hunting, ice fishing). More specifically the paper focuses on the relationship between distributed cognition concerning Inupiaq cultural ecological understandings and the network characteristics of hunters and fishers of the Northern Kotzebue Sound. The findings show that different network and actor attributes account for variation in cultural ecological understanding across the different knowledge domains.

Communication Networks. Chair: Jana Diesner
3:40 PM   The geography of internet communication networks
Andrzej Nowak
nowak@fau.edu
Dominik Batorski
Kamil Rakocy

Most previous studies of large social and internet networks have ignored the geography. The most crucial question concerns the spatial patterns of social relations and personal networks structures on the internet. The point of interest is how the structures of both networks of social relations and internet communication depends on physical distance and spatial distribution of nodes? We use networks of over 2 millions of users in 2004 and over 6 millions of users in 2007 and compare their spatial properties. This kind of computer-mediated communication is used mainly to communicate with people known from off-line world and everyday life and to maintain ties with relatives, friends and coworkers. Instant Messaging is a convenient way to check if friends and family are online and to communicate with them in real time. In the analysis we used data from the whole network of communication measured in two weekly time frame for 2004 and 2007. The key analysis was based on examining how variability in various network properties is related to users place of living and it changes with increase number of users by 3 times during 3 years between measurements. The distribution of relations according to physical distance between nodes was measured. Further we analyze how mutuality and balance in personal networks depends on distance and how the position (centrality) of individuals in networks depends on geography. Our analysis indicates that the structures of social networks are strongly governed by physical proximity.

4:00 PM   Social Networks and Social Interaction Perspectives: An Integrative Approach to Understanding Processes of Organizing

Alena Vasilyeva

alenavas@scils.rutgers.edu

Organizations play a very important part in our lives, so it is not surprising that they have become the focus of much research. Organizations are very complex entities, so scholars view them in different ways and have taken various approaches to study them. In Weber's theory of bureaucracy, for example, the organization is regarded as "an almost mechanical social arrangement" (McPhee & Zaug, 2001, p. 577). The structurational tradition emphasizes humans' role in creating social structures that are considered to be both a manifestation and product of communication in the organization. From the perspective of communication field, the most salient approach is Weick's organizing process theory that regards communication to be the essence of organization (Fulk & Boyd, 1991). In this paper, I will consider two perspectives on organizations that share this view of communication and organization as being highly interrelated and interconnected, namely, the social networks and social interaction approaches. I will analyze and compare their main assumptions and key concepts in terms of their use in understanding organization and communication relationships that occur in the context of work and will try to show how they can complement each other in an endeavor to understand organizations.

4:20 PM   He Says, She Says - Identity and Polarization in Communication Networks of an Organization in Crisis

Jana Diesner

jdiesner@andrew.cmu.edu

Kathleen Carley

Harald Katzmair

Previous research suggests that during an organizational crisis social networks increase in heterogeneity, while the variability or entropy of the actual communication in the network decreases. In this study we investigate empirically what changes in communication might contribute to the decrease of entropy of the exchanged information. We focus on two dimensions of changes in communicative behavior, and derive and test two hypotheses: First, we hypothesize that in the light of a crisis people are trying to finger point to sources of rumors and failures, to attribute accountability for the crisis to others, and to establish the belief that responsibility is not allocated with themselves, without casting specific blame. One indicator for this behavior is the increased usage of anaphora; pronouns that refer back to another social entity. Our methodological contribution here is anaphora resolution, which identifies who refers to whom without repeating names. We use this information to update the weights of nodes and edges of valued network data, and analyze the impact of this enhancement on network analytic measures computed on the graph. Secondly, we hypothesize that the intra-organizational discourse drifts towards polarized opinions, and that people try to establish an identity by contrasting points of view and taking a stand on their beliefs. An indicator for this communication style is the increased occurrence of antonyms within and across messages from individuals.

Sunday, Jan. 27   Morning 1

Sun - Jan 27th - AM

Community. Chair: Keith Hampton

9:00 AM   The network structure of serious leisure social worlds

Lawrence Bendle

s4062351@student.uq.edu.au

Little is known about the network structure of groups and organisations involved in serious leisure social worlds. Generally, research into serious leisure has focused upon the individual, mainly in amateur sports, some hobbies, and a few career volunteer activities. This present paper reports on a broader view, framed by social network analysis, serious leisure theory, and social world theory, that has investigated the structure of social worlds formed by amateur artists in a regional Australian city. Data from an exploratory study identified a network of 49 grassroots associations and allied commercial, cultural, and educational organisations expressly concerned with resident amateur artists. The study found that these network elements were nested in a hierarchy that could dovetail with local and regional levels of social world analysis. Consequently, the study found that heterogeneous links between groups and organisations were substantially more prevalent than homogenous links between group and group or organisation and organisation. While not wanting to draw definitive conclusions without further empirical research, the paper provides tentative evidence of the network structure of regional serious leisure social worlds.

9:20 AM   Social Space and Physical Space: Homophily, propinquity, and the formation of neighborhood ties

John Hipp

john.hipp@uci.edu

Andrew J. Perrin

Prior studies have separately suggested the importance of physical distance or social distance effects for the creation of neighborhood ties. This project adopts a case study approach and simultaneously tests for propinquity and homophily effects on neighborhood ties by employing a full-network sample from a recently-developed New Urbanist neighborhood within a mid-sized southern city. The authors find that physical distance reduces the likelihood of weak or strong ties forming, suggesting the importance of accounting for propinquity when estimating social tie formation. The authors simultaneously find that social distance along wealth reduces the likelihood of weak ties forming. Social distance on life course markers—age, marital status, and the presence of children—reduces the formation of weak ties. Consistent with the systemic model, each additional month of shared residence in the neighborhood increases both weak and strong ties. An important innovation is this study's ability to directly compare the effects of physical distance and social distance, placing them into equivalent units: a ten percent increase in home value difference is equivalent to a 5.6 percent increase in physical distance.

9:40 AM   WiFi and Public Spaces: A Study Privatism and Network Diversity as a result of Wireless Internet Use

Keith Hampton

khampton@asc.upenn.edu

This paper explores preliminary findings from a study of how municipal and community WiFi influences social interactions in public spaces and the overall structure of people's social networks. This project assesses whether WiFi use provides social benefits within public spaces, such as building community or social interaction, and whether it increases or decreases privatism; networks that are home and kin centered. Findings are based on survey and observational data collected from seven public parks, plazas, and markets located in New York, Philadelphia, San Francisco, and Toronto. Observational data includes counts and maps of planned and serendipitous encounters as well as detailed ethnographic notes on individual activities and interpersonal interactions. Survey data includes a position generator and name generator (discuss important matters) administered to 228 users of WiFi in public spaces. Findings suggest that WiFi users are a homogeneous group with unusually diverse social networks, but their activities within public spaces trend toward reducing overall opportunities for interaction within those spaces.

10:00 AM   Building farmers' capacities for networking: Strengthening rural groups in Colombia through network analysis

Boru Douthwaite

bdouthwaite@gmail.com

This paper presents work conducted by the International Center for Tropical Agriculture (CIAT) to adapt network mapping techniques to a rural and developing country context. It reports on work in Colombia to develop a prototype network diagnosis tool for use by service providers who work to strengthen small rural groups. Drawing network maps helped group members to: develop a clearer sense of identity and a clearer idea of the benefit of being in a group; clarify and communicate their contributions to their community; identify internal group management issues; and, clarify their strategy towards funding raising and seeking support from outside. We, the researchers, benefited from a better understanding of group functions and motivations. Comparing ratios of internal to external network links allowed us to assess relative levels of bonding, linking and bridging social capital. Subsequent participatory analysis and discussion of these maps built the capacity of group members to strengthen their networks. Research is ongoing to test whether computer-based SNA is simple and practical enough to be used by rural service providers.

Sun - Jan 27th - AM   **Community Economic Networks. Chair: Valids Krebs**

9:00 AM   Social Network Analysis: A Cluster-Based Economic Development Management Strategy

Neil Reid
neil.reid@utoledo.edu
Bruce Smith
Michael Carroll

In recent years, cluster-based economic development has gained in popularity as a strategy for local economic development in both the United States and abroad. For a cluster initiative to be viable, it must operate as a network driven economic strategy that stresses communication between participants in the core industry, the core's local suppliers, as well as local government and support institutions, such as universities, think tanks and development agencies. While many researchers have argued that collaboration is a key to cluster success, none have empirically examined the relationship networks in a cluster. This research is a case study of the social networks in a northwestern Ohio greenhouse cluster that has been developing since 2003. In this paper, we will discuss the conceptual framework of cluster-based local economic development. Within that context, using social network analysis, the previously invisible networks through which participants collaborate on projects, share new ideas, and provide advice and support are unpacked. In addition, the utility of social network analysis for the strategic management of a cluster is evaluated. Finally, the benefits of integrating social network analysis with Geographic Information Systems in client consultations will be discussed. This paper is the initial phase of a larger project focusing on the role of networks in local economic development.

9:20 AM   Social Network Mapping as a Method to Positively Influence Transformation of Low-Income Communities: the Case of San Antonio's West Side

Tamara Casso
tamaracasso.photoethnography@gmail.com

This paper focuses on social network mapping projects developed by seven community-based organizations located in the West Side of San Antonio, Texas. The West Side is a Mexican-identified community with many unique neighborhoods each with historical, cultural, linguistic, and family ties to residents past and present (WS CRECER 2007). It is home to 134,000 residents, the majority of which are educationally and economically disadvantaged. The Annie E. Casey Foundation selected the West Side for its neighborhood transformation/family development initiative, Making Connections-San Antonio. The initiative's intent is three fold; first to enable residents and community-based organizations to voice the needs of the community; second to provide technical assistance in evaluating and addressing these needs; and third to facilitate building 'smart' networks between residents, organizations, and institutions. Through 'weaving' social networks among residents, non-profit and faith-based organizations, businesses and government, creative community transformation is being achieved on the West Side (Holley 2007). The West Side Center for Resident Engagement in Community Evaluation Research (WS- CRECER), a community-based participatory research center that is an initiative of the Casey Foundation's Making Connections-San Antonio, provides a culturally relevant learning environment in which to develop resident capacity to conduct applied research and evaluation (WS CRECER 2007). In 2007, over fifty resident leaders participated in Smart Network Analyzer® training, which resulted in seven social network mapping projects. Utilizing this software, resident leaders have found a user-friendly research methodology that can demonstrate the powerful linkage between social networking, resiliency and authentic community demand for change.

9:40 AM   Identifying Regional Industry Clusters Using an Input/Output Network

Tim Weidemann
tweidemann@fairweatherconsulting.com
Tayo Fabusuyi

A major goal of regional economic development efforts is the strategic attraction of new firms to strengthen the region's economy. An approach often employed by Economic Development Organizations (EDOs) is the use of industry cluster analysis to target attraction and retention efforts on firms within the region's identified clusters. Typically, this approach begins by identifying the industries present in a region, and then proceeds to identify clusters within this set. However, the industries that are missing from the regional cluster, but which are present in larger-scale economies and geographies, are a promising target that is often overlooked by EDOs. In this paper, we present a hybrid micro and meso analysis model to identify clusters and subsequently use the clusters identified to develop a targeted regional approach to business attraction. The model is a three step process and involves the use of Social Network Analysis to identify clusters within the national Input/Output tables; a broad industry scan to validate the industry clusters identified in the national table; and an examination of the regional input output tables for several counties in New York State and their comparisons with the national table. We use this comparison to identify nascent clusters that EDOs can cultivate and expand.

10:00 AM   Analyzing regional industry development by social network method – take Shanghai industry as an example

Jin Zhang

wanminguo@163.com

The industry in Shanghai plays an important role in the economy development in the Yangtze Delta Areas. The purpose of this paper is using the methodology of social network to quantitatively analyze the interaction between Shanghai industry and the industry cluster in the whole Yangtze Delta Areas. The paper tries to establish an social network model to analyze regional industry development and the propose some suggestions for the regional industry development.

10:20 AM   Mapping Community Networks

Valdis Krebs

valdis@orgnet.com

Many econoic development, community building and not-for-profit organizations are looking at their social and economic networks, mapping them and then weaving new connections to attain their organizational goals. I will review several actual projects from the last 4 years in major US cities. Discussed will be the survey instruments, networks mapped, and action steps taken from insights from the maps.

Sun - Jan 27th - AM   **Ethnicity and Networks. Chair: Clifford Broman**

9:00 AM   How to Become Famous: Popular Culture Networks

Elizabeth Currid

currid@sppd.usc.edu

Gilad Ravid

One of the central explorations in recent studies of popular culture is the process by which a cultural product (or person) establishes popularity and distribution (or in the case of people, "fame") through the wider consumer market [1, 2]. Two theories put forth argue that first, cultural goods become increasingly successful because people see what other's are consuming (whether music, art, fashion etc.) which encourages more people to consume those particular products thus reinforcing their legitimacy and cumulative advantage over other goods [1]. Another theory argues that those cultural producers who are in highly elite but authoritative social networks are more likely to be successful as they will have greater access (e.g. "weak ties" [2]) to cultural authorities or "gatekeepers", along with access to other important cultural figures [3, 4] and greater possibility of distribution to consumer markets [5]. We are interested in the structure and behavior of the social networks of successful cultural producers, (e.g. "celebrities") and seek to unearth possible characteristics of these networks that may influence the success of pop culture producers and their products. We started to build a network of celebrities by looking at their social behavior patterns. We use documented elite social events as a proxy for celebrity social activity. We employed a special web agent that retrieves the entire caption and all associated data linked to a public image (photograph) associated with a particular cultural event. We used Getty Images photography data from March 2006 through March 2007 as our data source. Each Getty image also has free text description which lists the names and occupations of those in the photograph along with date and place of event. A destined text mining tool extracts from the description names of photographed people. For geo-network analysis we have employed coders to encode the event's addresses. a The data set contains 6000 events, 616,248 images and more than 1,013,376 person-image links. Our presentation will discuss the purpose of the study, method and present results. The results, so far, support several of the aforementioned theories on popular culture [2,4]. [1] Salganik, M. J., Dodds, P.S. and Watts, D.J. (2006). "Experimental study of in-equality and unpredictability in an artificial cultural market." Science 311: 854-856. [2] Currid, E. (2007) The Warhol Economy: How Fashion, Art and Music Drive New York City. Princeton University Press [3] Currid, E. (with Ravid, G.) (2007). How to Become Famous: Join the Celebrity Network. Gawker Media: Gawker.com [4] Granovetter, M.S. (1972). "The Strength of Weak Ties." The American Journal of Sociology 78 (6) [5] Hirsch, P. M. (1972). Processing Fads and Fashions: An Organization-Set Analysis of Cultural Industry Systems. The American Journal of Sociology 77(4): 639-659.

9:20 AM   Reporting on social networks: The role of race

Clifford Broman
broman@msu.edu

The fundamental basis of much of the research on social networks is self report. That is, respondents tell an interviewer who the people in their social network are, and report on other characteristics that the interviewer might ask about. The research on self report generally finds that people are relatively honest, but there are some issues that have been insufficiently addressed. One such issue is the reporting of network members by race and ethnicity. In this paper, we address the issue of how reports of network members may vary by the perceived race of the interviewer. We use data from a random sample survey of the State of Michigan. The data were collected in the spring of 2007. We hypothesized that respondents would be more likely to report friends who are minority when they perceived that the interviewer was a member of a minority group. Results were as follows. First, white respondents were significantly more likely than non-white respondents to report only white network members. African-Americans reported a much higher proportion of white network members, and people from minority groups other than black were much more likely to report white network members. We found support for our basic hypothesis. For both African-American and white respondents, the perception of the interviewer being white increased reports of white network members. For whites, the perception that the interviewer was African-American increased the report of black network members. For African-Americans, the perception of the interviewer being black increased reports of black network members. Implications of the results will be discussed. As a post-script, no more than 82% of the respondents accurately named the race-ethnic group of the interviewer.

9:40 AM   A LOGITUDNAL STUDY ON THE BARRIERS TO SOCIAL CAPITAL UTILIZATION: IMPACT ON OUTCOMES FOR VISIBLE MINORITIES

Arjun Bhardwaj
arjunbhardwaj@hotmail.com
Israr Qureshi
Alison Konrad
Seung-Hwan (Mark) Lee

Research on the structural perspectives of social capital has underscored the importance of occupying structurally advantageous positions in social networks. Scholars within this stream of research emphasize that certain positions in social networks are more advantageous than others and individuals who occupy these structurally advantageous positions gain several benefits. For example, individuals located in these structurally advantageous positions gain greater brokerage opportunities, have better access to information about resources, and are able to better coordinate information sharing. Consequently, individuals located in these structurally advantageous positions may achieve higher performance, faster promotions, and greater career success. These positive outcomes associated with network positions are typically assumed to be identity neutral. That is, these advantages would accrue to individuals irrespective of their gender or race. We integrate the aforesaid structural perspective of social capital with research in social psychology to propose that race/ethnicity may be a boundary condition to the positive relationship between social capital and positive outcomes. Specifically, we delineate mechanisms and interaction patterns in social networks that reduce social capital payoffs for visible minorities. We empirically test our arguments in a cohort of undergraduate business students. Results from network regression analysis using quadratic assignment procedure support our hypothesis. Specifically, the relationship between centrality in the friendship network and satisfaction is significant in the expected direction for whites but not for visible minority students. Further, results from a longitudinal analysis reveal that these disadvantageous for visible minorities persist over time. The theoretical and practical implications of our research are discussed.

10:00 AM   Beyond Racial Homophily: An Analysis of Social Network Formation among College Students

Andreas Wimmer
awimmer@soc.ucla.edu
Kevin Lewis

"Race" has long been considered one of the most important principles for the formation of communities in US society, a view supported by many studies of racial homophily in social networks. In this paper, we draw upon a new social network dataset using Facebook.com (consisting of a complete cohort of 1,640 college students) to suggest that a large part of the racial homophily documented in past research is the product of routine theoretical assumptions about the relevance of race—and of research designs that correspond with these assumptions. First, we demonstrate with exponential random graph models (ERGMs) that past network studies have overestimated the importance of race by failing to control for three other important factors: 1) homophily based on lower levels of categorical differentiation, such as region-of-origin (Middle-East, South-Asia, etc.) or country-of-origin categories; 2) network effects, such as reciprocity or transitivity; and 3) homophily on other dimensions, such as academic interests. Second, using additional ERGMs and goodness-of-fit plots, we elaborate a model of social network formation that closely resembles our observed data without imposing the dimensions of homophily that the model is supposed to trace. The model suggests that the social world consists of a diverse landscape of networked groups—some of which are based on racial or ethnic similarity (especially homophily among black students), but most of which are not.

10:20 AM   Insurgency in Sudan

Patrick T. Colloton
nroberts@nps.edu
Benjamin R. Maitre

Tommy E. Stoner
Nancy Roberts
Sean Everton

Neither economic sanctions nor diplomatic initiatives have found a significant degree of success in curtailing violence in the Sudan. The struggle in southern Sudan has resulted in over two million deaths over a 21-year period, while displacing four million people within Sudan. In Darfur, at present it is estimated that approximately 450,000 persons have been killed since 2003, with an additional 2.3 million displaced either internally or into neighboring Chad. Despite international sanctions, the efforts of humanitarian relief organizations, and the presence of both African Union (AMIS) and United Nations (UNMIS) peace-keeping forces, the Sudanese regime, and opposing factions continue to resist an effective negotiation process or an arbitrated solution. This research fuses geospatial analysis, ethnography, and social network analysis to identify and explore multiplex tribal, ethnic, coalitional, and operational relationships among Sudanese insurgent organizations. Results identify 19 insurgent organizations, 6 coalitions, and 57 tribal groups. Contrary to conventional conflict resolution theory and practice, the results suggest that the route to influencing the conflict in Sudan is through tribal affiliations.

Sun - Jan 27th - AM

Networks and Teams. Barbara Schultz-Jones

9:00 AM

Coolr - Peer Support Through Social Networks

Ido Guy
ido@il.ibm.com

In today's global world and the age of information overload it is crucial to get access to information as fast and efficiently as possible. Social software, such as blogs, wikis, and forums, has facilitated information sharing. Yet, a lot of information is still tacit, and resides only in people's minds. One of the biggest challenges in global organizations is locating the right people to help in solving a problem. Coolr is a system for peer support that tries to imitate the process of finding an answer to a question in real life: we usually start with people we know - roommates, colleagues, or friends and hope that they will be able to answer or to refer us to the right direction. This way, after a few iterations at most, we normally reach a person with social proximity to us, who might not be the number one expert for the subject, but is more likely to be motivated to help due to the social adjacency. What Coolr offers, in essence, is to use social networks to regulate traffic of questions. On the one hand, people will only get questions from people they know, and are thus more likely to respond. On the other hand, since people will forward questions to people they know they are likely to be more careful and accurate w.r.t what they forward to whom.

9:20 AM

Social network collaboration patterns in a public service model

Barbara Schultz-Jones, Ph.D.
bjones@lis.admin.unt.edu

Examining human interaction networks contributes to an understanding of factors that improve and constrain collaboration. This study examined multiple levels of networks that exchange information within a public service model designed to strengthen community partnerships by connecting city services to community neighborhoods. The research setting was the Neighbourhood Integrated Service Teams (NIST) program in Vancouver, B.C., Canada. A combination of research methods including surveys, semi-structured interviews, field observation and feedback sessions with the participants, combined with social network analysis of interactions within sample teams and across the full program membership, provided insights into the complexity of the model's operation. The social network structure provided the framework to enable information use and collaboration among team members. Other design characteristics worked in tandem with the network structure to address information needs: face-to-face meetings, email, personal interactions, and boundary spanning activities. The results indicated that the information networks operating in the context of this complex public administration setting illustrated dimensions of social capital, transactive memory, and public goods theories. These results suggest that the structural design of the program corresponded to the

contextual realities in the City of Vancouver and was effective for accomplishing program goals. The information environment of NIST demonstrated a complex combination of network interactions that ultimately translated to successful delivery of public services.

9:40 AM   Networks of trust in distributed work groups
Tom Julsrud
tom-erik.julsrud@telenor.com
An increasing number of teams and groups have members who are distributed at multiple sites, often working in different departments or organizations, sometimes also in different countries. Although separated in space such units must collaborate and deliver results and value to their organizations. It is now generally acknowledged that trust is a core asset for such groups, as it can help to reduce conflicts and enhance knowledge sharing and efficiency. This article argues that a network approach can be useful for developing a deeper understanding of the development of trust in such groups. A network approach makes it also possible to explore and analyze the flow of trust across geographical boundaries, as well as the roles individual actors' may have in trust networks. This paper present results from a series of case studies of distributed workers in a Scandinavian telecom company. Networks of affective and cognitive trust are analyzed in these groups, as well as their internal communication networks (mediated and face-toface). The findings suggest that affective and cognitive trust follow different patterns although with significant overlaps. Moreover we find that individuals acting as trust brokers, connecting different part of a dispersed group, are particular important for the development of general trust within distributed groups. The role of trust brokers in distributed groups are then further discussed with reference to literature on brokerage and boundary spanning.

10:00 AM   Can Network Analysis and Simulation of Distant Thunderstorms Explain Spontaneous Synchronization of Lightning Flashes?
Gilad Ravid
gilad@ravid.org
Yoav Yair
Aviv Reuven
Colin Price
There is now a considerable body of theoretical and experimental research that relates the properties of complex dynamical phenomena in nature to those described by network theory [Strogatz, Nature, 2001]. In this context, a network is a system composed of several separate interacting entities, relating to each other in different modes with varying levels of complexity. We propose that thunderstorm cells embedded within mesoscale convective system (MCS) constitute a network, and that their lightning frequency is closely connected. Analysis of space-shuttle video footage of 6 storm systems with varying flash rates showed that when the storm flash rate was high, lightning activity in horizontally remote electrically active cells became clustered, with bursts of nearly simultaneous activity separated by quiet periods [Yair et al., JASTP, 2006]. This behavior is similar to the collective dynamics of a network of weakly coupled limit-cycle oscillators, best described in terms of phase-locking of a globally coupled array. We expand our analysis to other data-sets of thunderstorm activity, derived from ground-based lightning location systems, and compare the basic parameters of the observed lightning rate with predictions of random-graph network models. Initial results suggest

that network theory parameters of lightning activity in distant cells exhibits a high clustering coefficient and small average path lengths. This type of networks is capable of supporting fast response, synchronization and coherent oscillations. Several topologies of the thunderstorm network were simulated with varying degrees of coupling, assuming a fixed probability of links between active cells. The results suggest that when the coupling in the network is higher than a certain critical value, all thunderstorm cells will eventually flash in a synchronized manner. Steven H. Strogatz S. H. (2001) Exploring complex networks. Nature 410, 268-276 (8 March 2001) Yair, Y., Aviv, A., Ravid, G., Yaniv, R. , Ziv, B., Price, C. (2006) Evidence for synchronicity of lightning activity in networks of spatially remote thunderstorms Journal of Atmospheric and Solar-Terrestrial Physics, 68(12), PP. 1401-1415

<table>
<tr><td>Sun - Jan 27th - AM</td><td>**Qualitative Network Studies. Chair: Beverly Wellman**</td></tr>
</table>

Sun - Jan 27th - AM

Qualitative Network Studies. Chair: Beverly Wellman

9:00 AM Mixing Ethnography and Information Technology to Assess Organizational Innovation Networks

Julia Gluesing
j.gluesing@wayne.edu
Tara Eaton
Ken Riopelle
James Danowski

As part of a National Science Foundation study of innovation diffusion networks in global networked organizations, a team of researchers has been collecting data which flows through the information technology infrastructure at Ford Motor Company, General Motors Corporation, and DaimlerChrysler Corporation to display diffusion patterns and networks dynamically. In addition to this IT-based method, the team is also gathering information about the diffusion networks using ethnographic interviewing and shadowing techniques, where anthropologists are observing network actors' communicative behavior as they go about their daily work. The ethnographers also are asking organizational participants about the innovation project itself to assess the extent of adoption, to learn more about the innovation process and to uncover both obstacles and innovation accelerators in the diffusion process. The purpose of this paper is to provide an example of the ethnographic techniques and how they are being used to supplement the IT-based network data as well as to provide some of the initial findings from the ongoing research.

9:20 AM Networking Towards Professionalization: The Case of Four Complementary and Alternative Medicine Occupations

Beverly Wellman
bevwell@chass.utoronto.ca

Networks have a role to play in the way in which occupations move towards professionalization, either by facilitating their goals and aspirations or by constraining them through the lack of key network members. The study of social networks has become one of the major ways to make sense of organizational life, from the emergence of new organizations to professional collaborations within and across organizations and organizing change. We chose to study four health care occupations in the process of professionalizing. We interviewed the leaders (34) of four complementary and alternative health care occupations (chiropractors, naturopaths, homeopaths, traditional Chinese medicine doctors/acupuncturists) in Ontario, Canada, in 2004 about their goals for their occupation and asked them whom they talked to about matters related to getting ahead professionally. In this qualitative study, we included a section on professional relationships in which we asked five standard network questions related to occupational ties. For example, we asked who do you talk with about professional matters such as standards of practice and codes of ethics and who do you consult with about regulation and licensing matters? It was our plan to follow-up with in-depth questions related to strength of relationship, frequency of contact and occupation. The most striking results, however, were the ways in which the questions were answered. It was in more general terms such as other members of the association, other faculty members of the colleges, and other colleagues from allied health professions. In the end, we had a list of leaders and their affiliations together with in-depth responses to questions about moving their profession forward. Therefore, affiliation networks seemed the most appropriate analytic tool for examining this data. We began by defining Intra-organizational and Inter-organizational contacts, followed by affiliation matrices, co-membership matrices, and organizations linked by shared members. The major finding is that chiropractors, the most professionally advanced group, had the highest total number of contacts per leader (9.8). By comparison, the naturopaths had an average of 8.9 contacts per leader. Despite the similarities in network structure, the qualitative material from the interviews revealed that the chiropractors felt challenged by the negative press they had been receiving and the naturopaths felt empowered by the inroads they were making as a profession. The homeopaths and traditional Chinese medicine doctors/acupuncturists had similar profiles in terms of the average number of intra and inter organizational network ties, yet the traditional Chinese medicine doctors/acupuncturists have just been granted self-regulation and the homeopaths are still waiting for regulatory status. The interviews revealed that despite a lack of cohesion in both groups, the traditional Chinese/acupuncture leaders were able to influence the political process in ways that the homeopaths have yet to demonstrate. Without the in-depth qualitative interview data, the network data is insufficient.

9:40 AM **"The 'Real' Value of Fakes: Network-based Subcultures of Brand Appropriations and the Implications for Consumer-Brand Relationships"**

Renee Ann Richardson
rrichardson@hbs.edu

My research examines a setting where managers cannot exercise control over consumers' relationships with their brands: counterfeit markets. Firms are now vigorously combating counterfeits and the market has responded by becoming increasingly network-based. Consumers are now able to shop at in-home "purse parties" similar to Tupperware parties. My research investigates the impact of these network-based markets on the consumption of counterfeits, and consequences for consumers-brand relationships. My methodology is qualitative; I conducted a longitudinal ethnographic study over the course of a year in two market settings: 1) the socially-embedded "purse party" network, and, 2) the anonymous street vendor market. I studied the impact of the consumption of counterfeits in each type of market on consumers' attitudes toward the authentic brands. My findings indicate that consumers who purchased counterfeits in network settings exhibited a higher propensity to later purchase the authentic good (controlling for prior purchase of the authentic good). These results counter the conventional wisdom that counterfeit purchases preclude the consumption of the authentic brand. We know that a person's value for an item increases once she owns it (Kahneman and Tversky, 1984), however, it has also been shown that it is possible to experience a "pseudo-endowment effect" without actual possession (Ariely and Simonson 2003; Sen and Johnson 1997). I will argue that this pseudo-endowment effect is operating with counterfeits, but that the consumers feel attachment to the authentic brand. This is because in the socially-embedded setting, consumers re-negotiate their social identities as the brand becomes aspirational. In these networks that I

observed, the consumers had never purchased the authentic brand (their in-group was "too smart to pay for the real thing"), and they made negative attributions to those who do (the out-group was described as "label-conscious and frivolous"). However, as these consumers' positive self-images became salient among their friends, the constant reminders that they were consuming counterfeits ran counter to their self-concepts and caused tension. Research has shown that consumers view their possessions to be extensions of themselves (Belk 1988). Therefore, these consumers experience tension because that they are no longer in the in-group as previously defined, but they can no longer make the negative attributions to people in the out-group, as they now desire the authentic product. The tension is relieved by, in many cases, transitioning to a new group – adopters of the authentic good. The key factor here that moderates this process of social identity re-negotiation and pseudo-endowment effects is the social network.

10:00 AM Vennmaker 1.0 – Bridging the Gap Between Qualitative And Quantitative Social Network Analysis. A New Software Tool in the Making

Michael Schoenhuth

schoenhu@uni-trier.de

In organizational research and consultancy in recent years there is growing use of participatory appraisal techniques to represent the views of stakeholders on their organizational setting, to analyze and plan together in a participatory action research frame. While these techniques (known as 'institutional diagrams', 'venn diagrams'or 'chapati diagrams') have had a successful career in organizational development and international aid projects, from a scientific point of view they are faced with at least three major constraints - through the qualitative and actor centred appraisal process, the results would not come up with scientific validity standards - the process oriented diagrams would only allow statements for an arbitrary time section - the assessments and categories of participating actors would not allow for quantification and replication within whole organizational settings This contribution will introduce an interdisciplinary effort of social scientists and software specialists in the Cluster of Excellence at the University of Trier – Germany, to develop a tool that combines the advantages of participatory Venn-Diagrams and software based quantitative computer analysis. The actor-centered appraisal- and analysis software should be useful within scientific network analysis as well as in client-oriented consultancy or stakeholder analysis within development aid programs. While the first steps are encouraging, the team also faces challenges especially at the interface between human agency and software complexity, which we would like to discuss with you mainly from the social scientists point of view.

10:20 AM Where's (not What's) the Message? Religious Organizational Networks and HIV Prevention in Rural Malawi

jimi adams

ja2441@columbia.edu

Researchers studying intra-organizational information flow frequently address questions of efficiency and structure of formal and informal networks. In an examination of within-denomination HIV-related messages in rural Malawi, I find considerable differences in the content and presentation of these messages in ties focused at the local-congregational level as compared to those that bridge the national-denominational level. This initially appears to be evidence of poor efficiency, and lack of internal agreement within denominational networks. However, by refocusing the question from what organizations say to where messages are said (and constructed), a picture of message concordance arises that more directly matches the relevant local-network patterns.

Sunday, Jan. 27   Morning 2

Semantic Network Analysis. Chair: James Danowski

11:00 AM Procedures for the Precise Analysis of Very Large Textual Datasets.

Hao Chen
imick24@gmail.com
Carolyn Evans
Brenda Battleson
Ezra Zubrow
Joseph Woelfel

Artificial Neural Networks have been widely used in the analysis of text. In general, they provide richer, deeper and more finely detailed clusters than co-occurrence models because of their ability to consider indirect connections among words. Since the number of possible indirect connections increases exponentially with increases in size of the network, this advantage should be greatly amplified in very large datasets. In this study a very large neural network running on the CCR supercomputing cluster at the University at Buffalo was used to analyze text retrieved from a six-month search of 4500 world news sources about disabilities rights. Increasing the size of the neural network allowed more connections between concepts to be discovered. This lead to a network that was better trained and results that were more detailed and informative, showing more depth.

11:20 AM Analysis of Email Senders & Receivers and Semantic Message Content Networks in Innovation Management

James Danowski
jimd@uic.edu
Julia Gluesing
Ken Riopelle

Large volumes of email have in recent years been analyzed with social network analysis techniques using senders and receivers as nodes. Often such analysis is done either with the publicly available Enron corpus or with individual's personal mailbox contents. In contrast, this study demonstrates the real time capture of samples of organizational email and its analysis in near real time. In such efforts there are strategic reasons for selecting time segments of email for comparative semantic network analysis. One reason is that during a particular period in time email users exhibit who-to-whom network structures that are indicative of collaborative online innovation networks (COINs) (Gloor, 2007). Condor (Gloor, 2007) software is effective for identifying COINs. When such groups form, it is of interest to study the content of what they are communicating. While Condor also performs some useful analysis of message content, its approach is limited compared to WordLink (Danowski, 1982, 1993, 2007). WordLink is particularly effective at automated identification of semantic network components that are significantly associated with the formation of these innovation groups. As well OptiComm (Danowski, 2007), through automated analysis of semantic networks, identifies optimal messages that are most likely to successfully introduce new concepts into discussions, reinforce existing threads, or contribute to their dissolution (Danowski, 1982). Email data from a global networked automobile company are used to refine the Condor, WordLink, and OptiComm methods, increase the automation of their implementation, and integrate them in a strategic innovation management context. The approach is generalizable to organizations that use Outlook or Eudroa for email.

11:40 PM Narrative Networks and Culture: Structure in the Service of Action

Ryan Light
light.36@osu.edu

Can networks help us understand qualitative texts, such as song lyrics, scientific articles, or memoirs? With the proliferation of digital media, scholars have created numerous techniques grounded in social network analysis to organize and analyze textual data. Information scientists, for example, use networks to explore the more opaque relationships structuring science, such as knowledge communities or invisible colleges. Linguists have also used networks to analyze text developing a structural approach to language grounded in the shared relationships between words in large-scale semantic networks. Simultaneously, sociologists and other scholars studying culture have theorized that culture, often seen as the purview of micro-oriented research, develops structurally and relationally. These scholars call for a relational, networks-based approach to understanding cultural objects, such as texts. Using a unique dataset comprised of 19th century American slave narratives, this paper explores how networks can locate similarities and differences between texts often overlooked in typical qualitative analyses. Based on similarities derived from the co-occurrence of words, the emergent networks in this analysis describe the central themes within the slave narratives from the quotidian, such as daily chores, to the extreme, such as torture. Outliers highlight the diverse experiences of the narratives' authors. I conclude by describing how these methods can inform more qualitative approaches to studying culture.

Making Sense of Public Ties: Online Ties. Chair: Emily Plant

11:00 AM **What's a friend when you have thousands? The implications of online social networking for social network theory**
Emily Plant
emily.Plant@uky.edu
Josh Marineau
Ajay Mehra

Online social networking has really taken off. According to recent estimates, social networking sites now account for about 10% of all traffic on the web. Although this phenomenon has been made much of in the business and popular press, there has, with some notable exceptions, been little discussion thusfar on the topic in published social network research. In this paper, we hope to initiate a critical dialogue about the implications of online social networking for social network theory. Specifically, we examine how online social networking-- because of the new ways it allows people to form, learn about, monitor, enforce, and leverage their social contacts-- offers new, testable insights about how people perceive and manipulate their social worlds.

11:20 AM Unpacking the Tie: A Research Agenda for Qualitative Research into the Meaning of Virtual Ties
travis grosser
travis.grosser@yahoo.com
Ajay Mehra
Steve Borgatti
The subjective meanings individuals attach to their social network ties have been purposively ignored in much social network analysis. Indeed, the structuralist perspective in social network analysis appears to have taken as a foundational principle the Mayhewian conviction that any science "which assumes that individuals in fact know what they are doing is in serious difficulty" (Mayhew, 1968:8). This stance is problematic because much social network research relies on individuals' reports of their ties as its primary data. Yet the social network tie has been treated largely as a black-box affair. In this conceptual paper, we propose a research agenda that seeks to open this black-box. To illustrate the potential fruitfulness of such an agenda, we show in this paper how qualitative research can be used to gain a better understanding of the subjective meaning that actors attach to their online social network ties, and we discuss the value of this understanding for social network theory

11:40 PM Gaming Ties: Social Networks, Player Success, and Enjoyment in Online Games

De Liu

de4liu@gmail.com

Massively multiplayer online games (MMOG), such as World of Warcraft and Everquest, have become hugely popular in recent years. Most of the research on electronic gaming has focused solely on a human-computer (HC) framework. In the HC framework, researchers try to understand players' motivations and design features that help them achieve these motivations. This HC framework has virtually ignored the social interactions among online games as facilitated by in-game interactions and out-of-game interactions such as discussion forums. In this paper, I build theory and offer testable hypotheses linking social embeddedness within the virtual community of the MMOG to player success and the enjoyment of the game by players.

Gender and Social Networks. Chair: Renee Ellis

11:00 AM   Dynamic Geospatial and Social Network Simulation: Dynet

Il-Chul Moon

icmoon@cmu.edu

Traditional social network analysis has dealt with only a snapshot of a social network of people-to-people relations with little attention to geo-location of those people. Thus, the traditional analysis is not able to capture 1) dynamic evolution of social networks in space and 2) what-if scenario assessment in space. Dynet is a multi-agent simulation for network analysis that evolves social and knowledge networks. Herein, we describe how this can be extended to include a spatial component in the simulation. Agents in the extended Dynet have social interaction mechanism such as homophily and geospatial relocation behavior following law of propinquity. These agent behaviors evolve the social network in space. We apply Dynet to a multi-mode and multi-plex network, or Meta-Network, and observe the network evolution through time and space, the correlation between the social and geospatial dimensions, and the near term impact on networks as nodes and edges removed. Particularly, this paper displays the result from the simulation of a global terrorist network. In Dynet, the terrorist network evolves over time and changes key terrorists as well as key locations. Also, we strategize a set of node and link removals and observe the change of the integrity of the terrorist network.

11:20 AM   Gender, Welfare State, and Social Networks: A Cross-National Comparison

Renee Ellis

ellisrr@uci.edu

The interaction of gender equality and welfare state policies has typically been studied using comparative studies of policies on various items such as childcare availability, child leave, and lone parents. What has been understudied is the impact of welfare state policies on social support networks and how network differences impact gender equity. Some work has been done that shows differences in the social support networks of men and women and how these differences contribute to norm development, traditional social roles, and the continuation of gender inequality. However, there are no comparative studies of social network differences across welfare state regimes. This paper is an initial exploratory attempt to compare social support networks of women in different welfare regimes and examine the similarities and differences between women and men's social networks across these regimes. Using the ISSP Social Networks Survey (2001) comparisons are made on the structure of the social networks of women and the similarity to the structure of men's social networks across six countries: Finland, Denmark, Germany, Italy, Canada, and the United States.

11:40 PM   Micro Credit Finance and its influence on the social networks of Ghanaian village women

Michael Asare-Bediako

r.raeside@napier.ac.uk

In many parts of the developing world micro credit is perceived as a powerful tool to enhance wellbeing, especially the well being of women. To study this effect sociometric data has been collected by interview from women in three villages in Eastern Ghana. In these villages women engaged to different degrees in micro finance schemes. Engagement in these schemes was generally found to be beneficial for women in being associated with increased autonomy and economic well being. When the social networks of micro credit users and non users were compared it was found that the influence of friends and contacts was less important in influencing behaviour amongst micro credit users than non users. Generally in the social networks of the village women measures of centrality were found to be far greater amongst the non users of micro credit than the users. Accordingly as a predictor of number of children the centrality of women in their social networks was found to be more powerful than classical variables such as female autonomy. These points to the conclusion that in the absence of modernising initiatives such as the development of micro credit schemes the influence of friends and associates is a powerful determinant of behaviour.

12:00 Noon **A "New Girls Club": Using Social Network Analysis to Assess the Effectiveness of Efforts to Remedy the Isolation of Women in Academia**

Maria Plummer
mmp36@njit.edu
Starr Roxanne Hiltz
Nancy Steffen-Fluhr

The isolation of female faculty members in the Science, Technology, Engineering, and Mathematics (STEM) fields in academia has been identified as one of the primary reasons for the disparity between the rates at which men and women in these fields advance in their careers. Isolation limits opportunities to get vetting of new ideas and research initiatives. It limits access to tacit knowledge; timely news about hot research areas and funding opportunities; unpublished research; invitations to join grant initiatives; support for intellectual exploration and risk-taking; guidance that demystifies promotion processes; and, brokered connections to the high status people. In short, it cuts women off from the assets that flow to male peers through their social networks or the "Old Boys Club". To address this problem, a Science and Technology University, with NSF funding, is undertaking a number of strategies aimed at expanding collaborative networks of its faculty members, and in particular, its female faculty members in the STEM fields. To assess the effectiveness of these strategies, the social networks of a sample of the university's academicians before and after the implementation of the strategies are to be analyzed and compared. Thus far, baseline or "before" data on the social and research networks of this sample have been collected. In this paper, we discuss the results of the initial social network analysis of the baseline data collected. Results of analyses of ego networks, subgroups and the entire network of the participants are presented.

Classroom social networks. Chair: Chyi-In Wu

11:00 AM Educational System, Class Climate and Students' Academic Achievement: The Interplay of Structure and Context

Ming-yi Chang
cmy@gate.sinica.edu.tw
Chyi-In Wu

Traditional sociological theorists have attempted to answer the question on mutual influences of social structure and human behaviors, though the mechanism still remains unclear. Adapting two panel data from Taiwan Youth Project and Taipei Youth Project, with complete network data for numerous networks in classes from a varity of schools, we intend to examine the theoretical arguments about macro-structure effects, inter-group relations and individual outcomes which Blau (1977, 1984) proposed about heterogeneity and Inequality. The purpose of this study is to test the macro-level structure, as indicated by two different educational systems, local structure and context, as indicated by different class environments where individual are embedded in, and the interplaying impacts on individuals' academic achievements. As to the measurements, network cohesion and class climate are used to reflect the class context so as to examine the covariates among network structure, context and students' behaviors. Multilevel p* models will be employed to investigate the mechanism, how macro structure influences local context and local relations and then further alters students' behaviors. Further discussions will be provided to discuss about the theoretical implications.

11:20 AM **Chain Reaction: How Teacher Communication Networks Change Individual Attitudes about Reform**

Russell Cole
rpcole@dolphin.upenn.edu
Elliot Weinbaum

This paper focuses on the impacts of several in-school communication networks on teacher attitude about school reform. Drawing on previous research that shows a link between attitude and behavioral choices, we focus on teacher attitude as a vital piece in understanding the process of school change. Using longitudinal data from a sample of nine U.S. high schools, we analyze three different types of communication networks; an established instrumental or professional advice-seeking network, a friendship or expressive network, and a newly developed network specific to the reform effort underway. We empirically demonstrate that teacher attitude about reform is a function of the social environment of the school. More specifically, we find that the expressive network has the greatest influence on teacher attitude about reform efforts, both in terms of teachers' direct connections and their indirect connections. The established instrumental network has a similar, though less strong impact on teachers' attitudes and is more limited to direct communication partners. The newly developed reform network has the least impact on teacher attitude about the reform effort that is underway. In addition, teachers' attitudes increasingly come into balance with those of their peers, both those peers with whom they are in direct communication and those who are at some remove from a particular teacher but still contribute to the normative pressure in the organization. Overall, our paper provides strong evidence of the influential nature of pre-existing social influences even in the face of significant reform efforts.

11:40 PM **Pattern and variability identification in children's cognitive processes**

Rafael Hurtado
rghurtadoh@unal.edu.co

We use Social Network Analysis to study children cognitive processes when learning to write numerals. The model is based on the affiliation of children to the strategies they use to write numerals, these strategies are constructed in representations which combine the syntactic morphology of numerals and the structure of syntactic errors. Due to this structure the mapping of children, numerals and strategies give information on the transcodification process. Results of this application are the identification of a superposition of the syntactic structure of numerals and specific advances in the learning process, patterns which group children according to the composition of the set of strategies they use, and a methodology which can be used to evaluate school communities and educational programs. The field work was carried in eight schools of the city of Cali, in Colombia, and data reveal further possibilities for this study as the lexical structure could be better probed by comparing languages.

12:00 PM **Are teachers the most influential? Methods for creating and empirical cutpoint.**

Michael Weiss

notmikeweiss@gmail.com

Russell Cole
Uncovering the most influential individuals in an organization may be of great use for researchers and practitioners. As central hubs in the organization, these individuals can be key co-creators or co-adapters for the diffusion of organizational reform. In this paper we examine the question "Who are the most influential individuals in an organization?" Using social network data, we assess organizational members' levels of influence in four different advice-seeking networks, as well as in one "friendship" network through a measure of peer-endorsement. We investigate four methods for the classification of individuals as "influentials". Using the decision method developed by the authors (a random permutation procedure), we examine the characteristics of the most influential people in nine high schools across the five social networks. We find that teachers are disproportionately identified as most influential in the "course content and planning" advice network, and that administrators are rarely identified as most influential in this network. In contrast, administrators are disproportionately recognized as influential in the "classroom management" advice network. Furthermore, it is teachers, not administrators, whose influence spans multiple dimensions of conversation and can therefore be considered the most influential members of our sample of high schools.

Entrepreneurial Networks. Chair: Dimitri Christopoulos

11:00 AM Networks and political entrepreneurs: the relational dimension of exceptional action

Dimitrios Christopoulos

dc.christopoulos@uwe.ac.uk
Political entrepreneurs differ from economic entrepreneurs because of their distinct incentive structure and discrete structural constraints. To understand the actions of these exceptional agents a mere description of their decision making is not adequate. I contend that to comprehend these actors we have to contextualise them in their personal and professional relational networks. Management of their network as a resource is vital to their success. Most significantly, as all entrepreneurial activity bears risks, network relations are employed to mitigate them. I contend that a valid research framework would consider specific actions to be relatively entrepreneurial while individual actors to hold the potential for entrepreneurial behaviour. Focusing on an actor's relational context, it is possible to distinguish those elements most significant for entrepreneurial political behaviour. From a critical examination of the social science literature I propose a synthesis of theoretical view points by incorporating a relational perspective when presenting accounts of exceptional political action.

11:20 AM Partner value and successful business network development of entrepreneurs

Thorsten Semrau

semrau@wiso.uni-koeln.de
A large number of studies in the field of business network dynamics focus on factors responsible for dysfunctional network adaptation. Especially in the field of entrepreneurial network research some factors hindering proper network development like cognitive or relational lock-in-effects (Maurer & Ebers, 2006) have been identified. The aim of this paper is to propose a complementary perspective. In order to do so, 17 in-depth-exploratory interviews with entrepreneurs, successful in developing their business network were conducted and analyzed. Out of these data, a rationale for successfully adapting an existing business network to changing conditions was extracted. This rationale, which is mainly grounded on a multi-facet-concept of partner value, including the value of resources an external partner provides, the costs for resource provision, the collaborative capability match between the actors and the external partner's trustworthiness, but also takes the costs for network development into account, will be presented. Additionally, the interplay between the four partner-value determinants and the processes of establishing new partnerships and cutting existing network relationships will be explained.

11:40 AM Creativity, proximity and centrality: Entrepreneurial use of social media for business recovery

Teresa Luetjen-Keeler
tlkeeler@eden.rutgers.edu
Marya Doerfel

Recent disasters, such as Hurricanes Andrew, Katrina, Rita, and even the 9/11 attacks, demonstrated that such events are new contexts for understanding entrepreneurial activity. In the case of Hurricane Katrina, entire cities evacuated and businesses closed, for not just days but weeks, shutting off ongoing and entrepreneurial networks. The communication and network reactivation strategies following Katrina mimic those of a newly formed company and involve the entrepreneurs' abilities to rebuild their network relationships and strategic partnering. This study combines mediated communication theories with social capital and social support theories examined in the context of returning and rebuilding businesses following a natural disaster. An initial sample of nearly twenty entrepreneurs will be drawn from a list of New Orleans business leaders that recently participated in a National Science Foundation study of Hurricane Katrina. Then using a combination of snowball sampling (recommendations from the initial group of participants) and purposive sampling (listings from the city's Chamber of Commerce of businesses with less than twenty employees) an additional fifty participants will be selected. Since the individual entrepreneur can be viewed as the organization, differences among the entrepreneurs, particularly in terms of social media usage, could dramatically influence the network structure and recovery of their organizations. Entrepreneurs that use technology, specifically social media, in ways different from their peers, could also challenge previously held ideas about computer-mediated communication and social support networks and, ultimately, alter public policies funding business redevelopment.