ABSTRACTS

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INTERNATIONAL NETWORK FOR SOCIAL NETWORK ANALYSIS

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Abstracts

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2-Mode Networks: Culture & Health

How Do People Know Each Other? Categories of Knowing across Cultures Using a Two-mode Personal Network Approach
Bernard, H. Russell, Vacca, Raffaele, McCarty, Christopher, Al-Kuwari, Shaikha
University of Florida, Gainesville, FL, United States

Our previous research examined the co-use of linguistic categories of knowing in Thai. Twenty one respondents listed 30 alters and indicated which of 26 Thai words for knowing someone applied to each alter. An analysis of the distribution of co-use suggested optimal levels for collapsing categories. We expand on this additional work by adding data from other languages collected using a web survey. We also present alternative methods for identifying optimal levels for collapsing categories. While application of two-mode personal networks is limited we will suggest other potential uses in network analysis.

An Indonesian 2-mode Network Study of Gay, Bisexual and MSM Engagement with Social and Sexual Sites in Three Cities
Grierson, Jeffrey1, McNally, Stephen1, Hidayana, Irwan2
(1)La Trobe University, ARCSHS, Melbourne, VIC, Australia, (2)University of Indonesia, Center of Gender and Sexuality Studies, Jakarta, Indonesia

Background: We report on a 2-mode network study of gay, bisexual and other men who have sex with men and sites of social and sexual engagement in three Indonesian cities. The overall aims of the study were to comprehensively map the relationship between these men and the venues and to characterise the structures and pathways of these relationships.

Method: Men were recruited from Medan, Jakarta and Bali in 2012. Data were collected via an online questionnaire which included a separate site list for each of the three locations (10 in Medan, 13 in Jakarta, 11 in Bali). Participants were recruited both face to face and online. Participants completed the survey either at recruitment using a handheld device or hand-phone, or independently at another time.

Results: A total of 1329 men completed the survey with roughly equal numbers in each setting. Men had a median age of 26 years. 58% identified as gay/homosexual and 40% as bisexual. Around half (48%) had a regular male partner and 23% had a regular female partner. 53% had had an HIV test and 6% reported being HIV positive (12% of those tested). On average men had visited 29% of sites at least once in the previous year. Men reported their reason for visiting and whether they had sex with men they met there. We report on the structure of these networks in the three settings and the characterization of men who visit them. We discuss the challenges of research translation in this context.

Quick, Simple, Effective: Pajek, 2-mode Networks and Archival Data
McCreery, John L.
The Word Works, Ltd., Yokohama, Japan

This presentation introduces quick, simple and effective ways to use Pajek to answer three basic questions about archival data that tell us which actors participated in which events. How many actors participate in more than one event? Which actors are most important and how often do they participate in events together? How can we trace careers over time, tracking the kinds of events in which actors participate? The techniques introduced involve two basic tools: extended partitions and fused networks. Examples are taken from an on-going study of Tokyo creators involved in creation of award-winning ads: actors = creators and events = ads. Networks are constructed from results of an annual ad contest examined at five-year intervals from 1981 to 1996. This presentation may be of particular interest to historians engaged in prosopography, investigations of the common characteristics of historical groups.

Effects of Doctor Coordination on Pneumonia Patient Outcomes
Palesis, John A., DeShazo, Jonathan P., Ghosh, Preetam, Abdelzaher, Ahmed, Jackson, David, Al Musawi, Ahmad, Robichaux, Matthew
(1)Virginia Commonwealth University, Information Systems, Richmond, VA, United States, (2)Virginia Commonwealth University, Department of Health Administration, Richmond, VA, United States, (3)Virginia Commonwealth University, Computer Science, Richmond, VA, United States
Network Science methods were applied to Electronic Health Record (EHR) data representing 23,000 pneumonia hospital patients and the 1,600 doctors who treated them over a period of seven months to explore possible effects of doctor coordination on patient outcomes. A two-mode network representing doctor-patient relationships and a weighted one-mode network representing the number of patients shared between each pair of doctors were constructed based on the administrative data. Pollack et al. previously demonstrated that patient-sharing is a valid method for inferring coordination among doctors and Barnett et al. recently reported an inverse correlation between the level of patient sharing and the overall cost of patient care in congestive heart failure and diabetes patients. Network analytic results of the pneumonia patients support the inverse correlation of patient sharing with health care costs as well as other related care process outcomes such as hospital length of stay and number of doctors directly involved in the treatment of a patient. Analysis of the pneumonia data also reveals a significant difference between the level of patient sharing for patients who expire during their hospital encounter and that for patients discharged to home, thus suggesting a possible correlation between doctor coordination and health outcomes. In addition to the network analysis, this paper presents possible next steps toward understanding the dynamics of doctor coordination and its impact on health care outcomes.

Affiliation Networks in Art Worlds

Panzer, Gerhard
TU Dresden, Institute of Sociology, Dresden, Germany

Art worlds are good cases to be analysed with affiliations networks because this instrument allows to link actors to groups, institutions, and events. The theoretical concept of art world analysis (Becker) will be used as a heuristic instrument to examine empirically which role plays networks with different affiliations in art world of visual arts. In order to reconstruct a local art world it is necessary to combine these different qualities of affiliation together in a suitable model to catch the significant forces in the local art world. It will be examined how useful it is to apply the island and 4-ring weights instruments. The data has been collected from exhibition catalogue, literature and investigations in archives. In the center of the investigation stands an art world with an art academy, artist groups, an art society and some large-scale exhibitions in particular during the 20s to the 1930s. The main question is to develop an approach for actors as well in institutions as at events.
2-Mode Networks: Methods and applications

Concepts and Measures for Two-mode Networks

Carley, Kathleen M., Pfeffer, Juergen
Carnegie Mellon University, Pittsburgh, PA, United States

Many social network data consists of people that are connected through a second mode of nodes, e.g. memberships in clubs, boards of companies, shared publications, knowledge or expertise. A common way of analyzing these network data is by folding (transforming) the rectangular two-mode matrices to squared one-mode matrices of people in which a link is created in case of shared connections to nodes of the original second mode. However, two-mode data can also be analyzed “as is”, as a growing body of examples in social network literature show. In this paper we present a grouping of available two-mode network measures based on underlying concepts and elaborate these concepts. “Quantity” measures count or average the entries of a matrix. “Variance” measures describe the distribution of connections in networks. “Correlation” measures describe similarities/dissimilarities between pairs of nodes. Finally, “specialization” measures identify nodes that have either exclusive or redundant connections to other node class entities.

Expanding Ties in 2-mode Networks

Chu, Kar-Hai
University of Southern California, Los Angeles, CA, United States

This paper explores new methods for studying ties in 2-mode networks, and demonstrates how they can be applied to research in online sociotechnical systems. Typically, 2-mode network data include ties that are unidirectional and represent a single concept. Classic examples are affiliation networks that join people and the organizations to which they belong, or event networks connecting people with events they have attended. In such cases, all ties are symmetrical. However, that can limit the ways in which we study other types of networks, such as user interactions in online sociotechnical systems. This research explores how to include multi-directional and multi-symbolic ties in such studies. We examine a 2-mode network of actors and digital artifacts (e.g. files, chat rooms, etc.) in a sociotechnical system. Ties between the different mode types can exist in either or both directions, as defined by the interactions between the actor and artifact. They are also not constrained by a single classification. How an actor interacts with different artifacts is determined by many factors (e.g. affordances), and should be represented accordingly. We provide different examples in studying expanded 2-mode networks, visualizations with graphing tools, and show how existing 2-mode social network analysis techniques might be applied (e.g. compressing to a classic sociogram).

Two-mode Brokerage: Water Policy Negotiations in the San Francisco Bay Delta

Jasny, Lorien, Lubell, Mark
University of California, Environmental Science and Policy, Davis, CA, United States

In this paper, we examine a two-mode network of organizations concerned with water quality issues in California, USA, and the forums where they negotiate policy. We extend traditional notions of brokerage to this two-mode scenario without converting the data to one-mode networks. First, we show the differences between applying brokerage to the one-mode projections and two-mode network. Second, we develop hypotheses about the nature of two-mode brokerage patterns and test them with extensions of the Gould-Fernandez methods and Exponential Random Graph Models.

Factorial Methods to Visually Explore Three-way Two-mode Networks

Ragozini, Giancarlo1, D’Esposito, Maria Rosaria2, De Stefano, Domenico3
(1)Federico II University of Naples, Department of Political Science, Naples, Italy, (2)University of Salerno, Department of Economics and Statistics, Fisciano, Italy, (3)University of Trieste, Department of Economics, Business, Mathematics and Statistics, Trieste, Italy

Three-way two-mode networks are characterized by a set of n actors and a set of m events in which actors are involved, observed at r different levels (e.g., space or time occasions). They are represented by a three-dimensional relational matrix X=[x_{ijk}], where i=1,...,n; j=1,...,m; k=1,...,r; and where X_{ijk} is for each k a two-mode network. Usually a simultaneous analysis of ways and modes of such a matrix is not explicitly considered. Traditional approaches drop out a mode (e.g., conversion approach of two-mode networks) or a way (e.g., by using trajectories). In this work we propose to analyze the three-way two-mode network as it is, adopting the direct approach. We suggest a two-steps procedure: in
the first one, to visually explore the $X_{..k}$ two-mode networks, for each $k=1,...,r$, we propose to use the Multiple Correspondence Analysis (MCA), that, when compared with the commonly used Correspondence Analysis, better reproduces the structural equivalence pattern present in a two-mode network (D’Esposito et al. JCS-CLADAG12 Proceedings). In the second step, we propose the use of Multiple Factorial Analysis (MFA) - that as known extends factorial methods to the analysis of three-way data matrices (Escofier and Pagès, 1998; 1998) - to simultaneously visualize the MCA representations of the two-mode networks $X_{..k}$, obtained in the first step. Within the proposed approach, distinct features of each mode could be highlighted, actor attributes can be taken into account, and the variation of relational structure along the $k$ dimension (time or space) can be quite easily visualized.
2-Mode Networks: Organizational and online research

How Do Interdisciplinary Scientific Communities Emerge Globally When Science and Technology Overlap? A Two-mode Network Approach

Carafa, Andrea
EU FP7 ManETEI & Grenoble-EM, Grenoble, France

The paper focuses on the emergence of interdisciplinary scientific communities at the intersection of science and technology. The study addresses the following interrogatives: How do interdisciplinary scientific communities emerge globally when science and technology overlap? How do different organizations tie different disciplines together? The empirical study focuses on the emergence of particle therapy, a cutting-edge cancer therapy that uses particle accelerators. It blends bibliometric and social network analysis of approx. 2,900 scientific publications over the past four decades. The 2-mode network of organizations and disciplines within the community is analysed cumulatively and over time. Core, relevant and peripheral (but complementary) disciplines are identified within an interdisciplinary spectrum. The organizations that tie different disciplines together are placed visually in the interdisciplinary space and scored quantitatively. The pattern followed by disciplines and organizations reveals how the community emerges as interdisciplinary and what drives this emergence.

Analysis of Bibliographic Networks on "Social Networks"

Cerinšek, Monika¹, Batagelj, Vladimir²
(1) Hruška d.o.o., Ljubljana, Slovenia, (2) University of Ljubljana, FMF, Ljubljana, Slovenia

From the Web of Science (WoS) we obtained a data set SN9 of descriptions of papers on the topic "social networks" published till December 2012. Using the program WoS2Pajek the corresponding collection of network data was produced: citation network between works, some two-mode networks (works x authors, works x journals, works x keywords, works x institutions, works x countries), some partitions of works (by language, by publication year, by being cited only) and a vector of number of pages. Using network multiplication different interesting derived networks can be obtained. In defining them an appropriate normalization should be considered. Among other, we propose a measure of collaborativeness of authors with respect to a given bibliography and show how to compute the network of citations between authors. We will present the main results from the analyses of the SN9 collection of networks, such as: interesting distributions; the most important authors, works, journals, keywords in the field of social networks; the most productive / collaborative authors; the main "streams" in development of SNA; and citation communities.

Expertise Similarity and Complementarity in Collaborative Relationships

Sasovova, Zuzana, Tamburri, Damian
VU University Amsterdam, Amsterdam, Netherlands

We use two-mode network methodology to examine patterns of similarity and complementarity in collaborative relationships between scientists. Previous conceptual work on optimal cognitive distance suggests that a certain degree of overlap in expertise is necessary to have a sufficient amount of shared knowledge for a productive collaboration. On the other hand, too much similarity may hinder identification of creative solutions to problems or the ability to address them from different perspectives. We use data from a field study investigating collaboration among computer scientists across boundaries of different subdisciplines. First, we code and classify self-reported areas of expertise of the respondents applying subjective coding techniques using grounded theory and Q-sort method. Using grounded theory approach, we develop a simple framework for the unique labels respondents reported and then have experts from the relevant fields rate the expertise areas as similar vs. different. After reconciling the differences and assessing intercoder reliability, the resulting dataset defined as relations between respondents and their encoded areas of expertise is used as input for bipartite graphs. Analyzing the two-mode data we explore the extent of homophily with respect to expertise areas and contrast this with reported patterns of collaboration and subsequent research output.

Career Mobility, Social Identity and Organizational Performance. How Does the Career Trajectories of Hedge Fund Managers Impact their Firm Performance?

Torlo, Vanina Jasmine¹, Halgin, Dan², Lomi, Alessandro²
Our aim is to contribute to contemporary research linking career mobility and organizational performance by looking at the trajectories of hedge fund managers and their firms' performance. More specifically, we answer the following research question: do some hedge funds outperform others because their managers have better skills and knowledge (human capital explanation) or because their managers are better connected (social capital explanation)?

The empirical setting is particularly valuable for testing these hypotheses due to the availability of affiliation data and objective performance. We argue that upon joining a hedge fund, managers bring with them both knowledge and information acquired in their prior experience (human capital) as well as network ties to external resources and sources of information (social capital). We focus on the social identity of being a member of an identifiable professional subgroups (former employees of elite banks such as Goldman Sachs) to study its impact on organizational performance. This is particularly important in uncertain segments of the financial industry where connections to prominent investor/clients are typically believed to reduce uncertainty about the quality of the hedge fund which cannot be observed directly. We predict that performance of hedge funds increases when they attract managers with a highly resonant social identity (conferred, for example, by affiliations with prominent financial institutions) that makes them able to have access to better funding opportunities and to the best potential investors. We analyze the trajectories of approximately 1,000 funds and 3,000 managers.

The Structural Dimension of Human Cooperation

Two main approaches have emerged to analyze human cooperation: an under-socialized approach mainly focused on the micro-level interactions of agents (Axelrod, 2006), and an over-socialized approach, mainly focused on institutional arrangements and organizing principles of collaborative communities (Adler & Heckscher, 2006). Both approaches have in common the same shortcoming: they both neglect the role of social structures in shaping the cooperation (Granovetter, 1985). We develop a structural perspective on cooperation by leveraging the concept of structural cohesion (Moody & White, 2003). We hypothesize, on the one hand, that collaboration dynamics shape the structure of the cooperation network, and on the other hand, that the structural position affects not only the disposition of an actor to cooperate but also the intensity of her work. Our empirical setting is a large community of software developers: the Free/Open Source Debian project; we analyze the cooperation patterns among more than a thousand developers working together during a period of ten years (2000-2011). We model these cooperation patterns as a bipartite network, and measure the embeddedness of actors (developers) and objects (programs) in terms of the structural cohesion of the groups that they form. Preliminary analysis shows that changes on the organizing principles of the production process have a significant impact on the network structure. Furthermore controlling for developer and program characteristics, the intensity of work that each developer puts in the programs she is working is positively related to their level of structural embeddedness.

Tied to Perform: The Influence of Latent Ties on Mobilization

Team assembly around a project has always been a headache for project managers. I set out to try to understand how commitment of a new team member to the project she is joining can be predicted based on the past ties she had to members already enrolled. The setting is a large online community of open-source software developers (SourceForge). In this community numerous projects are developed in parallel. I measure the effect of new team members' links to already enrolled members - prior to joining - on commitment to the project. Commitment is measured as activity in two different types of tasks (communication and bug solving). We revisit the strong tie/weak tie debate by showing how a previous strong tie predicts a higher communication involvement, whereas a previous weak tie predicts a higher technical involvement. We also revisit the effect of indirect ties in the strong tie or weak tie network. We show that indirect ties can have a more positive influence on mobilization than direct ties in some situations.
Relations between Doctorate Students and their Phd Committees: Comparison of Practices in 3 Laboratories through a Network Approach

Bes, Marie-Pierre¹, Lamy, Jerome²
(1)ISAE & LISST, Toulouse, France, (2)LISST CNRS, Toulouse, France

This research started from questions about possible a-symmetrical relations between doctorate students and their supervisors, as raised in different works (O. Hagstrom, T. Shinn). The approach here consists in understanding how doctorate students rely or not on the PhD thesis committee to become publishers then researchers themselves. This means to identify the committees members and to analyze their relations, through an analysis of co-publishing among the group and/or including the doctorate student. The first methodological choice was to carry out an analysis of their professional relations through “public” information on co-publications - including PhD theses- and on the researchers' career paths. Secondly a comparative analysis of 3 scientific domains (archaeology, economics, and astrophysics) was systematically done in order to underline the variety of research and labor division practices. The analysis on committee PhD defended between 2003 and 2008 in the 3 Doctorate Specializations of Toulouse University corresponding to those subjects was purely bibliometric. We built and analyzed scientific networks based on co-publishing and co-quoting data to compare the 3 scientific areas. Considering these networks, we underline the structural characteristics, the position of some central and intermediate researches and the network dynamic for the chosen period. In addition, we present three doctorates profiles, related to theirs co-publishing activities with theirs committees.

Individual Publication Strategies and Collaboration in Authorship: Analysis of Co-authorship Network from a Large University

Bojanowski, Michał
University of Warsaw, Warsaw, Poland

Publications are the main medium of scientific communication. They are the primary way of documenting and communicating research results. Different scientific disciplines developed different norms regarding the utility and function of different types of publications, i.e., journal articles, books, edited volumes, or conference proceedings, etc. Choice of a particular publication types for a stream of individual publications is an element of a broader individual publication strategy. The other element of that strategy is whether these publications, and research they document, are produced in collaboration with others. Scientometric studies report a steadily growing number of co-authored research articles. Co-authorship is an indicator of social relations between scientists: collaboration, but often also authority. Scientific disciplines differ in terms of norms related to co-authorship too. We present a dynamic analysis of co-authorship between the researchers from a large university. The data span 10 years and can be considered complete: contain all relevant publications of about 20+ thousands employees of the university. We investigate dynamic patterns and disciplinary differences in publication strategies in terms of both the structure of co-authorship networks and types of publication.

Educational Research Communities and Networks in Hungary

Molnar, Pal
ELTE University, Faculty of Science, Budapest, Hungary

This report presents early results of the network structure of Hungarian educational researchers by investigating co-authorship patterns based on the main Hungarian educational journals. This type of collaboration fosters access to expertise and resources, knowledge exchange between research communities, increased productivity, improve access to funds and obtain prestige or visibility. The main goal of the study was to discover and visualize the co-authorship network and landscape of researchers (n=2410) who published articles (n=4093) in the field of education between 1991 and 2011, in order to investigate the pattern and structure of scientific collaborations, the keyplayers and the main research communities. The network structure of the cumulative co-authorship data consists of two giant component (n1=78, d1=14 and n2=53, d2=7) and more smalest (n=250), but the structure of the two biggest network is remarkably different. The smallest is more connected with shorter paths, that suggests more collaboration, more intense knowledge exchange, interactions and productivity. The rate of collaborations is low (36%). Two of the journals shows, that the amount of co-authored, published articles increased, and one of them shows a decreasing tendency - though the rate of co-authored
articles are increased in all journals, respectively. The cumulative data shows that co-authorship is slowly increased in the investigated period, which is promising.

The Role of Cognitive Distinctiveness on Co-author Selection and the Influence of Co-authoring on Cognitive Structure: Co-evolution of Collaboration and Semantic Networks

Ozel, Bulent, Suerdem, Ahmet K.
Istanbul Bilgi University, Istanbul, Turkey

Analysis of co-authorship relations is a tangible and reliable way of tracking scientific collaboration networks. Particularly, they give important information about knowledge diffusion. Habitually, bibliometric network analyses focus on the effects of author attributes on author interactions such as homophily or compositional measures. However, the interaction between collaboration networks and cognitive structures is a relatively less studied area. Particularly, how co-authors may influence each other's knowledge structures and the role of cognitive homophily or heterogeneity for the selection of potential co-authors is essential to understand knowledge diffusion within an academic domain. Studies up to now show how author attributes affect whom to collaborate while underplaying how this interaction influences the cognitive structures of the collaborating authors. Our objective is to analyse not only how collaboration network changes as a function of itself and author attributes but also how the author cognitive structures change as a function of themselves and of the network. We use a stochastic actor-based model to test the effects of cognitive structures on network change and the effects of network change on cognitive structures. Our model is an actor driven model where each author is capable of selecting its co-author and his/her interest area. We operationalize cognitive structures of individual actors as semantic networks. Cognitive similarities are calculated according to the co-occurrence of the subject keywords within the articles. We test the hypothesis that authors would choose to collaborate with authors cognitively distinct from them since there would be more possibilities for cross-fertilization compared to cognitive homophily.

Modelling the Network of International Scholarly Co-authorships with ERGM

Safonova, Maria1,2
(1)National Research University - Higher School of Economics, Department of Sociology, St. Petersburg, Russian Federation, (2)Russian Presidential Academy of National Economy and Public Administration, Department of Comparative Political Science, St. Petersburg, Russian Federation

This paper applies ERGM to modelling the global system of international co-authorships. Numbers of papers co-authored by scholars from different countries (Web of Science database) in four groups of disciplines (social sciences, earth sciences, physics and biology) between 1970 and 2010 are used as the dependent variable. The following continuous country attribute parameters are used in generating models: (1) the numbers of researchers and teaching staff; (2) expenditures on science and higher education, (3) general measures of economic welfare. Three dyadic attribute parameters are integrated into the models: (1) historical experience of dependency from some centre of political power (usually the centre of colonial empire); (2) experience of co-belonging to the same political system (colonial empire); (3) spatial proximity. The resulting estimates of parameters providing the closest fit are then discussed in the light of theoretical models dominating the studies of international research collaboration: academic world-system and its world-culture variety (Meyer, Schenhav, Schoffer), “network science” (Leyesdorff) and others. It is demonstrated that, counter to what the theories suggest, the resulting pattern is much closer to “small-world” model with former colonial empires forming recognizable groups, which has become, if anything, more salient in the recent decades. In addition, data on different disciplines are used to test two hypotheses: (a) the capital-intensive disciplines moved further from the “academic empires” pattern towards “academic world-system pattern”, forming a core-periphery model; (b) the more context-specific disciplines moved in the opposite direction, creating denser network between the former colonial countries inside single imperial zone.

Social Capital and Selectivity in Co-authoring Academic Networks: The Case of Accounting Sciences in Brazil

Salej Higgins, Silvia 1, Barbosa, João Estevão 2, Ribeiro, Antônio Carlos 3, Veneroso Alves da Cunha, Jacqueline 4
(1)Universidade Federal de Minas Gerais, Sociology, Belo Horizonte, Brazil, (2)Universidade Federal de Minas Gerais, Accounting Sciences, Belo Horizonte, Brazil

This study tests one of two hypotheses on social capital from the point of view of social network analysis: the structural autonomy (structural hole). The test applies to a case study: the academic co-authoring networks of accounting science programs in Brazil, between the period 2002-2010. We also carried out analyses of the dynamics of selectivity present in this specific network: intertemporal choice criteria, endogamic institutional choices (E-Index, cliquish analysis), and reciprocal choices by productivity criteria (Moran autocorrelation). Were observed: negative correlations between
constraint index of authors (C index) and academic productivity (score qualis), cascading intertemporal choices and tendencies for endogamic institutional choices and for mutual choices identified by productivity criteria. Highlights: • A structural hole hypothesis is tested on a network of scientific co-authorship between faculty of graduate programs in accounting sciences in Brazil. • The data analyzed cover a longitudinal window between 2002 and 2010. • An inverse correlation was found between quality scores in publications and structural autonomy of network members. • A cascading effect, according to the seniority of the members, was found in partnerships copublication. • A tendency to endogamic academic choices was verified through the E-Index and analysis of cliquish.
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**Collaboration Networks in 'Big Science' Experiments: The Case of the ATLAS Experiment at CERN**

Canals, Agustí¹, Ortoll, Eva¹, Nordberg, Markus²

¹Universitat Oberta de Catalunya, Information and Communication Sciences Department, Barcelona, Spain, ²CERN, The ATLAS Collaboration, Geneva, Switzerland

In the last decades, scientific experiments in some areas (elementary particles, genome, big telescopes, nuclear fusion) have become huge organizations involving hundreds of research institutions and thousands of researchers. One of the less studied aspects of such big scientific enterprises from a sociological point of view is the structure and dynamics of internal collaborations between the participating institutions. The analysis of normal co-authorship networks, very common in the scientific collaboration literature, is not useful since in these projects publications are often signed by all of their members. In this study we resort to the analysis of internal data coming from one ‘big science’ project, the ATLAS experiment at CERN, to intend to shed some light on this issue. ATLAS (together with its sibling experiment CMS) is one of the most complex scientific experiments in history. It was there where in July 2012 the Higgs boson was detected, leading to the verification of the Standard Model of Particle Physics. The ATLAS Collaboration in charge of the experiment consists of about 140 institutions and more than 3000 scientists from all over the world working together in the different tasks of the experiment, often using sophisticated online systems like the so-called ‘Grid’. Based on internal data of the collaboration from the tasks of physical analysis performed in the last three years, we can analyse the network of collaborations between the different institutions involved. From the analysis of that network we can draw interesting conclusions on the collaboration patterns of ‘big science’ experiments.

**Invisible Colleges Meet Networked Organizations**

Dimitrova, Dimitrina¹, Mo, Guang Ying², Wellman, Barry²

¹York University, Toronto, ON, Canada, ²University of Toronto, Toronto, ON, Canada

We focus on the intersection of scholarly networks and networked organizations. Since the emergence of the big science in the 1930s and 1940s, research has become the domain of large collaborative projects that are often multi-disciplinary, multi-institutional, and distributed. Such large-scale research collaborations require different organizational arrangements: many research networks are no longer informal ‘invisible colleges’ but function instead as virtual or networked organizations. The transition to more formal organization structures is not well understood. Yet the study of scholarly networked organizations is important: it contributes to our knowledge of new post-bureaucratic organizational forms and can assist practitioners in better designing and supporting large-scale research endeavours. This analysis examines the distribution of power and influence in a scholarly networked organization. How does power and influence change when more formal hierarchical structures are superimposed over informal egalitarian scholarly networks? How do scholarly networked organizations resolve the tension between the need of flexible information flows to boost creativity and performance, on the one hand, and the need of hierarchy and centralization to improve efficiency of large-scale collaborations, on the other? Our own research and the research of others suggest complex picture: in scholarly networked organizations authority and communication structures can be decoupled, emergent communication structures may overlay old authority structure and functional divisions, and fostering cross-boundary interactions may simultaneously encourage hierarchy in communication. This analysis sheds further light on how power and influence function in scholarly networked organizations.

**The Emergence of Successful Ideas from Social and Content Networks**

Moser, Christine¹, Birkholz, Julie¹, Deichmann, Dirk¹, Groenewegen, Peter², Wang, Shenghui²

¹VU University Amsterdam, Amsterdam, Netherlands, ²OCLC Research, Leiden, Netherlands

Despite a growing body of research on ideation, creativity and innovation, there is a lack of knowledge on the process of why some ideas successfully emerge and stand out from the crowd while others do not surface or remain unnoticed. The question therefore is how social and content spaces relate to successful idea emergence. In this paper, we address this question and explain how ideation iteratively evolves over time from the social network as well as the content network. While earlier literature typically has addressed these network perspectives separately, combining them allows us to capture how social interactions and semantic structures interact and thereby create the space for successful idea emergence. Our study setting focuses on academic conference papers of a community of Computer Scientists. These papers serve as a representation for the topics and ideas that are emerging in the field over time. We analyze the social
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network using conference co-authorship data of a subfield of Computer Science from 2006-2011. This allows for an assessment of the characteristics of the network position of the scientists. We link this information to the semantic content space which we establish by plotting the network of title words of papers. We measure idea success using best paper awards. Applying panel logistic regressions, we show how both social and content networks relate to idea success. Our study contributes to knowledge on ideation and innovation in general as well as science studies in particular.

Employees' Goal Orientations and Network Structures: Implications for Innovative Work Behavior

Nuyts, Nathalie¹, Van Rossem, Ronan¹, De Beuckelaer, Alain², Verstraete, Cédric¹
(1) Ghent University, Ghent, Belgium, (2) Renmin University of China, Beijing, China

Goal orientations (i.e., mastery and performance orientation) comprise the differences in goal preferences in achievement situations encountered at work. The direct effects of goal orientations on innovative work behavior have been examined before: mastery orientation relates positively to innovative work behavior, whereas performance orientation associates negatively with innovative work behavior. Recently, scholars have pointed out that goal orientation not only influences innovative work behavior, but also the social interactions within achievement situations. Mainly theoretical and experimental studies showed that the manner in which individuals perceive others in their work environment and interact with them is related to their goal orientations. These interpersonal perceptions and behaviors lead to network structures which can either stimulate or constraint innovative work behavior. Therefore, in addition to a direct effect, an indirect effect of goal orientation on innovative work behavior through structural network characteristics (e.g. degree centrality and reciprocity) can be expected. Using data from 428 researchers from 37 academic and industrial research teams, this study examines how different goal preferences give access to different places in a team network and lead to different ego-network structures, which in turn results in different levels of innovative work behavior. High mastery orientation is hypothesized to lead to pro-social behavior, resulting in structural network characteristics which stimulate innovative work behavior. In contrast, high performance orientation is hypothesized to lead to maladaptive social behavior, resulting in structural network characteristics which impede innovative work behavior.

Decoding Happiness: The Social Space of Scientific Construction of Happiness

Rodríguez, José A.¹, Mohr, John W.², Arroyo, Liliana¹
(1) University of Barcelona, Sociology, Barcelona, Spain, (2) University of California, Davis & Santa Barbara, Sociology, Santa Barbara, CA, United States

In recent years there has been a noticeable rise in social and scientific interest on Happiness. Economics, Psychology, Political Science and Sociology have recently joined Religion and Philosophy in an interplay of competition, sharing and combinations shaping the happiness field. We see the happiness field as a system of interrelations of varying perspectives, approaches, definitions, measures, methods, explanations, solutions, organizations, and scientific disciplines. Using Google Scholar’s top referenced papers on happiness as a source of information for issues such as definitions, indicators and measurements, types of information and data used by the papers, temporal and spatial characteristics of the data, types of analysis and types of journals we map the Happiness Social Field as the social structure emerging from the interplay between papers and issues defining and conceptualizing. With information of the explanatory models used by the papers along with the types and characteristics of actions proposed in order to reach happiness we analyze how disciplines and time-periods yield different “causal networks” as systems of interrelations between the variables used. The paper visualizes and studies happiness as a social field (socially mapped) where the cartography of the territory is represented by the elements participating in the definition process and the “causal networks” draw the Roads to Happiness.
Gender Homophily in Research Collaborations among Tenure-Line Faculty across a University

Falci, Christina
University of Nebraska Lincoln, Sociology, Lincoln, NE, United States

Normal 0 false false false EN-US JA X-NONE /* Style Definitions */ table.MsoNormalTable {mso-style-name:"Table Normal"; mso-tstyle-rowband-size:0; mso-tstyle-colband-size:0; mso-style-noshow:yes; mso-style-priority:99; mso-style-parent:""; mso-padding-alt:0in 5.4pt 0in 5.4pt; mso-para-margin:0in; mso-para-margin-bottom:.0001pt; mso-pagination:widow-orphan; font-size:12.0pt; font-family:Cambria; mso-ascii-font-family:Cambria; mso-ascii-theme-font:minor-latin; mso-hansi-font-family:Cambria; mso-hansi-theme-font:minor-latin;}

Rates of research collaboration within the academic literature are increasing. Yet, we know little about what factors contribute to two faculty members within the same university deciding to engage in research collaboration. The purpose of this research is to explore gender homophily in the formation of a research collaboration tie controlling for other types of homophily (i.e., race, age and discipline). Drawing from ideal worker norms and competencies biases, both women and men are expected to prefer research collaborations with men. In other words, gender homophily will be differential not uniform. Data come from the Faculty Network and Workload Study (FNWS), which collected complete research collaboration networks among tenure-line faculty within the physical and social sciences at a research-intensive university. Preliminary ERGM analyses indicate strong tendencies toward gender, age, race and discipline homophily. Contrary to expectations, gender homophily is uniform. Both men and women prefer to collaborate with another faculty member of the same gender. Race homophily is differential whereby only minority faculty prefer same-race collaborations. With regard to age, the probability of collaboration decreases as the age difference increases. Future analysis will include measures of propinquity (geocodes for the distances across physical office space) and research interest areas (a textual analysis of similarity in journal article titles).

A Theory of Scientific Co-operation on the Basis of Social Network Analysis

Heidler, Richard
University Wuppertal, Soziologie der Organisation, Wuppertal, Germany

Since the rise of sociology of science and the associated bibliometric methods, there is plenty of research on scientific collaborations. The paradigmatic approach of social network analysis which is increasingly combined with scientometric data and the study of co-authorship networks have added to this development. Growing scientific interest in research co-operations is accompanied by a large-scale fundamental trend of expansion of collaborative research in size and frequency within the science system as a whole. However, a theory of scientific collaboration, incorporating and synthesizing what already has been ascertained, is still missing. Such an integrated theory should explain what forms of scientific collaborations occur, under which circumstances and between whom. As explanatory mechanisms it should take into account: the microlevel of reflexive actors, the meso-level of structural preconditions and the macrolevel of disciplinary and scientific change. Such a network-based integrated theory of scientific co-operation will be elaborated and exemplified.

Cohesive Sub-groups in Academic Networks: A Clique Analysis on Principal Investigators

Kegen, Nadine V.
Universität Hamburg, Centre for Globalisation and Governance, Hamburg, Germany

Limited time and resources, problems of uncertainty as well as homophile tendencies facilitate the creation of cohesive sub-groups in networks. Such a cluster is a zone of dense connections of usually similar actors compared to the overall network and termed a “clique”. Exchange relations within cliques promise safety and benefits from accelerating cooperation and generalised reciprocal support. In the present study, I conduct clique analyses within formal and informal academic networks. Which cohesive sub-group structures can be uncovered in the different relations? How can they be characterised? Are they formed around central men? Are women excluded therefrom? The paper builds on the assumption that female and male investigators are differently embedded in scientific net structures which contributes to the reproduction of inequality in academia. To date, most gender-and-science research on requirements for women’s success in academia has focused on questions of importance and subjective perception of network integration. Empirical verification of women’s involvement in scientific - particularly informal - net structures is still fragmented. Furthermore, there is very sparse knowledge about clique structures within predefined science networks. I examine the intra-network
mechanisms that promote cooperation and support between female and male scientists in cutting-edge research by applying clique analysis to principal investigators who all participated in the German Excellence Initiative. This analysis depicts gender-specific grouping patterns and reflects levels of social integration. It makes a contribution to the study of cohesive sub-groups and integrates it into research on gender and higher education.

Classifying Scientific Disciplines Using Dynamic Collaboration Networks in Slovenia

Kronegger, Luka, Frligoj, Anuška, Mali, Franc, Doreian, Patrick

(1)University of Ljubljana, Faculty of Social Sciences, Ljubljana, Slovenia, (2)University of Pittsburgh, Department of Sociology, Pittsburgh, PA, United States

We discuss the classification of scientific disciplines according to two theoretical explanations for the temporal changes of collaborative networks among scientists. One is preferential attachment, known in sociological theory as cumulative advantage, and the other is the small world model. The disciplines are clustered according to estimated parameters resulting from stochastic actor based models of network dynamics implemented in SIENA. One dimension of the small world is measured by the clustering level, while the preferential attachment is operationalised through the collaboration of each researcher within and outside their research discipline, and their scientific excellence measured by the number and the quality of their publications. A clustering procedure is applied on 68 disciplinary coauthorship networks which cover more than 14,000 researchers who are members of the Slovenian Research Agency. The results of the clustering procedure reveal that the classification according to the changes in disciplinary co-authorship networks of researchers does not correspond to the established officially used classifications of disciplines suggesting that the latter is, at best, only partially correct.

The Duality of Philosophers' Social Lives and Ideas: Conceptual Solidarity and Theoretical Leadership in the Frankfurt School

Lee, Monica

University of Chicago, Sociology, Chicago, IL, United States

There is great excitement in network sociology over innovative ways to investigate the culture/structure duality. This study explores this duality in philosophical schools. I analyze the Frankfurt School’s social history in tandem with its intellectual history, examining the homology between its social and conceptual networks. On the one side, I produce social network data from archival research on the Frankfurt School’s set of social relations. On the other side, I use computer-assisted textual analysis to produce concept maps of key texts by the same thinkers. The union of these networks represents the school as a structural-cultural whole. I propose that the Frankfurt School exhibits two types of homomorphism between its social structure and idea structure. First, social cohesiveness in the school is shown conducive to its theoretical coherence. During the Frankfurt School’s exile period, a high level of social cohesiveness accompanied a high level of coherence in the school’s core set of ideas; during its postwar period, a decreased level of social cohesiveness accompanied a fragmented set of core ideas. Second, the leadership structure of the school is reflected in members’ varying levels of dominance over its set of collective philosophical ideas. I find that institutional leaders of the Frankfurt School tended to represent the school’s core ideas in their individual works more comprehensively than other members. Thus, I offer a new method for studying complex texts as networks and for combining this with social structural analysis, as well as hypotheses about the culture/structure duality in philosophical schools.

Cultures of Sociology. The Interdependency of Semantic and Structural Change

Riebling, Jan R., Heiberger, Raphael H.

Otto-Friedrich Universität Bamberg, Sociology, Bamberg, Germany

One of the prevalent questions in sociology has always been the interdependent relationship of structural (i.e. organization, institutions and rules) and cultural (i.e. meaning, ideas and discourse) components of social systems. For example, the ideas and knowledge of science are constantly changing while the underlying structure, as embodied in “invisible colleges”, “paradigms”, “funding policies” etc., changes on a much slower timescale. Thus, the question becomes how the dynamic flow of information and its supporting infrastructure can be adequately modeled and understood. As a first step towards an answer we suggest a combination of natural language processing techniques, especially latent semantic analysis, and network analytical tools and routines. The first allows us to model the information and content of large text corpora, while the later not only provides us with the means to understand and describe the structural properties of research networks but also allows us to combine them analytically through the construction of a two-mode (or bipartite) network. Using a comprehensive dataset of sociology articles from the Web of
Science database and the python programming language as a computational framework for both the natural language processing as well as the network analysis, we show how different sociological cultures are constructed. The cultural dimension is then contrasted with co-author citation and institutional collaboration networks (mainly journals and universities) through the use of two-mode network models. Concluding, we discuss the possible uses of such an analytical framework as well as its pitfalls and problems.
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Scientists at the Crossroads - Building Research Networks in Contemporary Science

Czerniawska, Dominika
University of Warsaw, ICM, Warsaw, Poland

Contemporary scientists work in extremely complicated network of institutions, funders, professional associations, formal and informal relations. All these links are important to manage your career effectively. Scientists have to engage in variety of networks, which can be institutionalized in traditional forms like research institutions, learned societies, conferences, scientific committees and councils. However, there are new tools to build a research network across those more traditional organizations. The Internet provides scientists with web pages like Academia.edu, Mendeley, Twitter, and blogs to share resources, present papers, seek for help to resolve new scientific inquiries. Recent studies (Weller 2011) show that new tools changed practices around scientific networks on communication and collaboration level. How do scientists perceive these changes? How do they navigate in this complicated network of traditional institutions and novel forms of communication, cooperation, and exchanging ideas? What do they gain and what do they lose? How do they build their own network of resources to build a career in an intensively changing scientific environment? The research is based on the set of in-depth interviews with Polish scientists with experience in traditional institutions and novel forms of scientific communication.

Do Contacts Really Help to Get a Job in the Academic Labor Market ? A Natural Random Experiment with French Intellectuals at EHESS

Godechot, Olivier
CNRS - Centre Maurice Halbwachs, Paris, France

The effect of social capital is very often overrated because contacts and centrality are also a consequence of success rather than its cause. In order to assess the real causal effect of social capital we need to rely on random experiments or natural experiments, experiments that are unfortunately quite rare. In this paper, we rely on data on recruitment at Eheess, a leading institution in Social Science in France, between 1960 and 2005. In this process, the electoral commission, a comity that produces a first ranking of candidates provided to the professors’ assembly for final voting is partly composed of randomly drawn members of the assembly. We exploit this feature in order to compare the chance of success of candidates whose contact is a member of the assembly randomly drawn (treated) versus those whose contact is a member of the assembly that was not drawn (placebo). We show that a contact like the PhD supervisor has a causal impact for assistant professor exams and doubles the chance of being ranked and increases by 10% the numbers of votes. This phenomenon may explain part of the classical academic inbreeding phenomenon.

Predicting Advice Giving by Examining Email Usage: A Longitudinal Study of Research Organization

Hayat, Zack, Mo, Guang Ying, Barry, Wellman
University of Toronto, Toronto, ON, Canada

Communication is a fundamental component of all phases of research collaboration. Without ongoing communication, researchers will not learn from each other, and perceptions of distrust may emerge. One of the most prominent channels by which researchers interact is email; this is in part due to the fact that it enables asynchronous dialogues as well as documentation of the conversations. In this study, we analyze how email communication patterns of individual researchers can help predict one of the central components of research collaboration, advice giving. Our study's focal point is the Graphics, Animation, and New Media (GRAND) network, a national research organization in Canada. By conducting a longitudinal social network survey (N=144), we were able to study the predictors for advice giving among GRAND members. Our findings indicate that: (1) the centrality of researchers in the email communication network positively predicts advice giving. However, (2) the effective network size of email communication networks more strongly predict advice-giving, (3) especially for the researchers in higher hierarchical positions in GRAND. Overall our findings indicate that it is both the communication network (i.e., effective network size), as well as hierarchical structure that serve as the strongest predictors for advice giving. These findings are then discussed within the context of their potential implication for the body of studies dealing with research collaboration.

Predicting Future Thematic Affiliations of Researchers in Publication Networks
Hecking, Tobias, Göhnert, Tilman, Zeini, Sam, Hoppe, Ulrich  
Universtiy of Duisburg-Essen, Duisburg, Germany

Knowledge and indications about the future are useful for decision making in any case. In the context of science it can be an advantage to recognize research trends early for strategic adjustment of the own research. In our work we aim to predict future interests of researchers in research topics based on publication data. More precisely we adopt Link Prediction techniques to predict a future bipartite author-topic network based on the observation of previous author-topic networks. The topics were extracted from the abstracts of the publications of the particular researchers. The goal is to predict new as well as reoccurring relations of researchers and publication topics. We could show that Link Prediction techniques are adequate for the prediction of author-topic relations based on previous author-topic relations on its own. Despite the results using simple unsupervised Link Prediction techniques are quite valuable, a new approach is presented, which enriches the pure author-topic information with additional information, in particular co-authorships and citation relations between researchers. The basic idea is that scientists are, in their thematic orientation, somehow influenced by information that they gather from their collaborators and papers they cite. We could show that it is possible to enhance the quality of author-topic predictions by incorporating those relationships between researchers as side information. The presented approach does not introduce a completely new Link Prediction algorithm but rather describes a formal strategy to adopt simple Link Prediction techniques to heterogeneous and multirelational networks.

Open up the Research Gate: Networking and Researching Communities on Academic Social Network Sites  
Lutz, Christoph, Hoffmann, Christian Pieter  
University of St. Gallen, Institute for Media and Communications Management, St. Gallen, Switzerland

Academic social network sites (SNS) have gained enormous ground over the last years. The biggest services ResearchGate, Mendeley and Academia.edu all have much more than 1 million members and the numbers are rapidly increasing. However, only limited research has been carried out on social media in science (Nentwich & König, 2012). Although a vivid community creates and implements alternative measures of scientific impact with social media data (Altmetrics; Priem & Hemminger, 2011), little use has been made of academic SNS to analyze scientific communities. Our aim is twofold: Firstly, we outline the state of research on and with scientific SNS. We show how such data is useful both to enhance our knowledge in the sociology of science and for practical purposes. Secondly, we present preliminary results of a project with ResearchGate. Drawing on extensive data from this SNS, we describe the scholarly network of the Business Innovation area of the University of St. Gallen. The sample consists of roughly 100 nodes. We relate follower/followee networks to co-authorship patterns, as complete bibliographic information is available. The network data is complemented with detailed attribute data, such as department affiliation, (in some instances) awards and position within the university hierarchy. Our contribution connects social network analysis with academic community research. Nentwich, M. & König, R. (2012): Cyberscience 2.0 - Research in the Age of Digital Social Networks. Frankfurt & New York, Campus. Priem, J. & Hemminger, B.H. (2010). Scientometrics 2.0: New metrics of scholarly impact on the social Web. First Monday, 15(7-5).

Acknowledgements in Journal Articles: The Network of Sociologists in the Three Most Important Sociological Journals in the World  
Rausch, Alexandre¹, Stegbauer, Christian²  
(1)Goethe-Universität Frankfurt, HRZ, Frankfurt, Germany, (2)Goethe-Universität Frankfurt, FB Gesellschaftswissenschaften, Frankfurt, Germany

Acknowledgements in scientific journals indicate relationships among scientists. They reveal who gives advice to whom. In other words they provide information about personal connections in the scientific world. These structures are indications of the circulation of very early versions of papers. The network can be interpreted as a network of scientific influence. In contrast to citation networks, which can comprise negative references, the acknowledgement of other scientists is clearly positive. Unlike co-author networks, the present investigations address a different type of cooperation. Acknowledged scholars helped the authors in various ways. Maybe they read the manuscript and discussed it with them, helped them to carry out the research or just reviewed pieces of their scientific work. In the present study, acknowledgements in the three most important sociological journals in the world (measured by their impact factor) were investigated. Ten volumes each of the American Journal of Sociology, American Sociological Review and Annual Review of Sociology were included in the study. There are various methods of constructing networks with these data. First, a two-mode network, connecting all scholars acknowledged in the different articles, can be created. Second, a one-mode directed network of those whom the author has named in the acknowledgement can be obtained. Our results clarify the social network (and the related schools) behind the rationality of science.
Agent-Based Models and Multi-Agent Systems

Dynamic Link Prediction of Adolescent School-based Networks

*Fetta, Angelico G.*, Harper, Paul R., Williams, Janet E., Knight, Vincent A.
Cardiff University, Mathematics, Cardiff, United Kingdom

Research on link predictions for social networks, whereby we desire to predict future links that will be added to the network, has been greatly advanced in recent years following a surge in quantifiable data. Our research aims to explore links that may occur between nodes based upon some structural properties that the nodes possess, and has included the study of methods such as Adamic/Adar, PageRank, and Katz. Furthermore, game theoretic approaches have been investigated to analyse the potential benefits of allowing nodes to actively seek links that optimise a personal utility. Through the use of simulation techniques, validating the work against a cohort of British adolescents over a period of three years, a rigorous investigation is presented.

Modeling Engineering Education as a Complex Adaptive System at the National Science Foundation

*Hill, Victoria A.*
National Science Foundation - AAAS Fellow, Engineering Education & Centers, Arlington, VA, United States

The National Science Foundation (NSF) is funding efforts to view Engineering Education as a Complex Adaptive System using the concepts of Network Analysis and tools such as Systems Dynamics and Agent-Based Modeling. The models being developed are designed to create a framework from which the NSF may gain insights on the linkages and interactions that make up the system. These efforts are being made to better understand the leverage points through which improved investments in the Engineering Education system can be made, as well as to examine the impacts of potentially disruptive elements to the system.

Wisdom of the Network: Reducing Correlated Errors through Inferred Diffusion

*Lazer, David*, Margolin, Drew, Keegan, Brian
Northeastern University, Boston, MA, United States

Much speculation and many resources go into the prediction of the outcomes of large, widely observed events, such as elections. This study examines the ways in which the diffusion of information through networks can lead to biases in these predictions and the ways in which knowledge of network structure can be used to correct for these biases. The canonical example is the prediction of election outcomes using aggregations of costly forms of support such as in prediction markets or through political donations or endorsements. We argue that in many cases, individuals will take cues from others in their networks, unaware that everyone is relying on the same sources of information. When this network distortion takes place, there will be an empirical signature in network correlated errors, that is, people in close network proximity to one another will tend to err in the same way, showing overconfidence in the same candidates. We construct an agent-based simulation to examine the implications of these arguments. Agents are placed into social networks and update their beliefs regarding the outcome of an event (an election) based on the beliefs of their alters. We then calculate the overall accuracy of the network’s prediction using a naive model in which network structure is ignored and a variety of network “re-weighting” techniques in which each individual’s contribution to the aggregate prediction is adjusted based on their position relative to other individuals and their predictions.

How Political Parties Die When Voters’ Expectations Are Interdependent. A Simulation Study

*Martin, Christian W.*, Harder, Niklas
(1)University of Kiel, Political Science, Kiel, Germany, (2)University of Konstanz, Graduate School of Decision Sciences, Konstanz, Germany

The fate of political parties is not only determined by their policy positions but also by the expectations about their electoral success that voters form before an election. In this paper, we are interested in the demise and death of political parties as a result of voters expecting a party to be unsuccessful when these expectations are formed interdependently. We draw on an agent based model of expectation formation with interdependent expectations. Voters base their voting decisions on two considerations, namely the distance of their ideal point to a party in the policy space and their expectation about the party’s vote share in an upcoming election. We model the second argument in this function as
Agent-Based Models and Multi-Agent Systems

influenced by other voters’ expectations about the electoral success of political parties. Under certain conditions, a downward spiral can emerge that leads to the demise of a party because too few voters expect the party to win even though it could have won based on its policy positions alone. We will explore the conditions under which such a phenomenon can occur and assess the plausibility of the resulting parameter ranges by relating our model’s properties to real world observations. In particular, we assess the influence of different network topologies on electoral outcomes. We are particularly interested in the influence of information transmission in these networks. In a second step, we suggest ways to endogenize network structures based on the success with which existing networks were able to induce voting behavior in line with voters’ preferences.

Exploring Knowledge and Seed Transfer in a Community of Practice of Farmers

Thomas, Mathieu\textsuperscript{1,2}, Stadtfeld, Christoph\textsuperscript{1}, van Duijn, Marijtte A. J.\textsuperscript{1}, Steglich, Christian E. G.\textsuperscript{1}, Snijders, Tom A. B.\textsuperscript{1} 
(1)University of Groningen, Sociology, Groningen, Netherlands, (2)Institut National de la Recherche Agronomique, Unité Mixte de Recherche 0518 Mathématiques et Informatique Appliquées, Paris, France

The diffusion of knowledge is a crucial issue for the adoption of innovative and sustainable practices in agriculture and food production. This knowledge transfer relies strongly on social relationship. The aim of this paper is to better understand the role of social organisation in knowledge and seed transfer among farmers involved in maintenance and evolution of crop diversity. An agent-based stochastic network simulation study is conducted. Based on an ethnobotanic study focusing on a French social movement of farmers involved in seed autonomy, it was possible to apply the community of practice concept and identify specific rules of the embedded learning process occurring among actors. Farmer associations as social organization sharing social norms shape knowledge and seed transfer. Farmers participate in local or national meetings. These two types of social events contribute differently to exchange of advice and seeds, changing the level of individual and shared knowledge of farmers. Individual knowledge is considered as a node attribute and shared knowledge as a tie attribute. The model aims at investigating the role of the social organisation and its evolution on the dynamic of individual and collective knowledge focusing on topological properties of the emerging knowledge network. The range of parameters of the model was defined with the help of qualitative data. A sensitivity analysis was carried out to identify new insights regarding emergent properties of this type of complex adaptive system. This work contributes to assessing the resilience of these socio-ecological systems.

Bayesian Parameter Estimations in the Joint Co-evolution Model of Social Behavior and Network

Tong, Liping, Shoham, David, Cooper, Richard 
 Loyola University Chicago, Chicago, IL, United States

An individual’s behaviors may be influenced by the behaviors of friends, and preferences for these behaviors may also influence the choice of friends. To study the interdependence of social network and behavior, we have proposed a joint co-evolution model of social behavior and network, which is a revision of Snidjers et al.’s actor based stochastic models (ABSM). Our co-evolution model turns out to be useful particularly for numerical behavior variables, such as body mass index (BMI), screen time, and so on. However, due to extensive computations in the maximum likelihood estimation (MLE) of parameters, our model is limited to small networks with number of individuals around fifty. Since the major computational burden in the MLE process is caused by an Markov chain Monte Carlo procedure in the expectation and maximization (EM) algorithm, we can now improve our computation by using Bayesian parameter estimation methods. In addition to improvement of computational speed, the Bayesian parameter estimations are also more robust compared with MLE. We use simulation as well as real examples to show our results.
Archaeological Networks

Exploring Archaeological Visibility Networks with ERGM: A Case Study on Urban Connectivity in Iron Age and Roman Southern Spain

Brughmans, Tom\(^1\), Keay, Simon\(^2\), Earl, Graeme\(^1\)

\(^1\)University of Southampton, Archaeological Computing Research Group, Southampton, United Kingdom, \(^2\)University of Southampton, Department of Archaeology, Southampton, United Kingdom

Traditional approaches to the archaeology of Roman southern Spain have neglected the study of inter-urban connections. Iron Age (ca. 5-th c.BC to 3-rd c.BC) and Roman (ca. 3-rd c.BC to 5-th c.AD) sites as well as different archaeological data types are often studied independently, which is necessary for a critical understanding of these different sources. However, all these sources were also once part of a single long-term cultural process which requires a large-scale approach to the study of inter-urban connections. This paper concerns an exploratory network analysis and ERGM of aspects of the changing interactions between 190 sites dated to a range of ten centuries as evidenced through visibility networks. In these networks a pair of sites is connected when one site can be seen from the other. Archaeologists analyse the visibility (or not) of landscapes, sites, features and objects to evaluate its possible impact on human behaviour. They aim to evaluate the probability that visibility patterns were intentionally created. Current approaches rarely analyse hypothetical processes that might have given rise to observed visibility patterns. We suggest a novel approach based on exploratory network analysis combined with ERGM, which allows us to explore the structure of patterns of inter-visibility between sites, the commonalities and differences in the patterns of individual sites, as well as explore hypotheses of how patterns of high or low visibility could have emerged on their own or in relation to a few external attributes.

Which Network Model Should I Use? A Quantitative Comparison of Spatial Network Models in Archaeology

Evans, Tim S.\(^1\), Rivers, Ray\(^1\), Knappett, Carl\(^2\)

\(^1\)Imperial College London, Physics, London, United Kingdom, \(^2\)University of Toronto, Department of Art, Toronto, ON, Canada

Regional and global interactions can be hard to consider in archaeology where there may be little or no direct evidence of the interactions. One answer to this ‘site centric’ view is to use an edge model to generate a network of links between a set of known sites. There are a wide selection of models to choose from, some of which have not been used in archaeology. Some are old yet still popular in archaeology, such as Proximal Point Analysis (e.g. Terrell 1977, Broodbank 2000). Others are well known in modern spatial analysis, such as the Gravity models (Wilson 1967). The Radiation model (Simini et al, 2012) is an example of a new variation on an old theme. We have suggested the use of Monte Carlo methods in our ariadne model (Knappett et al, 2008). We will show how these models, and many others, all fit into a common framework which thereby highlights the similarities and differences in the concepts behind each model. This qualitative overview can help identify which model is most appropriate for a given question. I will then ask how we can quantify the differences between the outputs of such models. This is challenging as they can produce very different types of networks despite all being derived from the same spatial information. This can be used to compare models against existing data (perhaps from a modern context, Bamis et al 2013). It can also help to choose the right model for the job at hand.

The Social and Spatial Dynamics of Social Networks in the Late Prehispanic Southwest

Mills, Barbara J.\(^1\), Peeples, Matthew\(^2\), Borck, Lewis R.\(^2\), Clark, Jeffery J.\(^2\), Haas Jr., W. R.\(^2\), Hill, Brett\(^2\), Roberts Jr., John M.\(^3\)

\(^1\)University of Arizona, School of Anthropology, Tucson, AZ, United States, \(^2\)Archaeology Southwest, Tucson, AZ, United States, \(^3\)University of New Mexico, Sociology, Albuquerque, NM, United States

A large amount of information on networks is available through archaeological research, but only recently has social network analysis (SNA) become explicitly used by archaeologists. Archaeological data are not “ready made” for SNA, however, and there are many methodological challenges in applying network approaches to materials from archaeological sites. Yet, there are several advantages that archaeological case studies can bring to the wider study of social networks (and vice-versa). These include (1) temporal scales on the order of centuries; (2) well-documented demographic transformations for comparison to social network changes; (3) widespread use of geographic information systems (GIS) by archaeologists amenable for comparing spatial and social analyses; and (4) for some areas, including the U.S. Southwest, the availability of large amounts of existing data. In this paper we provide a brief overview of the Southwest Social Networks Project’s application of SNA to archaeological data (especially polychrome pottery) collected.
from sites dating between A.D. 1200 to 1450 in the western U.S. Southwest. Then we address three major questions: (1) How does shifting the spatial scale of the analysis from local to macro-regional change the kinds of social questions addressed with archaeological data; (2) How does the strength of social relationships based on distance change over time, especially when compared to known demographic shifts, such as migration; and (3) Does spatial propinquity predict social connectivity (and if not, why not)?

Seven Ways to Think of the Eruption of Thera

Rivers, Ray¹, Evans, Tim¹, Knappett, Carl²
(1)Imperial College London, Physics, London, United Kingdom, (2)University of Toronto, Art, Toronto, ON, Canada

At the height of Minoan influence the eruption of the island of Thera in the S. Aegean in the Middle Bronze Age removed what might have been expected to be a crucial gateway between Knossos and the Cyclades, and hence to the Peloponnesse and Dodecanese. Surprisingly, after the eruption, exchange throughout the S. Aegean arguably intensified rather than diminished until the ‘burning of the palaces’ some years later. The Minoan maritime network of exchange and settlement has a sufficiently patchy archaeological record to permit several descriptions. In order to explore the network’s resilience to natural disaster we present the effect of removing Thera on a wide variety of network models. Thera’s role as a gateway site is due to its geographical position, a single journey from the N. Crete coast for contemporary sail-driven vessels. Network resilience reflects the relevance of geography to the patterns of exchange. The seven models I shall present put different emphasis on the relative importance of geographical and social factors. They range from our own cost-benefit models (Knappett et al. 2011), adapted from socioeconomics, to maximum entropy/information models used in transport and migration theory. Although, in general, network connectivity can overrule local geographical factors the models give distinguishably different exchange patterns of greater or lesser plausibility, as we shall discuss. Knappett, C, Evans, TS, and Rivers, RJ, “Modelling maritime interaction in the Aegean Bronze Age, II. The Theran eruption and Minoan palatial collapse”, Antiquity 85, 329, 1008 - 1023 (2011).

Authority and Social Interaction in Ptolemaic and Roman Egypt: Social Network Analysis and the Zenon Archive

Vanbeselaere, Silke, Broux, Yanne
KU Leuven, Leuven, Belgium

The project ‘Authority and Social Interaction in Ptolemaic and Roman Egypt’ aims to explore and visualize social networks and their development in Ptolemaic and Roman Egypt (332 BC - AD 284). Starting from letters, petitions and contracts, it studies horizontal and vertical relations as well as the different communicative strategies used. Graeco-Roman Egypt lends itself optimally to social network analysis because of the rich papyrological documentation, in which interpersonal connections are abundant. The database Trismegistos (www.trismegistos.org) with almost half a million attestations of personal names will serve as a starting point. In a first stage, which we will present here, the project focuses on the famous mid-third century BC archive of the Greek manager Zenon, with its 1127 letters and 5013 attestations of people. We will not only study the direct connections between the individuals, but also their shared presence in a papyrus. As such a two-mode network will be established, which will link the actors through the papyri in which they are mentioned. Affiliation analysis may help us then to get back to a simpler view on this network through a one-mode graph. On the basis of an existing prosopography, we will measure the centrality of particular people and groups, as well as the overall density and compare this to modalities of interaction in the archive. This combination of quantitative and qualitative methods may lead to a refreshing view on this well-known archive and on social interaction in Ptolemaic Egypt.
Citation Networks 1

Approaches to Analysis of Citation Networks

Batagelj, Vladimir1,2, Cerinšek, Monika3
(1)University of Ljubljana, FMF, Department of Mathematics, Ljubljana, Slovenia, (2)IMFM, Department of Theoretical Computer Science, Ljubljana, Slovenia, (3)Hruška d.o.o., Ljubljana, Slovenia

From bibliographical data bases, such as Web of Knowledge, we can obtain a collection of compatible networks: citation network and two-mode networks: works X authors, works X keywords, works X institutions, works X countries, etc. Besides this we get also partition of works by publication year, partition of works by journal, and the DC partition distinguishing between works with complete description and the cited only works. Using the multiplication of networks we can obtain from them different derived networks. For example multiplying authors X works network with works X keywords network we get the two-mode network authors X keywords with the weight of the arc (u, k) counting in how many works the author u used the keyword k. In our paper we present different approaches used for analysis of citation networks (hubs and authorities, Hummon-Doreian weights, bibliographic coupling, co-citation) and discuss the related normalization problems. In the second part we present some interesting derived networks based on citation network. The proposed approaches will be illustrated with their applications on the collection of network data sets obtained from the Web of Knowledge on the topic "Social networks".

Ambiguity and Intellectual Engagement

Evans, James, McMahan, Peter
University of Chicago, Sociology, Chicago, IL, United States

How do knowledge cultures differ in their precision of expression? And what is the consequence of ambiguity in knowledge claims? Do ambiguous claims lead to greater integration, drawing competing interpretations into conversation with one another, or do they fragment fields as distinct interpretations avoid or ignore one another? We develop a measure of ambiguous expression that involves the calculation of Shannon information theoretic entropy on the substitution frequency of words with their synonyms, conditioned on linguistic context. We then link ambiguity assessments to the pattern of citations they eventually receive. We assess the fragmentation or bushiness of each received citation tree by measuring its topological entropy (Corominas-Murtra et al, 2010). We find that this measure correlates very highly with network modularity. We then predict these measures of citation-tree fragmentation using the ambiguity of the root article. We demonstrate that more ambiguity leads to more integration and less fragmentation in the knowledge community, not only within but across fields. This is likely because ambiguity, and resulting uncertainty, stimulates social learning. We conclude by considering the implications of these findings for the evolution and accumulation of knowledge.

A Network Based Delineation of the Social Network Research Field

Lietz, Haiko, Strotmann, Andreas
GESIS - Leibniz Institute for the Social Sciences, Köln, Germany

The analysis of social networks has come a long way. Starting with Moreno’s sociometry and Rapoport’s research on random and biased nets, we have seen the emergence of Harvard structuralism, the cultural turn, and the "invasion of the physicists." Today’s social network research is a multi- and interdisciplinary endeavor at the dawn of large-scale computational social science, an ideal field on which to model and test sociological network theories. Delineating this field in terms of its publications for this purpose is not an easy task. There are journals devoted to this topic but they represent just a minor fraction of the field. Delineation must therefore occur on the level of individual articles. But not all relevant articles can easily be identified lexically: Merton’s work on the Matthew Effect, even though relevant, is not on networks, and Barabási’s paper on the network model of this principle does not use the term "social" in a searchable way. Neither can the field be delineated by just retrieving all publications that cite a set of canonical publications: even if the latter can be identified, some have become common knowledge and may no longer be cited. More complex network analysis methods such as community detection in citation networks, combined with lexical methods, promise to allow delineating the social network research field more thoroughly.

Appraising Scientific Impact from Local Dynamics of Citation and Socio-semantic Networks

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Citation Networks 1

Roth, Camille¹, Wu, Jiang², Lozano, Sergi³, Taramasco, Carla⁴, Cointet, Jean-Philippe⁵, Bucheli, Victor A⁶
(1)CNRS, Centre Marc Bloch, Berlin, Germany, (2)Wuhan University, School of Information Management, Wuhan, China, (3)Institut Català de Paleoecologia Humana i Evolució Social, Tarragona, Spain, (4)Universidad de Valparaiso, Escuela de Ingeniería Civil Informatica, Facultad de Ingeniería, Valparaiso, Chile, (5)INRA, SenS, Marne-la-Vallée, France, (6)Universidad de los Andes, Departamento de Ingeniería Industrial, Bogota, Colombia

We show how the interest raised by a given scientific paper is related to the dynamical features of both its local citation network and the socio-semantic network of its underlying author team. On one side, we exhibit universal patterns, across several distinct fields, in the local dynamics of citations and references, up to a given rescaling constant. We define essentially temporal indices, notably a rebirth-index which aims at quantitatively detecting ‘sleeping beauties’ or ‘early birds’, whose dynamic citation profile suggests a specific worthiness for the scientific community, and show that they have significantly poorer-than-average citation metrics. In particular, we exhibit correlations between final citation counts and citation network metrics which suggests that citation counts essentially captures normal science, focused on the relatively recent past. On the other side, impact is also correlated to fundamental variables historically describing the social and semantic composition of the author team. This socio-semantic structure is notably assessed in terms of the past production, past impact, and past combinations of authors and concepts of the present team. Teams with the highest impact typically gather a large number of agents and concepts, have a moderately-aged and highly visible oldest author and keyword, with a strongly (yet not absolutely) original combination of concepts. We generally suggest that citation data and team composition information which is immediately available at publication time may be predictive of final impact. Focusing on local, dynamical patterns of bibliographical networks opens a door to further research on hybrid models and recommendation algorithms.

A Network Analysis of Technological Paradigms, Technological Trajectories and Industrial Dynamics in the Semiconductor Industry

Triulzi, Giorgio¹²
(1)UNU-MERIT, Maastricht, Netherlands, (2)Maastricht University, Maastricht, Netherlands

Since the seminal work of Dosi (1982), the concepts of technological paradigms and technological trajectories have become common terms in the academic discourse on technological change. The work by Hummon and Doreian (1989), Verspagen (2007), Fontana et al., (2009) and Martinelli (2008; 2009) defined a methodology which analyzes the evolution of the network of main paths of citations between patents (or publications) to empirically describe technological paradigms and trace technological trajectories. In this paper we contribute to the improvement of this methodology by formally defining a bunch of new indexes which aim to: (a) identify changes in the technological paradigm and (b) understand which firms have been responsible for those turbulences. We apply this framework to the analysis of the semiconductor industry. We show that semiconductors have been characterized by a tentative of paradigm shift in the mid-1990s. This change was driven by new entrant firms from Korea and Taiwan and by a few US incumbents. Interestingly the technological trajectories followed by those firms did not provide a persistent alternative to the main technological paradigm as it was set in the 1980s and beginning of the 1990s. Indeed the dominant technological paradigm which emerged after 1995, is a technological synthesis which includes the trajectories followed by the old American and Japanese incumbents in the 80s and 90s, those proposed by new entrants from Korea and Taiwan in the 90s and those set by a couple of US firms which became key players in the 2000s.
Citation Networks 2

The Strength of Varying Tie Strength
Bruggeman, Jeroen
University of Amsterdam, Sociology and Anthropology, Amsterdam, Netherlands

“The Strength of Weak Ties” argument (Granovetter 1973) says that the most valuable information is best collected through bridging ties with other social circles than one’s own, and that those ties tend to be weak. Aral and Van Alstyne (2011) added that to access complex information, actors need strong ties (“high bandwidth”) instead. These insights I generalize by pointing at actors’ interest to avoid spending large resources on low value information. Weak ties are well-suited for relatively simple information at low transmission and tie maintenance costs, whereas for complex information, the best outcomes are expected for those actors who vary their bandwidths along with the value of information accessed. To support my claim I use all patents in the USA (two million) over the period 1975—1999. I also show that in rationalized fields, such as technology, bandwidth correlates highly with the value of information, which provides support for using this proxy if value can’t be measured directly. Finally, I show that betweenness centrality is a better measure for brokerage than the often used constraint, and explain why.

Substance, Context and Decisions in a Large Citation Network of US Supreme Court Decisions
Doreian, Patrick1,2, Vladimir, Batagelj3
(1)University of Pittsburgh, Sociology, Pittsburgh, PA, United States, (2)University of Ljubljana, Faculty of Social Sciences, Ljubljana, Slovenia, (3)University of Ljubljana, Mathematics and Physics, Ljubljana, Slovenia

We examine citation patterns between the US Supreme Court decisions from its inception in 1798 through 2001 by extracting line and vertex islands of decisions in the cocited and cociting networks obtained from the decision citation network. The islands we consider in detail focus on laws pertaining to Native American societies, to maritime law, and law aimed at allegedly subversive groups. The decisions in these islands are coupled to their historical contexts, particularly laws enacted at federal, state, and local levels. We examine also some well known important decisions, their reliance on earlier decisions, and their impact on subsequent decisions.

Learning and the Structure of Citation Networks
Lafond, François
Maastricht University, UNU-MERIT and SBE, Maastricht, Netherlands

The distribution of citations received by scientific publications can be approximated by a power law, a finding that has been explained by “cumulative advantage”. This paper argues that socially embedded learning is a plausible mechanism behind this cumulative advantage. Based on a two-mode author-paper network, a model assuming that scientists face a time trade-off between learning and writing papers, that they learn the papers known by their peers, and that they cite papers they know, generates a power law distribution of popularity, and a shifted power law for the distribution of citations received. The two distributions flatten if there is relatively more learning. The predicted exponent for the distribution of citations is independent of the average in-(or out-) degree, contrary to an untested prediction of the reference model (Price, 1976). Using publicly available citation networks, an estimate of the share of time devoted to learning (against producing) is given around two thirds.

Dynamic Art Objects: The Evolving Structural Composition of the Global Art Scene
Rule, Alix1,2, Brandt, Philipp1
(1)Columbia University, Department of Sociology, New York, NY, United States, (2)INCITE, Department of Sociology, New York, NY, United States

We track the changing geography of status in contemporary art by extracting city-mentions from a corpus of 10,000+ press release sent out over the period of 1999-2012 via the art world’s flagship digital institution, e-flux. We conceive each press release as a strategic attempt by one (geographically-situated) institution to promote itself—to raise its status—by selectively citing other (geographically-situated) related events. The texts are rather conventionalized, and invariably cite not only the location of the event in question, but those cities in which the significant past and future events marshaled to promote it take place. Cities are conceived as nodes and mentions as directed ties, analogous with a
citation network. We extract place names from the corpus with the aid of Named Entity Recognition techniques, and build dynamic directed graphs for our 12-year time period. Revealed is an object that is at once imaginary and real -- "the art world" - which has largely resisted empirical description. The evolution of the network reveals the geographic shifts in significant (high-status) contemporary art activity, making a contribution to the debates on so-called the "globalization" of contemporary art since the 1990s.
Cognitive Social Structure

Do Hearts and Musical Notes Trump "Dating" and "Choir"?: Understanding and Remembering Social Networks

Hoagland, Emily, Brashears, Matthew
Cornell University, Sociology, Ithaca, NY, United States

Work on cognition in social networks is growing quickly but much of it is focused on how well people's internal models of their social networks reflect their actual social networks (i.e. perceptual accuracy). Less work has been done on how people actually understand and remember social network information. We explore this new area by using an innovative experimental design to both explore how individuals represent network information in the mind, and to link these representations to the success of recall. The experimental manipulation is a vignette that illustrates the relations between fifteen people under varying structural conditions. Participants are asked to memorize the networks depicted in the vignettes and are given the opportunity to take notes as an aid. We then analyze these notes to gain insight into how individuals understand and represent social network information. The results indicate that network information is most often represented as either a list of information, or as a diagram. Moreover, translating the information into diagram form, as well as graphically representing the types or content of relationships (e.g. marking intimate relationships with a heart), improves recall. Finally, there is preliminary evidence that respondents are biased towards the perception of balance in networks, implying that many individuals are unable to recall unbalanced triads simply because they tend not to notice them in the first place.

How Good Are People at Estimating Who Will Be Their Friends?

Johnson, Jeffrey C
East Carolina University, Department of Sociology, Greenville, NC, United States

In the course of meeting new people actors often “size-up” new acquaintances about their potential for closer relations, such as friendship. How good are actors at those estimations and how do they play out over time? In addition, does accuracy in estimation have some benefit? For example, does having a good sense of who one might form a reciprocated friendships with over time have psychological benefits? In this presentation we look at data collected from South Pole winter-over crews' estimation of who they think they will be friends with over the coming year. Crew members were, on their first meeting, asked to rank from 1 to n-1 who they think they will become friends with in the group. These rankings can be compared to social network relational data collected over the course of the year. In addition, data on individual psychological well-being and moral can be related to accuracy and stability in friendship estimates to understand the effects of accuracy on group dynamics and individual well-being.

Network Perception under Fire: The Role of Anger in Rival Network Cognition

Landis, Blaine, Kilduff, Martin, Menges, Jochen
(1)University of Cambridge, Cambridge, United Kingdom, (2)University College London, London, United Kingdom

We explore how anger influences perceptions of network relations surrounding a rival. In two lab studies, we establish that anger, relative to neutral emotion, affects the extent to which people see others as more connected than they really are. In a field experiment, we replicate and extend these findings by showing that anger not only promotes exaggerated perceptions of rival network connectedness, but also the tendency to see these networks are more homogeneous, group-like (entitative), and agentic than they are in actuality. Thus, relative to neutral emotion, anger seems to distort perceptions in such a way that people see their rivals and their rival's allies as representing stronger coalitions than may actually be the case.

Social Capital and Effectiveness Improvement

Schorch, Sebastian, Gerbasi, Alexandra
Grenoble Ecole de Management, Grenoble, France

Many studies have related social network characteristics and social capital to the effectiveness and performance of employees, and revealed positive and negative effects of certain social constellations and relationships. This literature has however neglected what might have been an important antecedent for performance: Before employees can become
more effective in what they do, they need to recognize an opportunity for effectiveness improvement through both, their human and social capital. In this article we explore from a social capital perspective how structural characteristics of actors impact their recognition of such opportunities. We relate opportunity recognition mechanisms found among managers and entrepreneurs to employees in an organization and distinguish two strategies for increasing social capital: the intensification of existing relationships, and the creation of new relationships within the organization. Drawing on empirical findings from a network analysis of a group of 87 employees, we find that employees see opportunities for effectiveness improvement in intensifying relationships to individuals in boundary spanning positions, in creating relationships to individuals who are not in boundary spanning positions, and generally in increasing closure of their social network. Unexpected negative implications of being in a boundary spanning position on passive social capital extension and the contingent value of boundary spanners for the improvement of employee effectiveness are discussed.

The Cognition of Structural Holes: Implications for Individual Performance

Soltis, Scott M¹, Borgatti, Steve², Mehra, Ajay²

(1)University of Missouri-St. Louis, Managment, St. Louis, MO, United States, (2)University of Kentucky, Lexington, KY, United States

Individual performance in an organization is enhanced by a disconnected network rich in "structural holes". Using multiple data sets and analytic techniques (including a recently developed set of measures), we explore the extent to which these performance benefits can be altered by the awareness of the individual that they occupy these generally advantageous positions. We test the ideas that accurately 'seeing holes' will enhance benefits to performance, seeing fewer structural holes than actually exist will diminish benefits, and that seeing holes that do not actually exist could hinder performance.
Collaboration, Coordination and Cooperation

The effect of embeddedness in multiple contexts on shared MTS cognition
DeChurch, Leslie A.¹, Asencio, Raquel¹, Murase, Toshio¹, Zaccaro, Stephen J.²
(¹)Georgia Institute of Technology, School of Psychology, Atlanta, GA, United States, (²)George Mason University, Psychology, Fairfax, VA, United States

Solving complex issues requires teams to collaborate across disciplines in order to pool diverse knowledge and expertise. Such collectives are known as multiteam systems (MTS; Mathieu, Marks, & Zaccaro, 2001). In MTSs members generate ideas and perspectives through interactions with their team and MTS members, but also members in the communities within which they are embedded. Thus, members can engage in three types of interactions: within-teams, between-teams, and within the community-of-practice (CoP). This embeddedness in multiple contexts provides different resources for MTS processes and performance because between- and within-team interactions directly influence MTS performance (Marks et al., 2005), and interactions within the respective communities benefit MTS performance by tapping into the knowledge available outside the MTS (Ancona & Caldwell, 1992). However, this complex embeddedness can hinder collaboration as members often operate from different time zones, disciplines, and cultures. Members must overcome this challenge by developing shared cognitive schema regarding information and work processes (Hinds & Mortensen, 2005). Three types of interactions influence one another, and the way members develop shared perceptions of MTS context. We hypothesize interactions within teams and the CoP have an inverted U-shape relationship with between-team bridging: excessive or insufficient amounts of these behaviors detract members from engaging in between-team bridging. Additionally, between-team bridging moderates the relationship between CoP interaction and shared context, such that CoP interactions are effective only when there is high between-team bridging. We tested and confirmed these hypotheses in an 8-week long quasi-field study using 32 MTSs composed of four teams each.

The Role of Communication Networks in Inter- and Intra-group Cooperation
Larson, Jennifer
New York University, Politics, New York, NY, United States

The number of communities for which rich network data exists is growing rapidly, but theory relating the structure of these networks to cooperative outcomes has lagged behind. The theory of small groups with complete communication networks is well-understood: such groups can use reputation mechanisms and decentralized punishment to keep members cooperating internally and with other groups. However, the theory of groups with more realistic incomplete networks is less well-understood, beyond the intuition that cooperation should be harder. When news relevant to reputation and punishment must travel from person to person along communication networks, the ability to enforce cooperation depends on properties of these networks. I present a game-theoretic model in which rational players encounter in- and out-group members at random and gossip about their experiences within a fixed communication network determined by their social structure. This approach allows a characterization of the relationship between group structure and cooperation, and yields a centrality measure with which arbitrary networks can be compared in terms of cooperativeness, and arbitrary people within a network can be compared in terms of trustworthiness. I assess the cooperative prospects of social structures of interest to the social sciences (hierarchies, segregated groups, etc.) and explore barriers to full-cooperation.

Integrating Social Networks: About the Influence of Network Cohesion and Scarification
Mirc, Nicola¹,²
(¹)IAE Toulouse, University of Toulouse 1 Capitole, Toulouse, France, (²)Ecole Polytechnique, Palaiseau, France

The paper addresses the process of organizational network integration after a corporate acquisition. It highlights the role of inter-individual relations and social structures as the shaping forces of synergy creation. The emphasis is further put on the evolution of these relations and structures in time, considering thus synergy creation not as discrete but as a continuous process. Findings are based on longitudinal data on a single case study of an acquisition in the consultancy sector through network surveys and qualitative interviews. On the macro level, analysis points out the way the social structure of relationships in each firm effect the creation of synergies. Strong social cohesion and network closure as observed at the acquiring firm were found to have an impeding impact on the engagement in synergy promoting ties. These were, by contrast, promoted by strong network scarification, as observed at the acquired company. On the micro
level, two individual network properties has been identified as particularly favoring the engagement in synergy promoting ties, i.e. a high level of structural autonomy and network centrality.

**Identifying Optimal Business Network Configurations in Construction Project Supply Chains**

*Pryke, Stephen D., Badi, Sulafa*

University College London, School of Construction and Project Management, London, United Kingdom

The construction of a building, or other facility, is a complex, information dependent, prototype production process where conception, design and production phases are compressed, concurrent and highly interdependent, in an environment where there exists unusually large number of internal and external uncertainties. This paper relates to a research project where Social Network Analysis (SNA) is used to gather data relating to transaction sets associated with the main functions of the project coalition. The paper looks at networks relating to contractual conditions, performance incentives and cost management information exchange. Analysis of the contractual relationship networks reveals significant differences in network path lengths depending on the model used to manage the supply chain. The experienced private sector client chose a non-bureaucratic model with exceptionally short path lengths; the comparable public sector model using a supply chain managing agent (SCMA), involving longer path lengths and less privity of contract between client and Tier 2. Performance incentives are tacit and relate to maintenance of workload in the non-bureaucratic private sector supply chain network; the public sector’s use of a SCMA required extensive use of contiguous performance incentives. Finally the cost management networks revealed (inter alia) that independent cost management functions are partly obviated by collaborative supply chain relationships.

**Regional Rail Planning; a Study of the Importance of ´Steering´ and ´Pragmatism´ in Stakeholder Networks**

*Pryke, Stephen D.¹, Shepherd, Richard K.²*

(1)University College London, School of Construction and Project Management, London, United Kingdom, (2)Network Rail, London, United Kingdom

This paper investigates the significance of social networks in stakeholder groups related to regional rail planning. The research focuses on the identification of the relative significance of three core factors in regional planning - ´communicative discourse´, ´steering´ and ´environment´. A case study of the Highlands and Islands region of Scotland was studied. Social network analysis (SNA) data was used alongside qualitative data gathered through structured interviews. Analysis revealed low density local communicative discourse networks supported by relatively high density networks of key individuals in regional stakeholder groups. Bridging links between the two network types facilitated the establishment of trust, permanence and confidentiality underlying the collaborative planning exhibited in the region. The bridging relationships were found to evolve primarily through a need for conflict resolution emphasising pragmatism and respect for the relationships established by others. The network configurations were a function of sparsely populated regions where steering by an individual or group is more common and accepted. Acceptance of ´steering´ within a spirit of inclusion and local legitimacy serves to facilitate planning networks in a way unavailable in more urbanised and smaller, less coordinated community environments.
Collective Action and Social Movements: Networks and the coordination of collective action

Comparing Civil Society Structures

*Diani, Mario*1,2
(1) University of Trento, Trento, Italy, (2) ICREA-UPF, Barcelona, Spain

The structure of civic organizational fields may be analyzed with data on organizations’ mutual perceptions of relevance, and with data on ‘objective’ interactions, derived from joint participation in multiple events. In this paper I draw upon ERGM and the approach outlined in the recent book edited by Lusher, Koskinen and Robins to compare inter-organizational networks of voluntary organizations working on a range of public and collective issues, based on the two criteria indicated above. That data come from studies conducted in two British cities, Glasgow and Bristol, enables to conduct a double comparison, between networks based on the same type of data across cities, and between networks based on different data within cities.

Between Cooperation and Competition - Social Movement Organisations within South Africa’s Environmental Movement Industry

*Euler, Thorsten*
University of Hamburg, School of Business, Economics and Social Sciences, Hamburg, Germany

Unlike western countries like Germany, environmental movements as one sort of social movements are a quite recent phenomena in developing countries. Being relieved of the struggle for basic need for survival the growing urban and semi-urban middle class in emerging economies has discovered its environmental needs and has allied with traditional conservationists and victims of anthropogenic hazards and environmental change to form new environmental movements. Likewise to the speed of economic progress this has happened in next to no time. This paper incorporates the ideas of a PhD-project focusing on social movement organisations within the environmental movement industry in South Africa. Using the organisational adaption of the resource mobilisation theory by Mayer and Zald it examines the possibility of cooperation and competition between environmental organisations for the accumulation of resources within society. South Africa presents a special case with a civil society widely influenced by collective action and social movement during the struggle against Apartheid reign. The question arises how environmental organisation can stand to benefit from this history of collective action. The second point asks to what extent they join and link to each other for their common cause to share resources between different types of environmental organisations stretching over social classes and the rural-urban divide.

Trade Union Networks and Coordinated Action in the Metal Sector in Europe - The Case of a Single Network?

*Nordin, Patrik*
University of Vienna, Department of Sociology, Vienna, Austria

Since the early 1990’s, deepening European integration and increasing internationalization of production lines has brought the issue of trade union cooperation into discussion. In order to keep up with this development cross-border networks of trade unions under the European Trade Union Federations, such as the European Metalworkers’ Federation (EMF) have been established to safeguard the workers interests. On the other side, especially after the EU enlargement, trade unions have faced challenges due to the persisting divergence in patterns of industrial relations and the increasing international competition that can seriously hamper the development of cooperation between European trade unions. By using the methods of social network analysis, this study shows how network power, positioning, resources and structure have shaped trade unionism in the metal sector at the European level by studying the 71 trade unions affiliated to the EMF. A special emphasis is given to the relationships between and within the trade unions from three "blocks": EU15, Central Eastern Europe and Southeastern Europe. The core-periphery structure of the network enables us to see whether we should talk about a single network or multiple ones, while also helping to spot institutional developments, sustainability and progress of the network. Advantageous or disadvantageous positioning of actors in the network helps to explain their influence and power positions and their ability to realize their interests to a considerable extent, since powerful actors are able to dictate the policy agenda at the European level and thus diminish the interest level of the less powerful actors.
The Spatial Dynamics of Collective Action. Social Reform Conferences, 1840-1880

Verbruggen, Christophe, Blomme, Hans
Ghent University, Department of History, Research Unit Social History since 1750, Ghent, Belgium

As Mario Diani and others already pointed out, researchers of social reform movements and collective action have been increasingly adopting network concepts and perspectives in their work, while their use of formal network analytical tools is still very limited. This has everything to do with heuristic barriers identifying valid sources of data to chart the evolution of interorganizational networks and spatio-temporal issues in searching, processing and visualizing research data. With the creation of appropriate research infrastructures, the digitization of 19th-century sources and alternative ways of scholarly collaboration, it will become possible to overcome these barriers and to explore how networks of people and discursive frameworks come into existence, hold themselves together, or sometimes disintegrate. That’s why we have coined TIC Collaborative, a joint international research effort coordinated by Maastricht University and Ghent University. The overall aim is to highlight the interconnectedness of local activism, national reform agendas and the transnational circulation of ideas and collective action related to welfare, social and cultural reform. International conferences were vital in this regard. Both private persons and (local) organizations adhered to reform conferences. In this paper we will present a first (multivariate) graphic exploration of the local embeddedness of transnational educational reform networks, using multiple memberships of local organization and international conferences between 1840 and 1880.

Producing Public Goods in Networks: Some Effects of Social Comparison and Endogenous Network Change

Zschache, Johannes
University of Leipzig, Institute of Sociology, Leipzig, Germany

As actors participate in the production of public goods, processes of social comparison may affect the decisions about the individual contributions as well as the endogenously changing structure of an underlying social network. This leads to the transformation of an ordinary n-player Prisoner’s Dilemma of collective action into an n-player coordination game. The paper uses agent-based simulations to trace the formation of public goods while varying network characteristics, such as density, segregation, or the strength of relationships. Additionally, the usage of both a forward and a backward-looking agent model shows possible implications of different assumptions about the actors’ decision making.
Collective Action and Social Movements: Networks, discourses, and outcomes

Who to Blame? Refracting Conflict Through Network Mediation and Its Implications for Discursive Frames

Borrero Luz, Joana
Institut National de la Recherche Scientifique, Centre Urbanisation Culture Societe, Montreal, QC, Canada

The purpose of this paper is to discuss the use of social network analysis in research on processes of institutionalization and co-optation of emerging social movements in the field of food security. As suggested by previous research, the capacity for social movements to generate change through conflict may be neutralized by the decoupling of discourse from underlying organisational logics of action and institutional mechanisms of control. Our research findings confirm this hypothesis. Based on a research project on the inter-organisational relations of the “collective kitchen” movement in Montreal (Canada), we collected relational data on 31 collective kitchen organisations (CCO), 156 directly associated organisations (DAO), and 277 indirectly associated organisations (IAO). We used social network analysis to compare network centrality and position of affiliation matrices (organisations and categories of discourse) and two-mode matrices (collective kitchens and associated organisations). Our research results suggest that 1) many CCO struggle to articulate conflict with organisations that are outside their ego-network and that are discursively similar, and 2) some organisations that are between CCO and IAO, are in position of refracting conflict between the two latter by making it difficult for CCO to articulate conflict about IAO. Decoupling thus facilitates co-optation by allowing discursive proximity between organisations (thus neutralizing conflict) that practice different logics of action and that are structurally distant. These findings have significant implications for theory, methodology and practice and suggest greater integration of social network analysis and critical discourse analysis in research on social movements.

Network Structure and Collective Action Outcomes: The Case of Urban Social Movements in Turkey

Ertan, Gunes
University of Pittsburgh, Pittsburgh, PA, United States

Despite the growth in research on networks and social movements, most studies either explore different structures among inter-organizational or interpersonal networks without examining the origins or consequences of these networks in relation to other social phenomena, or focus on the implications of network structure for individual actors (e.g. is more central also more powerful?). Therefore, the role of global network properties in relation to the macro characteristics/performance of the group/s under study still needs further examination. In order to address these gaps, this study focuses on a group of urban social movement cases based in Ankara, Turkey, between 2006 and 2011. The main goal of the study is to understand how network structures of these movements maybe related to their political outcomes. The preliminary findings of Crisp-Set Qualitative Comparison Analysis (csQCA) show that when combined with other certain causal conditions, network structure is associated with positive outcomes, but conditions relating to political opportunity structures seem to be more influential determinants of successful movement outcomes.

Collective Action at the Xingu: Mapping the Social Movement against the Belo Monte Dam

Peters, Ina
GIGA German Institute of Global and Area Studies, Hamburg, Germany

The Belo Monte Dam will be the third-largest hydroelectric power plant in the world. At the same time it is one of the most contested infrastructure projects in Brazil because of its substantial social, environmental and economic impacts. For more than 20 years, local grassroots organizations have been mobilizing townspeople, indigenous, riverine, and forest people in order to fight the construction of the dam while national and international organizations and activists have provided resources and advice. This paper seeks to analyze the collective action against Belo Monte by means of a social network analysis. A relational approach seems suitable as the collective action takes place under specific context conditions, including a high heterogeneity of the activists and complex socio-economic conditions. Drawing on data collected in semi-structured qualitative interviews conducted with Brazilian experts and activists in 2012, this paper seeks to reveal the means of interaction and cooperation between actors, the presence and absence of personal and institutional ties, and the role of leadership in the social movement against Belo Monte. The empirical results indicate that imbalances of power and unequal opportunities for political participation result in activists relying primarily on personal relations while institutional ties are weak. The paper contributes to empirical research on social movements in...
developing countries and evaluates the applicability of “western” social movement theories to a “non-western” case study. Knowledge of this kind is highly relevant, as similar conflicts can be expected to arise in Brazil and other emerging economies in the near future.

**Two-mode Network Centrality, Movement Identification, and Attitudes Toward Climate Change Amongst Environmental Organization Members**

*Tindall, David B.*, Stoddart, Mark C.J.*, Piggott, Georgia*

(1) Department of Sociology, Sociology, Vancouver, BC, Canada, (2) Memorial University of Newfoundland, Sociology, St. John’s, NL, Canada, (3) University of British Columbia, Sociology, Vancouver, BC, Canada

In this talk we analyze social survey data from a nation-wide probability sample of members of environmental organizations in Canada. Consistent with past literature in social psychology, and also with assertions in the policy network literature, we claim that attitude formation is associated with structural position in a two mode network of individuals and organizations. More specifically, individuals with higher eigenvector centrality - that is, those with ties to environmental organizations that are relatively more central in the network -- are more concerned about climate change. Level of movement identification is also positively correlated both with concern about climate change, and eigenvector centrality. These effects hold when a host of sociodemographic variables are controlled. We discuss the theoretical implications of these findings.

**Dissecting a Discursive Movement. A Network Analysis of the Dutch Debate on Minority Integration, 1990-2005**

*Uitermark, Justus*, Traag, V.A., Bruggeman, Jeroen

(1) Erasmus University, Rotterdam, Netherlands, (2) Université Catholique de Louvain, Louvain, Belgium, (3) University of Amsterdam, Amsterdam, Netherlands

Between 1990 and 2005, a sea change took place in the Dutch debate on minority integration. Whereas ethnic and religious differences were hitherto pacified through accommodation, an increasingly powerful movement in Dutch politics problematized the presence of Muslims and ethnic minorities. To account for the emergence of this movement, this paper develops a relational approach to examine power relations within contentious public debates. To map relations within and between contending groups, we develop relational conceptualizations and measures for polarization, leadership, solidarity, and various aspects of discursive power. The data consist of 8383 negative, neutral and positive references among 1958 actors made in three Dutch newspapers in the period 1990-2005. Over different periods in the debate, we find a recurrent pattern: a small yet cohesive group of challengers with strong leaders dominated the debate and forced upon other participants their framing of integration issues. We suggest that the pattern found in the Dutch case may exemplify a more universal figurational dynamic of discursive revolutions.
Collective Action and Social Movements: Online collective action

Social Networks on Twitter: Emergent Sociabilities

Amaral, Ines¹,²
(¹)University of Minho, Communication and Society Research Centre, Braga, Portugal, (²)Instituto Superior Miguel Torga, Coimbra, Portugal

This paper focuses on the appropriation of computer-mediated interaction tools, through techniques of semantic indexation, in order to understand whether there is an emergence of new forms of sociability with new practices and social relations that represent an unterritorialized thermometer of society. The empirical research developed focuses on how hashtag networks, materialized on Twitter, represent structures that allow to analyse interactions as networks of users through the appropriation of content and conversation. The dataset used in this study was created by capturing archives of messages with the semantic indexation of #cablegate from Twitter’s public timeline. Different appropriations of Twitter’s conventions originate three networks: #cablegate network, #cablegate network of replies and #cablegate network of retweets. The networks were drawn over a corpus of 27452 tweets indexed. The results have revealed the emergence of new forms of sociability that arise from non-traditional social practices facilitated by technical tools. A pattern of ‘networked individualism’ (Castells, 2004) was identified and it describes potential collective action and virality, speed of information transmission and integration of audiences of audiences with multiple networks. This participation model also reveals poor cooperation and reciprocity, social structures fragmented into small cohesive groups and consolidated by the prevalence of weak ties, central actors and undemocratic networks. The new social ties focus on the content and conversation and turn the traditional audiences and consumers into ‘prosumers’. The global conclusion of this paper is that in asymmetrical social networks created through the indexation of content, sociabilities are different from the traditional ones.

The Bridges and Brokers of Global Campaigns in the Context of Social Media

Gonzalez-Bailon, Sandra, Wang, Ning
University of Oxford, Oxford Internet Institute, Oxford, United Kingdom

In May of 2011 a political movement emerged in Spain that, under the influence of the Arab Spring, occupied the squares of dozens of cities as a protest against policy reactions to the financial crisis; a few months later the Occupy movement erupted in New York, borrowing some of the tactics of the Spanish protesters and taking the message of discontent against the financial system to a global scale. A year later, the Spanish protesters went to the streets again, to celebrate the first anniversary of the first mass demonstrations, this time part of the global Occupy campaign. Protesters and media reporters converge in their view that social media play a significant role in the rapid growth of these mobilisations and in their internationalisation; however, there are still many open questions about how online networks operate and, in particular, about how they integrate local flows of information. We examine this question using data from Twitter communication, sampled over a two-month period in 2012, coinciding with the first anniversary of the Spanish (15-M) movement. Using the publicly available API, we collected close to a million messages containing information related to the Occupy and the 15-M campaigns. We reconstruct networks of communication using RTs and mentions, and we analyse the level of integration of information flows, shedding light on the users that act as brokers. Our findings help assess claims about the instrumental role of online networks in the dissemination of protest information and, more generally, about collective action in the digital age.

Contrasting Protest from Mundanity in Communication Networks: Cohesion, Centralization, and the Russian Opposition Movement

Lind, Benjamin E.
Higher School of Economics, Faculty of Sociology and Centre for Advanced Studies, Moscow, Russian Federation

Though the intersection of social movement theory and network analysis has advanced many subjects on social mobilization, the subfield offers few systematic descriptions of communication networks at protest sites. In order to address this gap in the literature, I treat social protest episodes as phenomena that, over the course of an event’s duration, alter a given venue’s population and its communication patterns from an otherwise mundane state. To offer a systematic characterization of protest communication networks, I contrast a venue’s communication network during a protest to that of a mundane period at the same venue exactly one week later using geospatial enabled updates to Twitter. I apply this procedure to seven Russian opposition protests and seven null events held in Moscow between June.
and December of 2012. Drawing upon theories on identity, solidarity, and leadership from the social movements literature and using network metrics complemented by meta-analyses, I evaluate if and how protest and mundane communication networks differ in terms of cohesion and centralization. This study bears implications for future research on the subjects of social movement theory, urban sociology, and network society.

The Role of Social Media and Social Networking Sites in the Russian Opposition Protests

Lonkila, Markku
University of Tampere, School of Social Sciences and Humanities, Tampere, Finland

Social media and social networking sites played an important part in launching of the wave of protests against Russian government in December 2011. This paper examines their role in preparing ground, mobilizing and coordinating the protest wave and opposition movement.

"Friendship" Networks and Leadership in Online Social Movement Communities: A Comparison of Election Observers' Groups in a Russian Social Networking Service

Rykov, Yuri¹, Koltsova, Olessia²
(¹)National Research University - Higher School of Economics, The Laboratory for Internet Studies, Saint Petersburg, Russian Federation, (²)National Research University - Higher School of Economics, Saint Petersburg, Russian Federation

The impact of Internet on social movements has been both immense and well-studied; however, less attention has been paid to social network structure of online social movements that may tell a lot about their emergence, development, sustainability and typology. The goal of this work in progress is to explain the level and the nature of activity of a set of online social movement groups through studying their network features, including patterns of online leadership and social capital distribution. The data have been obtained from the leading Russian social network service Vkontakte and are related to a recently emerged movement of election observers in St.Petersburg that has gone far beyond the elections in its activity. The sample includes all 17 groups corresponding to 17 districts of St.Petersburg, of varying size and activity. The networks are extracted from self-declared relations of mutual friendship and form 17 partially intersecting graphs. The preliminary analysis shows that, first, network structure (degree distribution, modularity coefficient and some other measures) is approximately the same for groups of all levels of activity and length of existence, and there is no association between them. Second, there is a visible positive correlation between individuals' communicative activity (measured as the number of posts, messages, comments, received comments and "likes") and their importance in the network (such as degree and betweenness centrality). It is still a question for further research whether presence of individuals with centralities over a certain threshold may predict the activity and the length of existence of groups.
Collective Action and Social Movements: Personal networks and collective action

Activists in Politics - The Influence of Personal Overlap on Social Movement’s Success

Böhm, Timo
University of Mannheim, Mannheim, Germany

Social movements strive for social change that realizes their ideal of how “the perfect world” should look like. Movements want to succeed as fast as possible and therefore try to find the most effective way of influencing decision-makers. In parliamentarian democracies, the central decision-makers are political parties. Much of the extant literature emphasize the use of public pressure and lobbying. In contrast, I argue that personal overlap between political parties and social movements is the strongest and most stable way for activists to influence politicians. Using novel micro data on the German antinuclear movement, and in particular its success in influencing the shutdown of nuclear power plants, I show how movements realize their goals significantly faster when they increase their personal overlap with political parties.

Detection and Analysis of Invisible Political Relationships

Ruths, Derek1, Lazer, David2
(1)McGill University, Computer Science, Montreal, QC, Canada, (2)Northeastern University, Political Science, Boston, MA, United States

In the United States, campaign contributions are a major form of political mobilization and comprise a significant source of funding for political candidates. Despite this fact, much remains unknown about the processes that influence the timing and recipients of individual campaign contributions. In this study, we use an annotated version of the FEC contribution data to identify likely relationships between pairs of contributors. We infer these relationships based on unlikely repeated coincidence of contribution timing of contributors. We find that that there is a powerful social network backbone to the pattern of contributions—large clusters of individuals who are repeatedly mobilized from campaign to campaign to co-contribute to the same candidates at about the same time. We validate our findings through identification of other evidence of relationships between contributors (e.g., known familial relationships, partnerships in law firms, geographic proximity, etc).

Clean up your Network - How a Strike Changed the Social Networks of a Working Team

Thommes, Kirsten, Akkerman, Agnes
Radboud University, Political Science, Nijmegen, Netherlands

The material cost of strikes, in terms of production losses, are well-documented in micro- and macroeconomic research. Nevertheless, the aftermath of strikes is often long-lasting and involves personal and relational costs that may have profound long-term effects on production. Relational costs and benefits after a strike action occur, because usually employees do not act in concert. Instead, subgroups of strikers and non-strikers emerge and both groups have incentives to avoid the expected negative consequences of deviation from norms of the out-group. We hypothesize that individuals aim at maximizing their social relations in the sense that they avoid contact and possible punishment by the minimizing contact to the out-group and instead intensify contacts to their in-group in order to receive social approval. We analyze how the network of 59 employees in a firm changed after a strike. Using a longitudinal dataset, we investigate whether ties to the out-group were deleted and whether new ties developed among in-group members. We did this for the work related network and informal network among employees, thereby testing the hypothesis for different levels of adaptability of network relations. We used dichotomized ties, as well as valued ties in order to answer the question whether network cohesion of the in-group (either strikers or non-strikers) increases, while cohesion between strikers and non-strikers weakens. Our analysis provides a first quantification of the relational costs that are triggered by the strike and occur, after the collective labor conflict is settled.

Transition among Participants in Activists’ Networks: Focusing on Protest Events

Tominaga, Kyoko
The University of Tokyo, Sociology, Tokyo, Japan
This presentation investigated the role of activists' networks in the social movement community. Like profit organizations, religious communities, and other organizations/communities, activists' networks are believed to affect the careers of participants because the networks define participants' roles, positions, and relationships with other people. This study investigated whether this argument could apply to social movement communities by focusing on “protest events.” Protest events not only constitute political activism but also provide opportunities to build networks for protesters; thus, it is appropriate to use them for investigating identity, career, and lifestyle transitions among the participants of the network. In this study, the author focused on the “protest event” against the 2008 G8 summit and on 50 activists' networks in Japan. Using interview data, the author investigated identity, career, and lifestyle transition among the networks' participants. The results are as follows: [1] After the protest event, the networks had a higher density then earlier. Through the event, participants formed relationships with each other. [2] After participating in the event, some people changed their jobs, families, and lifestyles. They played central roles in the event and changed their environment using the network created with other participants. Participants in this category tended to show greater commitment to social movements. [3] Some participants retired from activism, although they had high centrality during the summit protest. As a result of their devotion to the protest, they were “burned-out” and isolated from the protest community. Activists' network effects to their careers for better or worse.

Turning Passion into Action: Establishing Effective Advocacy Networks for Women's Issues by Using Social Media and Social Network Analysis for Social Change

Tunnard, Christopher R.
Fletcher School of Law and Diplomacy, Tufts University, Medford, MA, United States

Every year since 2006, Women2Women, a Boston-based NGO, has held a one-week conference whose goal is to build a network of young women with leadership potential from around the world, engage them in the issues that define their lives, and give them the tools to create action plans that they can implement domestically and trans-nationally. Top issues include: child marriage, gender-based discrimination, equal pay, domestic violence, and access to education. To date, more than 500 young women, primarily from the Middle East and North Africa, have been through the program. While social media tools are easily adopted by young people, they don't help them understand the shape and size of the issue networks, who is in them, and how effective they could be. So, two years ago, researchers from the Fletcher School began to survey participants and use social network software to visualize and analyze the networks in order to help answer questions like: Who’s talking to whom about what? What is the relative importance of each issue by country, region, and other attributes? Where is the potential thought leadership and influence for each issue? Ongoing analyses of communications networks, issue networks, and related NGO and job networks have revealed the success of these conferences in bringing young women together to create a new generation of networked advocates in parts of the world where women have not traditionally been empowered. Initial results will be presented, together with potential research partnership and participation opportunities in future surveys.
A Multidimensional Analysis of Face-to-Face Fleeting Interaction Antecedents. An RFID-based Case Study of an Incubator

Barzotto, Mariachiara, Comacchio, Anna
Ca' Foscari University of Venice, Management, Venice, Italy

Face-to-face (F2F) encounters still play an irreplaceable role in conveying complex and tacit knowledge and in developing trust-based relations, as essential elements to boost knowledge sharing and innovation organizations. Previous literature explains the employees' decision to engage in F2F encounters through three different factors: actors' attributes, network structure in which they are embedded and workplace spatial configuration. Yet there is no systematic research integrating these three aspects. The aim of the study is to bridge these explanations and to provide a deeper understanding of the antecedents driving the employee’s decision to personally meet a colleague. We investigate how social (friendship) and organizational (organizational unit, professional family and hierarchical level memberships) similarities, as well as office layout, impact on a dyadic fleeting F2F encounter when they are independently or jointly taken. Data on 7,799 dyadic F2F interactions among 91 employees of a private incubator in the Internet and Digital sector was examined. By using Radio-Frequency IDentification (RFID) badges, we recorded the dyadic employees' engagement in interactions over an observation period of 18 working days. Empirical results show how analyzing the presence of a single form of similarity may be potentially misleading in understanding workplace interpersonal connections if it is considered independently of other types of similarity and of the office spatial configuration in which employees work. Findings show that combinations of similarities linking two individuals and office layout have different impacts on frequency and duration of F2F encounters. Implications on patterns of interaction at the organizational level are discussed.

Analysis of the Internal Communication Network Structure of a German University Library

Kronenwett, Simone¹, Kronenwett, Michael²
(1)University at Cologne, Center for eHumanites, Cologne, Germany, (2)University of Trier, Trier, Germany

The project examines the status quo of formal and informal communication network structure of a German university library. The results of the survey will be used to develop improvements in the form of concrete recommendations. First, qualitative, semi-structured interviews were conducted with 30 employees. Based on the qualitative results, a quantitative, questionnaire-based survey was conducted. The quantitative survey included all employees of the University library. Only the networks within the university library were collected. Due to data protection, the network analysis was then performed at the level of organizational units (divisions, departments, staff positions). The following questions were the focus of analysis: What communication tools are available in the various organizational units and how are they used? Which organizational unit communicates on which way and with which other organizational unit? What differences can be seen in the formal and informal communication networks? With the help of ERGM these questions were investigated. Based on the results the internal communication should be optimized and the overall working environment should be improved.

Social Closure and Social Norms

Krugljakov, Nikita, Strobel, Martin
Maastricht University, Maastricht, Netherlands

We study how the structure of a communication network affects communication content and subsequent choices to exert or to prevent a negative externality. Coleman (1988) proposes that social closure is important to effectively internalize external effects. In a lab experiment we study whether social closure is sufficient to discipline subjects not to take money from others. Shareholder A chooses how much money to take from stakeholders B1 and B2. The stakeholders observe the amount taken. In the closure treatment stakeholders communicate with each other. In the noclosure treatment each stakeholder communicates with a bystander who is not affected by A’s choice. After communication stakeholders individually invest in punishing the shareholder. Punishment is costly. Our main result suggests that shareholders take more money from stakeholders in the closure treatment than in the noclosure treatment. This observation contradicts Coleman’s hypothesis. To test the robustness of our results we conduct a follow up experiment. We allow stakeholders to observe each other's punishment choices. Furthermore, we look at the effect of decreased punishment costs.
The Persistence of Social Signatures in Human Communication

Roberts, Sam G. B.1, Saramaki, Jari2, Leicht, Elizabeth A.3, Lopez, Eduardo3, Reed-Tsochas, Felix3, Dunbar, Robin I. M.4
1University of Chester, Department of Psychology, Chester, United Kingdom, 2Aalto University, Aalto, Finland, 3University of Oxford, CABDyN Complexity Centre, Oxford, United Kingdom, 4University of Oxford, Department of Experimental Psychology, Oxford, United Kingdom

Personal networks have a distinctive layered structure, with a small number of emotionally intense relationships, and a larger number of weak ties with less emotional intensity. This layered structure is partly due to the time and cognitive constraints that limit the number of relationships an individual can maintain at each level of emotional intensity. However, whether this distinctive layered structure is maintained when there is a high turnover of individual network members is unclear, and provides a crucial test of the hypothesis that there are limits on the number and quality of relationships that an individual can maintain. In this study, we use a unique 18-month longitudinal dataset of students making the transition from school to university, which combines mobile phone calls with questionnaire data, to track changes in the students’ personal networks and communication patterns. We found that individuals display a distinctive ‘social signature’ that depicts how their limited communication time is allocated across network members. Importantly, these individual social signatures are persistent over time, despite considerable turnover of individual network members, associated with the transition from school to university or work. Thus, as new network members are added, the old network members tend to receive fewer mobile phone calls, preserving the distinctive individual patterns of time allocation. These results provide the first direct evidence that the layered structure of social networks is shaped by a combination of cognitive constraints and the limited amount of time individuals have available for communication.

Social Networks Analysis in Sociolinguistic Research. A Valued Networks Problem

Sorolla, Natxo
Universitat de Barcelona, Centre Universitari de Sociolingüística i Comunicació, Xarxa CRUSCAT - IEC, Barcelona, Spain

Multilingual societies have a huge interest in sociolinguistic research for their language practices, ideologies and competences. Our research approach uses social network analysis to enable new questions in sociolinguistics discipline, such as who speaks with who, what languages uses, and why (Milroy, 1987). But social network analysis incorporates a methodological challenge in sociolinguistic, because sociolinguistic relations have attributes (valued networks): individuals have relations (1) or not (0), and their relations can be in one language (1) or in other language (2) (Gallagher, 2012). Our research is structured in three analysis levels: individual variables (attributes), context variables (classroom composition) and structural variables (centrality in the networks, triads...). Catalan is a minoritized language all over its linguistic territory, with 10 million speakers. That is why it has to coexist with Castilian in a language contact situation. This situation has usually been interpreted by means of the rule of linguistic subordination of the minority language. This rule has created — and fixed — a series of habits through which Catalan speakers use Catalan when they interact with Catalan-speakers, and Spanish when they speak to other language speakers. Nevertheless, some studies show how this rule has been broken in some Catalan-speaking linguistic areas. In some areas such as Catalonia, some Spanish speakers adapt to Catalan in their interpersonal relations. In other areas, such as La Franja (Aragon), some Catalan speakers use Spanish for their intra-ethnic communications. Our research takes into account a fieldwork with 245 early teenagers, 12 years old classmates in La Franja.
Community

Diversity and Generalized Trust: The Case of Turkey
Carkoglu, Ali*1, Cenker Ozek, Cerem Isil2
(1)Koc University, International Relations, Istanbul, Turkey, (2)Antalya International University, Political Science and International Relations, Antalya, Turkey

Earlier studies working with data from institutionalized democracies argued that ethnic diversity would first influence generalized trust negatively, yet the sustenance of interaction with different others is eventually expected to result in more trust in the fellow men. Along similar lines others underlined the significance of interaction among different ethnic groups as a positive determinant of generalized trust. These studies showed that segregation rather than diversity hinders trust and they further revealed the relevance of social interactions and networks at the neighborhood level for extending trust to the fellow men. Present study attempts to conduct a similar analysis in Turkey where democratic system has not institutionalized fully yet. Kurds are the most visible ethnic minority and Alevı are the most populous sectarian minority in Turkey. We employ a survey conducted in 2011, in five cities of Turkey which included a discussion network name generator to elicit the network data. Based on this survey, present study explores social network influence on generalized trust in settings of ethnic and religious diversity. The research findings show that diversity influences the generalized trust of the majority-Muslim Turks in this case- negatively, yet it does not pose any significant influence on generalized trust of the minority groups. Also, diversity within the family seems to have different influence on generalized trust than diversity among friends. The analysis aims to discuss these results within the context of Turkish society and democracy.

Producers’ Cooperatives: Brokers or Mirrors of the Social Structure?
Inguaggiato, Carla
University of Trento, Trento, Italy

The paper explores how social networks influence organizations’ emergence and composition. It focuses on determinants of households’ participation into producers’ cooperatives created by development agencies in three villages of the Northeast Brazil. The context of analysis can be considered a natural experiment in terms of village composition as they include both old and new settlers and economic activity as family farm sector represents an invention for the context. Factors that have been considered to influence participation to producers’ cooperatives are considered to be access to information, behavior of socially close households, activities promoted by producers’ cooperatives and ability of RPO members to adhere to donors’ expectations. Multiple intra-village networks among households collected include kinship, labor and frequent contact and organizational field. The main question is whether this specific type of organization becomes a mirror of existing network structures and/or development agency values or it becomes a broker creating new space of interaction.

Joining Together Personal Networks in Disaster-Affected Communities in Ecuador and Mexico, Using EgoNet and VisuAlYzer
Jones, Eric C1, Murphy, Arthur D1, Tobin, Graham A2, Whiteford, Linda M2, Faas, Albert J3
(1)UNC Greensboro, Greensboro, NC, United States, (2)University of South Florida, Tampa, FL, United States, (3)NC State, Raleigh, NC, United States

Personal/Egocentric Networks--in which the respondent evaluates relationships between people named by the respondent--generally elicit less than 50 network members. This is because the burden on the respondent is high, with lower bound being (n2-n)/2 for undirected graphs, and higher bound being n2-n for directed graphs. However, when several of these networks are put together, very complex and complicated community networks can be graphed. For community network studies, it is worth knowing what exactly is gained by joining together respondents’ full personal networks vs. joining together lists of names provided by each respondent. Using members named by more than one respondent, we put together full personal networks (of 25 members per network) in each of seven villages affect by disasters in Ecuador and Mexico. We compared structural characteristics of the combined network with another network created by combining only the lists given by the respondents, not the ties between members of each personal network. Structural variation between villages began with average number of unique people named in each village, but also varied by a number of other factors including whether villages were comprised of resettled people or non-resettled people following disasters.
Communities of Practice as Social Networks

Rioux-Pelletier, Marie Eve¹, Saint-Charles, Johanne¹, Mongeau, Pierre², Mertens, Frédéric³, St-Cyr Bouchard, Maude²
(¹Université du Québec à Montréal, Cinbiose, Montréal, QC, Canada, ²Université du Québec à Montréal, Faculté de Communication, Montréal, QC, Canada, ³Universidade de Brasília, Centro de Desenvolvimento Sustentável, Brasilia, Brazil

Building a community of practice that transcends sectors, disciplines and countries is not a small feat. Since 2005 the Comunidad de Práctica en Ecosalud de América Latina y el Caribe have brought together 120 people from various walks of life (academia, government, community groups) and from over 35 countries. Despite changes in membership, the community is still striving and has managed to reach its goals and create a space that brought about more collaboration between its members. In this presentation we will show how the network has evolved over time and become resilient to changes in membership. With regards to the network structure, we will focus on the diversity of local structures and on the connections between those smaller structures showing how this have contributed to the overall resilience of the community. With regards to relationships, we will explore the links between collaborative relationships, discussion relationships and trust.

New Wine in Old Wineskins: Social Networks and the Diffusion of 19th Century New School Presbyterian Theology

Rowe, Justin
Michigan State University, History, East Lansing, MI, United States

Using a modified version of Immanuel Wallerstein’s world system theory, the following analyzes the intellectual change of a 19th century community. Essentially, this article focuses on the American Presbyterian Church in the early 19th century and suggests that by breaking the church down into core, semiperipheral, and peripheral segments, historians and social scientists can better understand not only American intellectual history but also the sociology of ideological diffusion. Using the church as a case study, this essay traces how “New School” theological innovation successfully spread across the Presbyterian Church between 1801-1837. It argues that the reason for this success were the “semiperipheral” presbyteries within the church; that the key to any successful diffusion are the middle ground sections of a social system. In essence, this project is interdisciplinary, using social science quantitative methods to answer specifically how and why intellectual transformations of this nature occur. Ultimately, I have discovered that the way social networks structure themselves relationally, directly affects how they develop intellectually. In other words, the relational connections people maintain have the potential to change the doctrine of a church, the political philosophy of a party—the cultural values of a movement.

Communal Principle and Social Network

Ueno, Shinya
Kumamoto University, Center for Policy Studies, Kumamoto, Japan

Community development is an important and universal issue for the modern world. I would like to discuss the cooperative communal principle from the social network viewpoints. My paper is to consider the mechanism of community management, and create good governance methods for community. We will begin by considering whether community is emerging or disappearing in modern Japan. There are many distressed communities in rural areas and even big cities too. Then, we examine how we can empower these communities. We also noticed each country has developed a different type of community. We will see the difference of community function in China, the United States of America, and Japan. This comparison illustrates the characteristics of community's principle. Now in Japan, governments and local residents try to re-embed the communal sense to their community again, which was abandoned once during the high-speed growth era. I show the social networks of three different communities, and examine how they are managing. The communal principle is the key concept for management of community. Especially I would like to empathize the importance of the type of “network”, “sense of belonging” and “trust” of residents to foster a communal principle for good governance of the community.
Covert Networks

Multiplexity in a Drug Trafficking Network: Using Multiple Types of Directed Ties to Illuminate Criminal Network Structure

Bright, David A.¹, Greenhill, Catherine¹, Ritter, Alison¹, Morselli, Carlo², Gilroy, Helen¹
(1)University of New South Wales, Sydney, NSW, Australia, (2)University of Montreal, Montreal, QC, Canada

Understanding criminal networks can aid in the identification of key players and important relationships. Such information can assist law enforcement in the identification of interventions to dismantle or disrupt the network. The majority of SNA studies on criminal networks to date have focused on resource and information flows based on a single dimension of connection. However, social network are multiplex, and humans are connected to each other via many different types of ties. According to the network capital construct (Schwartz & Rouselle, 2010), network members have access to tangible and intangible commodities that can then be made available to other network members. Actors who possess multiple commodities and a greater number of different types of connections add more to network capital than members with less access to commodities and fewer types of ties. Hamill et al (2008) suggest a “layered” approach to the analysis of multiplex networks, in which different type of connections between network members are analysed separately, and which take into account that dyads within the network may be connected via different types of ties. We use both the network capital construct, and the layered approach suggested by Hamill et al (2008) to describe a drug trafficking network that operated in Australia in the 1990s. We describe a criminal network by applying SNA measures (density, centralization, centrality) at the network and node level. Implications for law enforcement practice/interventions are discussed.

The Creation of Trust in Covert Social Networks: The Case of Support Networks for Persecuted Jews during the Holocaust

Düring, Marten², Raab, Jörg²
(1) Radboud University, Nijmegen, Netherlands, (2)University of Tilburg, Tilburg, Netherlands

Trust in social networks is particularly important for dark networks in which actors face prosecution and need to operate secretly. The proposed paper will study the emergence of trust in support networks for persecuted Jews during the Holocaust in Germany. After years of systematic segregation and faced with their deportation to concentration camps, a small number of Jewish refugees chose to go into hiding. They faced denunciation as well as raids by German police forces. Only about a third of Jews who went into hiding survived with the help of fellow refugees and non-persecuted helpers; many of which they had not met before. The paper will look specifically at (1) the process of creating trust between individuals, (2) the distribution of trust within clusters of people and (3) the emergence of trust within these (highly volatile) covert network structures. The analysis is based on the extraction of relational data from such diverse sources as Gestapo interrogation reports, diaries, autobiographies and interviews. Despite the difficulties inherent in these sources, network visualizations show that trust was created through multi-layered relationships which were often characterized by good-will as much as financial gains and other forms of rewarding. Trust triads between individuals often grew into long chains and created a highly volatile social structure that lead to the emergence of trust in specific, well-known helpers and was often followed by the rapid growth and quick detection of the support networks. The paper concludes by discussing the implications for dark networks in general.

MAPPing Dark Networks: A Data Transformation Strategy for Clandestine Organizations

Gerdes, Luke M.
United States Military Academy, Behavioral Sciences and Leadership, West Point, NY, United States

There is a growing consensus that dark networks require special methodological considerations. Scholarly attention to the subject has focused on the front-end of the analytic process, by discussing unique data collection processes necessary to study dark networks, as well as on the back-end of the analytic process, by discussing unique interpretations of centrality in dark networks. However, little attention has been devoted to the data transformation processes that often comprise the middle steps in network analysis. This paper attempts to address this gap in the literature by offering a data transformation process designed to address the ambiguity inherent to dark networks. The paper presents the Median Additive Projection Process (MAPP), an algorithm to transform the multi-modal networks that characterize much of the data collected on clandestine organizations into one-mode networks so that assessments can utilize the most common network metrics. Standard approaches to the transformation of multi-modal data “fold” matrices, by binarizing the
network and multiplying it against its transpose. Unfortunately, this process produces exaggerated results when applied
to weighted networks, and consequently researchers often disregard information on tie-strength when transforming
data. MAPP builds on previous efforts of biologists and physicists, who have studied the problem of transforming
weighted multi-modal networks within the specific context of these disciplines. MAPP adapts existing scientific
methodology to the context of dark networks by treating relationship strength in a probabilistic fashion, thereby
accounting for the inherent ambiguity of clandestine organizations. Ultimately, the approach allows researchers to better
identify central actors in dark networks.
Dining with the Stars: Network Structure and Sustained Creative Success

Deichmann, Dirk¹, Moser, Christine¹, Vernet, Antoine²
(1)VU University Amsterdam, Amsterdam, Netherlands, (2)Imperial College London, London, United Kingdom

Many studies have aimed to explain the influence of social networks on outcomes such as creativity. However, what has been neglected in the literature is how changes in the network structure affect outcomes over time. In particular, how does change in network structures affect creative success in the long run? Answers to this question are important because benefits that individuals can reap from their position in a network over time are not independent of the change in the network they are embedded in. In particular, it is unclear whether and how creative success can be maintained when networks change. However, sustained creative success is necessary to be able to constantly renew capabilities and skills and thereby compete on a long-term basis. Therefore, in this paper we will investigate the effects of network structure and its change on sustained creative success. In order to shed light on this question, we conducted a longitudinal study in the context of the fine dining industry. Specifically, we focused on chefs working in restaurants that have received one or several Michelin stars in the period 2000-2012. Our findings reveal how chefs’ network positions as well as the change in their affiliation network structure affect their subsequent creative successes measured as Michelin star attributions over time. Our work contributes to the literature on social networks and creativity, and leads to implications for managers of organizations that strive to sustain their creative successes by highlighting how relational structures can enhance or hinder success.

Networks of Local Arts Organization - A Case Study in Germany

Kirchberg, Volker
Leuphana University of Lueneburg, Cultural Studies, Lueneburg, Germany

Based on the concept of ‘inter-organizational fields’, the corresponding organizational analysis of art production systems regard these as 'open natural systems', with a strong dependency on their social, economic and political surroundings. Inter-organizational fields are groups of actors held together by powerful brokers. Network analysis uncovers these brokers and reveals, distinguishes and examines powerful and powerless actors and their relations in networks. This paper presents a case study of such a network of arts organizations in a middle-sized German city and describes and explains the scope and structure of this network along the dimensions of ‘prestige and popularity’ (‘social capital’), ‘sovereignty and autonomy’ (‘brokerage’) and ‘sub-networks and cliques’ (‘cohesion’). This analysis is based on a comprehensive and on several stages reviewed quantitative and qualitative data collection in this town between 2007 and 2011. Applying PAJEK, this network analysis shows that the arts in this town are well connected but only in their role as solicitors dependent on other local players. Just a few of the art producers or art distributors are members of the ‘core clique’ of the network; and only two genres (church music and museums) are interconnected in dense 'triad' structures. The main power brokers of the local art network are the municipal administration - connected with the local political powers, and two main foundations that provide most of the resources for the local arts.

Music as Collective Invention: A Social Network Analysis of Composers

McAndrew, Siobhan¹, Everett, Martin²
(1)University of Manchester, Institute for Social Change, Manchester, United Kingdom, (2)University of Manchester, Mitchell Centre for Social Network Analysis, Manchester, United Kingdom

Composers generally write music alone, and we commonly understand the great figures of classical music as singular geniuses. Where composers' social networks and friendships are of contextual interest for musicologists and historians, it is arguable that their association with other musicians arises primarily because they socialise with similar others. However, creative work appears to require interaction and collaboration, and certain periods and places are considered hotspots of creativity where new musical ideas are shared and movements arise. Here we consider the case of British classical composition as an example of a music network, and to contribute to debates in music history. First, we examine the structure of the network, in particular the location of composers considered to be either leading or ‘under-recognised’ by historians. We analyse the main component using standard centrality measures, and examine the prevalence of homophily by characteristics such as gender, nationality, socio-economic status and musical education; and importance of cliques and communities for composition success, measured by number of works in the BBC Promenade Concerts and number of recordings achieved. Secondly, we distinguish between relationship types (family or friend,
teacher or student, colleague, collaborator) to examine the extent to which the network features multiplex relationships and whether multiplexity is associated with composition success. Thirdly, we model composition success using a finite mixture model specification, distinguishing between 'stars' and 'journeymen', and measures of centrality and multiplexity as explanatory variables.

**How Do Architects Collaborate?**

*Muetzel, Sophie, Farias, Ignacio*

Social Science Research Center Berlin (WZB), Berlin, Germany

The paper analyzes patterns of collaboration between architects across projects and across time. Using a unique data set of architectural projects worth a review in major architectural magazines over a span of 45 years, we show schools of collaboration at different time periods, spanning over major political and social upheaval. We compare the patterns of architectural collaboration with those found in other creative industries. Our findings suggest that rather than local, geographical clusters of architectural firms, “invisible colleges” based on education and further training explain patterns of collaborations. The paper thus contributes to ongoing discussions in organizational studies on creative industries and their network structure.

**Anywhere-wood: The Effects of Incentive Policy on Creative Production Networks in the American Film Industry**

*O'Brien, Nina*

University of Southern California, Los Angeles, CA, United States

This research employs longitudinal and geographic network analyses to examine how economic incentives offered by states promote the development of short-term, creative project networks, and to what degree these efforts promote sustainable development of creative industries over time. Tracking interorganizational film production networks in the United States against changes in tax incentive policies targeting creative industries over a fifteen-year period, this study demonstrates the challenges policy makers face when they lure industries based on temporary, project-based work, as well as compete with neighboring states for these highly-mobile organizations.

**Flexible Work, Flexible Networks? The Case of Self-employed Creative Professionals in Croatia**

*Tonkovic, Zeljka*

University of Zadar, Department of Sociology, Zadar, Croatia

The paper will present the results of a quantitative research on networks of creative professionals. Although the networking in the cultural and creative industries has been the subject of a number of studies, little research has focused on the relationship between different types of work and employment, social capital and network patterns. The empirical research has been undertaken using both egocentric and sociocentric network analysis and the data was collected in the form of structured interviews with 168 creative professionals. This study focuses on the compositional and structural properties of personal networks and uses Burt’s measures of structural holes as indicators of respondents’ social capital. The obtained results show that self-employed creative professionals, who are faced with precarious working conditions, rely both on bonding and bridging ties in order to ensure the reliable sources of social support and to maintain network heterogeneity and creativity.
Business Networks behind the Blue Veil of Silence: Hidden Roles and Secret Interactions in a Two-mode Analysis of Bulgarian Police Donations

Aymaliev, Ivan¹, Lind, Benjamin E.²

(1) Higher School of Economics, Laboratory for Anti-Corruption Policy, Moscow, Russian Federation, (2) Higher School of Economics, Centre for Advanced Studies, Moscow, Russian Federation

In 2011, the Bulgarian Interior Ministry received more donations than ever before: a record exceeding €5 million from businesses and individuals, including contributions from persons undergoing criminal investigations as well as convicts. Despite condemnation from the European Commission and formal prohibition by the Interior Minister, Bulgarian police have since continued to accept donations (Novinite, 2011). Drawing upon criminological and organizational theories and using the 2011 public registry of police donations alongside face-to-face interview data, this study examines the structural characteristics and donation patterns between corporations and Bulgarian police units using two-mode network analysis. We hypothesize that police connections with businesses will be greater at urban centers, where opportunities for corruption are greater. We expect that structurally equivalent corporations, by virtue of exercising corruptive pressure over the same set of police directorates, compete with each other for the same criminal police services, and thus will imitate each other, so as to enhance their own performance. We suppose that many neighbors donating in a province lightens the burden, so individually firms donate less, whereas at provinces with fewer donating firms, they will need to donate more. Moreover, we hypothesize that in places were incentives to free-ride are great, large corporations will diversify their business transactions to other provinces, so as to gain competitive advantage by discovering new business opportunities and expanding their economic and political influence. Lastly, we assess whether or not the most central police donors and their closest business partners are associated with considerable criminal offenses.

Gaming the Game: Fraud in Virtual Settings

Clark, Joshua

University of Southern California, Annenberg School, Los Angeles, CA, United States

With the growth of data mining and ubiquitous information logs, the study of illicit "dark networks" has benefitted immensely (Ahmad, Keegan, Srivastava, Williams, & Contractor, 2009; Hu, Kaza, & Chen, 2009). However, the network implications and signature of less secretive crimes, such as fraud, are still not well understood. These actions fall between dark networks and their fully exposed legitimate counterparts in that half of the parties involved, namely the perpetrators, are interested in keeping their role concealed while their victims have an incentive to publicize the process. This paper examines the network position of these perpetrators through data gathered from a virtual economy associated with the popular multiplayer shooter game Team Fortress Two through a sample consisting of 160,599 nodes linked by 472,168 edges. By comparing patterns of friendship formation between known fraudsters, their victims and the general population, it is possible to determine if each of these parties displays distinctive patterns of association. Preliminary results indicate that fraudulent players appear to avoid becoming embedded in tightly linked clusters but still retain ties to high prestige players. This suggests an attempt to balance the need for information about market trends originating from knowledgeable high prestige players with an impulse to seek out more players who serve as potential marks and speaks to the need for fraudulent actors to balance their need for information with reputation management.


Duran, Xavier¹, Quintane, Eric²

(1) University of los Andes, School of Management, Bogota, Colombia, (2) The University of Lugano, Institute of Management, Lugano, Switzerland

The supply of cocaine from South America to the United States experienced a dramatic change in structure at some point during the late 1970s or the early 1980s when drug cartels appeared. This paper sets out to explore the details, reasons and dynamics of this change. Using a unique dataset of almost 5,000 New York Times news articles spanning the 1970 to 1984 period, this paper shows that before 1980 most of the traffic could be counted in grams and crossed the border using a large number of non-professional “mules” in commercial flights and ships, all organized by a large group of independent and decentralized small scale traffickers. At the beginning of the 1980s traffic became more concentrated to a handful of large scale traffickers who bought coca leaves from a variety of producers, transformed it into tons of
cocaine and arranged shipments across the border on private airplanes and speed boats. By 1985 about 70% of cocaine was trafficked by two organizations, the Cali and the Medellin cartels. Based on extant theories in economics and sociology, this paper examines alternative hypotheses that can explain how the Cali and Medellin cartels came to occupy such a pivotal position in the cocaine trafficking network. In doing so, it aims to contribute a historical understanding of the actors and the actions that they took to create and maintain this network structure and their position within it.

Criminal Networks and Social Organizing

Edling, Christofer¹, Liljeros, Fredrik², Rostami, Amir²
(1)Lund University, Lund, Sweden, (2)Stockholm University, Stockholm, Sweden

With this project we wish to contribute to our understanding of the process of social organizing outside of formal organizations by analyzing the evolution of criminal networks (co-offending). Theoretically we draw from many sources, ranging from new institutional organizations theory to statistical physics. Empirically we map longitudinal data on criminal co-offending onto observed network structures of known criminal gangs. In the Sunbelt presentation we will outline the project aim and research strategy and present some initial and preliminary empirical results.

A Social Network Analysis of Islamic Terrorism and the Malian Rebellion

Walther, Olivier¹,², Christopoulos, Dimitris³
(1)Rutgers University, Center for African Studies, Piscataway, NJ, United States, (2)CEPS/INSTEAD Luxembourg, Luxembourg, Luxembourg, (3)MODUL University Vienna, Public Governance and Management, Vienna, Austria

Using social network analysis, our first aim is to illuminate the relationships between the Islamists and the rebels involved in the current Malian conflict. We use a selection of newspaper articles to demonstrate that the connection between Islamists and rebels depends on brokers who passed from the Tuareg rebellion to radical groups. Our second objective is to detail the internal relationships within each of the subgroups. Our findings show how Islamists were affected by the accidental disappearance of one of the AQMI regional emirs and how the death of one of the architects of the Tuareg rebellion affected rebel cohesion.
Detection of Small Covert Networks Embedded in Large Networks

Airoldi, Edo¹, Pearson, Carl², Singer, Burton²

(1) Harvard University, Statistics, Cambridge, MA, United States, (2) University of Florida, Emerging Pathogens Institute, Gainesville, FL, United States

We specify and test a simulation model for identifying small sparsely connected covert networks embedded in large networks containing many sub-networks that represent a background of clutter. The covert network is planning a coordinated action that requires rapid identification. Instructions and details of the plan are transmitted in fragments, each of which by itself is insufficient to identify a suspicious plan. We examine a diversity of sequential strategies to be employed by an external observer for sampling message transmission in the large network and passively identifying the target covert network in minimum time. Scenarios where members of the covert network send out decoy signals and where the observer employs deceptive messaging as part of a sequential search strategy are also considered. Depending upon the levels of mutual deception by the covert network and the observer, identification of the full target network may be impossible. We characterize such situations and then indicate the largest sub-network of the covert group that is identifiable with confidence. Such identification is used to signal when action should be taken against a coordinated scheme. More generally, we explore trade-offs between information available to an observer/experimenter and ability to confidently detect suspicious activity. This study is part of a larger statistical program aimed at developing optimal sequential designs in the presence of social interference.

Finding Unknown Members of a Network: Uncovering a Conspiracy, Finding a Cancer, and Identifying Hard-to-Reach Populations

Arney, David, Coronges, Kathryn

United States Military Academy, West Point, NY, United States

The information-age along with its information-laden Internet has brought us many opportunities to study organizations. If a sub-organization is hidden from view either by choice or circumstance yet the parent organization is fully known, how does one find the most likely members of the sub-organization. The three situations we present are: 1) identifying the potential conspirators within a company’s communication network who are plotting to commit a crime; 2) finding the most likely cells which contain a disease or other attribute that cannot be directly determined; and 3) identifying the members of a hard-to-reach population in the network. In the problems, some nodes are already identified as known members of the hidden network and others are identified as definitely not being members. The goal is to prioritize the unknown nodes in terms of likelihood of membership in the sub-organization or to cluster the organization into two distinct subgroups. In addition to calculating structural measures and attribute homophily, we look at the sensitivity of the network measures to missing and changing information about the networks. This work is a motivated by the 2012 Interdisciplinary Modeling Contest where over 1300 teams of undergraduate students submitted solutions to a crime conspiracy problem and the authors served as judges for the contest. The presentation will also briefly describe the 2013 contest problem in network science.

The Impact of Data Source Type on the Analysis of Extracted Semantic Networks

Lee, Ju-Sung, Carley, Kathleen M

Carnegie Mellon University, ISR, Pittsburgh, PA, United States

We computationally draw multi-mode, semantic networks using relation extraction from three distinct source types (namely, publicly available news articles, private interviews, and court documents) for organizations of interest to law enforcement: Al-Muhajiroun and the Irish Republican Army (IRA). Specifically, we analyze a complete set of sources devoted to each of the organizations and compare conspicuous network features, such as centralized nodes, across the source types as well as linkages to concepts that help us infer organizational adaptation. While the mass of news articles offers breadth of topic coverage and potentially more robust networks, the precise nature of interviews and court data affords greater accuracy in the generated networks, which consequently contain a smaller set of key actors. Additionally, we explore accuracy issues surrounding algorithmic network extraction, by comparing some of the produced networks to human-mapped ones.
It has been proposed that informing a population about a high extent of crime increases unlawful behavior. Individuals who underestimated the crime rate, it has been argued, will become criminal when they learn that there is more crime than they expected. This can aggregate to an increased crime rate. We challenge this theoretical line of reasoning, arguing that there must also be initially unlawful individuals who overestimated the crime rate and might turn lawful when they realize that there is less crime than they estimated. These decisions might neutralize the increase in crime that has been predicted, leading to a stable crime rate. In order to test the logical validity of our criticism, we developed an agent-based model of crime. Agents are represented as nodes in a network and individually estimate the crime rate based on the behavior (criminal or unlawful) of their network contacts. Agents turn criminal when this estimate exceeds their individual crime threshold and are lawful otherwise. With this model, we study the following simulation scenario. First, we study crime dynamics until they reached equilibrium. Next, agents reconsider their behavior based on the actual crime rate in the network. Finally, simulations continue with the initial model assumptions until a new equilibrium is reached. We measure the difference in the equilibrium crime rates before and after agents have reconsidered their behavior. We conducted simulation experiments to explore the conditions of increasing and decreasing crime rates, focusing on the distribution of crime thresholds in the network and network structure.
Data Collection and Sampling

SDCF - A Sensor Data Collection Framework for Social and Ubiquitous Environments: Challenges and First Experiences in Sensor-based Social Networks
Atzmueller, Martin, Hilgenberg, Katy
University of Kassel, Knowledge and Data Engineering Group, Kassel, Germany

Sensor-based social networks usually emerge from mobile or pervasive applications. In this way, ubiquitous social systems help to bridge the gap between physical and online worlds utilizing context awareness, pervasive computing and sensor networks. Mobile and ubiquitous devices, such as smartphones or RFID tags, coupled with appropriate social applications enable an integrated approach for both physical and digital social interactions. The core of such applications involves an effective data collection. There is a variety of social networks which can be created using co-location and contact information in a mobile setting, that is, social networks enabled by sensors and mobile devices, as well as ephemeral networks created "spontaneously" during certain events. Typically sensor information is utilized to enrich social network data with valuable context information. In this paper, we provide an overview on the Sensor Data Collection Framework (SDCF) - a flexible and highly configurable framework to collect various physical and virtual sensor data on mobile Android devices (http://www.sdcf.eu). After that, we discuss challenges in sensor-based social networking. Finally, we report first experiences with the framework and the collected interaction data in a collaborative workgroup context.

How Well Do you Know your Peers? Maybe your Phone Log Knows
Comulada, Warren S., Ramanathan, Nithya S., Swendeman, Dallas S., Latkin, Carl A., Estrin, Deborah S.
(1)Univ. of California at Los Angeles, Psychiatry and Biobehavioral Sciences, Los Angeles, CA, United States, (2)Univ. of California at Los Angeles, Computer Science, Los Angeles, CA, United States, (3)Johns Hopkins University, Health Policy and Management, Baltimore, MD, United States, (4)Cornell Tech, Computer Science, New York, NY, United States

The recruitment of peers by index participants is a key component of egocentric studies and studies that call upon snowball and respondent-driven sampling to recruit hard-to-reach populations, e.g. drug users. Despite the necessity of peer recruitment and suggested statistical adjustments in the literature, it is often difficult to gauge whether recruited “peers” are part of the index participant’s personal network as intended by the study design. We introduce an innovative method to inform the peer definition by tapping into resources provided by a ubiquitous data collection tool that is becoming increasingly popular in health research: the mobile phone. A case study is provided by egocentric data collected on gay men and their peers in a pilot study that used study participants' own mobile phones to assess daily health-related behaviors through Ohmage, a mobile data collection app. In addition, phone log data was automatically recorded for gay men with Android phones through SystemSens, another mobile app. As a proxy measure of peer closeness, we used phone log data to compare the amount of call time and texting that gay men engaged in with study peers versus individuals outside the study. The phone log algorithm scrambled phone numbers so that only the phone numbers of peers in the study could be determined; the privacy of individuals outside of the study was protected. We discuss our study design, especially in issues related to mobile implementation and the IRB, lessons learned, and results of the phone log data.

Field Methods for Studying Search in Natural Settings
MacAulay, Sam
Imperial College London, London, United Kingdom

There are a wide variety of field methods that could be used for collecting data on the sociology of search, but their comparative advantages are not widely discussed in the social networks literature. Social network scholars have instead primarily focused on Stanley Milgram's small world method for collecting data on search (Schnettler, 2009). The small-world method is far from being the only method at our disposal for understanding the sociology of search and has a crucial limitation: its experimental nature makes it poorly suited to capturing the complexity that defines search in natural settings. Unsurprisingly, the absence of this type of data has become an increasingly important gap in the literature on search (Granovetter, 2003). Without it, we are forced to speculate how people confronted with the emotion, obligation and incentives that characterise the real world behave when searching their social world. This paper contributes to filling this gap by drawing on methods for collecting data on organizational processes (Langley, 1999), chaining processes (Erickson, 1979) and problem solving (e.g. Newell and Simon, 1972) to construct a novel inventory of
techniques - such as 'search chain mapping' - that can be used when entering the field to study search processes in natural settings. These techniques provide access to rich processual data on search that differs significantly to that currently available to social network scholars. Combining this data with that already available through small-world experiments will provide an important new point of traction as we continue improving our understanding of search.

A ROC Approach Using Cognitive Social Structures to Estimate Social Networks

Yenigun, C. Deniz\textsuperscript{1}, Ertan, Gunes\textsuperscript{2}, Siciliano, Michael D.\textsuperscript{3}

\textsuperscript{1}Bilkent University, Ankara, Turkey, \textsuperscript{2}University of Pittsburgh, Pittsburgh, PA, United States, \textsuperscript{3}University of Illinois at Chicago, Chicago, IL, United States

In this study, we introduce a procedure to estimate networks by using a random sample of individuals' perceptions of the whole network. In a previous paper, we had focused on a similar problem where we controlled only Type I (commission) errors. This paper utilizes Receiver Operating Characteristic (ROC) curves to estimate networks while controlling the amount of both Type I (commission) and Type II (omission) errors. This new technique allows the researchers to set the tolerable amounts of both types of errors simultaneously.
Data Mining

Identifying Strong Ties Using Smartphone Log Data
Boase, Jeffrey¹, Hayat, Zack², Kobayashi, Tetsuro³
(1)Ryerson University, School of Professional Communication, Toronto, ON, Canada, (2)University of Toronto, Faculty of Information, Toronto, ON, Canada, (3)National Institute of Informatics, Information and Society Research Division, Tokyo, Japan

The embedding of smartphones into everyday life has meant that individuals are in constant contact with friends, family members and colleagues throughout the day. For this reason smartphone log files contain a trove of rich and accurate personal network data. Nevertheless, smartphone log data is limited to behavioural network indicators such as frequency and timing of interaction and lacks cognitive network indicators such as emotional closeness. Having the ability to infer cognitive network ties from smartphone log data is an important step toward leveraging the value inherent in this type of digital trace data. Building on existing research that uses mobile log data to identify peer friendship ties, we use smartphone data to identify cognitively strong ties as they exist within family, work, and friendship roles. We use data collected by a smartphone application that we developed to anonymize and collect voice calling and text message log data and administer daily pop-up survey questions regarding the perceived tie strength of recent contacted alters. The application was used by a panel of 233 US based adults for a period of 30 days, during which time the application collected a total 463,329 voice calling and text message events and pop-up survey data regarding 1,593 alters. Weaving together these various pieces of data our analysis examines the extent to which logged frequency of exchange and communication history predicts self-reported emotional closeness and the discussion of “important matters” among family, work and friendship ties.

Name Me if you Can (!) - Leveraging Networks of Given Names
Mitzlaff, Folke
University of Kassel, Knowledge and Data Engineering Group, Kassel, Germany

All over the world, future parents are facing the task of finding a suitable given name. This choice is influenced by different factors such as the social context, cultural background and especially personal taste. Although this task is omnipresent, little research has been conducted on the analysis and application of interrelations among given names from a data mining perspective. In the present work we present an approach for constructing and analyzing networks of given names based on data from the Social Web. The obtained results already gave rise to the name search engine "nameling.net" which serves as an academic research platform for applying and evaluating new name ranking and recommendation techniques and attracted more than 30,000 users within less than six months. We present emerging network structures and evaluation results for ranking and recommending given names with a focus on the combination of statical networks which are built from external data sources and dynamic networks, built from actual usage data in the running system. Thereby we point at open questions which are connected to various field of research, emphasizing the inherent interdisciplinary nature of the analysis of interrelationship among given names. To promote other researchers’ efforts, all considered usage data is made publicly available.

Mining Social Importance of Actors from Email Communication Network
Morzy, Mikolaj, Lubarski, Pawel
Poznan University of Technology, Institute of Computing Science, Poznan, Poland

Can we establish the importance of people by simply analyzing the database of sent and received emails, having no access to subject lines or contents of messages? The answer, apparently, is "yes we can". Intrinsic behavior of people reveals simple patterns in choosing which email to answer next. Our theory is based on two assumptions. We assume that people do their email communication in bursts, answering several messages consecutively and that they can freely choose the order of answers. Secondly, we believe that people use priority queues to manage their internal task lists, including the list of emails to be answered. Looking at timing and ordering of responses we derive individual rankings of importance of actors, because we posit that people have a tendency to reply to important actors first. These individual subjective rankings are significant because they reflect the relative importance of other actors as perceived by each actor. The individual rankings are aggregated into a global ranking of importance of all actors. We perform an experimental evaluation of our model by analyzing the dataset consisting of over 600,000 emails sent during one year period to 200 employees of our university. Our final ranking closely reflects the "true" importance of employees computed based on surveys. We think that our model is general and can be applied whenever behavioral data is available.
which includes any choice made by actors from a set of available alternatives with the alternatives having varying degrees of importance to individual actors.

**Graph Mining for Event based Social Network Evolution**

*Pei, Jiayin*¹,²

(¹) Harbin Institute of Technology, Harbin, China, (²) Utrecht University, Utrecht, Netherlands

Entity data, non-entity data (entity attributes), and the entity relations are three kinds of data that may result in or affect crisis evolution. Based on web 2.0 social media data in response to previous attacks, this research will generate datasets composed of graphs with a set of these three elements, and will try to mine the special patterns and create an early-warning model using graph data mining and fuzzy rough set combined method. The research considers that by mining a dataset with these characteristics a graph model can search patterns involving all these elements at the same time improving prediction accuracy, thus will be able to give better advice on how to handle the emergency situation.

**The Sociability of Detection: Mapping Interaction Networks in Detective Fiction**

*Ruths, Derek*¹, *Piper, Andrew*²

(¹) McGill University, Computer Science, Montreal, QC, Canada, (²) McGill University, Languages, Literatures and Cultures, Montreal, QC, Canada

Literature is an important field for the modeling of complex social networks. In this study, we examine the social networks established within a particular literary subgenre of detective fiction. Our aim is to identify the way changes to the structures of these networks provide insights into the historical understanding of how social groups participate in establishing normative notions of "detection", "fact-finding", or "insight". To conduct this study, we selected representative works of detective fiction from the nineteenth to the twentieth century and coded all social interactions present within the works through different groups of human coders. Individual coders' interaction sequences were then aligned using a combination of dynamic programming and probabilistic matching techniques to identify consensus sequences and the variants introduced by specific coders. Consensus sequences induce social networks which can then be quantitatively studied. In the present work, we explore the degree distribution, node centrality, and 3-node motifs present within the social networks of our selected set of literary works. We find that works drawn from different time periods have substantive differences in these features which can provide insights into shifting cultural notions of what we call the sociability of detection - how a group interacts to produce facts. To our knowledge, this is the first quantitative analysis of interaction networks in literature. With this project we hope to show how network analysis can be applied towards understanding cultural phenomena associated with the arts and works of the imagination.
**Diasporic networks: a panel for Waltraud Kokot**

**Chinese Migration to Namibia: An Ethnographic Exploration of Emerging Transnational Community Networks**

*Avenarius, Christine B.*

East Carolina University, Anthropology, Greenville, NC, United States

Since the 1990s, China increased its presence in African countries as a result of its own extraordinary domestic growth rate. Although some governmental efforts were geared towards the provision of development aid, by the 2000s, China’s interest in gaining Africa’s resources took on a profit-centered outlook. This research on Chinese migration to Namibia focuses on the structural properties of the emerging transnational community of Chinese migrants and on cultural and economic interactions between Chinese and Namibian citizens. An increasing number of Chinese state-owned and private-sector businesses have taken hold in Namibia, and Chinese entrepreneurs are involved in most sectors of the economy, including the informal economy of small vendors and traveling salespeople. To understand the economic success of Chinese involvement in Africa and its implication for the future development of south-south migration, this paper presents insights from ethnographic fieldwork on how, when and where Chinese migrants build and maintain social relationships across heterogeneous livelihoods and transnational spaces. Although the level of social isolation from native people is almost comparable to the experiences of Chinese migrants arriving in the US more than a century ago, the ready availability of the internet has provided different conditions for local community building than the previously observed process of community formation among overseas Chinese. In addition, there are noteworthy differences in the adaptive strategies and personal network structures of current Chinese migrants to Namibia that can be explained by gender, age, and years of experience as settlers in other African nation-states.

**Sweet Home Chicago? Elderly Mexican Migrants Addressing the Question of Return**

*Bedorf, Franziska*

Universitaet Hamburg, Hamburg, Germany

In my paper, which is based on a long-term fieldwork in Mexican parts of Chicago in 2010 and 2011, I seek to explore, how and why elderly Mexicans who have been living in Chicago since the 1960s and are about to retire relate to the Midwestern metropolis as their main point of reference when deciding on a retirement location. I want to address the reasons for this choice and link them back to the concept of Chicago as a place that has had a pivotal meaning for these people’s migratory experiences and biographies. Chicago has been a destination for immigrants from Mexico for more than one hundred years. Today the city is home to more than half a million Mexicans and the impact of Mexican life and culture is apparent in many neighborhoods. The Mexican migrants living in Chicago have been shaped as much by the city as they have left their imprint on Chicago. Their arrival in Chicago, the first years and the following experiences in Chicago were distinct and certainly different from migrating to, say, New York or Los Angeles regarding e.g. available jobs, the ethnic setup of the city, the history of Mexican migration, politics and the distance to Mexico. These people’s decision where to retire, I suggest, is not so much informed by the far more abstract concepts of the United States and Mexico but strongly depends on the nature of structures, history and issues of identity and belonging on a local level.

**The modernity of the Mafia: personalized network efficiency and the structural lethargy of institutions**

*Giordano, Christian*

Université de Fribourg, Séminaire d’Anthropologie sociale, Fribourg, Switzerland

For a long time the Mafia was considered an anti-modern phenomenon that would have come to an end with society’s evolution. Contrary to this expectation, the Mafia proved to be far more resilient, so much so that it responded effectively to the challenge of globalization. Analyses about the Mafia are often based on two myths, namely the folkloristic one and the pyramidal one. In the first one, the role of secret and occasionally gruesome rituals with an archaic aura has been voyeuristically played up, whereas the second one views the Mafia as a centralized institution on a par with a state institution. This paper highlights, instead, how the Mafia has shown to be more modern than the State on account of its strategic use of personalized networks. The personalized and informal Mafia networks have proven to be far more efficient and well organized both in public mistrust societies, in which the Mafia finds its most favorable habitat to flourish, and in the vast context of globalization, where formal institutions have trouble establishing themselves and imposing their role due to structural reasons.
Translocality is increasingly applied as an approach to grasp the tension between mobility and locality, to describe socio-spatial strategies of migrants and to understand diasporic conceptions of territorial belonging. In this paper I will trace the roots and dimensions of the concept of translocality and, in a second step, use it to sketch out (ethnographic) perspectives on the migration-environment nexus. Translocality can be summarized as the emergence of migrant networks that facilitate the circulation of resources, practices and ideas and thereby transform the places they connect. The concept builds on insights from transnationalism, while at the same time attempting to overcome some of the limitations of this long-established research perspective. As such, translocality is used to describe socio-spatial dynamics, processes of simultaneity and identity formation that transcend boundaries including but also extending beyond those of nation states. The concept of translocality provides the context and setting to explore remote interactions between local and distant actors and draws attention to how these interactions impact and transform particular localities. I will illustrate this by focussing on rural-urban migration and its impact on the natural environment, resource extraction and agricultural production in migrant sending areas. Based on cases from Southern and Eastern Africa I will argue that translocal research enhances our understanding of the complex relationship between networks, communities and the environment.

One of the fundamental problems for networked communities that are widely dispersed geographically is how to mobilize support from distant members during times of acute local need. For people living in the Oceanic region of Micronesia, this issue has long been a fundamental concern for survival on these ecologically fragile and resource poor small islands. Traditionally, Micronesians developed highly adaptive kinship and ritual exchange practices that produce reliable claims of belonging in spite of the distances involved and that help to ensure access to social support from distant kin during acute times of need. Over the last half-century, scholars and local leaders have regularly expressed urgent concern about the long term viability of these practices given the tremendous social and cultural changes on these islands over the last century. These concerns are particularly salient today because Micronesians have been migrating to regional metropolitan centers and to the mainland United States in increasing numbers over the last two decades. As greater distances create problems for active participation in ritual exchange, would kin networks become increasingly fragmented and less supportive? To address this question this paper draws on recent observations of how members of the Chuukese diaspora participated in funerals on Chuuk to explore how they are innovatively modifying practices of kinship and ritual exchange to ensure support from distant relatives. These practices continue to buffer the risk associated with ecological vulnerability. But, more importantly, they provide valuable economic and practical supports given these islands' marginal positions in the broader regional political-economy.

In a world characterized by massive migration what is the meaning of community? How do diasporic networks form and function over time and across places? In many comparative and ethnographic studies German anthropologist Waltraud Kokot has substantially contributed to our understanding of diasporic communities and transnational networks. Especially her concept of ‘diaspora as a resource’ has stimulated researchers to investigate how, when and why actors build and maintain complex social networks across often heterogeneous livelihoods and regions. Her ethnographic research projects in Greece, Bulgaria, Germany and the USA have been particularly influential for the understanding of diaspora and transnational community in urban contexts. In our contribution we want to honor Waltraud Kokot’s accomplishments in the field of diaspora and transnational network studies.
The formation of a critical mass of people is important for the transmission of information and its eventual wide acceptance. The dynamics involved in critical mass formation combine structural and relational properties. By combining two known sociological theories we aim to shed light on factors contributing to critical mass formation. According to the Diffusion of Innovations (DOI) theory, diffusion of ideas within a social system follows an S-shaped curve and critical mass is obtained when the rate of the adoption is fastest. Obtaining the critical mass point, according to DOI, implies vast diffusion. Critical Mass Theory (CMT), on the other hand, suggests that reaching the critical mass point does not necessarily imply vast diffusion. Rather, the dynamics leading towards this point influence the eventual outcome and thus affect overall diffusion. Using the process approach offered by CMT we investigate the DOI factor of reinvention as a contributor to critical mass formation and to the diffusion of information among individuals in online social networks. We present an agent-based model incorporating the theoretical constructs from both theories. The model was run on three networks harvested from the Web with similar results. This paper describes our work on the Hollywood Actors social network. Findings indicate that reinvention creates an evolutionary process that enhances the final spread of information by enlarging the value of information at the individual and network levels. Interestingly, reinvention did not improve the chance to reach critical mass point, but when it did, the spread of information was more extensive.

Social networks have been identified as valuable representations of the relations between individuals of a social system. To understand the behavioral spread in which individuals are influenced by their peers is crucial for allocating resources and achieving success of a community intervention focused on the spread of a behavior. We propose a simulation model for identifying an efficient set of nodes to initialize a diffusion process in a social network in order to accelerate the diffusion. We defined different sets of initial spreaders using 1) centrality measures of the network: Hubs (highest degree), Intermediaries (highest betweenness) and Closest (highest closeness) and 2) using local structural properties derived from the communities detected in the network: Community-Bridges (highest number of links with other communities) and Community-Hubs (highest number of links with the own community members). We simulated the canonical susceptible-infected model in the Erdős-Rényi random graph, Watts-Strogatz small-world and Barabási-Albert scale-free network topologies by varying the initial set of spreaders, the contact probability and size of the networks. The results suggest that Community-Hubs perform equal or better than Hubs as the size of the Erdős-Rényi network increases. Community-Bridges perform better than the other four sets of nodes for the Small-World topology independently of the network size. Hubs perform better than the other sets of nodes for small scale-free networks. As the scale-free network size increases, Community-Bridges equalizes the Hubs performance. Our sensitivity analysis for the Scale-Free topology suggest that Community-Bridges perform better for low clustered networks whereas Hubs and Intermediaries perform better for high clustered networks.

The identification of influential actors in social networks has been widely studied by researchers. At the same time we realize that little attention has been paid in the literature to influential structures themselves. In our previous research, we proposed a methodology to identify influential sets of actors in a social network, defined as focal structures. We argue that studies focusing on focal structures need to be pursued explicitly. For example, social movements, crisis responses, political campaigns, citizen engagements, and many other real-life events have been initiated and coordinated by a key set of individuals. It should be noted that the focus of our study is a key set of individuals rather than a set of key individuals. It is indeed a challenging task to identify and examine a set of individuals who are most influential. Further,
there is a need to explore the impact of those focal structures in terms of diffusing and facilitating their respective movements throughout the network. This research aims to demonstrate how the dynamics of diffusion processes have been shaped by focal structures. Furthermore, using real-world datasets, this research defines and estimates resilience and robustness of a network with the loss of the aforementioned focal structures. This research empirically demonstrates how information spreads throughout the network in the context of a social movement and advances our understanding of the role and impact of those key sets of players in real-life events.

Network Influences on the International Diffusion of a Health Treaty

Valente, Thomas W.1, Pitts, Stephanie R.2, Chu, Kar-Hai2, Wipfli, Heather2, Fujimoto, Kayo2
(1)University of Southern California, Preventive Medicine, Los Angeles, CA, United States, (2)The University of Texas-Houston Health Science Center, School of Public Health, Houston, TX, United States

This paper takes a network approach to understand how treaties are diffused and adopted among nations. We analyze three WHO treaties that went into force in the past 10 years. All three treaties have been ratified by at least 70% of WHO member states. The three treaties: (1) FCTC; (2) Convention against Corruption; and (3) Convention on Persistent Organic Pollutants have spread internationally over similar time periods and at approximately the same rate. The central research question we ask is: Do country and/or network characteristics predict the timing of individual country treaty adoptions? Our prior research showed that being connected to a global listserv communication forum (GlobaLink) was associated with country ratification of FCTC. We extend that analysis by comparing general network measures of trade and communication with individual country ratification of the three treaties, and compare model estimates across various network specifications. We include an expansive set of country attributes in the analyses to determine if these variables affect policy adoption and/or susceptibility to network influence. The analytic strategy we propose estimates dynamic network effects using event history approaches. Our results have implications for understanding (1) the importance of public health law and policy can contribute to population health; and 2) how social networks influence the adoption and spread of health-related behaviors.

The Effectiveness of Containment Strategies under Different Regimes of Propagation

Vermeer, Wouter, Koppius, Otto
Rotterdam School of Management - Erasmus University, Decision & Information Sciences, Rotterdam, Netherlands

How to contain a propagation process is a question which has been frequently asked in for example contagion literature. Different strategies such as isolation, buffering or vaccination can be used but their effectiveness is likely to be affected by characteristic of the propagation process being studied. We make the propagation process explicit, by distinguishing between three sub-processes during propagation; the radiation process by which a change in the state/behavior of an actor results in an outgoing signal, the convection process which considers how this signal is transferred from one actor to its alters and the reception process describing the way in which an alter responds to such a signal. Each of the previously mentioned containment strategies can be linked to a sub-process of propagation, isolation lowers the radiation, buffering reduces the convection and vaccination lowers the reception and thus is expected to have a different effect on the outcomes of the propagation process. Using a simulation approach, we show that not only it is essential to model propagation using three sub-processes, but also that containment strategies have different effectiveness under different regimes of the propagation, increasing both our understanding of effectiveness of containment strategies and propagation in general.

Diffuse Social Capital of Small Firm Owners: Different Social Capital, Different Innovation-adoption Phase?

Verstraete, Cédric, Van Rossem, Ronan, De Beuckelaer, Alain, Nuysts, Nathalie
Ghent University, Sociology, Ghent, Belgium

Extant entrepreneurship has a strong focus on the role social capital for the adoption of innovations by small-firm entrepreneurs but almost completely neglects the fact that the chance of adoption is not equally distributed throughout the distinct time-phases of the innovation diffusion process. We claim that social capital may turn out to be a divergent contributor to innovation adoption among small-firm entrepreneurs that strongly depends on the time of adoption. Firstly, by introducing a new analytic framework, we take the time-related role of social capital for innovation adoption into account focusing on information networks. Secondly, we test this framework on a sample of small firm entrepreneurs in the real estate sector. Results show that the new framework has a higher explanatory power than does a framework without the time-related role of social capital for adoption. Information embedded in social networks has a diffuse role for innovation adoption throughout the diffusion process over time, i.e. in each distinct adoption phase. It is remarkable that peer-entrepreneur information networks prove to be detrimental for adoption among the first group of
innovation adopters, the innovators, indicating a dark side of social capital. Distinct types of information networks do prove to be important for later adopters, especially for early-majority adopters where they serve as turbochargers for diffusion. Insights in this diffuse, time-related, role of entrepreneurial social capital for innovation adoption are - as far as we know - non-existent and contribute to the understanding on social change and upgrading processes of local economies.
Dynamic Networks of Adolescents 1

Developmental Trends in Selection and Socialization of Externalizing and Internalizing Behaviors in Early, Middle, and Late Adolescent Peer Networks

Burk, William J. 1, Stattin, Hakan 2
(1) Behavioural Science Institute, Radboud University, Nijmegen, Netherlands, (2) Center of Developmental Research, Academy of Law, Psychology and Social Work, Örebro University, Örebro, Sweden

It is generally acknowledged that adolescents choose friends with similar problem behaviors (selection), and that adolescents become more similar to their friends’ problems over time (socialization). Less is known about when selection and socialization emerge in peer networks, when these mechanisms are most robust, and when (or if) these mechanisms dissipate in importance. This study investigates the development of selection and socialization of delinquency and depressive symptoms from early to late adolescence using data from a large longitudinal project assessing peer relationships and behaviors from all adolescents in a small Swedish city. The sample included networks and behaviors of three cohorts of early (n = 978), middle (n = 1014), and late adolescents (n = 913) who completed surveys in at least two of the three annual assessments. Stochastic actor-oriented models examined peer network, externalizing and internalizing behavioral dynamics using RSIENA in the R statistical package. Results generally indicated that peer affiliates were more similar on delinquent behaviors than depressive symptoms across adolescence. For delinquency, socialization was relatively more important than selection early adolescence, both mechanisms predicted similarity in middle adolescence, and selection was relatively more robust than socialization in late adolescence. For depression, neither homophilic selection nor socialization emerged as significant predictors of similarity on depressive symptoms. Parameter estimates within the three age cohorts were consistently observed for delinquency, but estimates significantly differed in all three age groups for depressive symptoms. Findings are discussed in terms of various developmental models emphasizing the importance of peers on adolescent psychosocial functioning.

Selection and Influence Processes of TV Program Preferences. Contrasting a One-mode and Two-mode Approach

Friemel, Thomas
University of Zurich, Zurich, Switzerland

Everyday conversations include a multiplicity of references to mass media such as TV shows, movies, music, and books. This holds especially true for adolescents for which music and TV programs are the most frequent objects of references in everyday conversations. Among other reasons these media references are used for social integration and distinction from various social groups (peers, parents, etc.). Based on longitudinal social network analysis it has recently been found that social selection processes are the primary reason for network autocorrelation of TV genre preferences and interpersonal communication. This contrasts long standing theories regarding social influence processes which are assumed to be the main driver for homophilic structures. However, it is yet unanswered whether this dominance of the selection process also holds true on the more specific level of TV programs. It can be hypothesized that selection processes are primarily triggered by preferences for certain genres (e.g. crime series) while influence processes occur on the level of specific programs (e.g. CSI NY). This research question is addressed with a stochastic actor oriented model (SAOM) as implemented in RSienna by contrasting the results of a one-mode approach (based on genres) and a two-mode approach (based on specific programs). The network consists of 895 students in 35 school classes, 46 TV programs, and four panel waves.

Interethnic Relations, Ethnic Classification by Peers, and Identity Change: Is There a Connection?

Kisfalusi, Dorothea 1,2, Horlai, Sara 1,2, Andrási, Krisztina 3
(1) MTA TK ‘Lendület’ Research Center for Educational and Network Studies Centre for Social Sciences (RECENS), Budapest, Hungary, (2) Corvinus University of Budapest, Institute of Sociology and Social Policy, Budapest, Hungary, (3) Eötvös Loránd University, Faculty of Education and Psychology, Budapest, Hungary

Interethnic relations could be the source of social and cultural capital for minority students. International research indicates that even if students study in ethnically mixed classes, cross-ethnic friendships are rare (Moody, 2001). However, friendship segregation within classes has not yet been examined thoroughly in Hungary. While examining interethnic relations, nevertheless, difficulties may arise, because the formation of one’s identity occurs continuously through one’s identification with significant others. Therefore, ethnic identity, being both relational and contextual,
should be treated as a continuously changing process (Hall, 1996; Ladányi and Szelényi, 2001). Moreover, various classification systems may provide different data concerning students' ethnic identity. We suggest, there is a connection between self-identification, classification by peers and relational integration with classmates. In our study, we therefore hypothesize that students who identify themselves as Roma but are classified as non-Roma by a significant proportion of their peers are more likely to have a higher amount of positive interethnic relations than those who are classified as Roma by their peers. We also assume that students who identify themselves as Roma but are classified as non-Roma by a significant proportion of their peers are more likely to change their self-reported identity to non-Roma in time (between two waves of data collection). We control for socio-demographic factors and several network properties of students in both cases. Our research is based on a subsample (N=25 classes) of a Hungarian network panel study (OTKA K 81336). For data analysis, multilevel regression models are used.

Validating Network and Behavior Simulations from Stochastic Actor-based Models
Shoham, David A.1, Zhang, Jun1, Tong, Liping2, Durazo-Arvizu, Ramon1, Luke, Amy1
(1)Loyola University Chicago, Public Health Sciences, Maywood, IL, United States, (2)Loyola University Chicago, Mathematics and Statistics and Public Health Sciences, Maywood, IL, United States

Stochastic actor-based models (SABMs) as implemented in the R-Siena package have emerged as a powerful tool in analyzing network and behavior co-evolution. We have developed an agent-based model using parameters derived from the SABM. Just like the SABM, a simulation model is valid when it reproduces the empirical phenomena being studied; establishing a valid baseline model is a prerequisite to conducting simulation experiments and drawing counterfactual inferences. However, the SABM is defined by parameters at the individual level, and may not capture structural features of networks such as clustering. We present comparisons between empirical and simulated network models using saturation schools in the Add Health dataset observed over two waves one year apart. We focus on commonly used measures of network structure, including degree distribution, triad count and triad census, and clustering coefficient. We also compare empirical and simulated behavior changes, which are much more straightforward. We show that the model does a reasonable job of capturing network and behavior dynamics for the “average” agent, but may not accurately predict individual-level changes, especially in large networks. Implications for using SABMs to inform agent-based modeling and policy decisions are discussed.

Academic Disengagement and Friendship Dynamics: Selection and Influence Processes among High School Students
Veenstra, René1, Rambaran, J. Ashwin1, Hopmeyer Gorman, Andrea2, Badaly, Daryaneh3, Schwartz, David3
(1)University of Groningen, Groningen, Netherlands, (2)Occidental College, Los Angeles, CA, United States, (3)University of Southern California, Los Angeles, CA, United States

A growing body of researchers use longitudinal social network data to investigate network-behavior dynamics among adolescents. Yet, these studies provide no insight on the relation between academic disengagement and friendship dynamics. In this proposal, we present the answers to: (1) Do adolescents select friends based on their levels of GPA and truancy?; (2) Are adolescents influenced by their friends’ GPA and truancy? Participants were 342 adolescents (174 boys, 168 girls, M age = 14.0) from a moderately sized public high school in Los Angeles County. Four waves of data were obtained, with assessments conducted in the fall and spring during two years. Friendship nominations were collected by an unlimited nomination procedure among grademates in each wave. Academic disengagement was measured by both GPA and truancy, both collected by reviewing school records. GPA was calculated as the mean of the students’ five academic course grades for each semester. Truancy was a tally of the number of days students were absent from school without a valid explanation. Analyses were conducted using SIENA. This program makes it possible to simultaneously estimate parameters describing network dynamics (changes in friendship ties over time) and behavior dynamics (changes in academic disengagement over time), while controlling for each other. Adolescents preferred same-sex friends as well as friends that were similar in grades and truancy (indicating selection effects). Adolescents whose friends had lower grades moved toward lower grades themselves over time (influence effect). In addition, adolescents with higher truancy levels had lower grades over time, and vice versa.
Dynamic Networks of Adolescents 2

The Mysterious Three-cycle: The Micro-processes Underlying the Triad Census

Block, Per
Oxford University, Nuffield College, Oxford, United Kingdom

Siena Models applied to friendship networks regularly find a negative parameter for the three-cycle effect. Thus, there is a tendency in a triad against three un reciprocated ties where each individual is the sender and recipient of exactly one tie. This is often interpreted as indicating presence of local hierarchies, as predicted by the Davis-Leinhardt model. In this model, a one-directional tie represents a status difference between the sender and recipient. Under this assumption, a three-cycle means a circular hierarchy between three individuals - contradicting the idea of hierarchy and therefore rarely observed. The present study proposes a different interpretation of the negative parameter for the three-cycle effect found in Siena models. I suggest that the negative parameter is spurious and what is really modelled with the three-cycle effect is the relatively lower tendency towards reciprocation within triads. A three-cycle in combination with a transitive triad results in a triad with two asymmetric and one reciprocated tie - therefore, the three-cycle effect could also model the relative tendency against reciprocation in triads. This alternative explanation is tested by including both a three-cycle effect and an effect that specifically models the formation of dense triads with 4, 5 or 6 ties in the triad. If either of these effects is included in any of 12 datasets of adolescent friendships, the three-cycle effect loses significance; instead the dense triad effects show a negative parameter. Hence, the interpretation that the negative three-cycle parameter shows presence of local hierarchies does not stand to empirical testing.

Adolescents and their Cliques

Knecht, Andrea1, Steglich, Christian2, Ebels, Jasper3
(1)Universität Erlangen-Nürnberg, Business School, Nuremberg, Germany, (2)University of Groningen, ICS, Groningen, Netherlands, (3)University of Groningen, Groningen, Netherlands

Adolescents’ friendship relations often are organized in informal groups which we here colloquially refer to as cliques. These cliques are generally small (say, 3-7 members) and not necessarily confined to any formal boundary (e.g., the classroom, or the age group). They are important study objects because its members constitute the primary reference group for the adolescent. It can be expected that processes of peer influence and criteria for peer selection are clique specific. In our presentation, we will study these longitudinal aspects of cliques, starting with the already non-trivial question of how cliques can be identified over time when one has only discrete measurements of a binary network.

The Impact of Clique Hierarchization Processes in Adolescent Risk Behaviors

Pattiselanno, Kim1, Dijkstra, Jan Kornelis1, Steglich, Christian2, Franken, Aart2, Vollebergh, Wilma2, Veenstra, René1
(1)University of Groningen, Sociology, Groningen, Netherlands, (2)Utrecht University, Utrecht, Netherlands

Adolescents are influenced in their risk behaviors by their peers. Particularly, peers in smaller group of friends (so called cliques) are likely to be influential. Peer cliques, however, differ in many respects. One aspect of cliques we focus on is to what extent status differences in cliques (clique hierarchization) affect peer influence processes with regard to adolescent risk behaviors. We hypothesize that peer influence is stronger in hierarchical cliques (cliques with large status differences between members) than in egalitarian cliques (cliques with small status differences), due to the presence of role models who evoke a tendency among peers to imitate their behavior. We test our hypotheses in a longitudinal sample of 195 adolescents in secondary education (mean age = 13.20). Friendship relations, self-reported risk behavior, and perceived popularity are measured three times within one year. For identifying peer cliques, a set of partly overlapping groups (based on friendship nominations) is used to construct a proximity matrix, indicating for each pair of individuals the number of groups they jointly are part of. Based on a hierarchical clustering of this proximity matrix, non-overlapping ’communities’ are identified (e.g., cliques). Clique hierarchization is based on the centered range of status differences between clique-members, as derived from peer nominated perceived popularity. Using longitudinal social network modeling, we will examine to what extent influence processes in risk behaviors depend on clique hierarchization across three time points.

The Joint Evolution of Friendship and Liking Relations in Hungarian High-school Classrooms

Vörös, András1,2, Boda, Zsófia1,2, Néray, Bálint2,3, Block, Per2

1University of Groningen, Sociology, Groningen, Netherlands, 2University of Groningen, ICS, Groningen, Netherlands, 3University of Groningen, Groningen, Netherlands

The joint evolution of friendship and liking relations in Hungarian high-school classrooms is studied using network data from classrooms across three time points. Using a network approach, we will examine how these relations change over time and to what extent influence processes in risk behaviors depend on clique hierarchization across three time points.

Dynamic Networks of Adolescents 2
Being members of school communities, adolescents and their social behaviour are not only influenced by their close friends, but also by the larger peer groups that surround them. Therefore, in order to understand the evolution of friendship networks in schools, we have to take into account the impact of weaker positive relationships between students. Using two waves of a longitudinal network study of 43 Hungarian high-school classrooms (average group size = 33), we distinguish between two types of positive ties: friendship and liking. The Stochastic Actor-Oriented Model (SIENA) allows us to analyse the joint evolution of the two networks by modelling the probabilities of two threshold crossings: from no tie to liking and from liking to friendship. With a meta-analysis of group-level models, we explore the common trajectories of network dynamics in the analysed communities. The results provide insight into the evolution of balanced and unbalanced reciprocity, status inequalities, and transitive closure with multiple relations among adolescents. The explorative study also forms a good basis for later comparisons with datasets that measure positive relationships of different strength in school settings. The analysed dataset was collected by the Research Center for Educational and Network Studies (RECENS; our website: www.recensproject.hu/eng/) in the 2010-11 academic year.

**Development of Discretion, Initiative, and Network of International Students; A Longitudinal Actor-based Analysis**

Zandberg, Tjeerd

(1)Stenden, European Tourism Futures Institute, Leeuwarden, Netherlands, (2)University of Groningen, Sociology, Groningen, Netherlands

Studying abroad is assumed to be a forming year for students due to the exposure to different cultures, languages and new knowledge. One of the characteristics students might develop is their discretionary behavior - the ability to judge a given situation and to make independent decisions. As such, discretionary behavior resembles elements of individualism. Discretionary behavior is known to be influenced by both social network environment and personal antecedents like personality traits, study skills, and nationality. At the same time, discretionary behavior and other personal antecedents influence social network positions. This leads to a dynamic interaction between network position and behavior. In an eight month longitudinal study, the development of the friendship and advice networks of a group of fifty international master students is monitored. The development of discretionary behavior is measured using self-reported initiative as a proxy. In a longitudinal stochastic actor-based model, the co-evolution of network and discretion is estimated. Preliminary outcomes suggest that besides a contribution of personal antecedents, discretion influences the development of the network, but there is little evidence yet of network relations influencing discretion. Further results of this still ongoing research will be presented at the Sunbelt conference.
Dynamic Networks/Longitudinal Networks

The Limits of Scandal: Dynamics of Denunciation in Deviant Elite Networks

Grund, Thomas U.*, Morselli, Carlo†, Charette, Yanick‡
(1)Université de Montréal, CICC, Montreal, QC, Canada, (2)Institute for Futures Studies, Stockholm, Sweden

What is discovered during public inquiries into deviant economic and political affairs? In this study, we turn to the events and experiences of a Canadian Royal Commission, known as the Gomery Commission, which unfolded throughout 2004-2005 and inquired into the inner workings of a corrupt sponsorship program within the federal government. The main focus of the study is the sequence of denunciations which emerged from 20,000 pages of testimony offered by 172 witnesses. An interesting feature of the setting is that testimonies are public and that testifiers are aware who had been denounced by whom before. Drawing on multilevel discrete time event history methods we investigate the dynamics of denunciation. Some actors turn into ‘scapegoats’ and others get punished for having talked too much. At the same time previous network configurations matter: witnesses reciprocate denunciations and triad constellations where both sender and receiver have been denounced by a common actor increase the likelihood for denunciation ties to evolve. Overall, our study shows that serious and/or new denunciations are rare—the general pattern reveals a culture of silence with very few witnesses introducing new details. Such redundancy across testimonies is supported on both the level of actor attributes, but also in relation to the network configurations in which denunciation ties are embedded in. This carries us to the general argument of this study: that scandal is limited because what is revealed in such public commissions is more consistent with the maintenance of secrecy and less with the exposure of truth.

Longitudinal Analysis of a Dynamic Innovation Coalition in the Netherlands

Hermans, Frans
Wageningen University and Research Centre, Knowledge, Technology and Innovation, Wageningen, Netherlands

Innovation studies are slowly moving away from the traditional adoption and diffusion models towards a broader view of innovation systems. The relationships between businesses, policy makers, supplier and customers, NGOs, consultants and financial service providers form a complex network where a single actor is unable to advance an innovation alone. Flexible and dynamic innovation coalitions are formed promoting promising new practices through (1) joint learning, (2) lobbying and (3) brokering. This paper presents the results of a study into the changing network configurations of an innovation coalition. Two longitudinal two-mode affiliation networks of the actors involved in various research projects and public events were constructed using a special mapping technique. The analysis of the network dynamics was done both on the level of the whole network (graph level indicators) and on the node level. The graph level indicators show how the structural characteristics of the network show some distinct stable phases over time and how a successful coalition grows more connected, even when it grows in size. At the level of the individual actors results show the three functions of learning, lobbying and brokering are not evenly distributed over all participants in the network and that there is a small core for each of these three functions. These cores show only a small overlap leading to the conclusion that the ability to perform more than one innovation function over a longer period of time is extremely rare.

Disentangling the Dynamics of Status and Brokerage

Quintane, Eric, Carnabuci, Gianluca
University of Lugano, Lugano, Switzerland

Brokers enjoy sustained access to structural holes, which the extant literature on brokerage typically explains through brokers’ active pursuit of intermediation opportunities. Yet, brokers could also be provided with continuous access to structural holes because of their status and visibility. We argue that these two mechanisms (actively looking for and passively receiving structural holes) operate in tandem in order to generate and sustain a broker’s structural position. In order to disentangle the dynamics of these two related constructs, we selected newcomers to an organization because they are in the process of developing both their status and their brokerage position. More specifically, we follow the trajectories of 11 newcomers to a medium-sized organization over eight months, by examining their e-mail communication patterns. We use a relational event model in order to understand the dynamics of structural holes formation and status attainment. Our results shed light on the interplay between status and brokerage in organizations.

Make New Friends, but Keep the Old: “E-Mentorship” as a Predictor of Tie Churn in Professional Networks

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Rizzuto, Tracey
Louisiana State University, School for Human Resource Education and Workforce Development, Baton Rouge, LA, United States

A Personal Network Analysis of 66 high school science and math teachers revealed that relationships primarily maintained by technology-mediated communication or “e-mentorship” (e.g., email, text, web-streaming), as opposed to traditional face-to-face forms of communication, produced access to different forms of mentorship. E-mentorship resulted in personal networks enriched with greater emotional mentorship support, while traditional forms of communication were associated with greater access to instrumental mentorship (e.g., career guidance and decision-making support). In addition, a time-lagged analysis that tracked a subsample (N=23) of these teachers over a two-year period observed communications as a predictor of tie churn within professional mentorship networks. Although teachers who relied upon e-mentorship for communications reported more rapid growth in the number of ties within their mentorship networks over time, teachers who relied on traditional communications for mentorship were more likely to “make new friends” AND “keep the old,” ultimately resulting in greater retention of ties over time. Drawing on social exchange theory as a means to explain this pattern of tie churn, rewards and costs of e-mentorship are discussed along with practical implications for maintaining balance therein, especially when virtual mentorship is a necessary means for network-building.

Degree Dynamics: Spikes and Decay in Attention Relationships
Spiro, Emma S., Butts, Carter T.
University of California at Irvine, Irvine, CA, United States

Social networks can represent relations that are durable over time (e.g. marriage) as well as more ephemeral ties that may only exist for a few minutes (e.g. communication). As such, study of tie dynamics is a topic of longstanding interest among social network analysts. However, existing literature has focused primarily on the tie formation process; considerably less attention has been paid to the decay of relationships over time. A few studies have considered decay functions, but they focus on decay of strong interpersonal relationships (Burt 2000,2002). In contrast, many social systems now facilitate rapid re-organization (creation and dissolution) of social ties over short time scales on the order of days. Users on microblogging sites, for example, consistently create and remove ties in order to personalize the content they receive. Here, we examine tie decay following instances of mass coverage of attention (i.e. “degree spikes”) on particular users of a popular microblogging service. We do so for randomly sampled users as well as a population of targeted emergency management organizations. We characterize the decay function following spikes and consider variations in this function across types of users and types of events such as natural disasters.
Dynamic Networks/Longitudinal Networks 2

Missing Data Methods for Dynamic Network Logistic-regression
Almquist, Zack W., Spiro, Emma S., Butts, Carter T.
University of California at Irvine, Irvine, CA, United States

Methods for dynamic network analysis have greatly advanced in the recent decade. This paper extends current methods of dynamic network logistic-regression (DNR; a member of the Temporal Exponential Random Graph Models) to network-panel data which contains missing data in the edge set. We begin by reviewing the non-missing data form of dynamic network logistic regression. We then layout a missing data framework akin to that of Little and Rubin (2002) and Handcock and Gile (2011). Next, we apply this framework to the dynamic network logistic regression model, which allows us to account for the complexities in missingness via simulation methods (i.e., multiple imputation). Working within this likelihood based framework we derive a Metropolis-Hastings algorithm for imputing the missing values based on the full temporal conditionals of the (updated) logistic model and the observed data. Lastly, we apply the missing data model developed to a large, dynamic network of following (i.e. subscription) relationships among a set of US government emergency management-related organizations (federal and state level) obtained from a popular microblogging service. Specifically, We relate features of the organizations’ temporally evolving structural position within this network to their information exchange behavioral patterns, with an eye to their implications for hazards research.

Modelling Dynamic Structure and Interaction among Online Communities
Falzon, Lucia1,2, Kontoleon, Nectarios1, Pattison, Philippa E.2
(1)DSTO, Edinburgh, SA, Australia, (2)University of Melbourne, Melbourne, VIC, Australia

Social network analysis is widely used in the exploration of online communities and processes. It provides a general framework for exploring how social phenomena emerge from local interactions and shared affiliations, and allows relational patterns to be detected, described and compared over time and across observable networks. The underlying assumption is that social processes can be understood, in part, through the regularities that characterise relationships between social actors. Although a large part of the social network analysis literature is primarily concerned with static relational structures, the recent focus on the Internet as a locus of social processes, including the spread of ideas and the formation of social communities, has led to a growing interest in the analysis of dynamic interaction and relational structures. However, focusing on dynamic interactions and relations requires the development of new techniques for representing and analysing dynamic processes. Structure in online relations has been studied with respect to re-tweeting behaviour (Harrigan et al, 2012) but the sequential nature of online interactions may benefit from approaches that model the sequence in which interactions and relationships unfold. This is particularly the case when studying conversation threads in micro-blogs and social networking. In this paper we discuss recent developments in algebraic techniques for analysing dynamic interaction and relational structures and explore their utility in determining sequential patterns in social media data. Harrigan, N., Achananuparp, P., and Lim, E.-P., 2012, 'Influentials, novelty, and social contagion: The viral power of average friends, close communities, and old news' Social Networks, 34, 470-480.

The Network of Social Play among Wild Chimpanzees
Shimada, Masaki1, Sueur, Cédric2,3
(1)Teikyo University of Science, Department of Animal Sciences, Uenohara, Japan, (2)Université de Strasbourg, Département d’Ecologie, Physiologie et Ethologie, Strasbourg, France, (3)Université Libre de Bruxelles, Unit of Social Ecology, Bruxelles, Belgium

Since younger animals participated in social play more frequently and positively than elder animals, the networks of social play may differ from those of the other affiliative interactions, such as association or social grooming, in which adults play important roles. In order to describe the features of network of social play among wild chimpanzees, the field research was carried out on wild chimpanzees of M group in Mahale Mountains National Park, Tanzania, in 2010 (21 days) and 2011 (17 days). In both study periods, most of the members of M group participated in social play at least once. The play network centralities of infants, juveniles and youngs were significantly larger than those of adults. The participation in social play and the centrality of play network were significantly positively correlated. The play networks and the association networks were significantly positively correlated in infants and juveniles, although not correlated in youngs and adults. These results suggest that infants, juveniles, and youngs who played positively were more central and adults who played passively were more peripheral, and that such the overall structure of the network of social play were stable even if time passes. Participating in social play positively contributed to forming the affiliative social relationships.
of infant or juvenile chimpanzees. The play network may work as a place to acquire social techniques to become central in a society and form affiliative relations. However, this function seems to be lost when individuals becomes in young or adult period.

**Designing a Longitudinal Network Study: Critical Thresholds for Selection and Influence Models**

*Stadtfeld, Christoph*¹, *van Duijn, Marijtte A. J.*,¹ *Steglich, Christian E. G.*,¹ *Snijders, Tom A. B.*,¹,²

(1) University of Groningen, ICS, Groningen, Netherlands, (2) University of Oxford, Nuffield College, Oxford, United Kingdom

Social network studies are costly. When designing an empirical study on social selection and influence to be analyzed with SIENA, it has to be made sure that the collected data are rich enough to answer the hypothesized research questions. So, how many waves of data collection are necessary? What is a good time span between two sub-sequent waves? What is a sufficient network size? On which scale should behavioral variables be measured? At what level should the number of tie nominations be restricted? Social selection and influence processes are intrinsically dynamic. For example, the change in an actor’s behavior may have an effect on the behavior of friends (influence) or enable new, homophilic friendship ties (selection). Yet, behavior and network variables can often only be collected in discrete waves. The more complex a dynamic model gets, the more discrete data are necessary to test hypotheses. Studies that model both selection and influence mechanisms are particularly prone to suffering from a lack of power: weak effects may not be found in the data even though they are relevant. In this paper, we explore critical thresholds in longitudinal study designs by simulating artificial, longitudinal data sets, estimating these with SIENA, and investigating how well the model parameters used in the simulation are recovered. Of special interest is the power of the selection and influence parameters. The results are expected to provide practical guidelines on how to design a SIENA study.

**Using the Relational Event Model to Investigate Animal Behaviour and Cognition**

*Tranmer, Mark*¹, *Morton, Blake*², *de Kort, Selvino*³

(1) University of Manchester, Social Statistics, Mitchell Centre, Manchester, United Kingdom, (2) University of Stirling, Behaviour & Evolution Research Group, Psychology, Stirling, United Kingdom, (3) Manchester Metropolitan University, School of Science and The Environment, Manchester, United Kingdom

A recent development in the social network literature is the Relational Event Model (REM): a statistical model that allows patterns of actions over time in a network to be investigated and summarised. For example, based on the dyads of animals in the network, the REM can be used to determine whether future action is associated with actions that have occurred in the past between the animals. We use the REM to investigate animal behaviour and cognition based on two examples: 1) transfer of food items amongst a group of 12 Jackdaws (Corvus monedula), and 2) grooming behaviour amongst a group of 16 Capuchin Monkeys. We are particularly interested in identifying any patterns of action that may exist for these animals regarding the transfer of food or grooming; in particular, is future action associated with past action of a particular kind? We are also interested in the extent to which characteristics such as the sex, age, social rank, or the kinship of the animals are associated with their behaviour, and whether these characteristics explain all the observed actions, or whether future action is still associated with past action even after controlling for such characteristics. Empirical results will be given.

**Experimental Evidence for Preferential Attachment**

*vande Rijt, Arnout*

Stony Brook University, Stony Brook, NY, United States

I report on various field experiments I have conducted with various collaborators. In each experiment we test the preferential attachment thesis that the probability of attachment is proportional to the degree of the target actor. Observational studies make it difficult to identify a causal feedback effect of network degree on itself because the naturally higher attachment rate of more attractive actors produce spurious correlations between attachment events in longitudinal records. We constructed an experimental design that overcomes this difficulty and deployed this design in four naturally occurring systems. Our findings show that in each system initial ties formed through experimental intervention had a significant positive effect on later attachment.
We build on studies of collective learning through advice ties at the intra-organizational level to formulate hypotheses about the way in which entrepreneurs find a consensus about appropriate knowledge and legitimate epistemic authorities at the inter-organizational level. Our previous work about the milieu of Biotech entrepreneurs in France shows that the exchange of knowledge is characterized by the emergence of different, segmented epistemic communities in which most members align themselves on local opinion leaders that have different knowledge claims: scientific, economic or industrial. Our first hypothesis explores the effect of past professional affiliation of entrepreneurs on the evolution of knowledge exchange. We suggest that, as an identity criterion, not all past affiliations have the same consistency over time to explain homophily patterns. In particular, we argue that financial and industrial affiliates will show a stronger consistence in explaining social exchange than scientific affiliation. Our second hypothesis is about the way in which epistemic authorities preserve their informal status over time. The Biotech industry is experiencing rapid institutionalization. Epistemic authorities can progressively rely on collective and organized forms of social control to secure their position. They do not need to be very active advice seekers to safeguard their position. They can rely on rules that are more established, they can rely on a more rigid structure of authority relationships. Accordingly, we should observe a network evolution where the positive correlation between in degree and out degree centralities became negative over time.

The relation between boundary firm in the Open Source Software (OSS) Industry and its community, formed by individuals and firms, is characterized by an inherent tension among the particular sets of goals of each stakeholder. This study examines the effects of the interactions among stakeholders occurring in an open source software ecosystem sponsored by a firm over a period of two years. The aim of this research is to identify the mechanisms and network structures, which underline the (re-)establishing and negotiating of an ecosystem logic. This study builds on extant research on motivation that drives this type of ecosystems. This paper presents a longitudinal study of eZ Share, the online community of eZ Systems AB a Norwegian company developing a CMS (content management system) together with its ecosystem stakeholders. The period analyzed spans from October 2010 - November 2012, which was constellated by disrupting events in the relationship between the firm and its ecosystem. A textual analysis and social network analysis have been performed on forum data, online blogs and Twitter feeds. Through the identification of the principal stakeholders groups and the mechanisms characterizing their interactions overtime, this study contributes to a better understanding of the process of negotiation among the stakeholders competing logic.

The investigation of roles and positions has a long tradition in social sciences. In education sciences, learning has traditionally been conceptualized as an adaptive knowledge construction process in which both roles the learner and the educator has been established. This view has started to be extended by also taking the network structure and dynamics of interacting groups into account. We present a case study in which we use dynamic network analysis to investigate emerging social roles of actors within a remote learning community over a time period of five years. We analyze the communication structure of participants in web based collaborative learning to explore generalizable actor roles within instructed e-learning systems. We answer questions about conditions and effects of collaboration to emerge influential roles like Broker. The data comes from distance learning discussion boards that are actively used by eleven universities located in the state of Saxony, Germany. We use special relational analysis tools to examine the evolution processes of
emerging network roles within the participant networks of learners and educators to represent these data as dynamic networks. The social network data denote the collaboration between individuals over time. By performing structural analysis on these rich relational data we identify emerging social network roles of actors in the given e-learning environment as well as the relationship between network structure and learning roles. With this research we ultimately aim to contribute to a better understanding of the relationship between theories about socio-technical networks, communications, and learning in humans.

Social Influence and Social Selection Mechanisms: Co-evolution of Cognitive and Social Structures During Team Decision-making

Suerdem, Ahmet¹, Yilmaz, Cihan²
(1)Istanbul Bilgi University, Istanbul, Turkey, (2)Istanbul Bilgi University, Istanbul, Turkey

The most widely held view on group decision making depends on social choice theory. According to this theory a majority rule voting system will select the outcome most preferred by the aggregate voter. Rational voters will choose the best project designed to achieve an organizational goal according to their preferences. In this paper we challenge this assumption and assume that decisions are situated, embodied and individuals ground decisions with little processing. Voting majority not necessarily choses the best project; mechanisms of social influence and social selection will affect the group decision process. In our model, we hypothesize that decision approval relations are embedded in precedent approval relations; mutually shared social knowledge; and individual actor characteristics. For data collection, regular team meetings of eleven participants were observed on seven occasions. The agreement correspondence of each delegate on a issue is considered as a co-agreement event. Co-agreements within each meeting are aggregated to obtain seven asymmetric matrices to operationalize longitudinal development of decision approval networks. We operationalized mutually shared social knowledge as a belief configuration matrix. We presented participants with a problem decision outcome and a list of pro and con arguments to justify this outcome and instructed them to enumerate as many pro and con arguments. Corresponding arguments indicate cognitive similarity. We test the effects of hypothesized parameters on the network dynamics by means of stochastic actor-based model. We are using R-Siena software for this purpose and still experimenting with the data. The results up to now are promising.

The Effects of Fluid and Overlapping Memberships on Team Performance

Sullivan, Sophia, Contractor, Noshir S.
Northwestern University, Evanston, IL, United States

Teams are increasingly used in organizations to accomplish difficult tasks. Furthermore, many of these teams are fluid in their membership and share overlapping members with other teams. Since individuals frequently participate in several teams at once, they are not always able to actively participate in any one team. Unfortunately, most current team research assumes that teams have specific members that do not change. Therefore, little is known about the effect of shifting membership on team performance. Further, even less is known about how a particular team's position within the ecosystem of overlapping teams influences its performance. Using data from the Massively Multiplayer Online Game Chevalier’s Romance 3 (CR3), we explore the effects of shifting membership and team's position in the ecosystem on team performance. In CR3, a player creates a team then invites others to join. Members may play on a team once, play then return later, remain on the team for its duration, and also belong to other teams simultaneously. Access to the digital traces of all of these interactions provides a unique empirical opportunity to advance our understanding of the mechanisms by which networks influence the formation of these ad hoc fluid teams, in how these mechanisms influence that performance. From an analytic standpoint, we consider each team as a hyperedge within an ecosystem of teams, which constitute the Hypergraph. We therefore use metrics derived from hypergraphs to perform this analysis.

It Didn’t Work out Like we thought it Would: Understanding Unwanted Outcomes of a Planned Organizational Change

Towers, Ian
SRH Hochschule, Berlin, Germany

If we follow Heraclitus and accept that change is constant, we need to understand the relationships between planned endogenous organizational change and unintended and unwanted outcomes at macro, meso and micro-levels. This paper presents a qualitative longitudinal study of what was thought to be a relatively minor change in the organizational structure in a subsidiary of a pharmaceutical company - the creation of the position of Chief Operating Officer - and shows that the significant unintended organizational level outcomes of this change were linked to complex processes at the meso and micro level. The immediate causes of the change lay partly in the size of the senior management team and
how it worked and partly in the difficulties that were being caused by a recent change from a functional organizational structure to a matrix-like structure. Analysis shows how the senior management network was much affected by the appointment of the COO. Simultaneously, formal and informal networks within the organizational structure were reconfigured as the relationships within and between these groups were reordered. Based on extensive interviews, the paper links organizational and group level outcomes to individual level outcomes and shows the complexity of the interactions between these different levels. The mechanisms through which organizational change takes place are themselves subject to change caused by meso and micro-level forces, suggesting answers to the questions: how and why did the outcomes of an endogenous change in organizational structure turn out to be the opposite of those intended?

Bögenhold, Dieter
Alpen-Adria-Universität Klagenfurt, Dept. of Sociology, Fac. of Economics, Klagenfurt, Austria

Network analysis furnishes popular formulations of social embeddedness. Different network designs provide different opportunities to communicate, to receive information and to create different structures of cultural capital. Network analysis explores modes and contents of exchanges between different agents when symbols, emotions or goods and services are exchanged. Today, social network analysis has become a cross-disciplinary subject with applications in diverse fields of social and economic life. The message of the article is to highlight that social network analysis provides a tool to foster the understanding of social dynamics and that social network analysis enhances the recent debate on a micro-macro gap and on limitations of the cognitive and explanatory potential of economics.

Global Portfolio Investment Network and Stock Market Co-Movements

Chuluun, Tuugi
Loyola University Maryland, Finance, Baltimore, MD, United States

The recent global financial crisis yet again highlights the interconnectedness among financial markets, and this integrated nature makes network analysis an appropriate tool for studying financial markets. In this study, I employ network analysis and bilateral cross-border portfolio investment holdings data to create a global financial network. Using this approach, I examine the overall characteristics of the global portfolio investment network and the effects of the structure of this network on stock market co-movements and financial shock transmission. Stock market co-movements largely dictate the magnitude of potential gains that investors receive when they diversify their investments internationally, and thus, it is important to understand what drives stock market co-movements. Holdings of foreign securities reflect ties to foreign markets and the bilateral portfolio holdings create a network of financial linkages among countries. A country's position in this global portfolio investment network affects the extent of the co-movement of that country's stock market with other stock markets. By providing an alternative measure of financial integration and identifying an additional determinant of stock market co-movements with the use of network analysis, this research study contributes to various streams of literature in international finance that focus on international asset pricing as well as financial contagion.

The e-DNA™: A Network Approach to the Analysis of Regional Economics

Fabusuyi, Tayo1,2, Weidemann, Tim3
(1)Numeritics, Pittsburgh, PA, United States, (2)Carnegie Mellon University, Heinz College, Pittsburgh, PA, United States, (3)Rondout Consulting, Kingston, NY, United States

The e-DNA-TM, an acronym for economic development network analysis, is a novel approach for studying the structure of an economy using a combination of Network and Input-Output Analysis. The methodology employs input-output multipliers for the visualization of economies and for the computation of a set of network metrics which identify the inter-relationships among industries within the economy. This unique insight facilitates the ability to discern the structural make-up of the economy. It also enables a retrospective assessment of the economy while providing decision makers with the capability to proactively shape its future trajectory.

Re-Thinking the Market Model of Religion from the Perspective of Social Network Analysis: The Growth of Megachurches in the US

Kern, Thomas, Pruiken, Insa, Coronel, Janina
Heidelberg University, Heidelberg, Germany

Over the past decades, the market has become a central concept for the sociology of religion. The so-called "religious economies approach" implicitly models religion as an object of (rational) choice and production. Under competitive conditions, the success of a religious organization depends on the attractiveness of its offer. According to Finke, Stark and Iannaccone (1997: 351), the deregulation of religious markets enables entrepreneurs to increase the fitness of their supply with the preferences of the consumers. Consequently, religious mobilization often results from the deregulation
of the market. The "religious economies approach" is inappropriate because it neglects the social embeddedness of markets: "It is unable to specify analytically the boundaries of a market or to discriminate a production market as such from an entire industrial economy" (White 1981: 1). Accordingly, a religious organization’s market niche is largely shaped by (1) a network of organizations, (2) the organization’s audience and its preferences, and (3) a cultural network of meanings, ideas, and values. From this point of view, the analysis of religious mobilization shifts from individual preferences to specific niche structures. This contribution aims at employing concepts of social network analysis to understand the emergence and growth of so-called megachurches in the US. Megachurches are large evangelical congregations with at least 2,000 worship attenders each Sunday. Since the 1990s, their number increased from 300 to over 1,600. Our presentation will outline a theoretical concept for the analysis of this new organizational form by focusing on the specific structures of its niche.

Embeddedness of firms’ exports of innovations
Schott, Thomas¹, Sedaghat, Mahdokht²
(1)University of Southern Denmark, Kolding, Denmark, (2)University of Southern Denmark, Department of Entrepreneurship and Relationship Management, Kolding, Denmark

A firm may innovatively create products and bring them to market. Exporting, more than home-marketing, indicates successful innovation. Our starting point is the proposition that a firm’s innovativeness promotes its export, but that success does not flow from innovation. Rather, bringing innovation to the market, especially succeeding on the export-market, is expectedly facilitated by networking. Concretely, the firm’s exporting is embedded in the network around the firm. Embeddedness is expressed in the hypothesis that networking promotes exporting (a direct effect of networking) and the hypothesis that networking enhances the impact of innovativeness on exporting (a moderating effect of networking). These hypotheses concern the ‘population’ of firms in the world. We have a reasonably representative sample of 37843 firms around the world, recently surveyed in the research consortium Global Entrepreneurship Monitor. A firm’s export is measured by percentage of customers abroad, innovativeness by newness of technology, and networking by extent of the ego-network of collaborative relations with other enterprises about production, supplies, sales and effectiveness. The hypotheses are tested by hierarchical mixed linear modeling. In a model of exporting affected by innovativeness and control variables, the standardized coefficient for innovativeness is .09 (p< .00005). In a model of exporting affected by networking, the standardized coefficient for networking is .12 (p< .00005). In a model of exporting affected also by interaction between innovativeness and networking, the coefficient for the interaction term formed by the two standardized variables is .02 (p< .0005). This corroborates our hypotheses about embeddedness.
Economics, Markets, and Networks 2

Firm Value and Reciprocity among Large Companies: Networking Business Profitability in the UK

Arrieta-Paredes, Mary-Paz, Cronin, Bruce
University of Greenwich, International Business and Economics, Centre for Business Network Analysis, London, United Kingdom

The role that managers play as generators of company value is analysed in a network sample of 250 UK large companies. Corporate Finance literature (Wall & Greiling, 2011; Balachandran, 2006; Wallace, 1997) emphasizes the use of Residual Income models, according to which managerial performance is measured and rewarded in terms of shareholder value creation. Essentially, economic profit is generated by effective finance and investment decision-making, which translates into business profitability (Brealey et al, 2011). Applying a social networks approach, we debate if managerial practices for business profitability, and consequently company value creation, can be absorbed and diffused among organisations through recruitment (Campbell et al, 2012; Pazzaglia et al, 2012; Still & Strang, 2009). This can be explored via migration when the same executive manager is located as a key contact in two different companies at different points in time. With secondary data taken in 2006 (company group A) and 2011 (company group B), a cross-section of UK managers profiled as executives, were used to estimate and simulate ERGMs. We calibrated the weighted average cost of capital for the Residual Income model of each company group and then proxy firm value as a one-period perpetuity by discounting Net Income. Based on the converging parameters of the main component, simulations indicate that network formation occurs because firms tend to reciprocate managerial performance differences more than pre-recruitment company value assessments, between 50% and 90% of the times, which questions managerial performance emulation. Next step: Characterise this digraph’s general degree distribution for network modelling.

European Merchant Networks in Seville (1580-1640)

Crailsheim, Eberhard
University of Hamburg, History, Hamburg, Germany

In early modern times, the city of Seville was the hub for most of the trade connections and communication between Europe and Spanish America. Merchants from the Old World came to that city to establish trade relations with the New World. In addition, they maintained their old connections with compatriots in cities like Nantes, Antwerp or Hamburg. Hence, Seville became the center of an “international” trading network, connecting a large number of port cities of Europe with a growing American market. In the first half of the seventeenth century, the largest foreign communities in Seville were Portuguese and Flemings, followed by Frenchmen and Genoese. These groups left plenty of traces in various types of documents. On the one hand, rather private information of the merchants can be obtained from the naturalization files in the Indies Archives, while, on the other, commercial information is found in the archives of the notary offices in Seville. The respective information enables the reconstruction of networks, which complement each other—family and business were often very closely interlinked. As the networks consist of different types of connections, they have to be defined carefully. Ultimately, even complicated networks have the purpose to reduce the complexity of our vision of the past. In this paper this is accomplished visually and by showing the centrality of the actors, whereby the type of centrality is decisive for the importance of an actor in the network. Finally, the advantages of the Social Network Analysis for historical analysis will be exemplified.

Price is what you Pay: The Origins of Value for Bitcoin, a Decentralized Electronic Currency

Torfason, Magnus Thor, Piskorski, Mikolaj Jan, Nagle, Frank
Harvard University, Harvard Business School, Boston, MA, United States

We examine the determinants of value for “Bitcoins”, the units of exchange in the eponymous currency framework. The Bitcoin framework is completely decentralized and not backed by any state or organization. Bitcoins have no intrinsic value or utility and their price is therefore set solely by supply and demand, based on their perceived usefulness as a currency unit and medium of exchange. At one level the question, then, is: “Why are currencies worth something, rather than nothing.” To answer this question in detail, we utilize data on every transaction in the Bitcoin system from its inception in 2009, which allows us to examine in detail the complete exchange network. We combine this with data on Bitcoin market prices, online forum activity, and other sources. We find that the number and size of transactions in the network has only a weak relationship with the value of the currency. The number of actors who participate in the system, however, is strongly predictive of higher prices. Furthermore, we find that the level of centralization in the exchange network has a significant effect on prices, even after controlling for the size of the network, as does the level of activity in
online forums. This suggests that the value of the currency is only loosely dictated by the demand for transactions using that currency. Rather, its value derives from the actions of a cohesive and determined core of participants, who construct the idea of the currency as a valuable good through social interaction and discourse.

Supplier Collaboration in the Retrofitting Decision-making Process

Verhoog, Mart\textsuperscript{1,2}, Kirchgeorg, Manfred\textsuperscript{1}

(1)HHL Leipzig Graduate School of Management, Marketing Management, Leipzig, Germany, (2)University of Leipzig, Institut für Infrastruktur und Ressourcenmanagement, Leipzig, Germany

One third of all energy consumption is related to heating buildings. It is for this reason, that retrofitting is an important part of the German “Energiewende” (the last denotes the German transition process towards a sustainable energy system). Retrofitting aims to improve the energy efficiency of buildings (e.g. by adopting insulation material). It is generally believed that retrofitting rates of 2-3% are necessary to achieve the climate and energy objectives of the Federal Government. Despite legislation, information campaigns and subsidies, the current retrofitting rate in Germany is constantly at around 1%. Retrofitting decision-making processes can involve many different suppliers. As an example, suppliers can be responsible for planning (e.g. architects), for operational installation (e.g. installers of heating systems) or for administrative tasks (e.g. banks organizing a loan). Suppliers build networks around homeowners and influence their retrofitting decisions directly (and indirectly through influencing the whole network). The research question, which now arises, is “Which network constellations lead to retrofitting decisions most in favor of energy efficiency?”. As legislation, information campaigns and subsidies are hardly able to boost renovation, it is key to understand which supplier network persuades a homeowner to retrofit. A study was initiated to answer this research question in 2011. Over 1.000 retrofitting networks and the consequential retrofitting decisions were researched. The model developed for that purpose includes both network analytical components and consumer behavioral components. The study discusses the influence of retrofitting networks and supplier collaboration on retrofitting decisions.

International Supply Chains and Network Effects in Trade

Westbrock, Bastian\textsuperscript{1}, Bosker, Maarten\textsuperscript{2}

(1)Utrecht University, Economics, Utrecht, Netherlands, (2)Erasmus University, Economics, Rotterdam, Netherlands

In our paper, we develop a theoretical model of trade in an international supply chain. We derive three theoretical predictions concerning the relationship between the structure of the international trade network and differences in national income levels. We expand on existing trade models in the economics literature that relate the bilateral trade flows between countries to distance-related trade costs as well as to political, social, and other trade barriers between countries. Our main contribution is that we incorporate a country-spanning supply chain into this class of models and investigate the equilibrium predictions from our model. It turns out that the predictions are closely related to concepts from the social network literature: the trade flows between two countries in the international supply chain stimulate trade between other countries and therefore give rise to a higher-order externality in the world trade network that is reminiscent of information spillover effects. Investigating the comparative statics of our model, we demonstrate that this network externality has three important implications that are very different from those predicted by more standard trade models in economics. Moreover, we present an empirical estimation strategy in order to identify the parameters of our model and to do some counterfactual analysis for the real world trade network of the year 2007.
The Greek political and economic crisis is perhaps the most obvious public perception of life today. Although the reasons of this crisis are still much debated, no longer does anyone deny the important role of the hypertrophy of the state in combination with role of political clientelism. In our paper based on historical approach as well as on the statistical multilevel regression analysis in combination with a network approach we analyse the parliamentary elections from 1946 to 2012 in some electoral district of Greece. We found that in some cases of the so called “local notables” - who had widespread clientage relationships - the electoral influence forms a particular regional shape. We observed that in the fifties-sixties the elections results based on the interpersonal relationship of clientelism had a scale free character. In addition it is very important that this shape of votes connected only to the local notables. Other candidates who had also a great political influence without interpersonal clientage relationship didn’t present this structure. In the sixties-seventies a process of social mobilisation got under way. Within this context the influence of local notables decrease gradually while the increasing importance the parties in combination with the central role of state in functioning of the clientelistic system transform the traditional interpersonal clientelistic system to the so called bureaucratic clientelism. We analysed the consequences of this process on the relations between candidates and their voters with a network approach based on a many kinds of social and geographical distance.

State-building conducted by a foreign power is a complex problem set that has vexed great powers since the earliest empires. Ceteris paribus, the building of modern institutions in weak states, such as in Afghanistan, requires a significant amount of external actor resources and a native leadership willing to persuade their countrymen to invest in the long term success of the state. This paper will analyze the international community’s attempt to build modern institutions in Afghanistan and answer the question of why do externally supported modern institutions operate sub-optimally? I argue that modern institutions perform poorly in Afghanistan without significant monitoring because native elites have short time horizons that drive them to entrench their patronage networks as they compete for rents and power. This interest asymmetry subverts the external actor’s nation building objectives. The external actor attempts to monitor and correct defection from the institutional game but is hampered by an information asymmetry. This results in inefficient, failed institutions that delegitimize the nascent state and fail to promote the interests of the external actor. The research will require the building of a dataset that measures official institutional networks and unofficial elite corruption and patronage networks. Network analysis will be used to map the networks that are subverting the official institutional hierarchies and a multivariate model will measure how specified variables impact institutional performance. The paper will make a contribution by identifying variables that contribute to sub-optimal institutional performance and whether institutional design and monitoring can ultimately reduce corruption.

The change of political regime influencing on governing elites in former Soviet republics - Armenia, Georgia and Ukraine, was explored by various scholars. Though patterns of elite circulation and recruitment were analyzed in various studies, it is still a gap in understanding of the relational structures of ‘power circles’. The paper attempts to analyze connections between the members of political elites (people on top positions in legislative and executive authorities) in three countries - Armenia, Georgia and Ukraine, two of which experienced non-violent ‘revolutions’ during the last decade. The research tasks include: 1) exploration and comparison of connections through common affiliations between political actors in three countries; 2) definition of clusters of in-country networks and assessment of the fragmentation of national elites; 3) identification of beneficial network positions of individual actors and cliques. In order to assess the impact of
network capital on elite continuity in three aforementioned states, the composition of legislative and executive elites during 2002-2012 was analyzed. Network datasets were compiled with individuals and their affiliations detecting common biographical experiences among the elite members. Additionally, attributes of sex, age, party affiliation and regional origin of political elite members were used for the analysis of the homogeneity of the networks. Finally, the most 'surviving groups' in each country were compared, revealing the role of connectedness of elite groups (or their network structures) in their ability to stay in power during political transformations.

**A Network Based Approach to Evaluate Policy Processes: An Application to Agricultural Policy in Malawi**  
*Krampe, Eva, Henning, Christian*  
Christian-Albrechts-Universität zu Kiel, Kiel, Germany

We introduce a theory driven framework to evaluate a policy process that involves multiple actors like national government, development partners, research organizations and interest groups. The framework comprises a theory of policy processes and an empirical approach to apply the theory in practice. This systematic approach enables researchers and policy analysts to assess the participatory character of policy processes, the network-based influence of non-governmental organizations on national policy decisions and the inclusion of scientific evidence into policy formulation quantitatively. The theoretical part builds upon the idea that a country's elite forms her policy beliefs in communication networks. Then, in order to reflect political games and the legislative procedure, the process of policy belief formation is integrated into a Baron-Ferejohn type legislative decision-making model. The empirical part presents a clear guideline how to implement the theory driven model of policy processes in practice. In detail, we propose to use quantitative survey data collected via face-to-face interviews with a clearly structured questionnaire. Such an elite network study involves questions about policy positions and interests as well as about communication and reputation networks. Respondents are chosen using snowball sampling and data from a reputation network in order to ensure that the final data set comprises policy positions and networks of a country’s political elite. As an example for the application of the framework in practice, we use the participatory policy process in Malawi that has lead to the adoption of CAADP. A self-conducted network study from 2010 builds the empirical database.

**When and Why Do Developing Countries Undertake Reform? Mapping and Analyzing Elite Policy Networks in a Cross-national Comparative Framework**  
*Rice, Zachary J., Parks, Bradley C.*  
College of William & Mary, Institute for the Theory and Practice of International Relations, Williamsburg, VA, United States

The Making Reform Incentives Work for Developing Countries survey, which is slated for implementation in 2013, represents one of the first attempts at using survey methods to map and analyze national policy networks in a cross-country comparative framework. The survey has a target sample of 30,000 elites in over 130 countries and semi-autonomous regions, covering 17 policy domains over the period 2004-2013. With the data from this survey, we will evaluate a set of network analysis-inspired hypotheses related to the conditions under which developing countries design and implement political, economic, social, and environmental reforms. We are particularly interested in the roles of (a) organization actor centrality, density, and betweeness; (b) inter-organizational reciprocity and trust structures; and (c) donor and international organization influence. Using a survey tool to collect network data on a large, comparative scale presents several difficulties, two of which relate two the definition of network boundaries and respondent recall. In this presentation, we will explore two central questions: whether and how ties between individual policy elites can be redefined as ties between organizations; and the extent to which individuals are able to identify the formal and informal ties between organizations. We will introduce the criteria that our research team employed to build consistent and comparable national sampling frames. We will also report preliminary pre-testing results on recall devices and methods. We hope to gather input from conference participants that can be used to improve the Making Reform Incentives Work for Developing Countries survey instrument.

**Network Structure and Campaign Contribution Strategies of Competing PACs**  
*Serôdio, Paulo, Ziaja, Sebastian*  
University of Essex, Colchester, United Kingdom

Special interest groups’ strategies of campaign contributions in the US are generally portrayed as either partisan, service or policy-seeking. However, there is a strategic component to the contribution patterns which is overlooked in the literature and this article seeks to explore. Our theoretical approach suggests SIGs strategic behaviour is conditional on electoral competition, candidates' ideological polarization, and the network structure at the district level. Modularity analysis identifies communities of groups that resemble the structure of economic sectors rather than the expected
partisan blocks, which suggests groups are responsive to intra-sector competition and adapt their contribution strategies according to it. Using FEC campaign contribution data from 1980 to 2010, we apply a temporal ERGM to estimate the effect of network structural forces on the probability two PACs contribute to the same candidate in the general election of an election cycle. The preliminary results suggest groups respond less to the degree of ideological homophily in their networks and more to the contribution patterns, both in the previous and current election cycle, of their sector competitors. The effects of the network structure (density, centralization and clustering) are conditional on the degree of electoral competition, on whether an incumbent is running for reelection, and on the degree of candidates’ ideological polarization.
Elite Networks 2

The Formation of Elite Communication Networks in Malawi: A Bayesian Econometric Approach

Aßmann, Christian1, Krampe, Eva2, Henning, Christian H.C.A.2

(1) Otto-Friedrich-Universität Bamberg, Bamberg, Germany, (2) Christian-Albrechts-Universität Kiel, Kiel, Germany

We present an empirical analysis assessing the determinants of information gathering routines within a country’s political elite, i.e. of local stakeholders, donors and politicians. The empirical analysis provides insights that are valuable information for designing participatory policy processes and for increasing knowledge based policy formulation. Results from the econometric analysis will enable us to evaluate participatory policy processes by explicitly deriving insights into their information/distortion nature. However, since communication network data are usually collected via face-to-face interviews and thereby almost inevitably subject to item and unit non-response despite the highest efforts in fieldwork, a sound empirical assessment calls for econometric models dealing with these issues. We suggest a Bayesian estimation scheme for binary probit models based on Markov Chain Monte Carlo (MCMC) methodology, namely Gibbs sampling. Using the device of data augmentation, the estimation technique is well suited to deal with missing values in explaining factors and missing values within the dependent network relationship. Thus, the proposed econometric approach accounts for the uncertainty within parameter estimation due to missing data. Empirical results from an application of our model to survey data collected in Malawi suggest that the structural embeddedness of organizations into the network mainly determines the formation of elite communication ties, while knowledge is an important but not leading determinant of communication. We find no significance of homophily in policy interests and summarize thereby that, in the case of Malawi, participatory policy processes do not distort policy decisions in favor of special interests.

The Inner Circle in Egalitarian Society

Ellersgaard, Christoph H., Larsen, Anton G.
University of Copenhagen, Department of Sociology, Copenhagen, Denmark

In the discussion of the death of class, the social organisation of the capitalist class has been removed from sociological memory. Through the notion of a cohesive inner circle representing classwide rationality on behalf of the entire corporate elite, the importance of interlocks between members of this elite is examined using a highly egalitarian society, the Scandinavian Welfare State of Denmark, as case, using data on board and management of the top 1000 Danish corporations. Reintroducing a measure of social circles based on social network metrics of proximity, a cohesive inner circle with 170 members exhibiting high level of homogamy in network and high network centrality within the corporate elite as a whole. Furthermore, political action, such as business organisation membership, participation in commission and in other power spheres, is shown to be connected to inner circle membership. Finally the high level social homogeneity of the inner circle with regard to gender, social background, education and career path underlines the cohesion of the inner circle in Denmark. The paper thus explores how social network analysis can be used to identify certain segments of the elite.

Prestige and Networks among Danish Corporations

Grau Larsen, Anton
University of Copenhagen, Sociology, Copenhagen, Denmark

By combining social network and principal component analysis this paper investigates how the inclusion into the central parts of the corporate network of the top 1000 corporations in Denmark is controlled by company prestige. Prestige is in this context a combination of economic and symbolic resources inspired by the concept of symbolic capital by Bourdieu (1986; 1979). With principal component analysis we find that a combined measure of symbolic and economic capital is better at explaining network integration than simpler measures of economic size. This leads to an examination of the role of symbolic capital in corporate power; in particular the positions of prominent family owned businesses that are integrated disproportionately to their size. These prestigious corporations have ties both centrally within the business community and other sectors as science, politics, arts and law. The foreign companies are the antithesis of the prestigious family businesses. Being part of a foreign transnational corporation or being owned by foreigners disintegrates the network position of the corporation and reduces the corporations prestige. This study is one of few studies using data on Danish corporate interlocks and will give an insight into the relationship between nationally embedded and transnational corporate networks in the strong nation state of Denmark and the role of the strong
symbolic economy in the organization of the Danish business elite. Furthermore we hope to contribute to the methodological discussion within elite studies.


Korom, Philipp
University of Graz, Sociology, Graz, Austria

In this paper I analyze the changing composition of the Austrian corporate elite by combining two methods: social network analysis (SNA) and multiple correspondence analysis (MCA). I argue that such a combination is useful for grasping ongoing elite change and therefore I refer extensively to the methodological challenges and theoretical underpinnings of such an approach. My main point is that MCA helps us decisively understand not only the composition and strategies of specific elite fractions, but also dynamics within elite structures. Based on a sample of top managers of the 150 largest Austrian companies in 1983 and 2011 my analysis of »the field of economic power« (Bourdieu) reveals a profound change of the internal field stratification into more or less dominant positions. In the 1980s, as Austria still held on of the largest public sectors in Western Europe, politicized »statesmen of industry« with multiple positions within the banking and industry sector were the dominant connectors. Since a change from state to private ownership precipitated major reconfigurations of the network, political capital lost its value. At the same time privatizations opened up opportunity structures for new national and international types of managers. On the one hand, an internationalized corporate elite replaced the old corporatist elite. On the other hand, Austrian managers with political networks and local knowledge turn out to have profited from economic change at least to the same extent. Especially Austrian bankers proof to be still in dominant network positions.

Changing Elite Networks in Finland 1991-2011

Ruostetsaari, Ilkka
University of Tampere, School of Management, Tampere, Finland

The research task of my research project is to chart changes in recruitment, cohesiveness and mutual interplay of the elites, and the interconnection between the elites and the population in the context of pivotal social changes in Finland 1991-2011. Theoretically the research project is based on democratic elitism and methodologically on the positional approach. Identical postal surveys were conducted to the elites of politics, administration, business, organisations, the mass media, science and culture in 1991 (N=1121, rate of response 66.9, 2001 (N=1285, 53.5 %) and 2011 (N=1409, 34.3 %). In order to study elite networks the elite members were presented with a structured question dealing with their contacts to other elites. The most important findings were that the interaction networks of the Finnish elites have dispersed since the early 1990s and the number of institutions with which they interacted very intensively has decreased. In other words, the interaction network links elites to each other more and more loosely. Furthermore, the number of institutions included in the inner core of the interaction network has decreased and partially changed since the early 1990s. Within the elites there were only slight deviations from this general trend. However, the density of contacts of the mass media elite and also a lesser extent that of the scientific elite with various institutions have increased more than those of other elites. This also indicates the centrality of the mass media as a hub of the communication network of the elites.
Entrepreneurial Networks

Embedding and Decoupling in the Creation of French Start-ups
Grossetti, Michel
CNRS - University of Toulouse, LISST-Cers, Toulouse, France

This paper presents the results of a survey of new innovative companies. The investigation began in 2005 and has been continued since. The communication will present analysis on 61 companies of which 22 have been followed longitudinally. These companies were selected for their innovative character, attested by the fact that they received innovation subsidies or are housed in a nursery. They are located in the sectors of IT, biotechnologies, chemistry, and mechanics. The objective is to study both embeddedness into interpersonal networks and decoupling from these networks. To do this, we used crossed interviews for reconstructing the processes of creation of 61 innovative companies in various cities of France. We wrote a summary of the company’s story that we coded according to different levels of analysis: companies, founders, relations, sequences and especially access to resources. For each situation of access to external resources, we checked if the founders have used their personal relationships or used other means (institutional or commercial), which allow us to measure the level of embeddedness. The data analysis shows that the embedding is very important in the initial period during which the founders formalize their project and create the new company legally, and also during the first year. It then decreases steadily to stabilize at a level that remained significant (between 30% and 40%) in most cases. The embeddedness is reduced almost to zero for access to customers by companies whose activities are located on semi-massive markets.

The Influence of Social Networks, Gender, and Network Resources on Entrepreneurial Performance
Knirsch, Sarah
Humboldt-Universitaet zu Berlin, School of Business & Economics, Berlin, Germany

Background/research question: In entrepreneurship research it is widely accepted that besides human capital and tangible capital it is social capital that enhances entrepreneurial performance. The concept of social network analysis suggests that social capital lies within the relations that one is embedded in. Network outcomes depend on specific positions within a network and specific network characteristics. The network outcome seems to come via the resources one can gain from his or her network but very little is known about the link between one's access to resources and firm performance. This article introduces a design that connects entrepreneurs’ personal networks with their entrepreneurial performance by arguing that the value of one's network for entrepreneurial success lies within the resources one is able to generate from the network. According to career networks research, men and women benefit from different networks - e.g. women benefit from strong ties whereas men benefit from weak ties. Therefore we include a gender perspective. Data/method: Ego-centered network analysis is conducted using online-interview data based on information on 277 entrepreneurs (ego), 1,498 alteri and 5,005 possible alter-alter-relations. We use E-Net (Borgatti 2006) to visualize networks and calculate network-measures (homophily/heterogeneity/density); statistical procedures are calculated in STATA. Findings: Analysis reveal differences in network effects between women and men and between nascent and established entrepreneurs. Women and nascent entrepreneurs benefit from weak ties, for men network size and - surprisingly - high density matter. Networks' effect on performance can only partially be explained by resources gained from the network.

What Kind of Person Are you? A Network Analysis of Cultural Influences on Network Formation
Scherl, Christine M.
Nottingham University Business School, Nottingham, United Kingdom

The purpose of this research is to investigate cultural aspects of inter-organisational networks and networking activities and how these networks function in the context of small and medium-sized service enterprises in Germany - a hitherto neglected context. Social Capital, which is defined as trust, norms of reciprocity, and social networks, encourage individuals and entrepreneurs to engage in business networks. While network theory has studied the formation of network structure and content from the perspective of tie strength and density, yet how they emerge is an interesting issue which has not been studied to a great extent. In this paper I analyse the networker cult of personality and cultural influences on network formation and content. Twelve preliminary interviews and focus group discussion were conducted in order to ground and inform the empirical study. The empirical investigation covers 40 semi-structured interviews, document analysis and observations that are conducted in networked SMEs at a representative tourism destination in
Germany. This research project therefore will contribute to the knowledge of cultural influences on network structure and organisational relationships.

**Social Capital, Social Innovation and Social Impact**

*Weber, Christiana*, *Wallace, James*, *Tuschke, Anja*

(1)University of Hanover, Hanover, Germany, (2)University of Bradford, Bradford, United Kingdom, (3)University of Munich (LMU), Munich, Germany

Although there is considerable interest in the two closely connected phenomena of social entrepreneurship and social innovation (Dacin et al. 2010; Zahra et al., 2009), the literature lacks unified definitions (Short et al. 2009) or coherent theoretical frameworks (Weerawardena & Mort, 2006). Additionally, there is a predominance of qualitative, single and multi-case analyses based on explorative, anecdotal evidence (Mair & Marti 2006). Whilst acknowledging the formative contributions of this research, there is a lack of quantitative research to validate the propositions and hypotheses that have been put forward in previous research (Lepoutre et al. 2011). In this study, we address this need for quantitative research and integrate three important streams of research, namely: social entrepreneurship, social innovation, and social capital. In particular, we address the following key research questions: First, do the different dimensions of social capital (structural, relational, cognitive) for social enterprises impact social innovation in different ways? Second, what effect does social innovation for social enterprises have on social impact? We find that the three dimensions of social capital impact social innovation, differentially. Of particular note are the relatively strong direct contributions that the relational and cognitive dimensions make to knowledge transfer and social innovation, leading to a greater understanding of the overall way that social capital contributes to social provision.

**Entrepreneurial Team Formation and Trust Building: Linking Founding Institutional Environment and Interaction Experience**

*Zhang, Chenjian*, *Möllering, Guido*

(1)Jacobs University Bremen, School of Humanities & Social Sciences, Bremen, Germany, (2)University of Bremen, Bremen International Graduate School of Social Sciences, Bremen, Germany

Extant literature suggests that entrepreneurs often start up their ventures with existing ties which they have prior experience, it remains unclear about the contingent factors influencing entrepreneurs’ decision to team up with these existing ties or with new partners. In addition, the process of trust building with their team members during the firm emergence stage also remains unexplored. Integrating network research and institutional perspective, this study fills this gap by examining how institutional environment defines the search scope and how entrepreneurs cultivate trust relationship with their team members. Our inductive analysis of team formation process of two Chinese start-up cohorts show that when founded in an unfavorable institutional environment, entrepreneurs mainly rely on their existing ties and develop affective trust; while founded in a relatively favorable institutional environment, entrepreneurs actively seek out to form new partnership and build cognitive trust. This study contributes to entrepreneurship literature by offering a contingent view of team member selection and trust building and also showing how negative prior experience embedded in different institutional environments lead to different propensity of trust building.
Exponential Random Graphs

Interpreting Near-degeneracy of ERGMs in Terms of Socially Desirable Equilibria
Amati, Viviana, Brandes, Ulrik
University of Konstanz, Department of Computer & Information Science, Konstanz, Germany

Exponential-family Random Graph Models (ERGMs) are a parametric family of distributions used to model cross-sectional network data. Particular ERGM specifications can be afflicted by near-degeneracy, an issue that is problematic, e.g., for parameter estimation. Near-degeneracy occurs when the probability distribution is concentrated on few distinct network configurations, and it has been analyzed mainly from a statistical/mathematical perspective that is focused on the shape of the distribution and the sensitivity and instability of the statistics. We recently linked ERGMs to the outcome of a dynamic strategic game in which the interaction framework is designed as a potential game and actors take decision in an attempt to maximize their utility, albeit with error. After reviewing the relationships between actor utility and network statistics, we provide a “social” interpretation of near-degeneracy and its relation to the degree of error. From this interpretation we obtain notions of socially desirable equilibria and strategic stability.

Extended Brokerage Structures in Organizational Networks
Fitzhugh, Sean, Gibson, C. Ben, Butts, Carter
University of California at Irvine, Irvine, CA, United States

Recent advances in exponential random graph models (ERGMs) allow the use of terms for graphlets: small, connected, undirected subgraphs ranging in size from two nodes to five nodes (Yaveroglu, et al 2012). These subgraphs correspond to the connected, undirected isomorphism classes we see in the dyad, triad, tetrad, and pentad censuses. These extensions to the ERGM framework allow us to expand the scope of analysis of brokerage structures within a network. In addition modeling brokerage between single nodes, we can now account for structures where a single node holds a brokerage position between a dyad and a single node, a pair of dyads, or a triad and a single node. In this paper we use ERGMs to examine the association between organizational covariates—authority (i.e. the extent to which one has power or influence over others), organizational role, task group, etc.—and one’s position in one of these extended brokerage roles. We discuss the implications of these findings and practical issues related to modeling networks using graphlet terms.

Univariate and Multivariate Models of Positive and Negative Networks: Liking, Disliking, Defending, and Bully-Victim Relationships
Huitsing, Gijs 1, Van Duijn, Marijtte A.J. 1, Snijders, Tom A.B. 1, Wang, Peng 2, Sainio, Mia 3, Salmivalli, Christina 3, Veenstra, René 1
(1)University of Groningen, Sociology, Groningen, Netherlands, (2)University of Melbourne, Melbourne, VIC, Australia, (3)University of Turku, Psychology, Turku, Finland

Social network analysis has concentrated attention traditionally on relations with a positive interpretation with respect to affect, exchange, or cooperation. In our research, we explore the network structure of the negative relations of general dislike and bullying when considered on their own (i.e., univariately), as well as simultaneously with the positive relations of general like and defending in a classroom setting using a multivariate (multiplex) ERGM approach. We studied the network structure of positive and negative social networks, to answer the question which structural parameters are sufficient to model the network data adequately. We used two samples (18 Finnish classrooms, numbering 393 students and 25 Dutch elementary school classes, numbering 494 students) which were modeled using univariate and multivariate cross-sectional (statistical) network models. Exponential random graph models were summarized using meta-analyses. Results showed (balanced) network structures with positive ties between those who were structurally equivalent in the negative network. Children have a positive relation with similar others when they share difficulties with the same network partners. Moreover, essential structural parameters for the univariate network structure of positive (general like and defending) and negative (general dislike and bullying) tie networks were identified. Different structures emerged in positive and negative networks. The results provide a starting point for further theoretical and (multiplex) empirical research about negative ties and their interplay with positive ties.

Rigorous ERGM Inference for Egocentrically Sampled Data
Egocentric sampling comprises observation of a network of interest from the point of view of a set of sampled actors (egos), who provide information about themselves and their network neighbors (alters), but who often cannot disambiguate them. It is the only practical way to observe certain classes of networks, such as those of sexual partnerships. Although methods exist for recovering network features from such data, a unifying framework, such as exponential-family random graph (ERG) modeling, is lacking, and, so far, approaches to fitting ERGMs to such data have lacked a rigorous statistical foundation in general and measures of uncertainty, in particular. In this work, we identify a subclass of ERGMs amenable to being estimated from such data, develop techniques for doing so, and introduce a technique for rigorously evaluating the uncertainty (i.e., standard errors) of these estimates. For ERGMs parametrized to be invariant to network size, we also describe a computationally tractable approach for fitting these networks. We demonstrate these techniques through a simulation study and apply them to the 1992 National Health and Sex Life Survey (NHSLS) data.

Negative Ties or the Lack of Positive Ties? - Ethnic Segregation in Secondary School

Neray, Balint¹², Boda, Zsofia¹³
(1)RECENS - Research Center for Educational and Network Studies, Budapest, Hungary, (2)Corvinus University of Budapest, Budapest, Hungary, (3)University of Oxford, Oxford, United Kingdom

Ethnic integration, and specifically the problem of integrated education of students from different ethnic backgrounds, is the subject of serious socio-political debates. Advocates of integrated education often argue that in integrated school and classroom settings minority students have more opportunities to develop interpersonal relationships with the majority group. Through more developed positive connections, majority and minority groups get to know each other better, and through better knowledge one expects prejudice to decrease. However, empirical evidence suggests this not direct consequences of integrated education, since relationships themselves can still remain segregated in spite of the formal integration. Moreover, the level of friendship segregation seems to be the highest in classes with two similar sized ethnic groups. Nevertheless, for a more detailed picture it seems crucial to examine not only positive but also negative ties between students. Even if everyone has less friends from the other ethnic group(s) than from their own, this situation still can be more advantageous than the one in which ethnically different students do not even meet each other, so they do not have friends from the other group at all - but this is true only if the non-positive ties are mostly neutral and not negative ones. In our presentation, we focus on the effect of ethnicity (Roma and not Roma people) on negative ties in classroom networks. For the analysis, Exponential Random Graph Models are used. Our dataset contains 20 secondary school classes from 5 Hungarian schools.
Family Networks: Family Construction and Family Formation

David, Beata¹,², Albert, Fruszsa³
(1)Hungarian Academy of Sciences, Centre for Social Sciences, Budapest, Hungary, (2)Semmelweis University, Institute of Mental Health, Budapest, Hungary

In our presentation we show representative national data regarding core discussion networks collected in 1999, 2004 and 2011 in Hungary. From a methodological point of view, the questions were asked the same way in all surveys and in a similar context. The trend indicated by the data is in line with other relevant data in this regard. The ratio of isolates decreased: 9 % in 1999 and only 2 % in 2011. The proportion of non-kin ties has gradually increased from 13% (1999), then 21% (2004) to 40% (2011). Between 2004-2011 it seems that a significant proportion of kin-ties has been replaced by non-kin ties. This trend especially affects certain social groups, for example men, who formerly had their spouse as the one and only confidant whereas by 2011 more male friends appear in their core discussion networks. In 10 years in men's network structure the rate of male confidants has doubled from 25.5 % to 51 %. Our presentation will highlight the changes in the confidant network structure of the different socio-demographic groups. We show the shift how the dominant role of kin ties (partners, parents, children) is replaced and/or supplemented by non-kin ties (especially friends). This trend will be confirmed by other structural changes observed in the Hungarian society: loosening family ties, unstable (or even missing) partnerships and more, supportive functions ascribed to friendship.

Fertility Relevant Networks in Eastern and Western Germany
Klaerner, Andreas, Keim, Sylvia
University of Rostock, Institute for Sociology and Demography, Rostock, Germany

More than 20 years after unification, fertility related behavior is still considerably different in the eastern and western parts of Germany. For example, voluntary and permanent childlessness is more spread in western Germany. While in eastern Germany transition to motherhood takes place in younger ages and unmarried motherhood is more common. The two regions also differ in patterns of female employment and gender role attitudes. Our study aims at understanding east-west differences in family formation by taking a network perspective. Data and methods: We conducted 120 mixed-methods interviews with men and women aged around 30 in an eastern and western German city. The interviews focused on the respondents' life-course, their attitudes and intentions concerning parenthood and on their social networks. We were able to re-interview some of the focal persons six years later. First results: In the western German data, we have pointed out different mechanisms of social influence. Additionally, we have identified three basic types of fertility relevant networks: Family-oriented networks, which motivate, encourage and support Ego in having a child; heterogeneous networks, displaying various influences encouraging and discouraging Ego from having a child; family-remote networks, in which having children is either not yet an issue or voluntary childlessness is encouraged. In this presentation we ask: 1. How are processes of social influence narrated in Eastern and Western Germany? 2. Which fertility relevant networks can be found in the eastern German data? 3. How do fertility intentions and networks change over time in both settings?

Otters, Rosalie¹, Hollander, James²
(1)University of Arkansas at Little Rock, School of Social Work, Little Rock, AR, United States, (2)Independent Researcher, Little Rock, AR, United States

Decisions D of agents, personal value V to self of decision, and changes in influence network weights W influence subject agent's decision D to leave home (+1) or not (-1). Decisions D in multiple modes exert influence on each other. Conceptual scope issues involve "leave," "home," "family," "voluntariness," and new household formation. Model decisions for agents in leaving-home mode aggregate into numbers of agents leaving home in a population. A typology for such agent-based binary choice influence network model includes 1) influential agents inside/ outside home, 2) positive/negative weights W, 3) positive/negative personal value V to self of decision, 4) increasing/ decreasing magnitude of weights W and/or values V. Relevant decision modes include parent changing employment status, medical decisions, divorce, opposition/support by a parent or other family member, as well as subject agent's decision about leaving home (or returning). Thus decision D by an agent j in one decision mode m can influence decision D by another...
agent \( i \) in another decision mode \( k \). Signed magnitudes for values \( V_{ik} \) as to each decision mode sum with influences \( W_{ikjm} \) of other actors’ decisions \( D \) via weights \( W \). A plus/minus sign of combined result indicates or tips each agent’s choice in each mode. Repeated model computations in discrete time steps \( t \) evolve changes in decisions. Discrete-time network modeling with or without random variables accommodates boomerang (returning) decisions and clarifies understanding and simulation of complicated family interactions. One model is \( D_{ik,t+1} = \text{SIGN}[ V_{ik,t} + \sum_{j,m} W_{ikjm} D_{jm,t} ] \).

**Is Childbearing Contagious? Fertility and Social Interaction at the Workplace**

*Pink, Sebastian*, *Leopold, Thomas*, *Engelhardt, Henriette*

(1) University of Mannheim, Mannheim, Germany, (2) European University Institute, Florence, Italy, (3) University of Bamberg, Bamberg, Germany

We ask whether fertility at the workplace is “contagious”, investigating the influence of colleagues’ fertility on women’s transitions to first pregnancy. Based on the principles of analytical sociology, we propose different mechanisms that are likely to mediate social interaction effects on fertility. The empirical analysis draws on linked employer-employee panel data from the German Federal Employment Agency comprising 42,394 female co-workers in 7,560 firms. Discrete-time hazard models reveal a sizable contagion effect: In the year after a colleague gave birth, transition rates to pregnancy almost double. The results are consistent with desire- and belief-based mechanisms of social contagion, suggesting that interaction with pregnant colleagues and/or their newborns may generate or exacerbate the wish to have a child but also increase confidence in childbearing decisions by learning from a social model.

**The Kids Are Alright. What about their Influence on your Network?**

*Rözer, Jesper*, *Völker, Beate*, *Mollenhorst, Gerald*

Utrecht University, Sociology, Utrecht, Netherlands

Are children detrimental for the size of people’s social network? Existing research suggests that they are, at least in an early phase in life and when people’s core network is considered. Less is known about their influence on the size of the broader network and how they influence the composition of the network. Children may directly influence the network of their parents by becoming a network member, or indirectly by influencing their parents’ socializing behavior. They can influence their parent’s socializing behavior by affecting their resources, motivations and possibilities to form and maintain social relations. This may have different consequences for core network members (confidants) and less intimate relations (e.g. neighbors, colleagues and acquaintances). For instance, children are most likely to introduce parents to neighbors when they are young, but are only likely to become a core network member when they are grown up. Using the Survey on the Social Networks of The Dutch (SSND), we disentangle these direct and indirect influences of children on a broad range of social contacts of different strengths and with varying functions across the life course.
Family Networks: Family network dynamics over the life course

At the End of Life Course: Children, Sister, Friend - and Sometimes Ex-daughter-in-Law Are the Loved Ones. How Does a Network Look Like if Ego Moved into a Nursing Home?

Bäuerle Rodrigues, Dorothee L.
Universität Dortmund, CBT Köln, Köln, Germany

To move into a nursing home is oftenly a big last transition. New relationships with the other residents, with coworkers, with voluntaries can be established. Some gerontological and sociological theories and models describe social relations and networks in old age (socioemotional selectivity theory by Carstensen, 1991 or the model of social convoy by Kahn & Antonucci, 1980). If someone lives in a nursing home can these theories also explain the ties to relatives and friends? How does the family network look like? The ego-centric networks from 65 nursing home residents are analyzed. Mixed methods are used to explore the closest ties of the elderly. 56 residents lived 6 month or longer in the nursing home. All together data from 209 ties were generated. Sometimes the ex-daughter-in-law is an alter too. Duration of relationship, the patterns of interaction and other characteristics of the relations were measured. The sizes of the social networks of the nursing home residents shows a big variety. In the light of these research findings the personal networks in the setting of a nursing home can be described. It is possible to figure out the potential of social support from the informal and family network at the end of life course. The strengths and gaps of the theories will be discussed.

A Configurational Approach of Family Transitions: Combining Quantitative and Qualitative Approaches

Castren, Anna-Maija 1, Widmer, Eric 2
(1) University of Helsinki, Helsinki, Finland, (2) University of Geneva, Geneva, Switzerland

The paper discusses configurational approaches in studying family transitions related to separation/divorce and repartnering. Drawing from quantitative and qualitative research, we aim to grasp the dynamics of these life-transitions embedded in networks of ties. Survey based configurational research on reconstituted families has shown, for example, that in terms of wider family configurations the family recomposition is less determining than what is often expected. Qualitatively oriented research, on the other hand, has illustrated the significance of particular relations in directing the restructuring of relationship configurations in post-divorce situations. In this paper we focus on the methodological challenge of combining both quantitative and qualitative configurational approaches in the analysis as there is some inherent incompatibility related to the epistemological underpinnings in say narrative approach and network analysis. Whereas the first draws from social interactionist or social constructivist traditions, network analysis builds on more structural or functional approaches to social reality. Our aim is to enhance the systematization of research designs integrating the quantitative and qualitative tools in configurational analysis on family transitions.

The Effects of Atypical Employment on Family Networks: A Qualitative Approach to Social Support Dynamics in Precarious Life Situations

Gefken, Andreas
University of Hamburg, Hamburg, Germany

Family ties are an important source of social capital, especially in times of biographical uncertainty and precarious life circumstances. Family ties can supply emotional support, they can offer financial and material aid and help with managing everyday life. On the other hand, difficult life situations can have effects on ego’s family network: too much pressure on family ties can lead to an overusage of social support. Social withdrawal from the family, caused by stressful life conditions, can also endanger family ties and thereby social capital. The research project “Social Capital in the Life Course” focuses on a major risk factor for precarious life situations: atypical employment, such as part-time, fixed-term or temporary work, has been increasing during the last decades. Job insecurity, financial shortcomings and unstable occupational trajectories are often the results. The presentation focuses on two questions: 1) To what degree can family ties, especially intergenerational ties, compensate the effects of insecure labour market integration through social support? 2) What form(s) does the family network take when one’s life situation is affected by unstable employment? The presentation seeks to examine these questions through the use of both semi-structured interview data from atypical employees and the results of a network-mapping technique that generated ego-centered networks during the interview. Following a grounded-theory approach, the presentation focuses on the contexts, action strategies and consequences of functioning and dys functioning family ties of atypical employees. It also examines the changes in familiar solidarity and reciprocity caused by unstable employment of a family member.
**Network Structure and Social Support in the Single-parent Family: A Case Study**

*Lumino, Rosaria¹, Ragozini, Giancarlo², Vitale, Maria Prosperina³*

¹Federico II University of Naples, Sociology, Naples, Italy, ²Federico II University of Naples, Political Sciences, Naples, Italy, ³University of Salerno, Economics and Statistics, Fisciano, Italy

In the last decades, there has been a steady increase in single parent families (Cheeseman, Ferguson, Cohen, 2011), and consequently the number of risk areas relate to single mothers is increased (e.g., stressful life-events, role overload, lower income). In this perspective, the single mothers represent an interesting target study, because they are more exposed at risk of poverty and isolation, especially in geographical contexts where the lack of social services for children and the persistence of traditional models underpinning the division of domestic tasks, affects the time that women have to spend on running the family. This makes the work harder than is necessary and it is a burden that women tend to shoulder alone (Saraceno, 2002). Furthermore, although some scholars have shaped ideas about how survival strategies of poor single mothers are based on relationships of exchange (Stack, 1974; Bell; 1982) based on reciprocity (Nelson; 2000), a substantial body of literature offers more scepticism about the degree to which those in need can rely on others for support in getting by. Indeed, not only networks of solidarity can be developed between poor subjects, but also competitive and even constrictive relationships. Aim of the paper is to analyse ego-centered social networks in a sample of low income single mothers living in Naples (Italy), defining how the social context features influence the network structure, and describing the different type of relationships of support, their strength or weakness, and those on whom they rely for daily living.

**Constructing One's Personal Networks from Family and Non-family Relationships in Young Adulthood: The Role of Personality**

*von der Lippe, Holger*

University of Magdeburg, Institute of Psychology, Magdeburg, Germany

Young adulthood is, amongst other things, a period of the life-course in which personal relationships often change substantially. In parallel with major transitions (e.g., leaving parental home, entering the labor force, romantic partnerships) personal relationships are activated (initiated, selected) or protected (reorganized, transformed, dissolved; Lang, Reschke, & Neyer, 2006). From a family psychological perspective (Bray & Stanton, 2009) the question of how young adults' family and non-family relationships interact is of particular interest. The present study asks what family and relationship research can learn from the study of the interplay between different (sectors of) relationships in personal networks. More specifically, we ask whether personality traits make some young adults more inclined than others to specific ways of network regulation (e.g., family versus non-family orientation)—and to what personal consequences such differences lead. We collected egocentric network, relationship, and personality data from 111 young adults using a computer aided visualization procedure (Vennmaker; Gamper, Schönhuth, & Kronenwett, 2010). Personality measures included a new psychometric scale of dispositional personal networking. Results indicate that there are significant correlations between network as well as relationship characteristics and personality antecedents as well as outcomes. For instance, dispositional mental health went along with larger, non-family oriented networks. Higher in-degree and lower density values had an effect on higher relationship satisfaction. An active networking personality lead to larger non-family network, but was unrelated to the size of the family-network. Implications of findings for the understanding of family relationships and general relationship regulation in the life-course are discussed.
Family Networks: Intergenerational Exchanges and Support

Support and Conflict in Family and Personal Networks

Aeby, Gaëlle¹, Widmer, Eric D.²
(1)University of Lausanne, Lausanne, Switzerland, (2)University of Geneva, Geneva, Switzerland

Family relationships that matter are not defined by statuses, blood and alliance ties or household boundaries, but by actual family interdependencies. Families are often considered as the main source of solidarity. Within families, individuals are supposed to support each other, exchange advises, etc. Beside family members, close friends may also play a key role and be seen as a source of solidarity. Thus, personal networks composed of family members and close friends produce social capital that helps individuals throughout their life course. However, conflicts are also part of social life and often arise among significant others. Indeed ambivalence is a major component of social relationships. Therefore, it is important to study simultaneously positive and negative relationships within personal networks to understand contemporary family contexts. Using a representative sample of 803 individuals living in Switzerland and belonging to two distinct birth cohorts, this study examines ego-networks composed of significant others and investigates two types of relationships: emotional support and conflict. The relational structure of the networks is assessed using density and centralization measures. We hypothesize an association between those two types of relationships and a difference between networks exclusively composed of family members and networks composed of both family and friendship ties. First results show that a high density of emotional support is associated with a high density of conflicts. The density of conflicts is also higher in family networks. Results are discussed in the light of the configurational perspective on family and personal relationships.

Support Networks of Childless Older People in Europe

Deindl, Christian¹, Brandt, Martina²
(1)University of Cologne, Institute of Sociology and Social Psychology, Cologne, Germany, (2)Max-Planck-Institute for Social Law and Social Policy, Munich Center for the Economics of Aging (MEA), Munich, Germany

Western societies age rapidly. Today, people do not only live longer, they also have less children. These developments exert considerable pressure on pension and health systems. Children are the most important source of support in old age, especially when there is no partner. Older parents do not only receive most support from their children but also transfer significant amounts of money to them. In times of rising childlessness we thus face new challenges: On which support networks do childless older people rely? (How) can the lack of children be compensated? Who provides help and care? Who profits from financial resources of the elder people? We assess the support networks the childless aged 50 and over in 14 European countries based on the Survey of Health, Ageing and Retirement in Europe (SHARE). When comparing support networks of childless older people to parent`s networks we focus the importance of the extended family as well as public services. Our analyses show that financial transfers are diminished considerably and private help is often taken over by the extended family and neighbours. Intense care tasks, however, are mostly provided by public providers. The family and especially intergenerational relations play an important role for support in old age. When there are no children (or children live far away), vital support for older persons has to be taken over by public providers in many cases. In countries with low social service provision, childless older people thus experience a lack of help, especially when depending on vital care.

Structural Models of Genomic Risk Communication in Multi-generational Households

Marcum, Christopher S.¹, Wilkinson, Anna²
(1)National Human Genome Research Institute, Social Network Methods Section, Bethesda, MD, United States, (2)University of Texas, School of Public Health, Austin, TX, United States

Preferential pathways for resource—or other—exchanges within households have long been known to be dependent on the structure of relations between generations (Fuller-Thomson et al., 1997; Treas and Marcum, 2011). Much gerontological work has theorized models of intergenerational exchange— including, the 'sandwich generation' (Miller, 1981) and the 'skipped generation' pathways (Chalfie, 1994)—but there is little work relating these theories to relevant network mechanisms such as brokerage. To address this, a census of models of resource allocation between members of intergenerational households from a network perspective is introduced in this paper. Exemplary data come from genomic risk discussion networks among Hispanic multi-generational households and software to simulate household networks from each model is introduced.
Intergenerational Farm Family Networks - Conflict and Cooperation

Saggau, Volker
University of Kiel, Kiel, Germany

The farm household is a special household; it is both a household and a firm. Moreover, farm families traditionally pass on the farm to the next generation. Hence, intergenerational farm transfers are a common but also often not an easy task. Family relations are multi dimensional; this means that there are not only the intergenerational relations but also business and work relations. The farm family and the positions of the farm members are in a certain sense comparable with political exchange networks or with exchange networks in general. Each member has its own ideas and opinions on the one hand side but on the other hand side has also obligations, resources and rights. There is not always a consensus on how the farm shall develop. An agent-based model will be used to implement game theoretic settings of exchange in farm family networks. The aim is to identify the central issues of conflict and cooperation. Together with the agent-based model a mixed-methods approach will be applied to gain further insights with respect to observable processes. This means a case study will be used to support theoretical findings.

On the Compensating Role of Extended Family and Non-family Ties among the Childless Elderly

Schnettler, Sebastian, Wöhler, Thomas
University of Konstanz, Dept. of Sociology, Konstanz, Germany

Previous research shows that children, along with partners, are the most important support persons in old age. But the combined trends of increasing childlessness and increasing life expectancy leave ever more people without these potential supporters. This raises important questions: Do the childless elderly perceive and experience less support potential than parents? Or do other people in the networks of the childless elderly take over social support functions usually taken up by partners and children - and if so which persons? Previous research on the individual consequences of childlessness in old age has not been able to answer these questions, often due to problems associated with small case numbers. Using a pooled data set of three waves of the German Aging Survey (DEAS), including 1,866 childless individuals and 12,774 parents, we provide a detailed description of the social networks of the elderly childless, compared against those of parents, in a nationally representative sample. We will further present regression results on the possible determinants that mediate the existence of support ties in old age. Results indicate that the childless are not a homogenous, socially isolated group - instead we can identify important risk and resilience factors that moderate the influence between childlessness and perceived social support. Although we find childlessness to have a negative impact on support potential overall, compensation by other network members than children takes place, e.g. by siblings and friends. We further identify a cohort effect such that compensation is more likely for younger cohorts.
Friendship networks 1

The Development of Adolescents' Friendships and Antipathies: A Longitudinal Multivariate Network Approach

Dijkstra, Jan Kornelis¹, Rambaran, Ashwin¹, Munniksma, Anke², Cillessen, Antonius²

¹University of Groningen, Sociology, Groningen, Netherlands, ²Radboud University, Nijmegen, Netherlands

This study empirically tested the basic principles of balance theory by examining the interplay between friendships and antipathies (dislike relations) in a large sample of adolescents (N=480; 11-14 years) in two middle schools across three waves (grades 6, 7, and 8). Using longitudinal multivariate network analysis (SIENA) the effects of friendships on antipathies and vice versa were tested, while taking into account the role of gender and ethnicity in the formation of friendships and antipathies. Based on balance theory, we expected that friendships are formed when two adolescents both dislike the same person (common enemy hypothesis), and that friends tend to agree whom they dislike (friends agreement hypothesis). Support was found for both hypotheses. Furthermore, it was found that both friendships and antipathies were more likely to be same-gender and same-ethnic. Results are discussed in light of adolescent peer relations.

How Personality Affects Pupils' Networks - An Enhanced View on Homophily and Capital Resources

Gerlach, Katharina

Universität Bremen, Bremen, Germany

Actors constitute networks in which positions are not chosen randomly. Instead, structures of networks are determined by a variety of factors such as homophily and capital resources. It is believed that homophily in race and ethnicity creates the strongest divides in personal environments followed by age, religion, education, occupation and gender (McPherson et al. 2001). Valuable research on the effect of social and ethnic homophily on friendship choice implies that the probability to contract a friendship is higher between students with identical backgrounds. Furthermore, friendships which depend on homophily result in various subnetworks. Since a overproportionate number of pupils with migratory background come from uneducated homes, their contributions of individual capital resources to these subnetworks are limited. The lack of capital resources leads to disparities which intensify over the life course (Bourdieu 1983). Based on our current studies we propose an enhanced idea of homophily including a differential psychological view. We capture whole networks of pupils who acquire the Abitur at german high schools. Interestingly, our analyses show strong network positions of pupils although they come from social and ethnic minorities. Furthermore, it is not clear how intentional and selective choice of friendships can be explained if backgrounds are equal. We argue for more research on (a) friendship choices with comparable backgrounds and (b) disparities based on capital resources at german high schools. Therefore, we focus on personality traits, which are relatively constant over time. Additionally we look at social, economic and cultural resources and the pupils' life goals.

Reciprocity Rates in Acquaintance Networks of Young Adults - Fact or Artifact?

Kuhnt, Mathias Rüdiger, Brust, Oliver

Dresden University of Technology, Institute for Sociology, Dresden, Germany

The value of reciprocity is often discussed in the literature (e.g. Gouldner 1960, Buunk 1998). However, studies focusing on quantitative measures of reciprocity are scarce (e.g. Shulman 1976). Relatively low rates of reciprocity are an often reported finding which is however not supported by theoretical assumptions. In this study, we realized a complete network survey in two longitudinal datasets (N = 213 and N = 197) to identify possible predictors for different kinds of reciprocity and their development over time, like closeness of relation, mutuality, activity (outdegree), attractiveness (indegree), personality traits (Big 5) and leisure time interests. For this aim we introduce a distinction between active and passive reciprocity. Results include the following: Reciprocity does not increase with the strength of the relation. Non-mutual links tend to vanish over time. Links starting from attractive nodes have higher probabilities to be mutual but attractive nodes tend to reciprocate only a fraction of their incoming links. Personality traits such as conscientiousness, depression, emotionality and imagination show to some extent strong influences on active and passive reciprocity. Consequently, we argue that decisive differences exist between mutual and non-reciprocated links. A network in a strict definition is formed by mutual links only, while directed links are important actor attributes but contribute to the network only marginally.
Homophily and Influence in the Formation of Political Attitudes

Meidert, Nadine
University of Konstanz, Konstanz, Germany

Studies in Political Sociology report attitudinal homogeneity within social networks. Various theoretical mechanisms can lead to such an empirical observation. I focus on two mechanisms, namely homophily and influence. Homophily describes a selection mechanism and the finding that similarities in individual characteristics lead to connections between individuals (Lazarsfeld and Merton 1954; McPherson et al. 2001). Influence means that social networks limit someone’s knowledge about the range of possible attitudes, and thus individuals are directly influenced by their proximate social contacts (Katz 1957; Kelman 1961). Theoretically, it might seem obvious that both mechanisms affect attitudinal homogeneity within social networks, empirically it is, however, difficult to separate these effects from each other. To investigate both mechanisms in the co-evolution of social networks and attitudes, stochastic actor-based models as proposed by Steglich et al. (2010) are used. Changes in the network ties between actors and in the individual attitudes are modeled as consequence of the actors’ choices to connect or disconnect with another actor and respectively to change their attitudes. The data for the analysis was collected in two surveys among Political Sciences freshmen during a semester at the University of Konstanz. The students were asked about their political attitudes and their social relations to other students. Political attitudes were measured with trade-off questions evaluating political issues like the advantages or disadvantages of the Euro for the economy. The results show that both mechanisms impact network homogeneity in which influence proves to be especially robust.

The Effect of Substance Use, Personality and First-generation College Student Status on Ego-centric Networks of First Year College Students

Mullins, Ursula L; DeWall, C. Nathan
(1) University of Kentucky, Behavioral Science, Lexington, KY, United States, (2) University of Kentucky, Psychology, Lexington, KY, United States

Aim: The first year of college is a time of marked social change. Little is known about the factors affecting the structure of first-year students’ social networks. The purpose of the current study was to examine the network characteristics among first-year students in a residential living/learning dorm. Method: The study included 125 freshmen who resided in the living/learning community. To determine ego networks, participants were asked to name those from their living/learning community who encompassed their friendship network. Information on demographics, personality, and substance use were also collected. Data were analyzed to determine the effect of those characteristics on social network composition (i.e., density, size, and two-step reach) using linear regression. Results: The cohort was comprised of 125 individuals who were mostly Caucasian (74%) females (61%). 17% of the students were first-generation college students. There was a trend toward monthly non-prescription drug use being associated with two-step reach such that as substance use increased, two-step reach decreased (β = -.18, p=.053). Self-control was associated with higher ego density (β = .20, p< .05). First-generation students had decreased two-step reach (β = -.23, p< .05) as well as decreased network size (β = -.20, p< .05). Conclusions: We hypothesized that substance use would have negative effects on network composition and that appears true. Positive characteristics, such as self-control, appear to increase density. The results indicating that first-generation students have fewer friends supported our hypothesis. Further research is warranted to investigate the impact of decreased two-step reach for university retention campaigns.

Friendship and Help Ties of Students: Effect of GPA

Valeeva, Diliara; Poldin, Oleg; Yudkevich, Maria
(1) National Research University Higher School of Economics, Centre for Institutional Studies, Moscow, Russian Federation, (2) National Research University Higher School of Economics, Economics, Nizhny Novgorod, Russian Federation

Homophily of the individual characteristics is one of the key factors that determine connections between people. However, there are still few studies using social networks approach to the understanding of relationship between academic achievements of university students and their social environment. In this study we investigate the formation of social ties in the university environment with particular attention to the role of GPA in the segregation of ties. Our sample includes students of one of the prestigious universities in Russia. We consider two types of ties in administratively formed study groups. The first one is friendship ties (ones which exist with those classmates with whom students spend most of their time), the second one is help ties (that exist with those whom students prefer to ask when they need some educational help). Using p* models, we found that both friendship and help ties are determined by the homophily of students in their sex, study group, type of tuition. However, the contribution of GPA is different for different types of ties. If the difference in GPA is negatively significant in friendship ties (students with same grades are more likely to be
friends), it is not significant in help ties. We explain this, firstly, by the fact that friendship ties are more close ties and homophily in abilities is more important in this type of connections. Secondly, we show that students learn to adapt to difficult study situations and know whom to address for some help regardless the difference in their abilities.
Friendship networks 2

Friendship Ties and Gender in Cross-national Perspective
Drobnić, Sonja1, Techen, Andreas2
(1)University of Hamburg, Institute of Sociology, Hamburg, Germany, (2)Amt für Statistik Berlin-Brandenburg, Berlin, Germany

Previous research indicated a persistent gender gap in friendship network size and composition. Men in general have larger (non-kin) personal networks and men are more successful than women in using friendship networks to generate personal benefits. This has important implications because social relationships in which men and women are embedded affect the opportunities, resources, attitudes, and behavior of individuals, and have implications for their life chances, social integration and quality of life. In this paper, we combine both the individual level and the societal-level perspectives by employing a multilevel approach to study the gender gap in friendship networks in cross-national perspective. Data on 22 countries are drawn from the International Social Survey Programme (ISSP), module Social Networks II. Results indicate that men in general have more close friends than women. This gender gap is reduced by parenthood but for women it is harder to capitalize on their labor force participation in order to enlarge their networks and they are less successful in using friendship networks to generate benefits of their own. We find significant cross-country differences and a clear indication that women's friendship networks are more dependent on broader societal and economic structures than men's. Our study shows how the societal context shapes individuals' friendship ties and the structure of personal networks. In more general terms, this research contributes to the general understanding of relational aspects of gender and social inequalities.

The Effect of Ethnic Diversity in Schools on Students' School Outcomes: A Social Network Approach
Geven, Sara1, Kalmijn, Matthijs2, Van Tubergen, Frank2
(1)Utrecht University, Utrecht, Netherlands, (2)University of Amsterdam, Amsterdam, Netherlands

This paper deals with the effect of ethnic diversity in schools on school outcomes (i.e. grades and behavior in school) of adolescents in four European countries. We focus on the mechanisms underlying this relationship by investigating whether the effect of ethnic diversity on students' school outcomes is mediated by characteristics of students' social networks. We argue that ethnic diversity in schools might affect students' social networks in ways which can be beneficial as well as detrimental for students' school outcomes. Firstly, we hypothesize that in ethnically diverse schools students have more out-of-school friends (rather than in-school friends), and that such out-of-school friends, in turn, negatively affect students' school outcomes. Secondly, we argue that in ethnically diverse schools, students are more likely to have inter-ethnic encounters, either positively (friendship) or negatively (conflicts). Depending on the nature of these interethnic encounters and the ethnicity of the pupil, conditions are identified under which ethnic diversity either promotes or hampers school outcomes. We will make use of the “Children of Immigrants Longitudinal Survey in Four European Countries” (CILS4EU) data collected in 2010-2011. The data contain information on about 20,000 students aged 14, drawn from 976 school classes in the Netherlands, Germany, Sweden and England. The sample contains an overrepresentation of immigrant adolescents. We use multi-level path models to analyze ego-network and complete network data.

Ethnic Homogeneity in School Friendship Networks - Why does Neighbourhood Composition Matter?
Kruse, Hanna1, Smith, Sanne2, van Tubergen, Frank2, Maas, Ineke2
(1)Mannheim Center for European Social Research, Mannheim, Germany, (2)Utrecht University, Utrecht, Netherlands

Adolescents living in ethnically heterogeneous neighbourhoods maintain more interethnic friendships at school than pupils with mostly coethnic neighbours. Previous research established this finding, but the underlying mechanisms remain less well known. We examine to what extent and why the ethnic composition of adolescents’ neighbourhoods is related to ethnic homogeneity in high school friendships. We add to previous studies by simultaneously examining if the neighbourhood composition affects friendship formation in the classroom via the availability of outgroup peers, the propinquity to outgroup peers, i.e. additional shared foci to meet, and preferences for interethnic friendships. Using data from the "Children of Immigrants Longitudinal Survey in Four European Countries“ we are able to test our hypotheses for four countries (England, Germany, the Netherlands, Sweden), 952 classrooms and neighbourhoods of 18,716 pupils. We use exponential random graph models to predict variation in friendship homogeneity across individuals from different neighbourhoods and analyse differences across classes in a meta-analysis. Preliminary results suggest an association between ethnic friendship homogeneity and ethnic neighbourhood composition. There is strong evidence for the
availability mechanism: pupils with a high share of outgroup neighbours have generally more outgroup peers in class. Propinquity seems less important as pupils live close to both ingroup and outgroup peers in class equally. Also, we find weak support that the neighbourhood is related to preferences for ingroup friends: pupils who live in ethnically homogeneous neighbourhoods are only slightly less likely to have outgroup friends, regardless of the outgroup share in their classroom.

The Out-group as Friend or Foe: The Influence of Class Characteristics on Adolescent Interethnic Friendships in England, Germany, the Netherlands and Sweden

Smith, Sanne¹, McFarland, Daniel A.², Van Tubergen, Frank¹

(1)Utrecht University, Utrecht, Netherlands, (2)Stanford University, Stanford, CA, United States

Previous studies show considerable variation in the ethnic homogeneity of friendship networks between school(s) (classes) that have similar ethnic compositions, but have not yet sufficiently examined how contextual characteristics of classrooms may account for this above and beyond individual explanations. Addressing this gap of knowledge, we examine the conditions under which ethnic concentration in classes amplifies or dampens ethnic homogeneity in friendships. We study 454 complete friendship networks in classrooms using the unique dataset of the 'Children of Immigrants Longitudinal Study for Four European Countries' project, whereas previous studies were limited to smaller sample sizes. First, we estimate ethnic homogeneity of friendships controlled for individual explanations using ERGMS for each classroom. Second, we predict variation across classes in ethnic homogeneity of friendships by contextual characteristics in a meta-analysis. Our results show a negative effect of ethnic concentration on the ethnic homogeneity estimates within classes, indicating that more exposure to interethnic peers does not lead to more interethnic friendships above and beyond the opportunities for interethnic friends. Moreover, we find that this negative effect increases the more pupils are able to act according to ingroup preferences, that is, in larger classrooms. In addition, we show evidence for favorable conditions under which ethnic boundaries in friendship fade: classrooms with more equal status distributions, shared goals, and intergroup cooperation (e.g., less hierarchy in popularity, less variance in school performance, and more interethnic homework ties among pupils, respectively) and more resources available (e.g., higher socioeconomic status classrooms) show more interethnic friendships.

Sociometric Popularity in Academic Context

Titkova, Vera, Ivaniushina, Valeria, Alexandrov, Daniel

National Research University - Higher School of Economics, St. Petersburg, Russian Federation

Our study is focused on relation of sociometric popularity and individual academic achievement in different academic contexts, i.e. in classes and schools with different levels of academic culture and educational aspirations. The relation between academic success and popularity is found to be controversial, depending on the ethnic status, gender, and class’s academic achievement or academic aspirations (Adler 1992, Rodkin et al 2000, LaFontana & Cillessen 2002, Meijs et al 2010). Schools with different academic culture/values provide different conditions for peer popularity among boys and girls, high and low achievers. Our study is based on the survey of 5,058 students from 270 classes in 98 schools in St. Petersburg. We use two independent methods to analyze our data and test the influence of individual academic achievement, gender, family SES on the sociometric popularity: p * and hierarchical linear modeling. First, we analyze cross-level interaction between individual academic achievement and various indicators of classroom context. Second, we produce the p * models for class networks of three types: low, medium and high academic motivation. We find that in classes with low academic motivation student's academic achievement is negatively related to her/his popularity, and we find the threshold effect of academic context - there is a level of aggregate motivation at which the relation is reversed. We also find that relation between individual academic achievement and popularity is highly gender-specific.
Opinion Dynamics under Conformity

Buechel, Berno¹, Hellmann, Tim², Klößner, Stefan³

(1) University of Hamburg, Economics, Hamburg, Germany, (2) Bielefeld University, Bielefeld, Germany, (3) Saarland University, Saarbruecken, Germany

We present a model of opinion formation where individuals repeatedly engage in discussion and update their opinion in a social network similarly to the DeGroot model. Abstracting from the standard assumption that individuals always report their opinion truthfully, agents in our model may state an opinion that differs from their true opinion. The incentive to do so is induced by agents’ preferences for conformity. We model opinion formation as a dynamic process and identify conditions for convergence to a consensus. Studying the consensus in detail, we show that an agent’s social influence on the consensus opinion is increasing in network centrality and decreasing in the level of conformity. Thus, lower conformity fosters opinion leadership. Moreover, assuming that the initial opinion is a noisy signal about some true state of the world, we study how conformity affects the efficiency of information aggregation or the “wisdom” of the society. We show that the society becomes wiser, in the sense of a smaller mean squared error of their estimate, if players who are well informed (relative to their network importance) are less conform, while uninformed players (relative to their network importance) conform more with their neighbors.

The Evolution of R&D Networks

Dawid, Herbert, Hellmann, Tim

Bielefeld University, Bielefeld, Germany

We study a model where firms compete in determining the quantities of their products sold on the market and are able to form bilateral collaboration agreements which lower marginal cost. While a static analysis of such a model can be found in Goyal and Joshi [2003, Games and Economic Behavior], we introduce an evolutionary model. Stable networks (in the static sense) exhibit in both contexts the dominant group architecture and can be characterized with respect to the size of the group. However, in contrast to Goyal and Joshi [2003], we find that the group size of connected firms in stochastically stable networks is generically unique and decreasing in cost of link formation. Further, there exists a lower bound on the group size of connected firms such that a non-empty network can be stochastically stable. Finally, we show that the set of stochastically stable network may have an empty intersection with the set of pairwise Nash stable networks characterized by Goyal and Joshi [2003].

On Stable Networks in Homogeneous Societies

Hellmann, Tim, Landwehr, Jakob

Bielefeld University, Institute of Mathematical Economics, Bielefeld, Germany

Existence of stable networks is not guaranteed in a general setup. However, under certain assumptions concerning the payoff functions of the players such result can be established. The aim of this paper is to establish existence of stable networks for homogeneous societies in a game theoretic setting. The concept of stability used is pairwise stability as defined by Jackson and Wolinsky (Journal of Economic Theory, 1996). Moreover we try to narrow down possible architectures of pairwise stable networks for various forms of utility functions. After having introduced networks in homogeneous societies via anonymity of the payoff functions in the first part, we provide a strong existence result for positive link externalities, namely ordinal convexity and ordinal strategic complementarity as defined in Hellmann (International Journal of Game Theory, 2012), in the second part. We then show that for several classes of centrality-based utility functions (e.g. Bonacich centrality) satisfying these positive link externalities a pairwise stable network has necessarily the nested split architecture.

Volunteer Science: Online Behavioral Experiments using Facebook as a Subject Pool

Meleis, Waleed, Lazer, David, Keegan, Brian C., Karbeyaz, Ceyhun

Northeastern University, Boston, MA, United States

Traditional undergraduate participant pools impose significant limitations on the size and types of experiments that can be run as well as the generalizability of their findings. For example, testing the effects of network configurations like a
small-world topology on an iterated public goods game requires networks to have dozens of participants for each group observation, which would quickly exhaust traditional participant pools and experimenters' patience. To address these limitation and open up new types of experimental computational social science, we have developed an online platform called “Volunteer Science.” First, we review the design and implementation of this platform that allows researchers to conduct online behavioral experiments by using the Facebook API to recruit and collect demographic as well as network data about consenting participants. Second, we discuss the benefits of using Facebook participants over alternative crowdsourcing platforms such as Mechanical Turk as well as the challenges of bootstrapping up the platform. Third, we present the results of a basic group problem solving experiment involving eliciting solutions to a complex “traveling salesman problem” and compare it to prior findings to validate this approach. Finally, we present a research agenda for Volunteer Science for lowering the costs and expanding the possibilities of performing experimental research in computational social science.

Public Good Provision along Social Links: Experimental Results on Fairness Concerns
Rezaei Khavas, Tahereh1, Westbrock, Bastian1, Rosenkranz, Stephanie2, Weitzel, Utz3
(1)Utrecht University, Utrecht, Netherlands, (2)Utrecht University, Economics, Utrecht, Netherlands, (3)Radboud University, Nijmegen, Netherlands

While a long-standing tradition in economics views human beings as being exclusively self-interested, experimental economics has repeatedly shown that people deviate from purely self-interested behavior in a fair and often reciprocal manner. Laboratory experiments of public goods have been conducted by, among others, Isaac et al. (1984, 1985), Kim and Walker (1984), and Andreoni (1988). The evidence from these experiments is that people cooperate to a degree greater than would be implied by pure self-interest. The vast majority of these experiments considers decision making in completely transitive settings, i.e. situations in which the actions of players affect the payoffs of all other players. Real world examples for transitive settings are the provision of public goods in families, shared households, etc. We extend these studies to a setting of public good provision in a social interaction network, and thereby include settings in which the interaction structure is not fully transitive. In our experiment, actions impose local (positive) externalities, such that only the direct neighbors of an actor benefit from his or her contributions to the public good. Moreover, we investigate asymmetric interaction networks, where some players have more neighbors than others. In our experiment we find that subjects play fair only in completely transitive settings. In these settings our results confirm previous results: contributions that lead to fair outcomes are chosen with higher frequency than other contributions, and in larger groups self-interested free riding occurs more frequently than in smaller groups.
This paper studies how the structure of the International Trade Network (ITN) changes in geographical space and along time. We employ geographical distance between countries in the world to filter the ITN and build different sub-networks of countries located at different geographical distances. We then test if the topological properties of the ITN are invariant to distance. The short answer we get is: no. The effect of distance on trade is non-linear; the weighted ITN is disassortative in the long-distance while it is assortative in the short-distance; the same is observed in clustering: short-distance countries-triples are the major contributors to the strong level of international clustering. This evidence is persistent over time, from 1970 to 2000, and remains consistent even taking into account the role of the economic size of countries involved in trade.

There are conflicting theoretical claims and empirical evidence about the value to a firm of its propinquity to 'other' firms. Many scholars extol the virtues of proximate location in a regional cluster, arguing that firms' access to tacit knowledge, spillovers and other benefits improves as a result (e.g. Saxenian, 1994b; Jaffe, Trajtenberg, & Henderson, 1993). Some researchers question whether clusters actually help the firms because their competitive advantages may be imitated by nearby firms (e.g. Shaver & Flyer, 2000). We examine in this paper the performance effects of propinquity to resolve this apparent puzzle and to understand more fully the extent to which proximity is valuable for firms. Wherever a firm is located, whether it has one location or many, its presence in a geographic space positions it relative to itself and to others in a unique configuration. We label this configuration the geographic signature of a firm and parametrize it for each firm in our study. We focus on the US pharmaceutical and biotechnology industries due to their knowledge-intensive nature and the possibility of exploring anisotropic effects of distance. We define the two 'ego' industries as 'alter' to each other. We find that higher firm level performance is associated with greater scattering of a firm's sub-units. We also find surprising adverse effects of proximity to firms in the 'alter' industry, but and no effect of proximity to directly competing firms in the 'ego' industry.

Triggered by the revolutionary development of internet technologies, a diminishing role of geography was formulated in the "death of distance" theorem more than a decade ago. In contrast to this argument, empirical research demonstrated that online communities and internet infrastructure were bounded to physical, social, and cultural environment. This paper analyses the correspondence between offline geography and the topography of iWiW, the largest Hungarian online social network (OSN). Settlement to settlement distances in social space (measured by OSN ties) and physical space (measured by travel time) are strongly related, which provides new evidence that the online network is spatially based. Further findings suggest a dual role of geography. First, proximity to the capital matters for the share of OSN users among total population. Second, city-level averages of user-level degrees are higher in the peripheral than in the core regions of the country. Thus, we argue that spatially-based and space-less attributes of online communication are simultaneously present in OSN geography.

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Despite globalization is a reality of worldwide networks, most of the multinational firms' networks occurs through short distances linkages and is also facilitated by strong inter-national and even intra-urban sub-networks. Geographic distance still influences globalization. Its influence on globalization is combined with cultural and economic distances, territorial memberships (Countries), economic opening (Free trade zones), but also the capacity of localities matter like the weight of populations, markets, technological levels. Gravitation model is known since the XIX-th century (Carey, 1850; Ravenstein, 1880; Reilly, 1917; Stewart, 1945...) to usefully encompass all these factors in order to explain and estimate flows. This model has been sophisticated during the “quantitative revolution” in Geography during the 70's and 80's (Garrison, Berry, Marble, Morrill, Nystuen, 1959; Garrison, 1960; Berry, 1964; Dacey, 1964; Tobler, 1965; Gould and White, 1974; Wilson, 1980) and continue to be developed in Geography and in other sciences like physics or economics (Fagiolo, 2010; Wall et al., 2011; Head and Meyer, 2011). This paper aims to define the gravitation model on the globalization of cities through multinational firm networks and to compare the respective advantages to use “classical” statistic approaches or ERGM ones. The empirical approach will be developed on a global database that has been generated for the network of 1 million direct and indirect ownership links between the 800,000 subsidiaries of the top 3,000 multinational firms of the world, which are located within 1,205 metropolitan areas.

Firms Networks and the Effects of Border on their Spatial Distribution

Stambolic, Nora1,2
(1)CEPS/INSTEAD Luxembourg, Luxembourg, Luxembourg, (2)University of Lausanne, Lausanne, Switzerland

This paper aims at investigating whether and in which way national borders affect specific patterns of multinational firm networks. The European integration and the globalization processes opened up many national boundaries, providing new opportunities for the border regions and multinational companies in their vicinity. Therefore we need to reconsider how border regions are being transformed by economic networks, and at the same time how national borders affect the nature and extent of economic networks in border regions? In this respect, we aim to question if national borders are to be considered as interfaces bringing together firms located in adjacent territories or whether they still play a classic role of barrier producing the so-called “half circle economy”. It is assumed that the opening of national borders has enabled the development of cross-border functional areas. Such a context should thus offer opportunities for entrepreneurs to benefit from the comparative advantages that are present in border regions. To explore the interdependencies between networks and territories in which they installed, the social network analysis and GIS techniques are applied to a selected number of cross-border metropolitan regions in Europe. The data employed are extracted from the ORBIS database (Bureau Van Dijck 2010) giving information about the general characteristics and geographical locations (UNIL 2012) of the 3 000 world's corporations and the 800 000 subsidiaries, linked by one million ownership relations.
Geographic and Social Space 2

The Relationship between Social and Spatial Networks and their Effect on Clinical Outcomes
Ghosh, Debarchana¹, Altice, Frederick²
(¹)University of Connecticut, Geography, Storrs, CT, United States, (²)Yale University, Department of Medicine Infectious Disease AIDS Program, New Haven, CT, United States

This paper examines the spatial dimension of egocentric networks of opioid dependent individuals who are HIV positive and arrestees living in Washington, District of Columbia (HIV prevalence = 3%). The study population is involved in a clinical trial of Buprenorphine, an alternative to methadone, which treats substance use disorders and simultaneously reduces poor HIV treatment outcomes (decreased retention in care, access to ART, adherence, and viral suppression). Though recent studies support the use of Buprenorphine to optimize retention, arrestees under community settings face a number of complex obstacles that have yet to be disentangled. Using a combination of egocentric social network analysis and Geographic Information Systems, the paper focuses on the effect of study subjects’ (ego) homophily with the members (alters) of their social networks such as kinship, friendship, trust, frequency of contact, and drug users on i) risk of substance abuse, ii) retention on Buprenorphine, iii) HIV treatment, and iv) criminal justice recidivism. The paper also investigates the effect of space, such as location and distance between the alters, spatial clusters (or isolation) on centrality, structural holes, and homophily. Preliminary analysis shows that the effect of frequency of contact, friendship, and drug users networks have significant impact on clinical outcomes. For an individual, the effect is strongest when the frequency of contact and the drug user networks overlapped over 70%. As expected, homophily is strong for the kinship networks. Alters in the drug users network cluster spatially and are in close proximity to those egos with strong homophily.

Link to People you Meet and Visit People you Know: A Coupled Model of Human Mobility and Network Growth
Grabowicz, Przemyslaw Adam¹, Ramasco, Jose Javier², Gonçalves, Bruno², Eguíluz, Victor M.¹
(¹)IFISC (UIB-CSIC), Palma de Mallorca, Spain, (²)Aix-Marseille Université, Centre Physique Théorique, Marseille, France

Physical location and social relationships are inextricably entangled. The people we interact and maintain relationships with are often the ones that stay close to us geographically. It has been shown that social ties can be inferred from co-occurrences in space and time. Likewise, the location of a person can be predicted from the geographic positions of her friends. Despite this, there is lack of models that would couple social network growth and human mobility models. In this study we propose a model that fills this gap. We test the model against large geolocated data from Twitter. First, we propose a simple benchmark simultaneously assessing the goodness of fit of various network properties. Second, we show that the model is able to simultaneously reproduce several statistical properties of the network and physical distance between people, namely: The distance distribution of connected users. Number of nodes in connected components and average clustering coefficient. Dependence of number of common neighbors on the distance. Probability of triangle closure versus the distance. Reciprocity of connections in function of the distance. Third, we carefully investigate different components of the model in order to identify the most important ingredients of the model and to understand their impact on each of the mentioned features of the network. For instance, we show that triadic closure can be achieved by means of spatiotemporal co-occurrences with present contacts.

Moving Closer to Family and Friends
Kley, Stefanie A.
University of Hamburg, Hamburg, Germany

In migration research social networks play a decisive part in the analysis of chain migration processes from poor to rich countries and return migration. Little is known about the characteristics and motives of internal migrants who move closer to family members and friends. As economically relatively deprived regions, e.g. in Eastern Germany, still suffer from out-migration of young adults it is a vital question for municipalities how to attract return migrants. The proposed talk focuses on migrants who moved to an East German city with regard to whether the migrants had family members or friends in the city at the point in time of migration. A random sample of 250 persons aged 18 to 50 years who moved to this city within the last 12 months is analyzed, making use of both logistic regression (LR) and qualitative comparative analysis (QCA). The LR reveals that immigrants with social ties at the destination more often came to start a job but less often to enrol in education. Additionally, feelings of closeness with the city and coming from nearby are important. With
QCA important configurations within those who moved closer to family and friends are detected, e.g. immigrants who came for a job, those who came because the partner wished to move, and those who came because their partnership ended. Return migrants who formerly lived themselves in the city form a subgroup of those with social ties. The size of the subgroups and the characteristics of their members are described in detail.

**The Spatiality of Neighborhood Relationships**

*Ohrt, Anna, Zanker, Dagmar, Hollstein, Betina*

Universität Hamburg, Hamburg, Germany

Neighborhood relationships are defined as relationships to people living in physical proximity. Previous research has shown that intensity of neighborhood contacts varies by socio-structural characteristics of actors, like socio-economic status, gender, age, duration of residence, or the socio-structural composition of the neighborhood. In this paper we ask how structural properties of space influence neighborhood relationships and neighborhood networks. Theoretically we draw on the work of Georg Simmel (1908), who had pointed out that certain features of spatial organization of relationships (like borders, or whether a group has a physical center) can be seen as opportunity structure enabling certain actions and hindering others. Our analysis is based on participant observations and qualitative interviews, including an ego network survey via touchscreen computers (N = 100+), conducted in three neighborhoods in North Rhine-Westphalia in 2010-2011. The three neighborhoods are similar in socio-structural composition (traditional working class neighborhood, with today high local unemployment, and high proportion of migrants), but differ in spatial organization: a high-rise, a private backyard and a semi-public court. Firstly, we show how different structural features of the three spaces may affect the neighborhood practices and neighborhood relationships. Secondly, we ask which structural features of spatial organization can be seen as “foci” (Feld 1981), enabling the formation and stabilization of ties. Finally, we discuss the relative importance of these structural features in relation to socio-structural features of the actors involved.

**Social Cohesion across Demographics and Space**

*Smith, Emily¹, Boessen, Adam¹, Almquist, Zack¹, Nagle, Nicholas N.², Hipp, John R.², Butts, Carter T.¹*

(1)University of California at Irvine, Irvine, CA, United States, (2)University of Tennessee, Knoxville, TN, United States

The role of social cohesion in facilitating information exchange and enabling collective behavior has been well documented across societies and throughout history. Given that most social relations are homophilous (McPherson et al., 2001), disproportionately linking persons with similar demographic characteristics, ties that bridge cohesive subgroups have been thought to be particularly crucial for disseminating information across a population. Using data collected for the American Social Fabric Project, we examine a large-scale, geographically embedded network to address how size and composition of cohesive subgroups varies spatially and demographically across the western United States. Specifically, we estimate the distribution of cliques (maximally cohesive subgraphs where all nodes are directly connected to one another), focusing on how maximum and average clique sizes of individuals in social support and collective problem-solving networks vary across the western United States. We then examine how these properties are related to characteristics of locations such as urbanicity, income, and educational levels. Preliminary findings focused specifically on the Southern California portion of the survey suggests the presence of an “abyss” of social cohesion within the Orange County area, and larger regions of high cohesion that extend from northern Los Angeles eastward.
Geographic and Social Space 3

Linking Geographic and Social Space - The Duality of Space and a Socio-spatial Network Approach to Reconstruct the Processes of Giving Meaning to a City

Ferber, Nicole
Paris-Lodron University Salzburg, Z_GIS Department of Geoinformatics, Salzburg, Austria

The intrinsic logic of cities is a hotly debated topic in urban research in recent years. The concept put forward by Martina Löw is based on the assumption that highly specific, typical features and tacit processes giving meaning to cities. The intrinsic logic is based on the duality of space. Within this theoretical approach “space is as much an outcome of action as it structures action” (Löw 2008). The duality of space describes orderings of living entities and social goods. It spotlights the constitution of space in repetitive daily actions and in distinguishing between two processes. Placing subjects and objects in space is referred to as “spacing”, as of interlinking these in processes of perception, ideation and recall, is referred to as “synthesis” (Löw 2008). Hence, social and spatial orderings are visualized to interlink and reconstruct the processes of giving meaning to a city within a multi-layer-mapping approach. SNA is used as a tool to visualize the network of social space combined with their spatial orderings (Windhager, Zenk & Risku 2008). Additionally, visualizations of the processes of interlinking subject and objects, such as perception, ideation and recall are opposed. It is intended to combine several individual multi-layer maps. This is to visualize the processes in giving meaning to a city for a collective network in a synoptic map. This serves as analyzing tool to visualize similarities and differences within the social and spatial orderings, which in turn allows insights into the processes of giving meaning to the city.

Geography Is More than Just Distance! Toward Combining Different Spatial Effects in SNA

Sohn, Christophe1, Christopoulos, Dimitris2, Koskinen, Johan3
(1)Public Research Centre CEPS, Geography, Esch-sur-Alzette, Luxembourg, (2)MODUL University Vienna, Vienna, Austria, (3)University of Manchester, Manchester, United Kingdom

This presentation examines the effects of geographical space over policy related interactions using exponential random graph models (ERGMs). Our particular aim is to go beyond the mere consideration of distance and proximity effects and incorporate other effects related to the spatiality of networks. The analytical strategy is based on a hierarchical set of nested ERGMs in which physical space (Euclidian distance), institutional space (territories and political borders) and functional space (networks as sets of interlinked places) are taken into account. As the presence of interactions between spatial variables can have important implications in terms of interpretation, a specific approach is developed in order to control these effects. We investigate in particular the way borders and spatial relations moderate the effects of distance on tie formation. The data employed are derived from a survey undertaken in the framework of the MetroNet project and concern the exchange of information between organizations involved in two different policy domains (i.e. public transportation and business location marketing) in the cross-border region of Lille (France-Belgium).

Local Government Communication Networks Across Borders: A Study of Four Euroregions

Svensson, Sara1, Nordlund, Carl2
(1)Central European University, Department of Public Policy, Budapest, Hungary, (2)Central European University, Center for Network Science, Budapest, Hungary

The paper addresses two questions related to communication patterns within European institutionalized public cross-border cooperation organizations (Euroregions): First, to what extent do local governments within Euroregions communicate with their counterparts across the border in comparison with domestic neighbors? Second, is the shape of the communication networks on each side of the border, and across the border, related to how these organizations function and perform? In addition, the paper seeks to map whether specific types of actors can be identified that perform similar roles in the different Euroregional networks. The paper specifies and tests several theoretical expectations, including (1) communication between local governments is significantly constrained by national borders, (2) presence of dense networks on one side of the border impacts positively on presence of cross-border ties, and (3) Euroregional Chairs and board members perform similar roles within the networks. The paper relies on an extensive and unique dataset consisting of interviews with nearly a hundred political representatives of four Euroregions located along two national borders (Hungary/Slovakia and Sweden/Norway), and analyzes this with the help of social network analysis tools. Choosing suitable network metrics and methods based on the particular research questions and the substantive data at hand, this paper argues against the use of the E-I index and percentages of homophilic ties, instead finding that a
A blockmodeling approach is suited to address the second research question. Thus, this paper also strives to be a methodological contribution for the overall study of spatially bound political networks, cross-border or not.

**Does Geography Matter? The Effect of Geography and Diversity on Singaporean Networks**  
*Tan, Teresa*  
National University of Singapore, Sociology, Singapore, Singapore

Social contacts change one’s social network geography, due to the interplay between communication and transportation systems, lower generalized costs and changing social practices (Frei and Axhausen 2009). Although individuals utilize communication technologies to maintain their strong social and spatial ties (Beck 1992; Bauman 2000); occasional travel is still pertinent for building social capital as the human touch is irreplaceable (Kaufmann 2002, Frei and Axhausen 2007). This project illustrates the social network geographies of Singaporeans, and how their network capital, or access to communication technologies and affordable and well-connected transport (Larsen and Urry et al. 2006) impinges upon their ability to maintain meetingness. [Meetingness refers to the amount of time people spend talking, writing, emailing, travelling and visiting with network members (Urry 2003)]. This project investigates whether meetingness contributes to social capital (i.e. life satisfaction, educational success and labor outcomes (Lin and Ensel et al. 1981; Fernandez and Weinberg 1997; Lin 1999), and whether this is enhanced by diversity or geography. According to Nan Lin, dispersion across multiple states in America increases a person’s social capital. This project will explore whether this holds true for Singapore, a country with land area of 710 km²? Diversity in personal networks is also significant as personal communities are specialized - different community members supply different types of social support (Wellman and Wortley 1990). This project will explore whether the diversity of a person’s network is enhanced by its geographical spread, resulting in better outcomes for individual Singaporeans.

**The strength of weak relations between place based nonprofit organizations in Boston**  
*Watkin, Thomas*  
EHESS / Centre Maurice Halbwachs, Sociology, Paris, France

In the city of Boston nonprofit organizations involved in the affordable housing production delimit their territories of action in poor neighborhoods. Called CDCs or community development corporations, their success in few decades have been failing by overheating the housing market, attracting new investments and new incomers. This urban process increased competition but also made possible collaborations between the boards of those organizations. The location and the way the CDCs' territories overlap or are distant made also new interests on specific sites for the development of housing. This paper analyzes how those self-organized organizations build specific relationships depending on their locations and interests. We will analyze inter organizational structures of those CDC boards within the Bostonian territory. We will present the use of nonprofit boards' public data to map first the intra organizational structure of CDCs and later the relations between them to illustrate this inter organizational network at the city scale. A 2 mode network will be used.
German Language Tradition: Approaches to Social Networks

The Idea of Sociometry, the Wrong Way of Quantitative Sociometry and Sociometry as Topological Concept for Future Developments

Bien, Walter
German Youth Institute, München, Germany

Hildegard Hetzer and Jacob Moreno developed the idea of sociometry in the early 20th century to solve some psychosociological problems with their clients. Later, some methodologically oriented scientists interpreted sociograms as matrices which could be handled by matrix algebra. In Germany in the 70s, there were some attempts to use the Euclidean space to embed sociograms. Looking on the preconditions of an algebra or a metric space, sociometric data never will fulfill such requirements and much more relevant, their don’t exist any theoretical useful concepts which are related to such preconditions. On the other hand, some weaker concepts like a general topological approach or local consistent structures may be more useful and can help to describe real human problems.

Georg Simmel and the Science of Networks. “Wechselwirkung” and “Kreis” as Basic Concepts of a Relational Sociology

Haerpfer, Claudius
Goethe-University Frankfurt, Social Sciences, Frankfurt, Germany

The presentation explains two interrelated basic concepts of Georg Simmel’s formal Sociology, and their meaning as a systematic foundation of a sociological Science of Networks: “Wechselwirkung”, which had been translated into “interaction” or “reciprocity”, and “Kreis”, which is known as “circle” or “group” to the English-speaking world. For an adequate discussion of these concepts, it is inevitable to read them in the context of the interdisciplinary mesh of 19th century Physics (Helmholtz), Philosophy (Kant/Cohen) and Social Psychology (Lazarus) in Germany, which Simmel used as a foundation to develop his idea of Sociology as a relational and formal science. This re-reading of Simmel’s sociological works shows his systematic relational thinking as part of the not yet so-called Science of Networks at the beginning of the 20th century, which allows us some insights into possible forms of ties between actors, as well as the formation of social units.

The Bifurcated Framework of Social Relations: On the Confluences and Divergences between Phenomenology and Network Theory

Sheehan, Kathleen
Trinity College Dublin, Sociology, Dublin, Ireland

Both phenomenology and network theory concern themselves with community-level patterns that emerge from individual interactions. This talk will explore the parallels and complementarities of the two approaches, focusing on the phenomenological project developed by Alfred Schutz (1974), continued in the work of Berger and Luckmann (1966), and on the body of theory that undergirds contemporary social network analysis. The two perspectives utilize very different languages and tools to describe social reality—phenomenology tending towards questions of legitimation and meaning and SNA concentrating on externally measurable interactions. The outcome in network theory is that future interactions are limited by the resulting structure of the network, while in phenomenology, they are limited by the norms and values of the developing institutional order. Concepts such as community definition, role and reputation/fitness represent fruitful points of overlap, whereby SNA’s answers to what questions can work together with phenomenology’s why answers to form a more complete depiction of social interaction.
Communication Networks and Governance Mechanisms in IT Outsourcing: From the Supplier’s Perspective

Lin, Tingting
University of Turku, School of Economics, Turku, Finland

The governance of IT outsourcing (ITO) has been identified as an essential determinant for ITO success. An abundance of prior studies have shed light on effective governance mechanisms in different organizational contexts, i.e. market, hierarchy and network governance. However, few have studied the association between governance mechanisms and communication networks. In effect, during the implementation of ITO, communication among different actors essentially influences governance practices by disseminating governance decisions and forwarding relevant inputs; and communication networks also reflect the governance mechanism with prominent characteristics in the network structure, such as centrality and density. With a single case study from the supplier’s perspective in an ITO dyad, this research strives to explore and empirically understand how communication networks reflect and influence the ITO governance mechanism. Social Network Analysis (SNA), using an online survey to all 24 team members in an ITO supplier company dedicated to one particular client, was conducted for whole-network analysis of communication networks. In addition, qualitative approach of open-ended interviews with 7 selected team members was utilized to identify the governance mechanism in this specific ITO supplier company. The results suggest that the similarity between formal and informal communication networks reflects the hierarchy mechanism of governance; and the hierarchy governance is in turn reinforced by the geographically dispersed nature of team shown by evident differences between face-to-face and virtual communications. With this paper, I hope to inspire more empirical studies on communication networks and other governance mechanisms, such as network governance.

Dynamics of Natura 2000 Forest Policy Formulation in Croatia

Lovric, Marko
European Forest Institute, EFICEEC-EFISEE Regional Office, Varaždin, Croatia

Natura 2000 is the nature protection network of the European Union, and is based on two directives; the “Habitats directive” and the “Birds directive”. Before entering the EU the candidate countries need to incorporate these directives in their national legislation. These processes should be based just on scientific criteria, but the literature review reveals that they can be more easily characterized as a classical policy formulation processes. This research follows such policy formulation process - the expert working group on Natura 2000 in forestry in Croatia. The mandate of the working group is to make a forestry expert draft of the By-law on Natura 2000. The research analyzes how do stakeholders influence this policy formulation process through three types of networks. The first one is a network of interpersonal influences collected by a questionnaire where change of options on 9 key issues through two waves is studied. The second one is a network of interpersonal influences based on verbal and nonverbal communication collected through non-participant observation with seven waves. The third one is a network of interorganizational influences among the organizations which have representatives in the working group. The interorganizational influences are operationalized through the perspective of resource dependencies, and the data for this network is collected by a questionnaire in two waves. Data analysis shows consistencies between the “non-participant” and organizational networks where the outcome decisions are closer to the initial positions of more influential individuals and to the positions of organizations with higher out-degrees.

Stakeholder Representation in Public Policy Networks: Managing the Ministerial Advisory Groups

Mikulskiene, Birute
Mykolas Romeris University, Vilnius, Lithuania

The ministerial advisory groups could be analysed as a fragment of wider policy network. This network could act either as supportive or confronting formation to the policy proposed by public administration. Therefore the structure of network of external stakeholders together with scientific policy advisers and other public interest representatives is a source of knowledge about effectiveness of decision making made by public administration. The goal of research is to analyse the main obstacle of merging the existing vertical hierarchy at the ministerial level with the network like arrangements of external policy actors within the advisory groups. The two aspects of policy actors network management are analysed: the network members recognition by authorities and the role of the network members in the advisory group. Officially nominated advisory groups that were employed at the Ministry of Education and Science of Lithuania during two periods
of 2006-2007 and 2009-2010 were analysed by means of social network analysis. The overall research data set covers 246 temporary institutional arrangements and 1879 participation facts were detected. The two mode network (relations between actors and advisory group) analysis let us make distinguish the main role of external policy actors in the process of policy making and find out what type of actors are more desirable during discussions the certain policy topic. We can draw a conclusion with certainty that the practice of advisory group formation are mostly based on the purpose to search for knowledge with the strategic significance. However the stakeholder role is dangerously uncertain.

Network Governance of Environmental Systems: Structure, Culture and Effectiveness, Day-to-Day and in Disaster
Robins, Garry
University of Melbourne, Melbourne School of Psychological Sciences, Melbourne, VIC, Australia

Despite recent attention to network governance, there is little compelling empirical work on the conditions for effective network structure. In this talk, I concentrate on two interesting theories in the literature: the Berardo and Scholz (2010) risk hypothesis where effective structure is contingent on the nature of collective action problems; and the theory of embeddedness and culture by Jones, Hesterley and Borgatti (1997), extended by Robins et al, 2011. Determining effective structure, however, is further complicated when organizations have to respond to disaster situations. In what way should a “day-to-day” collaboration structure be changed to respond to a natural disaster? Drawing on Jones et al, I argue that entainment and/or exchange of positive and negative ties may indicate a failure in shared macro-culture. I review previous work on the network governance of a river system, where the embeddedness preconditions proposed by Jones et al were absent. I describe a new study of water management networks responding to a flood disaster. Statistical models for network structure, detailing the change from regular to disaster management collaboration, indicate that embeddedness is present in this case. I explain how the change from day-to-day to disaster management is consistent with both the embeddedness theory and the Berardo and Scholz risk hypothesis. I describe more nuanced analyses to combine qualitative and quantitative data into a multilevel network perspective to shed light on the cultures of these institutional systems.

Emerging Environmental Governance Networks: The Development of the Network in the Lake Champlain Basin Program's Opportunities for Action Plans
Scheinert, Steve1, Reynolds, Adam2, Koliba, Chris3, Zia, Asim3
(1)University of Vermont, Experimental Program to Stimulate Competitive Research, Burlington, VT, United States, (2)University of Vermont, Burlington, VT, United States, (3)University of Vermont, Community Development and Applied Economics, Burlington, VT, United States

Governance networks (Koliba, Meek, and Zia, 2011) do not usually result from a conscious and directed effort to formulate a network, but develop, organically, from the efforts of public managers and local actors, as each pursue their own goals. Characterized by non-linear and multi-threaded causality, and unexpected emergent properties that grow from simple behaviors (Johnson, 2002; Axelrod and Cohen, 2000; Holland, 1996, 1992), these complex adaptive systems are what give these management problem their “wicked” characteristic. Understanding the threshold points of change in each system, including what changes in the network they produced and how they produced them will provide insights into the functioning of the system will, in turn, provide guidance to public managers in their on-going efforts to produce effective and appropriate environmental governance of the watershed. This paper examines the development of two governance networks engaged in water quality management, the Vermont Total Maximum Daily Load (TMDL) and the Lake Champlain Basin’s Opportunities for Action (OFA) to answer the questions 1) what are the threshold points of change in the OFA plans and 2) how did the plans change in response to them. It builds and compares common task networks over time with the key events that occurred in the Lake Champlain Basin to identify connections between events and the changes in the plans and networks. These provide evidence of tipping points in the system while the content of event and changes will guide understanding of means and methods of response and adaptation.
Personal Network Characteristics and Trajectories of Cognitive Decline in Older Adults in the Netherlands

Ellwardt, Lea¹, Aartsen, Marja²
(1) University of Groningen, Sociology, Groningen, Netherlands, (2) VU University Amsterdam, Sociology, Amsterdam, Netherlands

The positive relationship between social integration and healthy aging is well-established. For example, older adults who are socially embedded and who engage in social activities show less decline in cognitive functioning and decreased risk of dementia than those who are lonely. Explanations are that social contacts reduce stress and stimulate brain activity. However, while previous studies have focused on size of personal networks and amount of social engagement among older adults, little attention has been paid to the composition of the personal network. Adults embedded in a small network of diverse relations (i.e., many social roles) may draw on a wider range of social resources and stimuli than adults embedded in a large network of similar relations (i.e., few social roles). We expect that higher numbers of social roles relate to slower rates of cognitive decline. Data are from the Longitudinal Aging Study Amsterdam (LASA) and include >2,000 Dutch participants aged 55 to 85 over a period of six years. Participants were measured three times. Cognitive functioning is assessed with the Mini-Mental State Examination (MMSE). The analyses control for physical limitations and socio-demographic characteristics of the participants. We test our expectations using longitudinal data analyses.

Using Family Health History to Motivate Communal Coping in Families of Mexican Origin

Koehly, Laura M.¹, Marcum, Christopher S.¹, Wilkinson, Anna V.²
(1) National Institutes of Health, SBRB/NHGRI, Bethesda, MD, United States, (2) The University of Texas–Houston Health Science Center, School of Public Health Austin Regional Campus, Austin, TX, United States

Family health history (FHH) is a genomic tool used within the clinical setting to personalize lifestyle and screening recommendations to a patient’s disease risk. FHH knowledge, however, comes through family members communicating about their own and relatives’ disease diagnoses. In turn, communication of family risk information may increase family members’ perceptions of their shared risk of disease and motivate the members to develop strategies, such as encouragement, to address their risk through risk-reducing behaviors. The current report considers the impact of a FHH feedback intervention on activating communal coping processes within families; these communal coping processes include the feedback sharing, risk communication, and behavioral encouragement networks of Mexican origin families. Baseline, 3-month, and 10-month follow-up assessments were completed by 451 members of 160 families. Assessments included a detailed enumeration of participants’ “family”, including first- and second-degree biological relatives, family by marriage, and social kin. For each enumerated relative, participants indicated with whom they shared their FHH feedback, discussed family risk of disease, encouraged or received encouragement from regarding risk-reducing behaviors, and exchange of social support resources. Results indicate that a family-based approach, in which personalized risk information is provided to multiple family members simultaneously, is more effective than the current standard of care, in which personalized risk information is provided to a single family member, in activating the communal coping process. Further analyses explore nodal (e.g., gender, risk status) and family systems characteristics (e.g., advice and support exchanges) that moderate intervention effectiveness.

Friendships and Physical Activity: Testing Network Structure and its Associations with Activity Behaviours in Adolescence

Macdonald-Wallis, Kyle¹, Jago, Russell², Sterne, Jonathan³
(1) University of Bristol, School of Social & Community Medicine, Bristol, United Kingdom, (2) University of Bristol, Centre for Exercise, Nutrition & Health Sciences, Bristol, United Kingdom

Background: The role of peers and friendship groups is an important factor in the design of effective interventions to increase physical activity and reduce sedentary time in childhood and adolescence. This research examines the association between the structural properties of friendship networks and physical activity behaviours of network actors, using cross-sectional data from the National Longitudinal Study of Adolescent Health (Add Health). Methods: Self-reported physical activity and sedentary data and friendship nomination data were used from 86 eligible schools (approximately 68,000 students) to construct school networks of friendship ties between participants. Exponential Random Graph Modelling (ERGM) was applied to each network observation, to test whether friends engaged in similar activity behaviours. Further structural parameters such as popularity and sociability were also tested for associations with...
activity behaviours. Following model estimation in R, parameter estimates for each network were then tested for heterogeneity through meta-analysis, with meta-regression used to examine the network level characteristics, such as network size, region, gender or ethnic composition and network norms for activity, that were associated with the observed variability in parameter estimates. Results and impact: Preliminary results indicate a positive association in activity behaviours between friends, but significant variability in the extent to which friendships share similarities in physical activity and sedentary behaviours. When applied, the meta-analysis of ERGM parameter estimates will help to explain potential environmental and social factors that may enhance or impede the impact of physical activity interventions for peers and friendship groups.

Patterns of Supportive and Negative Interdependencies in Family Networks of Individuals with Mental Illness: Longitudinal Examination in Relation to Psychological Adjustment

Sapin, Marlene
University of Lausanne, FORS, Lausanne, Switzerland

Family relationships account for a large part of the support available to individuals with mental illness. Although the structural features of family support were acknowledged as important by some studies, research has seldom taken them into account empirically. Family networks are diverse and much more than dense supportive groups. They might provide security as well as opportunity, but conflict and stress also coexist. Based on a 5-wave follow-up of 60 individuals undergoing psychotherapy in a private practice, this paper investigates the structural features of positive and negative interdependencies in family configurations and examines their association with psychiatric symptoms. Five distinct patterns of interdependencies were found. Compared with individuals within a Collective support pattern, individuals featuring an Overload pattern or an Ego-centered conflict pattern show higher levels of distress, while those within a Standing back pattern display significant lower level of distress. The inclusion of the longitudinal dimension of the data largely confirms these findings.

Sociability and Support in Online Eating Disorder Communities: Evidence from Personal Networks

Tubaro, Paola\textsuperscript{1}, Casilli, Antonio\textsuperscript{2}, Lemaire, Sylvan\textsuperscript{3}, Mounier, Lise\textsuperscript{3}
\textsuperscript{1}University of Greenwich, London, United Kingdom, \textsuperscript{2}Institut Mines-Télécom, Paris, France, \textsuperscript{3}CMH-CNRS, Paris, France

The so-called “pro-ana” and “pro-mia” websites, blogs and forums (where “ana” and “mia” stand for anorexia and bulimia) have raised lively and recurrent controversies in recent years, based on the belief that they may contribute to maintaining and even spreading eating disorders. We investigate the role and effects of use of these websites on health, adopting a personal network approach. We have fielded an online survey targeting users of French- and English-language pro-ana/mia websites, including an interactive graphical application to elicit personal network composition and structure. With a scenario approach, we have identified the segments of their networks that they would mobilise in search of health-related support. Through follow-up in-depth interviews, we have gained further insight into participants’ relational structures and health behaviours. Results show that computer-mediated interactions do not replace face-to-face interactions, but offer an instrument to reinforce existing strong ties (by providing an extra channel of communication), while also facilitating the formation of new, weaker ties. Different sets of ties are relied upon as sources of support for different needs, where stronger ties are more often activated when emotional and material support is sought, while informational support comes from a wider range of ties. Respondents carefully separate the segments of their personal networks on which they rely for health support, from all other connections, so as to better manage the stigma often associated with eating disorders. Finally, reliance on online support does not exclude medical mediation, but rather reveals an unmet, strong demand for enhanced healthcare.
Path-breaking Regulation Practices at the Network Level: Developments in Three Healthcare Networks in Germany

Bach, Mario
Freie Universität Berlin, Pfadkolleg Research Center, Berlin, Germany

Due to many integration efforts in the German healthcare system, the fragmentation of care delivery has remained stable over time (inpatient vs. outpatient sector). One promising and relatively new organizational form of care delivery are healthcare networks which aim to integrate service delivery. In my PhD-thesis I am investigating interorganizational developments at the network level in three healthcare networks. The developments are triggered by and materialize over time as new regulation practices, such as web based patient-records, network specific pathways for treatment, and the delegation of certain tasks to new healthcare professions. So my research focus lies on the shared practices at the network level in a process view. In a comparative case study (rural area, well developed area, big city) qualitative methods (interview data, retrospective document data) and quantitative methods (social network analysis in each network) are combined in a mixed methods design. For the conference I would like to present empirical and methodological findings: The observed developments at the network-level behavior are triggered and made possible by institutional changes (professionally, technically, locally). This is an interesting aspect for the theory development with regard to a whole network approach because institutional impacts on the structure and functioning of networks will be discussed. Another interesting topic is the methodological challenging endeavor of applying a mixed methods design to empirical cases that unfold over time. Here I want to demonstrate the use of the theory of path dependence with a special emphasis on path-breaking behavior at the network level.

Social Network Activities as a Predictor for Phase Transitions of Patients with Bipolar Affective Disorders - A Mobile Network Approach

Barbian, Guido, Maier, Andreas
Leuphana University, Lüneburg, Germany

This study applies social network analysis to predict phase transitions of patients with bipolar affective disorder (manic-depressive). During a manic period, which includes a high degree of social activities, some patients tend to drop medication. When mood swings from manic to depressive these patients are endangered committing suicide. Timely prediction of mood swings and adjustment of medication could potentially save patient's lifes. We analyse phase-specific patterns of social network activities (communication, in-person-meetings, moving to specific locations, social network dynamics) and derive phase transition predictors (early warners). For data collection by mobile smartphones we developed SIMBA, a social activity monitoring system, which is based on MIT's funf sensing framework (Aharony et al. 2011). The resulting overlapping networks based on communication, personal contact and location (two-mode) are analysed and SNA methods are used for clustering and evaluation. Predictors are derived by a Gaussian mixture model. An expectation-maximization algorithm is used for parameter estimation. The resulting phase transition predictors are used as signals for attending physicians and psychiatrists.

Extended Patient Profiling Using Subgroup Analysis Based on Similarity among Patients: Preliminary Findings

Gurel Koybasi, Nergis A. 1, Gunel, Banu 2
(1)Middle East Technical University, Medical Informatics, Ankara, Turkey, (2)Middle East Technical University, Information Systems, Ankara, Turkey

Patient interview is the process that provides the current complaints and medical history of the patient to the practitioner. Based on this interview, the practitioner tries to build a hypothesis about possible conditions depending on his/her knowledge and experience. Since more information enables the formulation of a more accurate hypothesis, providing an extended patient profile via social network analysis and broadening the practitioner's viewpoint is the aim of this study. The first step of structuring a network is gathering information from several patients before their medical examination by a specialist. The second step is the analysis of collected data using a two-mode network constructed among patients and conditions. The third step is obtaining a patient network from the two-mode network, where the patients are the nodes, which are connected to each other by individual traits such as medical conditions, history and management, preferences and drug regimen. Finally, subgroups are identified according to the shared traits of patients;
similarities are quantified and used in visualization. In this paper, the subgroups obtained by social network analysis are compared with those created by medical practitioners based on their medical experience. Results of this comparison are provided and a methodology is proposed to utilize this subgroup analysis in building patient profiles.

**Contact Metrics in a Hospital Emergency Department Are Related to Participant Type**

_Hertzberg, Vicki S.1, Baumgardner, Jason1, Elon, Lisa K.1, Lowery-North, Douglas2_

(1)Emory University, Biostatistics and Bioinformatics, Atlanta, GA, United States, (2)Emory University, Emergency Medicine, Atlanta, GA, United States

Recent developments in technology enable precise measurement of human movement and resultant contacts. Personal contact patterns in hospital emergency departments (EDs) are of interest to improve infection control. We used radiofrequency identification to measure the occurrence, duration, and location of contacts among 6944 patients and staff in a large urban ED during 81 12-hour shifts [July2009-June2010]. We calculated relative and relative weighted degree for each participant for each shift. Using linear models with repeated measures we examined relationships between these metrics and temporal characteristics (season of year, day v night, weekday v weekend), patient mix (volume, percent female, percent high acuity, percent black, median age), and participant type (patient, provider, nurse, administrative, the last 3 groups comprising a larger staff group). Number of staff and number of patients participants present during each shift as well as length of shift were control variables. Differences were observed between participant types, with staff having significantly higher degrees than patients. Within staff, providers had significantly lower degrees than nursing or administrative staff. Temporal characteristics and patient mix variables were not associated with degree. Degree is directly related to the potential for cross-infection, thus infection control efforts should target ways to reduce degree. It appears that the greatest potential for cross infection for staff lies in encounters with other staff, which lends further support to mandatory vaccination policies for hospital staff.

**Does Interorganizational Collaboration Allow Patients to Access Higher Quality Care? An Empirical Study of Patient Sharing Relations within a Regional Community of Hospitals**

_Lomi, Alessandro1, Pallotti, Francesca1, Conaldi, Guido2, Vu, Duy3_

(1)University of Lugano, Lugano, Switzerland, (2)University of Greenwich, International Business and Economics, London, United Kingdom, (3)University of Melbourne, Melbourne, VIC, Australia

In the context of health care services, an important issue concerns the extent to which collaborative relations between hospitals are actually beneficial for the patient. This concern is particularly critical when patients are being transferred across the organizational boundaries of partner hospitals. Does inter-hospital mobility allow patients to access higher quality care? We present preliminary results from the analysis of longitudinal data that we have collected on patient sharing events within a small regional community of hospital organizations during the period 2003-2007. Patient sharing events are directly observable and involve very high levels of interorganizational coordination and collaboration. The empirical context we selected for this study is particularly valuable because indicators of hospital quality are widely available and publicly accessible. Detailed information on the internal composition of hospital activities allow us to control for the potential effect of complementarity and absorptive capacity on inter-hospital collaboration. Estimates of relational event models provide preliminary evidence in support of the view that inter-hospital patient sharing relations may be driven by quality differentials between partner hospitals, with patients flowing from lower to higher quality hospitals.
The Influence of Indirect Others: An Ecological Approach to Understanding Weight-related Perceptions and Behaviors

Behler, Rachel L., Suh, Chan, Brashears, Matthew, Shi, Yongren
Cornell University, Department of Sociology, Ithaca, NY, United States

Research on the obesity crisis in the United States has focused on the influence of those to whom we are tied, but has overlooked the impact of the people who surround us, without being directly tied to us. We predict that influence flows not only from the people who comprise our social networks, but also from those unconnected people who constitute the social environments that we regularly experience, such as the broader workplace or neighborhood. These people who we see but do not know function as additional vectors of influence by supporting and enforcing, or opposing and subverting, norms about body weight, exercise and eating. More specifically, we look to and take weight-related cues from those who best match us along multiple dimensions of demographic characteristics, including race, gender, age, and SES. We predict that the weight-related behaviors and weight perceptions of those who resemble us, but with whom we do not necessarily have a relationship, will influence our own behaviors and perceptions. Using data from the Add Health, we combine this ecological perspective with social network analysis to examine the roles of direct alters and demographic doppelgangers on individual weight perceptions and behaviors.

Detection of Contact Network Clustering from Epidemic Transmission Trees

Carnegie, Nicole Bohme, Goyal, Ravi
Harvard School of Public Health, Biostatistics, Boston, MA, United States

As genetic sequencing of pathogens becomes more common, understanding what information about the underlying epidemic process and contact structure can be gleaned from phylogenetics analysis. We revisit the question of whether transmission trees or, by extension, phylogenetic trees, contain information on clustering in the underlying contact network. Welch (2011) argues that there is little information even in the more complete data of a transmission tree that would allow for discrimination between networks of high and low clustering but fixed degree distributions. We suggest, however, that the results in that paper are constrained by the choice of epidemic parameters and outcome measures, several of which one would not expect to vary for fixed infectivity, duration of infection and degree distribution. We find that the amount of overlap in distributions of structural features of the tree, such as maximum number concurrently infected, balance, and number of cherries varies significantly with the infectiousness of the pathogen, but there are areas of parameter space wherein structural features of the transmission tree are discernibly different between epidemics occurring over contact networks with high and low clustering.

Structure of Participation in Organized Sports and Adolescent Alcohol Use: Centrality and Two-mode ERGM Analysis

Fujimoto, Kayo¹, Wang, Peng²
(1)University of Texas Health Science Center at Houston, Division of Health Promotion and Behavioral Sciences, School of Public Health, Houston, TX, United States, (2)The University of Melbourne, Melbourne School of Psychological Sciences, Victoria, VIC, Australia

This study examines two-mode affiliation networks formed by adolescents participating in organized sport activities in relation to alcohol use, focusing on the positional influence of different two-mode centrality measures (normalized degree, normalized eigenvector, and normalized closeness centrality) involving individual adolescents, sports, drinking behavior and drinking rates. Additionally, meta-analysis of two-mode ERGMs is used to explore selective affinity of sport participation based on drinking. Using a national representative sample of Add Health (20,134 adolescents and 10 sports nested in 66 schools), participating in popular sports was associated with drinking. All three two-mode measures of degree, eigenvector and closeness had significant effects on adolescent past-year drinking (AOR=2.78, p< 0.001 for degree centrality; AOR=4.39, p< 0.001 for eigenvector centrality; AOR=2.65, p< 0.001 for closeness centrality). On the other hand, neither effects of event degree and eigenvector centralities had significant effects on drinking rate, while the effect of event closeness centrality had an almost significant effect on drinking rate that is defined as proportion of drinkers among participants for each sport at specific schools (b=0.25, p=0.06). These results indicate that the popularity of sports was not related to prevalence of drinking in general. The meta-analysis also suggests there is a weak but positive association between drinking behavior and sport participation.
Social Network Diagnostics: A Tool for Monitoring Group Interventions

Gesell, Sabina B.¹, Barkin, Shari L.², Valente, Thomas W.³

(¹) Wake Forest School of Medicine, Department of Social Sciences and Health Policy, Winston-Salem, NC, United States, (²) Vanderbilt University School of Medicine, Department of Pediatrics, Nashville, NC, United States, (³) University of Southern California, Department of Preventive Medicine, Los Angeles, CA, United States

Many behavioral interventions designed to improve health outcomes are delivered in group settings. Group settings are efficient: they are more cost-effective than individualized interventions, and behaviors can be changed more quickly if the group members influence one another. To date, however, group interventions have not been evaluated to determine if the groups generate interaction among members and how changes in group interaction may affect program outcomes at the individual or group level. This article presents a model and practical tool for monitoring group dynamics during program implementation to potentially improve program outcomes. The approach is based on social network analysis (SNA) and has two phases: (1) collecting network measurements at strategic intervention points to determine if group dynamics are evolving in ways specified or anticipated by the intervention and (2) providing the results back to the group leader to guide implementation next steps. This process aims to initially increase network connectivity and ultimately increase the diffusion of desirable behaviors through the new network. Thus, by intentionally leveraging the potential strength of a new social network, we intend to amplify intervention outcomes. The network measurements are converted to a set of individual and group-level network metrics that indicate how social ties and social structure are changing within the group. This article presents the Social Network Diagnostic Tool and pilot data collected during the formative phase of a childhood obesity intervention.

Drug Users’ Willingness to Encourage Risk Network Members to Receive a HIV Vaccine

Young, April M.¹,², Mullins, Ursula B.², Haiggin, Dan S.³, Havens, Jennifer R.²

(¹) Emory University, Department of Behavioral Science and Health Education, Atlanta, GA, United States, (²) University of Kentucky College of Medicine, Center on Drug and Alcohol Research, Lexington, KY, United States, (³) University of Kentucky Gatton College of Business and Economics, LINKS Center for Social Network Analysis, Lexington, KY, United States

A successful HIV vaccine could substantially impact the HIV epidemic; however, low vaccine uptake is a significant concern. Network-based vaccine promotion may help to facilitate HIV vaccine uptake within risk networks; however, the feasibility of this approach is currently unknown. The purpose of this study was to examine network-level correlates to high-risk drug users’ willingness to encourage their risk network members to receive a future HIV vaccine. Data have been collected from 291 drug users enrolled in a 2-year cohort study in Appalachia (data collection ongoing). Risk network ties were those in which partners had sex and/or injected drugs together. Data were collected on recent (past 6 months) risk network partnerships, attitudes toward HIV vaccination, and self-reported likelihood of encouraging partners to receive a HIV vaccine. UCInet’s logistic regression procedure based on quadratic assignment procedures was used for analysis. Encouragement of HIV vaccination was reported as likely to occur in 181 partnerships, and discouragement was only likely to occur in two. Regression analysis found that frequency of risk behavior (unprotected sex and equipment sharing) was negatively associated with likelihood of encouraging vaccination (OR: 0.69, p=0.004), controlling for perceptions of partner’s risk for HIV (OR: 1.03, p=0.414), personal HIV risk posed by partner (OR: 1.77, p=0.213), duration of relationship (months; OR: 0.99, p=0.201), and frequency of communication (OR: 0.81, p=0.026). These preliminary data suggest that network-based vaccine promotion may be feasible, but that vaccine promotion may be less likely to occur in partnerships where risk behaviors are most frequent.
In this paper, reflecting upon two recently competed projects, one on covert social movement networks (the Provisional IRA and the UK suffragettes), the other on punk and post-punk music networks, I discuss the methodological implications of analysing ‘collective action networks’ (i.e. networks of actors involved in some form of collective action) from a historical perspective and using historical (archival and/or secondary) data. I will suggest that both the focus upon collective action and the use of historical data sources raise significant methodological issues, posing problems for the researcher but also affording opportunities and avoiding problems that other forms of data might pose.

The aim of this work is to describe and analyse international preferential trading relations in the 19-th and early 20-th century (Pahre, 2008) and their evolution over time by applying Network Analysis (NA) techniques. In this work we show in historical perspective how trade relations and preferential trade agreements are strongly heterogeneous among countries, and that specific countries play different roles in the trade integration network structure over time. As underlined by Egger and Larch (2008), interdependence between countries is a key factor in their choice to join a preferential trade agreement – i.e. the participation to a preferential trade agreement by one country creates an incentive to participate for other countries, a “domino effect” (Baldwin, 1995). By using NA we make this interdependence explicit, exploring the interconnectedness of national trade policies, highlighting the structural characteristics of preferential trade integration through the evolving topological properties of the network. The application of NA to the study of trade relations is quite recent (De Benedictis and Tajoli, 2011; Fagiolo, Reyez and Schiavo, 2008; Garlaschelli and Loffredo, 2005; Kali and Reyes, 2007; Serrano and Bogunã, 2003) while its application to the same relation but in historical perspective is a rarity (Flandreau and Clemens, 2005). To the best of our knowledge, the present study is the first attempt to analyse trade integration in historical perspective using NA.

Prior research demonstrated persistent asymmetries in commodity flows between blocks of regularly equivalent countries in the world trade network between 1965 and 2000 (Mahutga, 2006 Social Forces 84(4):1863-1889). Moreover, patterns of asymmetry differed among commodity types. In this paper we extend the investigation of asymmetry in world trade by simultaneously representing multiple commodity networks at three points in time (1965, 1980, and 2000) using a multi-relational generalization of decomposition for skew-symmetry in valued, directed networks. Results allow us to simultaneously examine variation in patterns of trade asymmetry across five different categories of commodities (High technology Manufactures, Simple and Sophisticated Extractive, Low Wage Manufactures, and Food products) and to represent temporal change in positions of individual countries over a 35 year period.

This is a methodological proposal: exploiting network science for analysing a medieval historical narrative. My starting hypothesis is that network theory can contribute to the understanding of written sources and their authors’ social and political stand. The first problem to address is attempting to define the meaning of narrative, and its role in historical research. After that, I shall identify a complex system of social interactions within the narrative structure. Then, the
interaction system will be proposed to be represented as a narrative network of actors. The central idea of this approach is that the meaning of individuals and communities in a narrative is conditional on their position in a network of social relationships constructed by the author. Hence, a central problem when dealing with historical sources is framing and organising the author’s perspective of personal and collective connections in order to understand better the role of both the witness (viz. the persona that emerges from the historical narrative) and its testimony as reflected by the text. I will illustrate this proposed method with respect to a single narrative case: pseudo-Falcandus’ account on the Sicilian royal court. This historia became a fundamental text for the understanding of the Norman kingdom of Sicily in the second half of the twelfth century. The encounters, agreements, bargaining, gossiping, manoeuvring, and plotting described by the author offer us a complex interaction system of a medieval court society, and by using the proposed method I attempt to reconstruct and analyse such a system.

Craftsmen of Luxembourg in the Late Middle Ages (Eva Jullien)

Jullien, Eva
University of Luxembourg, Luxembourg, Luxembourg

At the conference I would like to present my PhD project which I am currently conducting at the University of Luxembourg. The thesis is concerned with the social structure of Luxembourger craftsmen in the 14-th and 15-th century. It examines the functions of their guilds, their economic conditions but also the respective social position they occupied within urban society. Who enjoyed social prestige and who exerted political influence? Did certain crafts encompass more prestigious and influential individuals than others? Furthermore it will be explored if their personal or commercial relationships were geared towards a specific trade. Did people interact preferentially with members of their own craft? The investigation is based on a dataset of approximately 2500 individuals. Apart from personal attributes like property or place of residence the data base contains information on family ties, commercial relations and neighbourhood. Medieval studies which apply historical network analysis usually concern themselves with the well documented upper levels of society. By contrast the focus on craftsmen comes along with an especially fragmentary state of source material, which does not allow for the generation of coherent networks. The proposed presentation deals with the problems which are involved in such a project, but also wants to provide concrete examples of how historical network research can be usefully applied even on the basis of incomplete data.

Household-to-Company Networks and Consumer Credit in Renaissance Florence

Mclean, Paul, Gondal, Neha
Rutgers University, Sociology, New Brunswick, NJ, United States

Recent research has documented extensive networks of commercial credit relations in Renaissance Florence (Padgett and McLean 2011). Banks financed Florentine wool and silk production and also provided the means for exporting finished goods. Amongst themselves, banks had extensive credit relations, built on an intricate architecture of current accounts held with each other. But this commercial system was also linked to Florentine households—both on the input side (via influxes of start-up capital from company partners and occasional large deposits from people other than company partners) and the output side (via the retailing of finished goods to household customers, and loans and deposit banking originating with local bankers). This paper analyzes the patterns of flow in this investment and consumer-credit network using a previously unanalyzed data set of person-to-company ties. We show the particular ways in which this network was embedded in other kinds of social relations, such as family and neighborhood, and we bring to light the existence of extensive consumer credit in a market long before the explosive spread of consumer credit in the late nineteenth and early twentieth centuries. We discuss some of the problems associated with teasing network information out of archival sources, and we describe certain challenges that arise in distinguishing some types of ties from others when documentary sources are not transparently clear.
Visualizing Historical Kinship Networks Using Data from Marriage Registers: The Netherlands, 1830-1950

Bras, Hilde¹, Kasakoff, Alice², Guo, Diansheng³, Koylu, Caglar³

(1)Radboud University, History, Nijmegen, Netherlands, (2)University of South Carolina, Anthropology, Columbia, SC, United States, (3)University of South Carolina, Geography, Columbia, SC, United States

During the second half of the nineteenth and the early twentieth century a process of intensification of kinship relations would have taken place across Europe. Co-residence with family and kin increased, cousin marriages and sibling-set exchange marriages rose to a high point, and kin were increasingly selected as witnesses at baptism and marriage. In this paper we expand on previous research by looking at the spatial and temporal dimensions of kinship networks by applying newly developed computational and visualization methods to historical marriage registers. The set of people mentioned on a marriage certificate (bride, groom, their parents, and witnesses) is a good proxy for people’s social networks in the past. The selection of a spouse and of marriage witnesses was in principle free, in the sense that it was not imposed by law or regulations. Marriage networks thus represent chosen patterns of sociability for a large proportion of the population. To what extent did social networks become denser over time and space, i.e. consisting of relatively more kin and/or of geographically more clustered family hubs, during the period 1830-1950? In order to answer this question, we have created a measure of ‘social connectedness’, which gauges the kinship intensity of marriage networks based on the number and geographical locations of the bride and groom, their parents (if alive) and the set of marriage witnesses. The networks are visualized across space and time. We also examine differences in social connectedness across regions, over periods, and across social classes and religious denominations.

Personal Networks and Social Classes in Rural Society. A Microstudy on Two Parishes in Eighteenth and Nineteenth Century Westphalia (Northwestern Germany)

Fertig, Christine

Universität Münster, Historisches Seminar, Münster, Germany

From the second half of eighteenth century on, most parts of Europe began to turn into a ‘modern world’. Political change, industrialization and urbanization are important characteristics of this transformation. This development went along with fundamental changes in the structure of social relationships. Kinship seemed to lose significance within personal networks, whereas class became an important principle of social organization. However, recent research emphasizes the lasting importance of kinship and other personal relationships throughout modernization processes. For some European regions historians even pointed to a growing reorientation towards kin, leading to segregation of social structure and, as a result, to class building also in rural society. In this view, pre-modern personal networks tended to integrate people from different social strata, whereas modern reorientation of personal networks promoted the development of distinct social classes. The paper will compare two rural communities in eighteenth and nineteenth century Westphalia (Northwestern Germany). The micro study applies social network analysis (as e.g. centrality measures in godparent networks, components in marriage networks, p-graph analysis of family reconstitution data, etc.) to investigate the relational structure of an agrarian and a protoindustrial community in a region with considerable population growth and economic development. It will be shown that social network analysis can help to gain insights into the structure and development of historical societies.

The Social Marriage Network of Europe’s Ruling Families, 1600-1900

Schröter, Wilko

Salzburg University of Applied Sciences, Zentrum für Zukunftsstudien, Salzburg, Austria

In this paper the social marriage behaviour of Europe’s ruling families from 17th to 19th century is examined. This people formed a closed society and dominated with their social similarities the political, social, economic and cultural development in the regions and also seem to anticipate the demographic behaviour of the common population. Primarily the “Isenburg stem tables”, 2nd corrected edition of 1956, were taken for the collection of the demographic data. All birth cohorts of Europe’s ruling families (12,657 cases) were recorded starting from the date of birth 1/1/1600. Exact and reliable information about birth, marriage, legitimate fertility, mortality and religious orientation is thereby available without censoring problems. Naturally all data can be interpreted as event data (e. g. time span from birth to death, period between birth and marriage, length of time from marriage to birth of the first child, duration from marriage to death...) and an event history network for longitudinal analysis was set up. What John Hajnal has referred to as the
European pattern of marriage with a high age at marriage and a substantial fraction of people remaining unmarried - thus already acting as an important control of population growth - clearly emerges early among the ruling families and is well established in the cohorts born in the late 17th century. There are subsequently no signs of major changes until the very recent reverse trend to lower age at marriage and higher proportions married, which the ruling families share with the general population.

Client-king? Me? The Social Networks of Local Rulers in the Roman Near East
Seland, Eivind H.
University of Bergen, Archaeology, History, Cultural Studies and Religion, Bergen, Norway

For several centuries, large parts of the eastern Roman Empire was ruled by way of a complex system of local dynasts, ranging from nomadic chiefs to descendants of powerful Hellenistic kings. These individuals are generally labelled client-rulers or client-kings in the research literature. This makes perfect sense when the organization of the empire is studied from the metropolitan point of view, but misses out on the complex matrix of ties between groups and individuals at and beyond the imperial fringe. Social network analysis has the potential to reveal how so-called client-rulers maintained ties of friendship, kinship, marriage, and patronage extending inside as well as outside the imperial borders. This enhances our understanding of Roman rule in the Near East in two respects. Firstly, it shows why the system was a practical, durable, and cost-efficient way of administrating an empire. Secondly, it highlights the independent agency of local rulers, for whom the relationship to Rome was but one, albeit important, of many connections and obligations which had to be balanced in order to maintain power and status.

Path Dependence or Societal Structures? A Comparison of Social and Political Networks in the Low Countries During the Seventeenth Century
Van Dijck, Maarten F.
Erasmus University Rotterdam, History Department, Rotterdam, Netherlands

The Dutch Revolt (1566-1648) caused the separation of Southern and Northern Netherlands. Both regions were quite comparable at the end of the Middle Ages since they belonged to the same urban belt at the shores of the North Sea. The Civil War at the end of the sixteenth century had dramatical results for both regions. Indeed, the northern provinces became a Calvinist Republic, while the Southern Provinces were recatholicized in the context of a monarchical system. These political and religious differences also influenced the social structure of both regions according to the existing literature. The Dutch Republic is considered as a society with predominantly horizontal relations while the Southern Netherlands are seen as a hierarchical society. However, local politics were also quite oligarchic in the Dutch Republic and this conclusion questions the results of earlier research. Our paper will compare two important cities in Northern and Southern Netherlands (Mechlin and Leyden) in order to test the conclusions in current historiography. Our social network analysis shows that towns in the Dutch Republic were characterized by a low network density and that networks were more hierarchical than in the Southern Netherlands. Social theory will help us to interpret these differences and to look at the political influence of the social structure of two divergent urban societies.
Information Networks Rethink. The Dimension of Spatial Dynamic on Diffusion Processes - A Historiographical Approach

Jacobs, Melanie, Reupke, Daniel
Saarland University, Department of History, Saarbruecken, Germany

Since network analysis is applied in history recent studies carried out the effects of network relations on information flows (Berghoff 2007 (cf. Hirsch-Kreinsen), Busse 2009, Casson 2003, Herres 2002 (cf. Welskopp)). Networks co-ordinated the actions of the people involved in just as they regulated the resource flows (including informations and subsequent innovations). However, the transfer of concepts and knowledge are difficult to measure, historical network research is presumed to be a tool to reveal the mechanisms of network communication. Accordingly, the proposed presentation will examine the effects of immovability respectively mobility on information networks. Our study focuses on two persons from the region of the Rhenish city of Trier: Wilhelm Tell von Fellenberg (1798-1880) and Franz Xaver Kraus (1840-1901). Fellenberg immigrated from Berne (Switzerland) in the swath between the rivers Saar and Moselle and attempted to diffuse his vision of both effective and humane farming as an agricultural entrepreneur together with some likeminded friends. Commuting between Germany and Italy the Trier-born Kraus - lastly Professor of Ecclesiastical History at University of Freiburg - established a widespread network within he mediates political and cultural sympathies amongst these nations. Fellenberg respectively Kraus left correspondences, autobiographical delineations, and programmatic writings. Based on these sources we reconstruct the information networks, visualise the relations, and hypothesise about the innovative effects. Finally, we assume that accumulation of concepts is strongly interconnected with the dimension of spatial dynamics. In contrast, location bound immovability or manoeuvrable mobility has a less significant impact on the diffusion of knowledge.

Mapping the Congress of Vienna 1814/15

Kerschbaumer, Florian
Alpen-Adria-Universität Klagenfurt, Institut für Geschichte, Klagenfurt, Austria

The Congress of Vienna 1814/15 is not only "probably the most seminal episode in modern history" [1], it is also one of the greatest social events of this era. A stream of noblemen, envoys and people came into the capital of the Habsburg monarchy wanted to be part of the peace conference which should reorganize Europe after the Napoleonic wars. Although the congress is one of the best researched topics in modern history, there are still many questions to be answered. Some of them concern the organization of the congress and the daily life at this time in Vienna. Based on different sources we have information about the residential addresses of 500 European representatives during their stay in Vienna. However, with this database it is not only possible to create a city map of Vienna with the marked houses of the European envoys; we have also the potential to answer questions with the help of the Historical Network Research. Through the use of attributes (nationality, rank etc.) you can show for example which of the represented countries at the Congress of Vienna had the best position in this network for information exchange or the easiest access to the European decision-makers. The answers of these outstanding questions can help us to understand one of greatest peace conferences in the history of humankind better. [1] Adam Zamoyski, Rites of Peace. The Fall of Napoleon and the Congress of Vienna, New Xork 2007, S. XIII.

Networks of Creditors and Debtors: A Rural Credit Market in Nineteenth-century Germany

Stark, Martin
University of Hamburg, Hamburg, Germany

This paper explores the effect of a legislative reform on the structure of a rural credit market in nineteenth-century Germany, comparing networks of creditors and debtors. The granting of loans in rural pre-modern credit markets was restricted to a narrow geographical and social space. Contrary to present-day financial markets which are often highly anonymous, in those days credit relationships relied on personal acquaintance between creditors and debtors, implying an increased informal flow of information and social control. Previous to a change in mortgage laws in 1825/28, there were two possibilities to raise a mortgage in the Kingdom of Württemberg: Firstly, a creditor’s claim could be registered in a public record, known as Unterpfandsbuch. Secondly, creditors and debtors could close a private loan contract without having it officially registered. As a consequence, there always remained a certain amount of uncertainty as to whether real assets in question had not already been pledged elsewhere. In the course of the reform, the right to
conclude unregistered loan contracts to raise mortgages was abolished. To show its impact on lending practice networks of two time slices are compared, one before the other after the amendment has taken its full effect. The case study examines two-mode-networks of creditors and debtors derived from mortgage and tax registers as well as church registers of the village of Ohmenhausen, which is said to be representative for the rural area of Swabia as far as its development during the 19th and early 20th century is concerned.

### Reconstructing Third World Elite Rotation Events from Newspapers

**Traag, Vincent A.**, **Van Klinken, Gerry**

(1)Université Catholique de Louvain, Louvain-la-Neuve, Belgium, (2)KITLV, Leiden, Netherlands

Two major transitions are central to Indonesian politics after the second World War. The first is the revolutionary war of independence from the Netherlands in 1945-1950 known as the "Revolusi", while the second is the democratic transition following the fall of the authoritarian President Suharto in 1998 known as "Reformasi". While historians have a good understanding of these periods, there is much we do not know about underlying patterns of elite rotation during these regime changes. We construct networks of elites in Indonesia based on newspaper articles. We dispose of a digitised archive of newspaper articles during the "Revolusi" period, while for the "Reformasi" period we were able to use newspaper articles from the internet. The transitions broadly reflect shifts on spectra between democracy and authoritarianism, and between centralism and decentralisation. We focus on the centrality of actors and how they are embedded in the network. We expect rising elites to show increasing centrality, but this may depend in subtle ways on how they are embedded. For example, tightly knit elites may have a higher likelihood of retaining their position. Alternatively, if contacts of somebody are marginalised, it is unlikely that (s)he will continue to play an important role. Certain ripple effects may spiral outwards from the most central person: those closer to the central authority have a higher chance to lose stature. Analysing the differences and similarities between the two transitional periods should deepen understanding of elite rotation events in poorly institutionalised polities.

### A Scene that Prides itself on Doing-it-Yourself - Network Formation and Innovation within the First Wave of Californian Hardcore Punk (1978-1986)

**Weiler, Michael**

Ruprecht-Karls-Universität Heidelberg, Heidelberg, Germany

The first wave of American hardcore punk (1978-1986) featured various interconnected scenes based on a do-it-yourself mentality and provided teenage actors with a suitable medium for expressing their frustration. Apart from being responsible for the development of underground music in general, their main contribution was the collaborative establishment of alternative institutions, mainly record labels, which existed along to the mainstream. This study is informed by Crossley’s (2009) approach to analyze music scenes, which he introduced for the post-punk movement in Manchester (UK). It takes a unique methodological route to exploring the emergence and growth of the American Hardcore scene in Southern California. The results of a formal social network analysis are combined with qualitative tools to investigate the interactions responsible for these findings in order to provide a detailed account of emerging collaborative structures. Several mechanisms of network formation, which are loosely based on common analytical concepts (including transitivity, foci theory, and preferential attachment) similar to those identified by Crossley (2009), were confirmed. For further verification, the study utilized bimodal networks to examine the interplay of innovation capacity and network structure, hereby drawing on concepts like brokerage. Its findings indicate that the analysis of affiliation networks is a worthwhile method for studying music scenes. They also suggest that (bimodal) networks could be further used to map their evolution and to understand their dynamics. In addition, a bimodal analysis offers the opportunity to address new questions. Therefore, this study represents an important empirical contribution to the research on artistic collaboration.
Innovation Networks: Facilitators, Agents and the Management of Innovative Networks

Network Perspectives of Organisational Innovation in Small and Medium Scale Enterprises

Acheampong, George
University of Ghana Business School, Accra, Ghana

The dynamic role of SMEs in development as engines of growth has long been recognised. However, most of these firms in the developing world do not grow beyond their micro-enterprise nature. There are several constraints these enterprises face. Innovation has been found to be a way for these enterprises to grow into large firms. However, what kind of innovation do they require? This study makes the case for organisational innovation and networking. A wide array of literature on organisational innovation, network theory and SME is used to support this assertion. The review finds that three broad categories of networking are required - environmental, organisational and individual level networking. Intensity of networking, proximity of networking, motivation and organisational size are some of the variables that impact on the level of networking to achieve organisational innovation in SMEs.

Born to Cook - Connect to Succeed

Aubke, Florian\(^1\), Christopoulos, Dimitris\(^2\)
\(1\) MODUL University Vienna, Department of Tourism and Hospitality Management, Vienna, Austria, \(2\) MODUL University Vienna, Department of Public Governance, Vienna, Austria

Despite a general fascination for the work of haute cuisine chefs, this profession has rarely been subject to rigorous scientific study, although advances have been made in exploring some aspects of creativity and culinary innovation. This study focuses on the career paths of Michelin-starred chefs in Germany and aims at identifying the creative hot spots of this culinary domain. In this culinary context, creativity is understood as a systemic phenomenon, thus the research pursues the question of “who makes a star-decorated chef?” The career progression of all German Chefs awarded a Michelin star in 2010 was examined as a 2-Mode network. The majority of three-star chefs are closely connected to a strong core of densely connected chefs and restaurants, suggesting that a small number of restaurants function as ‘career hubs’. Similarly, some chefs are more influential in this network structure than others. Individual significance in the network - expressed as betweenness centrality - was found to be independent of an actor’s star rating. Ties between chefs with different star ratings - status heterophily - occur more often than between chefs with similar star ratings. Findings suggest that a small number of ties are more beneficial for individual creative productivity and thus knowledge transfers are more likely to happen between chefs with different levels of experience, skills and creative ability.

Robust Communities Detection in Joint-patent Application Networks

Drago, Carlo, Cucco, Ivan
University of Naples “Federico II”, Naples, Italy

The structure of research collaboration networks is of great relevance for the economic analysis of regional innovation and growth. Patent data are often utilized in this context since, notwithstanding their limitations, they provide useful insights on the relational aspects of innovative activities. While Social Network Analysis applied to patent data increasingly belongs to the methodological repertoire of regional economics, the potential contribution of community-detection techniques to this field of enquiry remains largely unexplored. This work intends to fill this gap by showing that community detection techniques can be usefully applied to the analysis of co-patenting networks within studies of regional innovation and growth. We propose an original approach to assess the stability and robustness of the detected innovative communities. We apply different ensembles of methodologies on the same relational data and use statistical procedures to evaluate the level of agreement between the different procedures. The methodology is applied to a joint-patent application network drawn from the OECD REGPAT database for a sample of innovative firms operating in Italian technological districts. The identification of stable communities through statistical procedures is integrated with substantive information about the location, district participation and sectoral specialization of the firms in order to generate a taxonomy of local networks configurations.
Collaboration Dynamics and Knowledge Transfer in Innovation Networks: A Pre-specified Blockmodelling Analysis

Prota, Laura, Vitale, Maria Prosperina, D’Esposito, Maria Rosaria
University of Salerno, Department of Economics and Statistical Science, Fisciano, Italy

Collaboration networks linking firms, universities and local governments have been considered the loci of innovation since the 1990s. In recent years, a number of policy interventions were put in place to favor the development of such innovation networks throughout Europe. In Italy, for instance, an increasing number of Technological Districts (TD) was established by the government in mid-2000. The paper probes this public policy with the lens of network analysis to understand the evolutionary patterns of research collaborations within a TD located in Southern Italy. Yearly changes in the network of co-participation in R&D projects between 2005 and 2012 are examined. The main assumption of the study is that knowledge transfer between specialized research groups is an essential precondition of innovation. We use pre-specified blockmodelling to explore whether this process is occurring testing a core-periphery model, in which the core is defined by the actors that similarly bridge specialized research groups. Results show that the core-periphery model explains the collaboration network between organizations particularly well at the early stages of the TD development. Over time, however, cores rapidly increase, indicating an intensification of collaboration in projects within the district and the emergence of new hubs. Moreover, cores progressively change their composition: from a structure dominated by public research centers to the inclusion of public and private research centers, firms as well as international partners.

Service Innovation in Co-opetition Networks

Zach, Florian¹, Hill, T L²
(1)University of Southern Denmark, Institute of Design & Communication, Esbjerg, Denmark, (2)Temple University, Fox School of Business, Philadelphia, PA, United States

Central agent have the opportunity to orchestrate how interested parties participate in the innovation processes. Strategic management research argues that inter-organizational collaboration is valuable for innovation outcomes. However, research so far did not identify how organizations collaborate for innovation under co-opetition. This study investigates four similar US tourism destinations and the collaboration that takes place for everyday collaboration and innovation as well as perceived competition. Tourism destinations are the ideal study ground as they usually have a designated central agent (destination marketing organizations [DMOs]). Furthermore, destination businesses are used to collaborate on a daily basis to provide tourism services to destination visitors and to attract them to the destination while at the same time competing for these visitors to become patrons of their own business. Study results show that destinations with well established central agents (DMOs) are innovative with most innovation behavior taking place along inter-organizational relationships. At the same time destinations with central agents that are yet not well established are cannot achieve such levels of innovativeness and are broken into several groups.
Innovation Networks: Innovation in Cluster and Cooperative Networks

Clusters and Innovation in the Life-science Sector
D’Alise, Chiara, Giustiniano, Luca
LUISS Guido Carli University, Business and Management, Rome, Italy

The paper investigates the impact of clusters - aggregations of industrial, academic and institutional players in a localized network - on innovation in the life-science setting and aims to enrich the line of inquiry into cluster-based innovation by applying social network analysis (SNA) approach and methods. The cluster concept has been defined in ambiguous ways, it is rather flexible, corresponding to a large variety of spatial and organizational concrete configurations. Trying to understand which of them drives to a higher cluster’s innovative outcome is the paper general aim. The addressed research question is: What is the impact of intra-cluster and inter-cluster network characteristics on the cluster’s innovative performance in the life-science sector? More specifically we analyze what structural and nodal characteristics are best suited to maximize the likelihood of clusters’ innovation, from an intra-cluster and an inter-cluster perspective: we focus on network size and density/spanning of structural holes as main explanatory variables; on nodal vertical heterogeneity, industrial and geographical distance among the nodes, as contingency factors. Quantitative methods are applied to relational and nodal data, using SNA and a regression model. The paper can make a theoretical and empirical contribution, filling some gaps: the absence of significant contributions analyzing clusters of clusters and inter-cluster dynamics; the lack of agreement on the network structure most beneficial for innovation; the scarce attention to the network’s overall performance as a dependent, aggregated variable; the only occasional use of constructs and concepts derived from social network analysis in clusters’ actual operationalization.

Creation and Diffusion of Innovations in the New Economy: The Case of Lublin Province
Filipek, Kamil
John Paul II Catholic University of Lublin, Institute of Sociology, Lublin, Poland

The main purpose of this paper is to show how innovations are created and diffused in Lublin province. The analysis has been limited to the new economy field made of businesses organized in and around the internet. The proposed models of creation and diffusion of innovations are based on primary and secondary empirical data. The research questions has been spurred by the assumption that internal logic of creation and diffusion of innovations in the new economy is convergent with the SNA explanations on network dynamics and evolution (Rogers 2003; Willer 2007; Snijders, Bunt, Steglich 2010 etc.) Two types of dynamics has been examined and developed: dynamics of the network and dynamics on the network (Watts 2003). In the reconstructed networks certain roles of the actors e.g. bouncers, gatekeepers and consumers has been identified and explained.

Explaining Path-dependence in the Evolution of Networks. The Case of an Electronics Cluster in Argentina
Giuliani, Elisa¹, Matta, Andres²
(1)Pisa University, Pisa, Italy, (2)Cordoba University, Cordoba, Argentina

A wealth of empirical literature shows that one of key elements of the success of regional clusters is that they facilitate the formation of local inter-organizational networks, which act as conduits of knowledge and innovation. While most studies analyze the benefits and characteristics of regional cluster networks, very little is known about how such networks evolve over time and the extent to which their dynamics can affect development processes. Using longitudinal data of a cluster of Small and Medium Enterprises (SMEs) in the Argentinian electronics industry and stochastic actor-oriented models (SIENA) for network dynamics, this paper examines the microdynamics underpinning the formation of new knowledge ties among SMEs and explores the factors that contribute to a path dependent evolution of the network structure. It finds that path-dependence is due mainly to structural effects (reciprocity and preferential attachment) and to social connections (friendship and membership to the same local business association), but it does not relate to firm-level agency within the cluster. Empirical results have implications for theories about network dynamics in regional clusters and for cluster policies.

Network 'Stars' and Innovation Brokers: An Empirical Insight of How Collaborative Research and Development Is Enabled in Temporary Networks
King, Barbara J
Research and development (R&D) is increasingly undertaken within temporary networks in which transdisciplinary participants address a range of technical and scientific problems. Such assemblies share a common focus with respect to innovation objectives however the prescribed timeframes of many R&D projects limit opportunities to develop trusting relational connections that in turn impede innovation outcomes. Social and disciplinary differences need to be bridged in order for knowledge and action to become appropriately interactive. A better understanding is needed about the contribution of network roles that enable temporary social networks to 'hit the ground running' so that network participants can optimise R&D opportunities. This paper considers implications of the relational roles of the network 'stars' and innovation brokers drawing on an empirical study of a major Australian R&D network. The study used social network analysis in combination with qualitative ethnography to generate data about the structural and relational attributes of R&D 'stars' and brokers. Network maps were shared with participants and they reflected whether SNA was a useful way to understand the connections and functionality of their network. 'Stars' were evident by the intensity of network ties they shared across the network however innovation brokers were not as obvious. Innovation brokers were critically positioned between different knowledge groups and provided vital connectivity across the network. The paper makes a methodological and empirical contribution by demonstrating how SNA can be used in combination with qualitative methods to explain and describe the implications of network roles to collaborative processes in temporary R&D networks.

Firms’ Networking and Innovation in Trusting and Distrusting Societies: A Global Cross-National Study

Schott, Thomas, Jensen, Kent Wickstrøm
University of Southern Denmark, Department of Entrepreneurship and Relationship Management, Kolding, Denmark

A firm is often networking with other enterprises to promote its innovation. Such networking is pursued in an institutional context, the culture of society. Trust is a salient dimension of culture, differing among countries. A culture of trust plausible facilitates networking, whereas a culture of distrust impedes networking. We first hypothesize that firms’ networking is sparse in distrusting societies and denser in trusting societies. Second hypothesis is that firms’ networking promotes their innovation, this is not a new proposition, but worthwhile retesting, especially on a globally representative sample. Third, we hypothesize that this promotion is amplified in trusting societies, in the way that in a trusting culture a firm’s relations will be especially beneficial for its innovation, whereas in a distrusting culture relations will be less beneficial. Thus we hypothesize that trust both facilitates networking and amplifies the benefit of networking for innovation, but we do not expect a direct effect of trust on innovation. The hypotheses are tested with data on 68 countries and 41682 firms surveyed in the Global Entrepreneurship Monitor in 2012, using a measure of trust in each country that was derived from the World Values Survey. With fairly representative samples, the findings generalize to the population of firms in the world. Hypotheses are tested using hierarchical mixed linear modeling. The modeling corroborates the hypotheses that trust substantially promotes networking and that networking greatly promotes innovation, and provides additional insights into the dynamics on networking for innovation.
Innovation Networks: Intra-organizational Aspects on Innovation Management

Innovation Resilience Despite Corporate Downsizing: Benefits from Positioning in the Formal and Informal Network

Aalbers, Rick¹, Dolfsma, Wilfred²
(1) Radboud University, Institute for Management Research, Nijmegen, Netherlands, (2) University of Groningen, School of Economics and Business, Groningen, Netherlands

Downsizing is an important instrument for firms to reestablish alignment between strategy and organization. Yet many such corporate change efforts do not proceed as planned and might actually have negative effects for a company (Datta et al. 2010). Downsizing dissolves social relations forcefully and retaining the social infrastructure for innovation is not evident. Remarkably there is little empirical support for this claim: to date, few empirical research has studied the impact of downsizing on innovative knowledge sharing within organizations (Gandolfi and Oster 2010). We apply a longitudinal social network perspective to study the resilience of the innovation network following corporate downsizing. Studying a large financial service organization over a period of a year, we gain insight in the degree to which downsizing affects several organizational network characteristics that have been identified in earlier research as critical for innovative intra-organizational knowledge transfer. We show that innovative knowledge exchange is remarkably resilient throughout a downsizing episode. We show that surviving innovation ties remain strongly multiplex in nature, building forth on the benefits of the formal and informal organization for sustained innovative activity and find that resilience of ties in the innovation network is due to the control that individuals have over the information exchanged in the formal as well as the informal networks in an organization prior to downsizing. Innovation ties available to employees that maintain a central (betweenness) position in the formal-workflow network prior to downsizing prove most resilient to corporate reorganization. We find a similar effect for the informal network.

Intellectual Communication Networks as a Basis for Science, Education and Business Integration: The Two Cases of European Regional Clusters

Basov, Nikita¹², Minina, Vera¹, Voronina, Aleksandra³
(1) St. Petersburg State University, Sociology, St. Petersburg, Russian Federation, (2) St. Petersburg State University - Bielefeld University, Center for German and European Studies, St. Petersburg, Russian Federation, (3) St. Petersburg State University of Waterway Communications, St. Petersburg, Russian Federation

Building globally competitive innovation systems that integrate science, education and business sectors is a common policy task for many countries striving to complete transition to the knowledge-based economy. This task involves creating regional structures of inter-organizational collaboration across the boundaries of science, education and business to stimulate generation of innovations. Emergence of such inter-organizational network structures, we argue, requires development of effective inter-personal intellectual communication structures that connect members of research, academic and business organizations comprising the basis for trust, collaboration, information exchange and knowledge creation. This exploratory paper aims to provide insights on how inter-personal network structures influence network structures of science, education and business integration. We use multiple case study strategy and base on empirical evidence collected in two European regional clusters located in Bavaria (Germany) and in Algarve (Portugal) through regular social network surveys, expert surveys, and secondary data analysis. First, the state of science, education and business integration within each of the clusters is evaluated according to a set of indicators. Second, the structures of inter-organizational and inter-personal relations, which cross the boundaries of science, education and business sectors in each cluster, are mapped and network measures for each of the structures are calculated. Third, using both qualitative and quantitative methods we analyze the relations between inter-personal and inter-organizational network structures in both of the clusters. Fourth, we perform comparative qualitative analysis of the cases. The results indicate key characteristics of inter-personal networks that influence science, education and business integration network structures in regional clusters.

Innovation in SMEs: Social Networks Beyond a Formal NPD Process

Fliaster, Alexander, Kevilovski, Tanja
Otto-Friedrich-Universität Bamberg, Bamberg, Germany
Innovation Networks: Intra-organizational Aspects on Innovation Management

Past theoretical and empirical research has identified that the existence of a comprehensive formal product development process is an essential success factor of innovation (e.g. Ernst, 2002; Cooper et al., 2004). In many SMEs, however, such standardized formal processes are complemented or even replaced by informal collaborative networks among employees (e.g. Rüggeberg & Burmeister, 2008; Verworn et al., 2000). Nevertheless, the number of empirical studies shedding light on informal innovation networks in SMEs is still relatively scarce (e.g. Pullen et al., 2012). To contribute to this stream of research, we applied the case study methodology that becomes an increasingly popular and relevant research strategy (e.g., Eisenhardt & Graebner, 2007). In particular, we conducted more than twenty semi-structured interviews with key decision-makers in several German companies in the packaging and the electrical and electronics industry. In addition to qualitative interviews, we extensively used a rich variety of corporate data, such as organizational charts, formal workflow descriptions and archival project information. Integrating the concept of “social embeddedness” (Granovetter, 1992) and the innovation process theory (e.g. Tidd & Bessant, 2009) we mapped the social networks of “resourceful innovation actors” from both inside and outside of the NP D team (Thomas, 2009) and explored social resources (e.g. new and useful ideas) exchanged by these actors at various stages of the NPD process. As a result, we gained a deeper understanding of innovation networks in SMEs and thus, of the interdependencies between the formal and informal dimension of NPD and the creation of sustainable competitive advantages.

Creation and Diffusion of Innovation by User-Firm-University Collaborative Networks: A Patent Analysis of a CT Scanner

Hamaoka, Yutaka
Keio University, Tokyo, Japan

Analyzing the Japanese patent data for a CT scanner whose users are highly knowledgeable doctors, this research examines the determiners of the creation and diffusion of innovation. We found that the patent grant probability of medical institution patents is significantly higher. Even though, that of individual doctor patents is not significantly different, that of doctor and firm co-patents is significantly higher. This indicates that individual doctors who have enough needs information, but less technological information, can be complemented by the technological information from firms. Among social network indexes, network constraint has a negative impact on the patent grant probability. Thus, we confirmed Burt (1992)’s argument that actors facing structural holes can utilize heterogeneous knowledge from sub-social networks that lead to innovation. A similar analysis was conducted for the number of patent citations. We found that university patents have more citations. The managerial implications are also discussed.

Structural Analysis of Information Sharing with External Stakeholders in NPD Projects

Jepsen, Lisbeth Brøde, Pedersen, Jens Martinus (1)(2)(3)
(1)University of Southern Denmark, Department of Environmental and Business Economics, Esbjerg, Denmark, (2)Unilyze, Odense, Denmark, (3)University of Southern Denmark, Department of Marketing & Management, Odense, Denmark

Adopting a social network analysis approach this study investigates how a Project Manager (PM) share internal information with employees of the company, and external information with suppliers and customers during the phases of new product development (NPD) projects. The empirical research is based on a unique dataset, the complete email exchange to and from the PM (consistent of 6415 emails). We compare two longitudinal NPD projects (each of approximately two years duration), split the data into four phases of the NPD project, and subsequently analyze the data using QAP analytical techniques to reveal any changes in the information sharing structure between internal and external stakeholders during the progression of the NPD project. The results show significant differences in the information sharing structures with suppliers and customers along the phases. In the early phase the network structure is much sparser than in the late phases. In other words, much more information is shared with (and between) the customer and the suppliers during the late phases of the NPD project. Building on the actual information sharing of a PM regarding two NPD projects, the results are interesting from a managerial perspective. Since in both the NPD projects examined, significantly more external relationships are established in the late phases of the NPD project. In other words, there seems to be much stronger need for PM’s the orchestrate information sharing with/between customers and suppliers during the last phases of the NPD project then previously suggested in literature.
The Social Networks of Innovation: Broad vs. Narrow Ideas
Björk, Jennie1, Bergenholz, Carsten2, Magnusson, Mats1, Frederiksen, Lars2
(1)KTH Royal Institute of Technology, Integrated Product Development, Stockholm, Sweden, (2)Aarhus University, Department of Business Administration, Aarhus, Denmark

It is a well-known fact in the innovation management literature that social network structures both constrain and facilitate ideation activities within firm boundaries. Still, recent research shows how the impact of social network structures varies across different contexts, depending e.g. on the complexity of knowledge involved and the outcome of the innovation. Although, at initial stages of the ideation process both the type of knowledge required and the final outcome is often unknown or at least unclear, while the aim of the innovation is known in advance. We introduce a distinction between broad versus narrow innovation ideas reflecting such aims and claim that different ideas are related to varying network structures. E.g., this may indicate, that categories of more narrow ideas are built on more densely structured networks. Our research is based on a large-scale dataset from a global high-tech firm involving more than 20.000 ideas submitted and developed via an online platform. Each idea is selected into different categories depending on the initial aim of the idea. Multiple levels of analysis are in play, since we rely on data on innovation categories containing: 1) multiple ideas, 2) the characteristics of individuals involved in the given ideation process and 3) the social network activities of these individuals. The dependent variables are based on the idea level. Our research objective is two-fold: We explore how different kinds of social networks develop around varying idea categories and explain how particular social network structures facilitate some ideas to fare more successfully than others.

Interdependencies between External and Internal Boundary Spanning in Corporate R&D
Cords, Steffen, Brennecke, Julia, Rank, Olaf
Albert-Ludwigs-University of Freiburg, Freiburg, Germany

Success of corporate R&D activities depends on researchers' connections that span firm boundaries and on their embeddedness in intra-organizational structures. However, studies investigating social relations in corporate R&D tend to focus either on external or on intra-organizational networks, neglecting interdependencies between the two. Drawing on theories of knowledge diffusion and attention, we argue that researchers' internal and external boundary spanning activities are unlikely to be unrelated. From a knowledge diffusion perspective, expertise gained externally has to find its way to the right places inside an organization. For instance, researchers engaged heavily in external boundary spanning might participate at multiple internal projects. However, it needs to be considered that extensive boundary spanning - whether externally or internally between projects - requires substantial attention from the part of the researchers. This poses a limit to their network activities and suggests that strategic considerations are required to make sound project-staffing decisions. Building on that, we empirically analyze how researchers' external boundary spanning influences their position inside the firm. We examine the relationship between researchers’ industry-wide co-patenting activities and their position in an intra-organizational project network. Applying ERGMs for affiliation networks, we show that the structural features of the project network of approximately 400 researchers working on more than 200 projects are influenced by researchers' external activities and interact with several other variables. Our study highlights the importance of jointly analyzing intra-organizational and external networking activities as they do not emerge independently and have both been shown to impact R&D outcomes.

Inventing Networks: The Evolution of Inventor Networks in the Research Triangle Park
Feldman, Maryann1, Menzel, Max-Peter2
(1)University of North Carolina at Chapel Hill, Chapel Hill, NC, United States, (2)University of Hamburg, Hamburg, Germany

Regional networks are needed to support collective learning processes that underlie inventive activity. Despite their importance, there have been few studies that consider how networks evolve and develop the properties that contribute to knowledge generation. Ter Wal (2011) conducted a retrospective study to analyze the evolution of networks of inventors in ICT and life science in the research park of Sophia Antipolis in Southern France. He constructed the network based on inventors listed on patent and compared geographical orientation of links, clustering coefficient, average path length and share of main component of ICT and life science over time. We apply his framework to networks of inventors in the Research Triangle Park (RTP) in North Carolina using USPTO data from 1980 to 2006. Both places have a similar history. Outward oriented branch plants of US based multinationals in ICT and life science shaped their beginning. Later,
both parks showed signs of endogenous growth dynamics. Ter Wal (2011) found collective learning processes in ICT, but not in life science. He argued that (missing) spin-off processes were responsible for this difference. In RTP, preliminary results also showed stronger indicators for collective regional learning processes in ICT than in life science. But both industries experienced extensive spin-off processes. Furthermore, the regional network in ICT rapidly grows by connecting dispersed components, while it forms around an organically growing main component in life science. Ter Wal, A. (2010) Cluster emergence and network evolution: a longitudinal analysis of the inventor network in Sophia-Antipolis, Regional Studies, http://dx.doi.org/10.1080/00343401003614258

**Path Dependency and Evolution of Research Collaboration in the Innovation System of the Turbot Industry of Galicia-Spain**

Troncoso-Ojeda, Rodrigo Alfredo¹, Rodríguez-Rodríguez, Gonzalo¹, Carrete Montaña, Jesús², Varela-Cabo, Luis Miguel², Ricoy-Riego, Carlos Javier³

(1)University of Santiago de Compostela, Department of Applied Economics, Santiago de Compostela, Spain, (2)University of Santiago de Compostela, Department of Physics of Condensed Matter, Santiago de Compostela, Spain, (3)University of Santiago de Compostela, Department of Economics, Santiago de Compostela, Spain

This paper attempts linked the concept of Path Dependency (PD) with the Social Networks Analysis (SNA) and the theoretical frameworks of the Innovation Systems (IS) to understand the evolution and performance of the institution which interacting to production new knowledge how support of the technological innovation and industrial competitiveness. We did two studies to understand the role of scientific knowledge in the pattern of the Turbot Industry of Galicia (TIG). The first is qualitative analysis, it is reference to the historical technological and institutional trajectories of TIG. We generated the historical path through different literature sources, historical background, statistics, and three in-depth interviews. We identified five stages in the development of the industry. 1) Start-Up; 2) Generating Critical Mass (first expansion), 3) Natural Selection, 4) Technological Autonomy (second expansion), and 5) Offshoring-Internazionalization. The second is quantitative on a mapping and analyzing the scientific networks of research collaborations. Using the ISI WoK database of all paper related to the species Turbot (Scophthalmus-Maximus) from 1970 to 2010. We mapped actors (institutions) and analyzed the evolution of the interaction in research collaboration. The results show that the linked of this both elements; Path Dependency and SNA, can help to explain the trajectories with a long time period and could support in the evaluations and design of STI policies.
Interlocking Directorates: Beyond the Boardroom

When Family Rules... Inter-corporate Networks through Family and Kinship Ties. Evidence from Chile and Italy

Cardenas, Julian¹, Guzman-Concha, Cesar²
(1)University of Antioquia, Medellin, Colombia, (2)Freie Universität Berlin, Berlin, Germany

Family and kinship ties have been almost forgotten by studies of corporate interlock networks. Corporate networks are mostly examined through the analysis of interlocking directorates -the relationship between corporations by sharing directors, and interlocking ownership -the relationship between corporations by sharing shareholders. However, when members of the same family or kin belong to two or more corporations, a relationship between corporations is created (interlocking family-kinship). This linkage is also a channel of communication and control which can be determinant in the formation of board interlocks. We re-construct the corporate network through the study of these three different types of interlocking in order to assess to what extent board and ownership interlocks are associated to family and kinship interlocks. This research compares the cases of Chile and Italy, which differ in the economic organization but share the central role played by family and kinship in the social organization.

The Position of Financial Elites in the Eurozone’s Corporate Network

Dudouet, François-Xavier¹, Gremont, Eric², Vion, Antoine³, Penalva, Elise⁴
(1)Dauphine University, IRISSO, Paris, France, (2)OPESC, Paris, France, (3)Aix-Marseille Université, Organization Studies, Aix-en-Provence, France, (4)Dauphine University, Paris, France

This original paper explores the structural embeddedness of the Euro Zone’s business worlds within and between its five main stock exchange indices: the AEX 25 (Netherlands), the BEL 20 (Belgium), the CAC 40 (France), the DAX 30 (Germany) and the S&P/MIB 40 (Italy) in the most recent period (2005-2008). From original data based on the composition of the companies’ boards every 31-st of December, we build a longitudinal interlocking directorate study of the figuration of European networks. We provide some evidence about the centrality of financial elites in the this corporate network, and this from three perspectives. Firstly, financial firms remain very central in national business worlds, from consolidating core investment and credit activities through stock exchange inner networks: Allianz and Deutsche Bank in Germany, BNP-Paribas and AXA in France, Mediobanca and Generali in Italy play such leading roles. Secondly, considering transnational interlocks, we also find a centrality of financial firms. This is due to a methodology that allows multi-level analysis and grounds the analysis of transnational interlocks from deeper national grounds. An original result is that the CAC companies, and especially the financial ones, lead every bilateral network, so that they seem to be the most attractive partners of the Euro Zone, with a growing influence in Belgium and the Netherlands. Thirdly, we show that directors with financial profiles are the most attractive in these networks. We complement this by more qualitative data about the profiles of these financial interlockers.

The Social Cohesion of the Corporate Elite: The Case of Finland

Gronow, Antti
University of Helsinki, Helsinki, Finland

The presentation argues that a fruitful way to analyze the corporate elite is to analyze its social cohesion. This concept consists of two components: the extent of similarity of social background and the density of connections. Thus, if elite members are both very similar and densely connected then their level of cohesion is high. I propose to examine both of these aspects of in the case of the Finnish corporate elite. First, I analyze the interlocking of corporate directorates. Second, I examine the social background of directors having many connections. The network data will consist of Finnish data of exchange-listed companies from 1985, 2000 and 2012. In order to analyze the other aspect of social cohesion, similarity of social background, information on the directorate members will also be collected with a special focus on the big linkers. This data - which has to do, for example, with their profession, education and membership in non-economic boards - enlightens not only the issue of similarity of background but also reveals the possible links between the corporate and other elite sectors. Elite analysis has often focused on either formal positions or the characteristics of the persons inhabiting these positions. I focus on both of these factors and, in addition, the ties existing between elite positions. Thus, the perspective employed in the proposed research is novel. In addition, Finnish researchers have remained surprisingly silent on issues of corporate interlocks; previous research was published in the 1980’s.
Women on Corporate Boards: Who Stays at the Center of Interlocking Directorates over Time?
Mayorova, Olga V.
Higher School of Economics, Management, Perm, Russian Federation

Since the 1970s, American women have been gaining access to power networks by becoming members of corporate boards. But until this day women occupy mostly peripheral positions in the elite circles despite strong effort to advance women's standing in the corporate sector. The goal of this study is to examine the factors contributing to the women's progress on the way to power by looking at the dynamics of memberships on boards of Fortune 100 companies in 1997 and 2010. Management literature suggests that low representation of women in male-dominated groups leads to female tokenism which then creates barriers for women's further advancement into leadership positions. Previous research has also pointed out that women's advancement in the corporate networks is impeded by the fact that women on corporate boards tend to come from outside organizations, while the majority of men are inside directors. Moreover, women directors are frequently occupied outside the corporate world running nonprofit organizations and consulting businesses, doing academic or government work, while majority of male directors are top corporate managers. Finally, women are less likely than men to occupy central positions in the policy-planning network which consists of business, government and nonprofit organizations. In this study, I investigate how woman's occupation, centrality in the policy-planning network, and her connections to other female directors and influential male directors in the 1997 network of interlocking directorates influence her position in the 2010 network of interlocking directorates.

The Limits of State Regulation: J.P. Morgan & Co.'s Interlocking Directorates and Social Club Ties
Pak, Susie¹, Halgin, Daniel²
(1)St. John's University, History, Jamaica, NY, United States, (2)University of Kentucky, LiNKs Center for Social Network Analysis, Lexington, KY, United States

In this paper we study the social and economic ties between elite investment banks and their clients. Focusing on J.P. Morgan & Co., the most important private investment bank in the United States before the First World War, the paper studies whether social ties, in the form of overlapping social club memberships, could compensate for the loss of formal economic ties, such as interlocking directorates, in the wake of the Clayton Antitrust Act (1914). This paper builds on a 2012 Sunbelt presentation by using new data that extends the time period of study and expands the scope of the study to include both client-relations and bank-to-bank relations. It also introduces a new comparative dataset of the social and economic ties of J.P. Morgan & Co.'s most important competitor, the German Jewish bank of Kuhn, Loeb & Co. As a case study of the relationship between the social and economic ties of elite American private bankers, the paper offers compelling evidence for why state regulation of formal economic ties is limited in its understanding of how financial communities are organized. It also serves as an example for how to expand the study of interlocking directorates to better consider the multiple ties that bind historical actors.
Interlocking Directorates: Network Formation

Detecting Communities within French Intercorporate Network
Elouaer-Mrizak, Sana, Chastand, Marc
Université de la Méditerranée, Marseille, France

People sitting on the same board have the possibility to meet and interact. Therefore, directors holding many directorships constitute a link between boards. Overlap in group membership allows for the flow of information between groups, and perhaps coordination of the group’s actions. In comparison to the body of literature on interlocking directorates, there are relatively few studies on the network of French interlocks. In our study, and to detect community structure within the French board network among the companies listed in the French Financial Index CAC40, we use the maximum modularity approach. To our knowledge, this is the only study on French interlocks that employees a maximum modularity approach. The main result is that the network shows a strong community structure. This is due to several reasons. On the one hand, we have the existence directors serving in several boards. Generally, this means that the ‘small world’ of French listed companies is actually split into identifiable communities. On the other hand, we have motives to control and reduce environmental uncertainty. Overlap in group membership allows for the flow of information between groups, and perhaps coordination of the group’s actions. According to Sonquist and Koenig (1975), interlocking among boards through common directors make easily coordination among firms. Lang and Lockhart (1990) justified that a firm creates a connection through an interlock to guarantee access to external resource. Our results show that main financial institutions are present among the large extracted communities.

A Comparative Analysis of the Dynamics of Interlocks among Immigrant Organizations
Gagliolo, Matteo, Lenaerts, Tom, Jacobs, Dirk
(1)Université Libre de Bruxelles, Group for Research on Ethnic Relations, Migration and Equality (GERME), Brussels, Belgium,
(2)Université Libre de Bruxelles, Machine Learning Group (MLG), Brussels, Belgium

Social capital is naturally embedded in social networks. In his famous work on the causal relationship between "bridging" social capital (e.g., associational life), trust, and civic behavior, Putnam [1993] did not investigate the structural aspect of such networks. Recently, the relationship between associational life and civicness of ethnic minority groups in Europe has been investigated [Fennema, Tillie, 2001; Jacobs et al, 2004; Vermeulen, Berger, 2008], without reaching uniform conclusions. In this work, simple structural properties of the network of interlocking directorates among ethnic associations are used as a proxy of the social capital of the corresponding minority group. We pursue this line further, arguing that more advanced models may consistently predict differences among the studied communities, and look at the structure of such networks, but also at the dynamics that produced it. Here we present results with a stochastic actor-based model, SIENA [Snijders, 2010], which estimates the effect of actor covariates and local structure on network evolution. We model the dynamics of the full two-mode network among directors and boards of voluntary associations, including the structural effects proposed by [Koskinen, Edling, 2012], and considering the political orientation of associations as a covariate. Using data from [Vermeulen, Berger, 2008], we compare the evolution of interlocks among Turkish associations in two European capitals, and explain the noticeable difference in structure by looking at statistically significant differences among the estimated effects. In the longer term we intend to relate the dynamics of these networks to the civic behavior of the corresponding communities.

How Network Effects Determine the Evolution of Interlocking Directorates
Heemskerk, Eelke M., Struijs, Ferdi
(1)University of Amsterdam, Dept Political Science, Amsterdam, Netherlands,
(2)City of Amsterdam, Amsterdam, Netherlands

In inter-organizational networks, some ties matter more than others because of their position in the larger network structure. We build a firm-oriented actor-based model of network change to test how such five endogenous and three exogenous effects drive network formation. We use the SIENA package of network analysis to apply our model on the network of interlocking directorates in the Netherlands over the past 15 years. We find strong results for endogenous effects. Homophily rather than preferential attachment is an important driver for interlocking directorates. And contrary to our expectations, firms do not seek broker positions in the network but prefer to have ties with firms that are already in their direct network neighbourhood. Strategic behaviour aimed at securing a good network position drives network formation. In this firms seem to prefer cohesive networks with the high-status business community.
Corporate Misconducts and the Dominance of CEOs in the Japanese Corporate Network

Konamitsu, Jun
Kyoto Sangyo University, Business Administration, Kyoto, Japan

The corporate world is full of scandals, misconduct and even financial corruption. Corporate control based on the dominance of CEO over other directors is thought to be related to the occurrence or frequency of corporate corruption. Furthermore, cases of corporate misconduct most often entail CEO replacements. In our study on corporate social capital and corporate misconduct, we measure the degree of corporate misconduct as CEO duration and introduce two control variables of CEO’s dominance: 1) the average age differential between a CEO and the other directors; 2) the age differential between a CEO and No.2 director. We also include a network variable (page rank centrality) of the corporation in the whole interlocking directorate network. We examine all registered Japanese corporations between 2000 and 2010 during which Japanese corporations were experiencing historical corporate transformations. Our findings suggest that high performance of firms free of corporate corruption is positively correlated with CEO dominance and not correlated with network centrality.

The Explanation Potential of Dynamic Modeling for Large Networks. The Evolution of the „Deutschland AG”

Krenn, Karoline
Humboldt-Universitaet zu Berlin, Social Science, Berlin, Germany

The concept of social embeddedness is for the moment one of the dominant theoretical approaches in economic sociology. Varying forms of organization and coordination are explained by cultural differences, institutions and social networks. Current critic on the approach concerning its negligence of economic dynamics (Deutschmann 2010) is refutable since recent developments in dynamic modeling allow longitudinal analysis of network data (especially Snijders 2005; Snijders et al. 2010). The explanation potential of dynamic modeling will be challenged by corporate interlock data. A dense corporate network accounted until the end of the 20-th century as a central institution of the German variety of capitalism (Beyer 2003; Krempel 2010). Recent analysis on the interlock formation showed that these dense interlocks formed in the end of the German empire (Windolf 2006; Krenn 2010; Krenn 2012) and reinforced itself during the plural crisis of the Weimar Republic (Marx/Krenn 2012). The presentation will focus on unpublished data on social mechanisms underlying this formation processes. Dynamic modeling has some benefits compared to cross analysis. E.g. it allows identifying reciprocity as a main mechanism although there is very little reciprocity in each year of exploration. Moreover some dominant cross-sectional business variables (sectors) suddenly lose their explanation effects and turn out to be k-star effects. On the other, dynamical modeling is well put to test for small datasets as with school classes. For large datasets (in this case more than 300 companies) it entails some difficulties (e.g. concerning model convergence) which equally shall be exposed.

The Evolution of Interorganizational Networks for the Community-Based Participatory Research: Effects of Network Structure and Organizational Attributes

Wang, Rong1, Tanjasiri, Sora P.2, Valente, Thomas W.3
(1)University of Southern California, Annenberg School of Communication and Journalism, Los Angeles, CA, United States, (2)California State University, Health Science, Fullerton, CA, United States, (3)University of Southern California, Preventive Medicine, Alhambra, CA, United States

There is a growing recognition that Community-Based Participatory Research (CBPR) is a promising approach to bridge the enduring divide between scientific research and community impact (Gonzalez et al., 2011; Valente, Fujimoto, Palmer, & Tanjasiri, 2010). CBPR encourages collaborative and equitable involvement of all partners in all the phrases of research, and integrates knowledge sharing and intervention to achieve mutual benefits. CBPP partnerships reflect the growing interdependence between community-based organizations and academic institutes. A critical question lies in evaluating the sustainability of the collaboration among all the partners. Guided by multitheoretical multilevel (MTML) analytic framework (Monge & Contractor, 2003), this study applies evolutionary theories to examine interorganizational networks in the field of CBPR (Aldrich & Ruef, 2006). Specifically, we examine whether partnerships between community based organizations (CBOs) and academic institutions are driven by network structure or organizational attributes. We use the stochastic actor-oriented model approach (Snijders, 2001; Ripley, Snijders, & Preciado, 2012) to estimate factors associated with tie formation and dissolution. The data are derived from survey responses of about 100 individuals aggregated to 16 organizations at 3 points in time over 5 years. This study makes two contributions to the study of interorganizational networks. First, it provides an empirical investigation of how the evolutionary theories can be applied to explain the dynamics of CBPR partnerships. Second, this study demonstrates how network structure and
organizational attributes play different roles in the processes of variation, selection, and retention of interorganizational networks. Implications for sustaining CBPR partnerships are drawn from the findings.
Interlocking Directorates: Policy Planning Organizations

French Business Leaders and Think Tanks
Comet, Catherine
University of Lille 1, Clerésé-CNRS, Villeneuve d’Ascq, France

Think tanks have experienced a significant development in France for 20 years. Some promote neoliberal ideas such as the Institut Montaigne, whereas some others are more progressive as Terra Nova. We aim at analyzing the involvement of business leaders in the boards of these organizations, in order to highlight their political mobilization. From the composition of the 70 main think tank boards in 2008, we investigate the network structure of board co-memberships. Then we focus on the position of business leaders in this network. Finally, we look at the role of executive and non-executive directors of the 100 main companies in France. Despite their heterogeneity, most think tanks are rather well integrated thanks to their common board members. And business leaders play a major role in this cohesion. They stand at more central positions than the other categories of members (political leaders, scholars, journalists, bureaucrats...). Furthermore the interlinkages among them are more cohesive and centralized. These results illustrate the relational proximity of the business elite with the political and intellectual elites in particular. But they also reflect a better capacity from business leaders to defend their own ideas and values through these organizations, generally talking in the name of a so-called general interest.

US Foreign Policy and the Policy Planning Network
de Graaff, Nana, van Apeldoorn, Bastiaan
Free University Amsterdam, Amsterdam, Netherlands

This paper looks at how the policy-planning networks (including think tanks, policy advocacy groups, research institutes) connected to key foreign policy makers and advisors in the Post-Cold War administrations (Clinton, Bush, Obama) have helped to shape the formation of grand strategy in each respective government. In our Social Network Analysis of the interlocks between these foreign policy makers and American as well as transnational policy planning bodies, we find continuity with regard to a strong core within the policy-planning network constituted by central and ‘centrists’ think tanks (most notably the Council on Foreign Relations, but also e.g. the Trilateral Commission). Yet we also find significant differences between the three administrations, with in particular the Bush network showing a high degree of distinctiveness due to close links to neoconservative think tanks such as the American Enterprise Institute. On the basis of a qualitative analysis of the ideas propagated by these different policy-planning bodies we analyze how the varying ties of each administration to them can help us explain the observed variation in grand strategy of these administrations. That these differences must be regarded as intra-elite differences is illustrated with the part of the paper that analyses the financial sources of these policy-planning bodies; showing how in terms of their funding they are strongly linked to dominant sections of US capital.

Capital Ties and Ownership in Germany 2012 Some Insights from the Bafin Database
Krempel, Lothar
Max Planck Institute for the Study of Societies, Cologne, Germany

While capital ties and directory interlocks among the largest German companies have decreased during the last two decades, the shareholder structure of listed companies and the major holdings of voting rights remains an interesting topic. We seek to identify central shareholders by analysing the public Bafin (government) database to which natural and legal persons are obliged to notify of the percentage of their holdings of voting rights as soon as they rise above or fall below certain threshold. This does not only allow to identify the structure of direct holdings but also indirect holdings that result certain financial instruments with which shares can be acquired.

Understanding Cross-sectoral Collaboration in Elite Networks: The German Energiewende
Mans, Ulrich1, Heemsberk, Eelke M.2, Volkert, Dolores3
(1)University of Amsterdam, Amsterdam, Netherlands, (2)University of Amsterdam, Dept Political Science, Amsterdam, Netherlands, (3)Institute for Advanced Sustainability Studies (IASS), Global Contract for Sustainability (GCS), Potsdam, Germany
Germany has one of the most ambitious energy policies world-wide. After the Fukushima catastrophe in Japan, the German parliament decided to abandon nuclear power supply by 2022 and in turn increase the level of renewable energy. From the beginning, this new policy agenda was framed as a collaborative effort, calling for the support from all stakeholders ranging from politics, business, science and civil society. While the targets are set, the implementation is up for discussion. This article presents the findings of an explorative study on the elite network that underpins the unfolding decision-making process in Berlin. In order to do so, we look at the personal interlocks that are created through the board members of a selected number of Energiewende-related initiatives. We then investigate the topology and characteristics of the network and offer a first assessment of the distribution of knowledge resources across its nodes. The findings show that the network is biased towards actors based in Berlin, but also draws from a large variety of professional linkages outside the capital. Furthermore, the network’s membership reflects the four main stakeholder types and therefore confirms the notion of collaboration being a central aspect of the Energiewende policy-making process.

Two Steps Forward, One Step Back: How the Financial Crisis Affected the Global Financial Elite Network

van Veen, Kees
University of Groningen, Faculty of Economics and Business, Groningen, Netherlands

The demise of ‘Lehman Brother Holdings Inc.’ in September 2008 triggered an unprecedented financial crisis. Worldwide, financial institutions had taken excessive risks and corporate governance systems failed massively. This crisis showed how national financial systems were interconnected and constitute a network of international financial dependencies. Before the crisis, the emergence of this global financial network went hand in hand with the emergence of a transnational business elite. Top executives with different nationalities started joining top management teams from different countries-of-origin. Simultaneously, board members come from different countries and when they combine multiple directorships, they constitute the individual building blocks of the transnational interlocking directorate network. The crisis, however, showed how many boards failed in their core tasks: controlling top management by stimulating healthy bank strategies and avoiding excessive risk taking. Financial institutions were forced to choose for substantial write-downs, capital raisings, and even nationalization. The crisis created an abnormal shock in the system and it is intriguing to study how this changed the nature of the global financial elite. Here, we study the global financial elite between 2006 and 2011. We analyze the boards of the 46 largest banks in the world. We analyze transitions in board composition and relate this to the amount of trouble each bank got into. Subsequently, we analyze how these differences in board dynamics have affected the transnational nature of the global financial elite in terms of its composition and its interlocking directorate networks.
Interlocking Directorates: Resources & Politics

The Changing Mosaic of Ties and Political Contributions: 1983-84 and 1995-96

Barnes, Roy C.; Burris, Val
(1) University of Michigan-Flint, Sociology, Flint, MI, United States, (2) University of Oregon, Sociology, Eugene, OR, United States

Fresh from a period of heightened political mobilization and promotion of a right-wing policy agenda during the late-1970s and early 1980s, the US corporate elite moved toward a more pragmatic and moderate political stance during the second term of the Reagan presidency, which began in 1985. To explore the shifting set of social relations associated with this new political posture, this paper begins by documenting the unique effects of social ties from corporate, civic, political policy, and social club affiliations on corporate directors’ centrality and social connectedness for the period between 1983-84 and 1995-96. The paper then examines whether and how these network-based attributes influenced patterns of political behavior as measured by contributions to Republican candidates and committees during the 1983-84 and 1995-96 election cycles. Lastly, the paper explores the manner and extent to which changes in the underlying mosaic of social network ties may have been implicated in the broader shift in political action by corporate elites during this period.

The Value of UK Corporate Political Connections

Cronin, Bruce
University of Greenwich, Business School, London, United Kingdom

The “revolving door” phenomenon of business leaders entering politics and politicians and civil servants joining corporate boards on retirement is assumed to provide business with a conduit of influence or information with government policy makers. But until recently there has been little attempt to quantify the value of this channel. The exceptions draw on techniques from financial economics, measuring the change in share prices associated with a new political connection. On a micro-level, Fisman et al (2006) found no effect of changes to Vice President Cheney's health on the value of firms he was associated. But macro-level studies have pointed to value in these connections. Fisman (2001) finds share price movements associated positively with the appointment of politicians to Indonesian boards. Examining 149 political appointments in a wide range of countries, Faccio (2006) found interlocks with politicians increases cumulative abnormal returns (CAR) in daily stock returns. In the US, however, Hadani and Schuler (2013) find the effect limited to regulated industries. In this study, I apply these methods to UK data, extending the study beyond the revolving door to the maintenance of relationships, rather than the quantum of donations as used by Hadani and Schuler. In contrast to Fisman's Indonesian case, the UK provides a highly developed business environment, less susceptible to rent extraction, but more general than the specifics of VP Cheney's personal interests.

Legitimacy, Rent, and Ideology: Three Drivers of Corporate Political Donations

Harrigan, Nicholas
Singapore Management University, School of Social Sciences, Singapore, Singapore

A study of corporate political donations in Australia, suggests that corporate political donations appear to be driven by at least three distinct forces: legitimacy-seeking, rent-seeking, and ideological conservatism. The tendency towards legitimacy-seeking is dominant amongst the most heavily networked and central 25-40 corporations. These companies abstain from donations because of the potential legitimacy costs associated with 'dirty money', and the many powerful interests implicated in any decision of one company. The tendency towards rent-seeking is dominant amongst the 400 largest corporations, who tend to donate to both major parties (hedge) because of their institutional interests in favorable legislation. The tendency towards 'ideological conservatism' is evenly dispersed across corporations of all sizes, but occurs in clusters suggesting influence or homophily is taking place.

Campaign Contribution Networks: A Case Study in the 2008 Taiwanese Legislative Election

Yen, Tso-Jung; Lee, Zong-Rong; Huang, Liang-Cheng; Hwang, Jing-Shiang
(1) Institute of Statistical Science, Academia Sinica, Taipei, Taiwan, Republic of China, (2) Institute of Sociology, Academia Sinica, Taipei, Taiwan, Republic of China
In modern politics, firms tend to invest in politicians who have ability to solve conflicts in the fields that the firms have interests in. When two firms contribute money to the same politician, a tie between the firms is formed. In this paper we investigate mechanisms behind the tie formation by analyzing campaign contribution records made by firms during the 2008 Taiwanese legislative election. We conduct a simulation experiment to show non-randomness of the campaign contribution network, and propose a dynamic regression model to identify factors behind the tie formation in the network. The results show that not only network structure but also organizational attributes embedded in the structure have impacts on collective behavior of the firms in allocating campaign contributions.

**Interlocking Directorates as Relational Resource**

_Zdziarski, Michal_

Warsaw University, Management Faculty, Warsaw, Poland

Considering relationships as resources enabling to create and to sustain the competitive advantage has been proposed by management and economic scholars from different theoretical traditions such as: new institutional economics (Coase, 1937), resource dependence theory (Pfeffer & Salancik, 1978), resource based view (Barney, 1991), relational view (Dyer & Singh, 1998). Interlocking directorates are among most popular indicators of relationships among companies. My inquiry is into opportunities of intentional creation of relational resources through interlocks. Based on the data on the interlocking directorates for all Polish listed companies I examine the possibility of purposeful actions to construct a board with plenty of relational resources. By doing this I aim to answer the question if interlocks are meeting the criteria for resources that enable to create and sustain the competitive advantage.
Inter-Organizational Networks 1

How Inter-Organizational Networks Can Become Path-dependent: Bargaining Practices in the Photonics Industry
Burger, Markus, Sydow, Jörg
Freie Universität Berlin, Management, Berlin, Germany

This paper investigates how path dependence may come about in inter-organizational networks. To do so, we focus our analysis on one particular type of network management practices - bargaining practices - and ask whether and how they can become path-dependent. Bargaining practices are recurrent activities through which network partners agree to identify and distribute their cooperative surplus. Targeting these practices, we first operationalize the core concepts of path dependence theory by deriving empirical indicators. We then use a 'pattern matching' approach to analyze whether these empirical indicators can be found in real bargaining practices. Empirically, we conduct three case studies of regional networks in the photonics industry, using qualitative interviews and content analysis to reconstruct the development dynamics of their bargaining practices. A major finding is that network bargaining practices can indeed exhibit inter-organizational path dependencies. This paper contributes not only by operationalizing the theory of organizational path dependence but also by extending this theory to parsimoniously explain the dynamics of networks.

Network Growth and Decline Processes in the Australian Medical Biotechnology Industry, 2004-2011
Gilding, Michael¹, Lomi, Alessandro², Lusher, Dean¹, Pattison, Pip³
(1)Swinburne University of Technology, Hawthorn, VIC, Australia, (2)University of Lugano, Lugano, Switzerland, (3)University of Melbourne, Melbourne, VIC, Australia

The observed structure of inter-organizational networks may be viewed as the evolutionary product of time-dependent processes of growth and decline. While growth processes have attracted considerable theoretical attention during the last two decades, processes of network decline remain more poorly understood. As a consequence, a number of conceptual models have been proposed of how networks might grow over time, but there has been little discussion of how networks might decline. The objective of this paper is to contribute to our understanding of network decline by examining the departure of nodes and the consequent loss of network ties. We frame the problem of network decline using on data that we have collected on the Australian medical biotechnology network between 2004 and 2011. The sample consists of all biotechnology firms in Australia, and their partnerships with each other, public research organizations, venture capital, government agencies, bioscience firms, and multinational pharmaceutical corporations. Between 2004 and 2006 the network grew and progressively declined thereafter. We rely on a variety of modelling approaches to explore different forms of exit of biotech firms from the system as well as tie dissolution. Our results point to systematic and intriguing patterns that help us to outline a theoretical account of network decline, informing our understanding of biotech firm failure with respect to nodal characteristics as well as failure as a network phenomenon.

Media Production as Organizational Constellations. Multiple Collaborations Networks and the Italian TV-ﬁction Production (1996-2009)
Odella, Francesca
University of Trento, Sociology and Social Research, Trento, Italy

The paper deals with inter-organizational networks in the media sector and reports results and methods from the analysis of collaborative relations referring to ten years of media production in Italy (1996 to 2009). The dataset includes information about Italian soap operas and television fictions, about their organizational structure of production (companies, directors and other professionals) and registers all the projects that involved alliances, or literature-defined constellations, of Italian and foreign TV-production companies. The analysis of such dataset involved two main aims: first, to describe the structure of collaborative projects and the characteristics of successful constellations, and second to highlight the role of the Italian media sector organization in creating and preventing opportunities of creative collaboration. On the methodological side the paper reports the application of correspondence analysis to 2-mode network data, exemplifying its utility for formulating hypothesis on the evolution of the collaborative relations and to orientate the analysis of the domestic and international constellations. In the final part of the paper are discussed specific time-related methodological problems experienced in the analysis of this longitudinal networks dataset.
When Enemies Help and Friends Hinder - Competitive Implications of Inter-organizational Mobility in the “Palio di Siena” (1743-2010)

Operti, Elisa, Sgourev, Stoyan V.
ESSEC Business School, Management Department, Paris, France

A core finding in mobility research is that the gain or loss of key employees shapes a variety of organizational outcomes, including survival rates, capabilities and knowledge. However, studies typically do not account for the type of inter-organizational ties linking the source and recipient organization. Looking at these ties as “pipes” through which resources flow, we propose that moves of key employees between firms linked by a negative inter-organizational tie (i.e. rivalry) may enhance the recipient’s performance by facilitating the access to practices and competitive tactics developed by the rival. By contrast, when a key employee is hired from an ally, inter-organizational ties act as bonds that foster identification with both the source and the recipient. The resulting “split” loyalties limit the resource flows and reduce the set of practices that the employee can utilize in her new role, hurting the performance of the recipient. These conjectures are substantiated in an analysis of a unique historical dataset on the world-famous, biannual horse race in Siena, Italy (“Il Palio”) for the period 1743 to 2010. Siena is organized around 17 neighbourhoods (contrade), representing self-standing units pursuing the objectives of mutual aid provision and Palio-organization. The contrade maintain a set of alliances and rivalries to secure resources. We reconstructed the inter-organizational networks of alliances and rivalries between “contrade”, using them to shed light into how jockeys’ mobility across allies and enemies affects the performance of recipient contrada. The analysis controls for horse, jockey and contrada characteristics expected to bear on performance.

A Multilevel Model to Predict Organizational Turnover

Weng, Cindy1, Leavitt, Alex2, Reinecke, David2, Clark, Joshua2, Sullivan, Sophia D.4, Williams, Dmitri2, Contractor, Noshir5
(1)School of Communication, Northwestern University, Media, Technology and Society, Evanston, IL, United States, (2)Annenberg School for Communication, University of Southern California, Los Angeles, CA, United States, (3)Princeton University, Department of Sociology, Princeton, NJ, United States, (4)Northwestern University, Industrial Engineering and Management Sciences, Evanston, IL, United States, (5)School of Communication, Northwestern University, Evanston, IL, United States

The increase in mobility among individuals between organizations has made the study of turnover increasingly salient. Historically, the preponderance of research has focused on explaining turnover based on individual level attitudes such as job satisfaction and organizational commitment (Bluedorn, 1982). Others have considered organizational level characteristics such as profitability and individual demographic characteristics such as level of, or homophily in, age and tenure (Wagner, Pfeffer, & O’Reilly, 1984; McPherson, Smith-Lovin & Cook, 2001). Additionally, there have been efforts to offer network explanations such as structural equivalence, social influence and erosion for turnover (Feeley, 2000; Feeley & Barnett, 1997; Krackhardt & Porter, 1986). There has been a very limited attempt at positing and empirically testing a multilevel model of turnover that takes into account organizational, network and individual level explanations. Part of the reason is the empirical challenges associated with testing such models. We address this challenge by studying turnover among individuals belonging to corporations in EVE Online. EVE Online is a massively multiplayer online inter-galactic game where individuals organize themselves into corporations that engage in diverse activities such as mining, manufacturing and pirating. Using comprehensive, population-based, longitudinal data from eight years of organizational level characteristics, individual demographics, as well as in-game communication networks, we test a multilevel model that explains turnover practices around joining and leaving corporations in EVE Online.
PARTNERships in Inter-organizational Public Health Collaboratives
Bevc, Christine A.1, Retrum, Jessica1, Varda, Danielle2
(1) University of North Carolina - Chapel Hill, North Carolina Institute for Public Health, Chapel Hill, NC, United States, (2) University of Colorado, Denver, CO, United States

In a response to scarce public resources, there has been an increase in inter-organizational and multi-sector collaborations to address population needs. However, there is only minimal evidence and research to understand how and why such collaborative efforts are or are not successful. The study of inter-organizational networks is important and understudied in the realm of social, health, and public health systems research. The lack of considerable evidence-based research using inter-organizational networks from public health collaborations stems from a selection of case studies of only single or small collections of networks. In an effort to document the importance of inter-organizational coalitions on population health, this study examines data collected by PARTNER, a social network analysis tool designed for practitioners, funded by Robert Wood Johnson Foundation, to measure and monitor collaboration among organizations, to review an unprecedented number of public health collaborative networks (n=162) to better understand structured relationships and patterns of interaction among “actors” and their partners (combined total of 3,544 organizations) related to collaborative activities. More specifically, this research addresses the composition of public health collaboratives (i.e. who are more or less likely to be a part of a collaborative), as well as potential partner preferences across these networks. This study presents a summary of network descriptives and homophily/heterophily models to describe the observed inter-organizational relationships. Results of this study and implications for future practice research directions will also be discussed.

Religious Communities as Builder of Interreligious Social Capital?
Körs, Anna
Universitaet Hamburg, Academy of World Religions, Hamburg, Germany

Inter-religious dialogue is to be considered as key issue for preventing conflict and supporting peaceful coexistence in a pluralistic and heterogeneous society. This is also expressed by the great efforts that have been made by inter-governmental organizations developing practical guidance and policy recommendations. For example the governments of the 47 member states of the Council of Europe (2008: 24) emphasized the relevance of interreligious dialogue in a “White Paper on Intercultural Dialogue” by stating: “Interreligious dialogue can also contribute to a stronger consensus within society regarding the solutions to social problems”. But what does this mean concretely? To what extent are religious communities actually in contact with each other and what are their potentials for creating interreligious social capital on a local level? The paper draws on the results of a quantitative questioning of religious communities in Hamburg carried out within the project “Religion and Dialogue in Modern Societies. Interdisciplinary and internationally comparative studies on the possibilities and limitations of interreligious dialogue“ funded by the German Federal Ministry for Education (BMBF).

Empowering partnerships? How inter-organisational networks create low-carbon development paths for Central America
Kruckenberg, Lena
University of Leeds, School of Earth and Environment & Business School, Leeds, United Kingdom

This paper investigates the role of inter-organisational networks in creating low-carbon development pathways, and critically analyses what kinds of network relationships drive, facilitate or inhibit the sustainable adoption of renewable energy technologies (RETs) in the Central American region. It contributes to a better understanding of the co-evolution of RET markets and the organisations that populate them. Based on an ethnographic study of the ‘everyday’ practices of inter-organisational alliances in emerging RET markets, this paper uses renewable energy projects as points of entry into overlapping 'project networks': Inter-organisational networks linking rural entrepreneurs and their associations with NGOs and bilateral assistance agencies; technology manufacturers with R&D planners and utility companies; and government bodies with communities, regional agencies and international financial institutions. Organisations are embedded in various alliances and participate in markets heavily influenced by the aid industry. Professional networks create webs of cross-cutting affiliations on the interpersonal, organisational and inter-organisational level. This paper sheds light on the implications of these manifold ties on the creation and growth of a low carbon technology sector. It
shows that the network dynamics underlying RET projects make an important difference with regard to their ability to successfully initiate and institutionalize more sustainable development paths involving renewable energy technologies.

The Network Structure of Learning Mechanisms: The Case of Organic Wine Producers

Montes-Lihn, Jaime

Paris-Dauphine University, Paris, France

Conversion into organic farming among wine producers in the French Burgundy Region has developed rapidly over the past ten years. In this mode of production, wine producers deal with non-routine technical problems that they solve collectively. They are also in a crossroad regarding the definition of the profession itself. A complete network of over 50 organic wine domaines from a wine terroir in Burgundy has been analyzed in order to understand the learning mechanisms at an inter-organizational level. Organic wine producers face specific risks with deep economic impact. Through advice seeking, they co-construct appropriate information to make strategic and on a day-to-day basis decisions. ERGM analysis have been used here to understand the social context as well as the organizational characteristics that are relevant in the definition of an informed decision.

Use of Information Networks as Driver for International Organizations' Effectiveness: The Case of Turkish Policy Officials and OECD

Unay Gailhard, Ilkay

IAMO, Leibniz Institute of Agricultural Development in Central and Eastern Europe, Halle (Saale), Germany

At the Organisation for Economic Co-operation and Development (OECD) decisions concerning who conducts the OECD work for member states are left to the member countries. The decision making of national institutions on the relevant policy officials has been quite diverse amongst the member states. In this study, social network approach is used to investigate the role of institutional attributes to the use of OECD information networks by member state policy officials. The analysis was carried out with using a data set covering 126 Turkish top-level policy officials work for OECD in 2010. Member state officials interact with four main actors in OECD information networks: national institutions, member state permanent delegations, OECD committees and OECD secretariat. The study examines the structure of national institutions and the influence of three organizational attributes on the use of OECD information networks: the regularity of officials' OECD meeting participation, the degree of specialization of policy officials in OECD topics and the degree of priority setting to OECD work in terms of officials' tasks. The results show that the use of information networks is highly associated with the attributes of regularity and priority. However, contribution to the information exchange via communication with other national officials is low for the actors with the high levels of the regularity and priority attributes. Therefore, it is not surprising that most policy officials are in favour of more information flows at national level in order to achieve an efficient use of OECD studies for national policy work.
Network Analysis of Football Transfers: Strength of Player Transfer Ties and Club Success

Ganesh, Jai
Infosys, Infosys Labs, Bangalore, India

Football player transfer is an activity where a player under contract moves between football clubs. Players move from one professional club to another during a specific transfer window during the year and under the rules and regulations stipulated by the regulators governing the sport. The motivation for this research is to 1. understand football player transfers from a network perspective and understand how well are football clubs connected to each other, 2. examine the ambition of clubs as indicated by player transfers and understand football club philosophy with regard to player transfers vs. nourishing home grown talent, 3. understand the role played by football transfers in the success or failure of clubs. The transfer data during May 31, 2011-March 1, 2012 was obtained from ESPN Soccernet and consisted of 1824 global player transfers, 365 nodes (each node is a football club) and 1456 edges (the edges represent the player transfers). The data comprises of loan signings as well as permanent transfers across football clubs belonging to various leagues in the UK such as Barclays Premier League, Championship league, League One, League Two as well as several lower leagues. We split the transfers into two data sets: loan signings and permanent transfers and do separate analysis for both. The analysis reveals strong connections through player transfers between top ranked clubs in the top football leagues. The highly connected nature of clubs in the second leagues as seen from their transfer market activity depicts their ambition to perform at a higher level.

Corporate Reporting of International Alliances: CSR Partners Communicated in Corporate Websites and Annual Reports

Guth, Kristen L.
University of Southern California, Annenberg School for Communication, Los Angeles, CA, United States

This investigation explores the impact of homophily and assimilation on corporations’ alliance choices for corporate social responsibility (CSR) activity with governmental and non-governmental organizations (known as corporate social responsibility organizations, or CSROs). A sample of the top 100 corporations from Forbes Global 2000 and their CSR alliances, a type of strategic communication, with hundreds of CSROs from their corporate websites and annual reports were examined. Data were analyzed with exponential random graph models. This research demonstrates that all corporations were more likely to give resources rather than adhere to standards of a CSRO. Western corporations were more likely to report alliances with non-governmental CSROs than governmental CSROs. Western corporations were also more likely than non-Western corporations to report alliances with non-governmental CSROs. U.S. based corporations were more likely to form CSRO alliances than corporations based outside the U.S. Finally, the relationship between corporate locations and CSRO locations will be examined and mapped. Results are discussed with an emphasis on geo-political and geo-spatial proximity among corporate alliances with CSROs and the impacts of this network of alliances on global development.

Boards of Trusties in German Higher Education Institutions

Houben, Daniel
RWTH Aachen, Dept. for Sociology, Aachen, Germany

Since the establishment of university boards in the German higher education system several years ago there has been an ongoing debate about the possible merits and pitfalls of external or even non-academic organizations engaging in university governance. Supporters welcome the outside perspective of board members whereas opponents claim it to be a giant leap towards a neoliberal commodification of education. Only very little research on the structure and effects of these German corporate-university ties has been conducted so far (Bogumil 2007). Therefore we examined the university boards of major and minor public funded German universities in order to answer the following questions: 1.) What kind of corporate-university networks did emerge? How can their structure be described and analyzed in terms of centrality, interlocks and blocks? 2.) What kind of organizations and professions are most likely to be found on university boards? 3.) Do certain industrial sectors tie up with certain universities, for example technical schools? Does the corporate elite particularly link to the elite universities or is there a more local orientation at work? 4.) What kind of one-mode interorganizational networks can be deduced from the two-mode interlocking directorates for industrial, non-profit and research organizations? Our presentation will address the key findings, contrast them to the seminal work of American
and Canadian Colleagues (Useem 1981; Carroll, Beaton 2004) and demonstrate the benefit of a SNA-approach while also stressing the importance of further, more qualitative data.

**Network and Adaptiveness and Capacity: Use of Social Network Analysis**

*Kapucu, Naim*

University of Central Florida (UCF), Orlando, FL, United States

His presentation focuses on the interorganizational networks and adaptive capacity among nonprofit organizations in a southeastern state. In broad terms, adaptive capacity is defined as a function of interorganizational social capital and learning at the organizational and network level. The study examines the role of preexisting friendship ties and past collaborative dyadic ties on building new collaborative ties among small nonprofits. We used quadratic assignment procedure (QAP) to analyze relational data that was collected as part of a federally funded project. Findings support the literature, showing that organizations are likely to revitalize their past collaborative ties due to a high level of trust and positive reputation. Preexisting friendship ties, on the other hand, had a relatively weak influence on nonprofit collaborative dyadic tie building. The study contributes to the use of network analysis in a context of nonprofit capacity building.

**Emergence of Public Private Partnership Networks in the Turkish Health System**

*Öztas, Nail*¹, *Kesgin, Selman S.*²

(1)Gazi University, Public Administration Department, Ankara, Turkey, (2)Gazi University, Public Administration Department, Beşevler, Turkey

This study examines the emergence of network organizations in the Turkish health sector. In recent years, around the world, the emergence of network forms of goods and services production and delivery have been promoted. Influenced from this world-wide trend, as a public policy, in areas such as education, development and health the Turkish state has been encouraging the formation of networks of public and private organizations. The network organization is often described as an alternative for conventional government and market based models of public goods production and delivery. One form of frequently observed type of network in the public sector is called Public-Private Partnerships (PPP). PPP is defined as cooperative institutional arrangements between public and private sector actors to produce and/or deliver public services. This work focuses on the emergence of PPPs in the Turkish health sector. It tries to capture the changes that both has been taking place and also is required during such a transformation. Via semi-structured in depth interviews conducted with public and private partners of the new PPPs this study aims to explore the differences between traditional public organizations and networked public organizations. The two specific questions that this paper focuses on are: Why network form of organizations emerged in public administration? The political-economy of public private partnerships i.e. the political question. Can the network organizations respond to the complex issues of service provision and democracy at the same time? The capacity of public private partnerships i.e. the organizational question?
Female Entrepreneurship and Intra-organizational Networks: A Comparative Study

De Vita, Riccardo¹, Pais, Ivana², Manzo, Cecilia³, Bolis, Michela²

(1) University of Greenwich, International Business and Economics Department - Center for Business Network Analysis, London, United Kingdom, (2) Università Cattolica del Sacro Cuore, Milano, Italy, (3) Università degli Studi di Firenze, Firenze, Italy

This paper discusses the impact of the gender of the entrepreneur on the structure of intra-organizational networks in small enterprises. Existing studies showed that male and female entrepreneurs employ different managerial styles, which are likely to affect the relational networks linking the members of an organization. Network research, however, mainly focused only at the level of personal networks of men and women, identifying gender specific mechanisms characterizing the creation of, and the access to, networks within organizations. Moving from these findings this study explores whether the gender of the entrepreneur is associated with specific network properties at different levels. Hypotheses about three aspects of intra-organizational networks are developed and tested: the position of the entrepreneur; the global structures of the networks; the perceptions of the members of the organizations. Employing a comparative approach, the informal networks in four small businesses in Italy are analysed. Standard SNA measures are complemented by the analysis of the Cognitive Social Structures (CSS) in the four firms, in order to detect the influence of gender specific managerial styles on the perceptions of employees about the existing organizational networks. Even if exploratory, this study has the potential to contribute to both the advancement of knowledge about the relationship between gender and networks, as well as to put forward some practical implications, given the high importance of female entrepreneurship in the political agenda of several countries. Moreover it offers an interesting application of CSS data collection and analysis techniques in a comparative setting.

Analyzing Spain Soccer Team through the Lens of Network Analysis

Dharmawirya, Mathias

Binus International, Binus University, Jakarta, Indonesia

Analyzing the strategy of a soccer team is never as simple as looking at the formation it registered before the match. However, with more match data being collected and made available, it is possible to make use of statistical methods to dig deeper to understand how a team is operating. One of the methods is called social network analysis which is originally a sociological strategy to investigate social structures. Although originated from the field of sociology, it has been also used in other fields including in sports. In order to estimate the importance of individual players, we analyze the passing distribution data of every match that the Spain soccer team played in European Cup 2008, World Cup 2010, and European Cup 2012 soccer tournaments. Using network analysis method, we quantify the significance of individual players and their contribution to the team. We also analyze Barcelona matches in the UEFA Champions League tournament to investigate the similarity between the two teams as most of Barcelona first team players which are of Spain nationality are also members of the national team. One of the findings suggested that Xavi is the key player in the Spain national team. This is in agreement with what many sport analysts have suggested over the years. This indicates that the use of network analysis approach could be useful in quantifying the importance of individual players, especially when analyzing a team which has less exposure.

The Impact of Tie Multiplexity on the Behavioral Intention towards the Adoption of Organizational Change. The Case of the Hotel Industry

Hadjidis, Dimitrios, Parker, Andrew

Grenoble Ecole de Management, Grenoble, France

Numerous scholars have contributed to the discussion of tie multiplexity in organizational networks. However, previous research on tie multiplexity is characterized by its variance and subjectivity in approaching and interpreting the issue. This research further develops the extant theoretical knowledge base regarding tie multiplexity and the way it affects an individual’s behavioral intention towards the adoption of organizational change. The underlying theoretical basis of this research is that tie quality can be defined using the SERVQUAL’S TERRA dimensions. These dimensions define the strength of a dyadic relationship based upon five categories: Tangible, empathy, responsiveness, reliability and assurance. Furthermore, we seek to understand if aspects of an individual’s work environment such as customer contact and role have a moderating affect on the relationship between tie multiplexity and behavioral intention towards organizational change. In addition, we examine the extent to which job satisfaction and change readiness mediate the
relationship between multiplex ties and the behavioral intention towards organizational change. In a study of 100 hotel employees, employed in six hotels in Thessaloniki, Greece, we show that tie multiplexity, as a multidimensional construct, affects favorably an individual's behavioral intention towards the adoption of organizational change. Additional results highlight the roles of job satisfaction as a mediating variable and customer contact as a moderating variable between tie multiplexity and behavioral intention towards organizational change.

Organizational Tribalism in Online Social Networks and Variations in Employee Response to the 'Lehman Shock'

Howard, James D¹, Honda-Howard, Motoko²
(1)Meiji University, School of Business Administration, Tokyo, Japan, (2)Showa Women's University, Tokyo, Japan

Much research has been conducted over the past decade on the various occupational subcultures that exist in today's organizations and the different ways in which their members interact with peers. There has also been increased interest in recent years in using social network analysis (SNA) techniques to better understand the nature of the relationships between members of a group. While this research has traditionally been done using questionnaires, the advent of social networking sites such as Facebook and LinkedIn provide alternative sources of self-reported data researchers can use to map out and analyze relationships. We decided to see if there were any significant differences in the network topologies of two occupational subcultures in the Japan Branch of the former Lehman Brothers (the Finance and IT Divisions) by first, using LinkedIn connections to build a dataset of close to 150 individuals who belonged to one of these two “tribes”. Next, we performed SNA on this dataset, identified a number of differences in the networking structures of the tribes, and used information gathered from interviews with members of each tribe to describe the factors behind the key differences. And lastly, we used these insights to compare the main differences in how these two tribes reacted to the bankruptcy of the firm in October 2009 and its subsequent acquisition by Nomura Securities.

Dual Paths to Higher Individual Performance: Social Embeddedness Theory Revisited at the Individual Level

Waldstrøm, Christian¹, Shah, Neha P.², Parker, Andrew³
(1)Aarhus University, Aarhus, Denmark, (2)Rutgers Business School, Newark, NJ, United States, (3)Grenoble Ecole de Management, Grenoble, France

Scholars have long been aware of the advantages to performance when colleagues share work information. We know less about the implications of multiplex ties such as when the sharing of work information is combined with that of non-work information. We contrast social embeddedness theory with that of a market theory of information exchange, to explain how ties that include both work-focused and non-work-related discussion might produce different consequences from ties that include only work information. In our study of 154 people in an international bank, we show that there are two paths to better performance. First, there is a positive linear association between employees with many work-only ties and higher performance. Second, there is a curvilinear relationship between multiplex work-friendship ties and performance. Having some multiplex ties is a good thing, but having too many ultimately has a negative effect on performance. In addition, we find that the path to higher performance differs by the amount of time people have been in an organization. Those with low tenure outperformed colleagues with a moderate number of multiplex ties. Whereas, for their high tenure colleagues, multiplex ties had little effect.
Intra-Organizational Networks 2

Communication Networks and Innovation Success: Comparing the Cases of German Mechanical Engineering Companies
Basov, Nikita¹, Wühr, Daniela²
(1)St. Petersburg State University, St. Petersburg, Russian Federation, (2)SF Munich e.V., Munich, Germany

A key source of innovation is collaboration of actors within and between organizations. A deeper understanding of the relations between innovation and collaboration implies revealing the linkages between various types of communication structures and innovation success. In our contribution we empirically explore how intra-organizational network communication structures influence the success of innovation projects. To do that we run cross-case analysis of 4 German medium-sized mechanical engineering companies, which are successful innovators and market leaders. First, drawing on 57 guideline-oriented interviews we map network communication structures developed by project participants of each company in the product innovation process. Second, we identify profiles of companies’ innovation success categorized in ‘economic’, ‘technical’, ‘social’, and ‘organizational’ dimensions. Third, comparing the cases we look for interdependencies between the dimensions of innovation success and specific network configurations using such measures as centrality and centralization, constraint, density, as well as the relation of strong and weak ties, both for formal and informal communication structures. The results question existing consensuses and show that sometimes large amount of communication lowers innovation success, decentralization does not always benefit innovation projects and higher constraint levels may rise innovativeness of actors. We also explore which actors take the key communication network positions in successfully innovating companies. Finally, we discuss the results of correlation and regression analysis done to give an insight on the relations between informal and formal networks and innovation project success.

Intra-party Networks in the German Bundestag, 2005-2012
Baumann, Markus, Nyhuis, Dominic
University of Mannheim, Mannheim, Germany

The literature on party behavior and organization has generally accepted intra-party groups and factions as relevant factors in shaping party competition. However, the difficulty of empirically grasping intra-party organizations has largely led studies to assert that intra-party groups and factions are present, while empirical evidence on their composition and scale is rare. To fill in this gap, the present paper conducts a Social Network Analysis and exploits information on co-sponsorship of written parliamentary questions in the 16th and 17th German Bundestag. While networks within parties may result from various structures and shared characteristics of MPs such as age, gender or regional provenience, intra-party groups are generally considered to form around shared policy principles. Thus the present study seeks to disentangle policy-driven factors from structural factors determining network patterns. This allows systematically identifying and distinguishing intra-party organizations, yet drawing conclusions on which factors underlie the formation and persistence of intra-party groups.

The Dynamics of Informal Communication Networks in Large Distributed Teams: A Longitudinal Study
Gargiulo, Martin¹, Greve, Henrich¹, Gopalakrishnan, Gopakumar²
(1)INSEAD, Singapore, Singapore, (2)Infosys Technologies Ltd, Bangalore, India

The ability to communicate and coordinate and share knowledge across locations is essential to the performance of geographically distributed project teams. Informal networks play a crucial role in facilitating this communication. The communication and coordination requirements of the project, however, evolve with the functional requirements of the project, as well as with the flow of personnel coming in and out of the team. To effectively facilitate the communication and coordination among team members, informal networks must accompany the evolution of the project through its different phases, creating and dropping ties as needed. Yet, the structural inertia that characterizes informal network structures may a times hinder the adaptation of the network, which in turn can affect the effectiveness of the team. This study reports preliminary results on the evolution of the informal networks among all the members of a distributed team in charge of a large scale software project. The study comprises three waves of network data collection with more than 95% response rate. Preliminary results show that despite inertial tendencies, the informal network largely evolved to match the functional requirements of the project, suggesting the primacy of task interdependence in the formation of instrumental informal networks. However, we also find evidence of social barriers that could hinder the adaptation of the network under some specific circumstances.
Guanxi Circles in the Chinese Workplaces

Luo, Jar-Der

(1) Tsinghua University, Sociology, Beijing, China, (2) Chinese Network for Social Network Studies, Beijing, China

Following the thinking of ‘inner-group’ social exchange in LMX theory, this paper proposes a Chinese network structural phenomenon—the guanxi circle, and analyzes its influence on organizational trust. Briefly speaking, a guanxi circle is an ego-centric network with a structure of differential modes of association. There are three dynamic processes that make a Chinese guanxi operation flexible. One process is that a Chinese actor needs to balance the motivation of expressive and instrumental exchanges in guanxi. Another process is that he or she may dynamically move guanxi in and out of the inner rings of his or her ego-centered network. Lastly, this person, if he or she is a leader of a guanxi circle, needs to balance the interests of those both within and outside the guanxi circle to ensure the harmony of the larger social network. As our data analyses show, these guanxi operations produce a ring of periphery circle members, which is different from the inner core of the guanxi circle and outsiders in organizational behaviors. This middle ring makes a guanxi circle not closed, and maintains room for flexible operations.

Intra-Organizational Networks and Organizational Learning in Public Administration - Case Study form Poland

Ploszaj, Adam

University of Warsaw, Centre for European Regional and Local Studies (EUROREG), Warszawa, Poland

The aim of the paper is to characterise the influence of the intra-organizational networks on organizational learning processes in 4 central government organizations in Poland. The analysis is based on a large-scale empirical research. Quantitative data was collected through a computer assisted web interview with employees of the 4 Polish ministries. 1731 questionnaires were collected, yielding a response rate of 51%. Cooperation and advice networks as well as different aspects of organizational learning and knowledge management were measured in the survey. In addition the survey measured a number of contextual aspects (control variables), such as leadership, human capital, availability of resources, procedures, etc. The data were analysed at the level of organizational units (89 units). Factor analysis was used to reduce large number of explanatory variables and to help understand the dimensions of organizational learning in different types of units. Finally, these dimensions were compared with network measures to examine relationships between intra-organizational networks and learning performance at the level of organizational units.
An Activity-based Role Concept for Organized Business Networks

Hammer, Ingmar
University of Heidelberg, Heidelberg, Germany

How can business groups face the key challenge to learn and develop new knowledge? How can business firms as members of those groups gain advantage from this collective generated knowledge? Classic flow models (tertius jungens, tertius gaudens, closure) consider innovation and learning from the point of transferring knowledge between group members. From the viewpoint of knowledge development, the challenge is to generate new knowledge through intense interaction, bringing in new ideas is just one perspective. Therefore I offer an activity-based model of different roles in business groups. A business group is an organized network where firms are members to pursue collective goals. To generate new knowledge, members of organized networks have to take at least five different formal or emergent roles: (1) members who bring in problems, (2) members who participate in collective development, (3) members who participate in lateral governance, (4) members who coordinate formal project groups and (5) members who save and memorize tacit project knowledge. Classic flow concepts are important at the border between organized networks and the member firm where network participants serve as gatekeepers between network and firm. To maximize learning goals, member firms should identify competence teams who strategically participate in the collective development of knowledge within the organized network. Otherwise member firms risk not to absorb the collective generated knowledge. In this paper I conceptualize the described role concepts. In a second step I investigate the role concepts with sna-methodology in an international organized network.

Comparing advice networks: an approach grounded in a theory of social processes

Lazega, Emmanuel1, Jourda, Marie2
(1)Sciences Po, Paris, France, (2)CEPEL-CNRS, Montpellier, France

We explore a theory-grounded comparison between substantively similar networks measured across different types of social settings. Substantive similarity is defined as measurement of the same social process. We use advice networks measured in comparable organizational contexts to interpret differences in structure - both local and global - as indicators of variations in social learning processes in these contexts.

Does Diversity Create Diversity? A Multilevel Model of Multidisciplinary Collaborations (MDCs)

Mo, Guang Ying
University of Toronto, Department of Sociology, Toronto, ON, Canada

Few researchers would doubt that diversity can lead to innovative and productive outcomes in organizations. In the context of scientific research, disciplinary diversity is the primary form of diversity. When funding agencies and research institutions initiate multidisciplinary collaborations (MDC), they recruit researchers from various disciplines and require them to work together, assuming that MDCs will lead to great achievement and advances in a particular field will be fostered. This study aims to elaborate upon the effects the multidisciplinary design on collaborators’ practices and interactions across disciplinary boundaries. I raise three specific hypotheses: (1) Do research projects designed with greater disciplinary diversity increase interactions among collaborators across disciplinary boundaries? (2) Do higher statuses of researchers, due to such factors as seniority and role in the organization, increase their multidisciplinary interactions? (3) Does the MDC design of research project moderate the effects of status on multidisciplinary interactions? To test the hypothesis, the study surveyed 120 collaborators in 32 projects in GAND, a Canadian research network. Attempting to show how formal ties formed through organizational arrangement shape the informal ties developed among individual members during collaborations, I use social network analysis to approach the hypotheses. Furthermore, I develop a Hierarchical Linear Model to understand the mechanism between disciplinary diversity at the group level and cross-disciplinary ties at the individual level. The results show that the disciplinary diversity designed by the research organization does not directly influence collaborators’ practices. However, it reinforces the effects of researchers’ status on their informal ties across disciplines.

Multiple Knowledge Exchange Networks in a Biotechnology Consortium: Balancing Knowledge Generation and Knowledge Protection through Network Structure and Type of Knowledge Exchange
Interorganizational knowledge exchange (KX) networks are important drivers of innovation since new knowledge is often found outside of organizational boundaries. However, KX entails a complex duality. It involves striking a balance between two opposing forces: searching for exchange opportunities versus protecting one’s own knowledge. The ways organizations balance this duality has been under-theorized and rarely empirically examined. We utilize both qualitative (interviews) and quantitative (network) approaches to examine this question. We propose and test a theoretical framework by which network actors utilize network structures while controlling the type of knowledge they exchange with others to balance the risks and opportunities of interorganizational KX relationships. We argue that different types of knowledge exchanges will exhibit different dominant structural features. We utilize the structural concepts of triadic closure and structural holes as they apply to single and multiple KX relationships. Drawing on network data of various interorganizational KX ties between members of a biotechnology consortium, analyzed with univariate and multivariate exponential random graph (ERG) models, we provide evidence that largely supports our theoretical framework.

Influence of Organization (Structure) on Knowledge Transfer Network in Organizations

Sitar, Alesa Sasa¹, Pahor, Marko², Rozman, Rudi³
(1)Faculty of Economics University of Ljubljana, Management and Organization, Ljubljana, Slovenia, (2)Faculty of Economics University of Ljubljana, Ljubljana, Slovenia, (3)Faculty of Economics University of Ljubljana, Ljubljana, Slovenia

In the present article we try to empirically test the idea that knowledge transfer is more intense through those informal relationships that are formally supported as well as provide evidence in favor of organic organization for knowledge sharing as indicated in previous research. We study an organization (structure) as a multiplex network consisting of technical, motivational, power and communication relationships. Through the application of the social network perspective the influence of actual, mostly formal organizational network on informal network for knowledge flows in the form of advice, help on the job and new knowledge can be analyzed, thus recognizing to what extent organizational structure supports the knowledge transfer network. Further, formalization, specialization and standardization are included in the study, as perceived characteristics of mechanistic vs. organic organization by individual actors. We test the hypothesis in a globally recognized company, operating in the coatings industry. The sample consisted of 107 employees from 12 preselected R&D, technology, quality and production units. The data was gathered using a web-based questionnaire that focused on the influence of organization (structure) on transfer of the most relevant R&D and production knowledge among units. We studied the dependence of relations using MRQAP regression analysis. Some of the results show that the majority of immediate supervisors give advice and provide help on the job to their subordinates, but these represent only a smaller fraction of all advice and help relationships. Further, employees, who are important sources of knowledge and knowledge brokers, perceive organization to be more organic.
**Knowledge Networks 2**

**Does Homophily Affect Performance?**

Ertug, Gokhan¹, Gargiulo, Martin²

(1) Singapore Management University, Singapore, Singapore, (2) INSEAD, Singapore, Singapore

This paper studies how homophily shapes informal knowledge-exchange networks and affects the performance of knowledge workers. We argue that, while homophily might make it easier for workers to request and obtain knowledge from colleagues, it might also prompt them to approach less qualified colleagues. Consistent with past research, we find evidence of homophily in knowledge-exchange networks among employees in a global investment bank. More importantly, we show that although a colleague's ability to provide valuable inputs predicts seeking help from this colleague, the effect is dampened for homophilous ties. This suggests that a trade-off might exist between the accessibility of homophilous colleagues and the ability of colleagues to provide valuable task inputs. Taking this into account, we argue that homophilous tendencies should have a positive effect on the performance of employees who are likely to experience difficulties in securing help from colleagues, but it should hinder the performance of employees who face fewer obstacles in obtaining such help.

**Knowledge Networks and Knowledge Creation among Biomedical Scientists**

Llopis, Oscar¹², D’Este, Pablo¹, Yegros, Alfredo³

(1) INGENIO (CSIC - UPV), Valencia, Spain, (2) Universitat de València, Dep. de Direcció d’Empreses ‘Juan Jose’ Renau Piqueras’, Valencia, Spain, (3) Centre for Science and Technology Studies (CWTS), Leiden, Netherlands

The idea that scientific creativity is fostered when scientists work together and combine their knowledge stocks is well established in extant literature (He, Geng, & Campbell-Hunt, 2009; Rigby & Edler, 2005). The social capital perspective has provided valuable insights in exploring the effects of social interactions with others on the creation of knowledge. Although the benefits of social capital for the production of knowledge seems to be well grounded, studies examining the interplay between social network characteristics and individual features of scientists are few in number. To address this issue, our study conceives the scientists’ network structure as a potential opportunity from which actors may benefit to a greater or lesser extent (Adler & Kwon, 2002), we advocate that the value of ties with others for the production of knowledge depends on the particular ability of each scientist as well as on the nature of knowledge that each particular scientist aims to produce. We use the biomedical research context to test these ideas. Our study performs a longitudinal analysis of the knowledge networks and knowledge production of 381 biomedical scientists along a 13 years period. We examined how network patterns are related to the scientific and technological knowledge of each scientist, showing that the predictive power of the scientist's social network is stepped up when individual contingencies are considered.

**Knowledge Spillovers through Informal Networks in Emerging Market Economies: An Exploratory Case Study from the UAE**

Schloderer, Florian¹, Huang, Victor Z², Röder, Maya³

(1) INSEAD Abu Dhabi, Abu Dhabi, United Arab Emirates, (2) Zayed University Abu Dhabi, Abu Dhabi, United Arab Emirates, (3) Goethe-Institut Gulf Region, Abu Dhabi, United Arab Emirates

Many emerging market countries aim at diversifying their local economies by promoting the emergence of high-tech industries. However, this task is difficult because it often requires closing a knowledge gap with established high-tech industries in other countries by developing a local knowledge base. A useful instrument to develop such local knowledge base is strategic knowledge collaborations with foreign partners. While these knowledge collaborations create an arena for knowledge transfer, they often fail to deliver the desired results. In this paper, we study one important mechanism to explain the failure of knowledge transfer which is the lack of informal bridging ties between the members of the national workforce (knowledge receivers) and foreign workforce (knowledge providers). The objective of this paper is an exploratory study of informal knowledge networks between the national and foreign workforce in an emerging market economy. We use a small dataset on ego-networks gathered in an organization located in the United Arab Emirates. This exploratory study has important implications for policy makers who wish to promote the diversification of their economies more effectively by developing a local knowledge base through informal knowledge networks between the national and foreign workforce.
R&D Networks - Case Study and Social Network Analysis (Study 2)
Takahashi, Marissa
The University of Queensland, Business School, Brisbane, QLD, Australia

Conducting a successful collaborative R&D project is a challenge especially in corporate research settings where companies expect returns on their R&D investments. This study examines the network of R&D project teams within a global software company. These corporate R&D teams conduct research projects that aim to advance the state-of-the-art of the knowledge in their respective domains. In addition to their knowledge contribution, they are also expected to commercially exploit their results. To achieve these tasks, R&D teams collaborate, both face-to-face and electronically, with a network of diverse participants within their global ecosystem - a complex mesh of interconnected stakeholders dispersed geographically and across time zones. This study aims to investigate how network characteristics vary across the different R&D teams and how these network characteristics could influence the performance of these teams. This study presents the results of the second study done on collaborative R&D projects in the European setting. This is a follow-up study on the first study done on collaborative R&D projects in Australian setting. A case study approach is taken in conjunction with social network analysis, which enables the study of the project stakeholders' interactions within the network. The case study approach aims to gather richer data through multiple sources such as interviews, podcasts, project database, archival records, and others. Network analysis provides a quantitative and graphic description of the project teams and their interactions. While the analysis of case study data provide further corroboration and explanation to the description of the phenomenon provided by the network analysis.

Event Network Advancement - Applying Network Analysis for Conferences to Connect with Interesting People
Zenk, Lukas, Windhager, Florian, Smuc, Michael
Danube University Krems, Knowledge and Communication Management, Krems, Austria

The goal of the applied research project "Event Network Advancement" (www.donau-uni.ac.at/ena) is to support the active attendance of participants during knowledge-intensive events, e.g. conferences. To reach this goal we focus on two areas: The webtool "Virtual Event Explorer" enables participants to identify interesting people before and during the event. We ask them to declare their research interests, and based on these two-mode network data we provide user-centered recommendations and visualizations: Who has similar or complementary interests? Who do I want to connect with? The design of the "Enabling Event Space" supports participants to realize these potential connections during the event, by integrating approaches to architectural, technological and social space design: What are the core processes of the specific event? Which social formats and technologies can support their intended aims? We will present the first concepts and prototypes of the ongoing research project as well as case studies from other conferences.
Distinguishing Topical and Social Groups Based on Common Identity and Bond Theory
Grabowicz, Przemyslaw Adam¹, Aiello, Luca Maria², Eguíluz, Víctor M.¹, Jaimes, Alejandro²
(1)IFIC (UIB-CSIC), Palma de Mallorca, Spain, (2)Yahoo! Research, Barcelona, Spain

Social groups play a crucial role in social media platforms because they form the basis for user participation and engagement. Groups are created explicitly by members of the community, but also form organically as members interact. Due to their importance, they have been studied widely (e.g., community detection, evolution, activity, etc.). One of the key questions for understanding how such groups evolve is whether there are different types of groups and how they differ. In sociology, theories have been proposed to help explain how such groups form. In particular, the common identity and common bond theory states that people join groups based on identity (i.e., interest in the topics discussed) or bond attachment (i.e., social relationships). We use the identity and bond theory to define a set of metrics to classify groups into those two categories based on pairwise user interactions. Using a large dataset from Flickr, we extract user-defined groups and automatically-detected groups, obtained from a community detection algorithm. We discuss the process of manual labeling of groups into social or topical and present results of predicting the group label based on the defined metrics. We directly validate the predictions of the theory showing that the metrics are able to forecast the group type with high accuracy. In addition, we present a comparison between declared and detected groups along topicality and sociality dimensions.

Ripples on the Web: Diffusion of Activity Bursts across Hyperlink Networks in Wikipedia
Keegan, Brian C., Lin, Yu-Ru, Lazer, David
Northeastern University, Boston, MA, United States

Many types of social media are characterized by “bursts” where large amounts of activity occur in short periods of time. Prior work has developed models of the temporal distribution and identified distinct classes of bursts, but there is limited empirical work on how these bursts influence the behavior of other nodes in the network. Example of bursts often reflect sudden and widespread interest in topics about current events: the activity on the article about the 2011 Egyptian Revolution also led to significant increases in activity about distantly related articles and topics such as the Giza Necropolis. This paper uses historical data drawn from Wikipedia articles about major historical events such as elections, revolutions, and disasters to understand how rapid changes in pageview activity influence the hyperlink structure of articles linking to each other. First, we examine different classes of bursts on Wikipedia and assess the extent to which these classes predict the distance over which an article burst propagates from an ego to its alters and to more distant articles. Second, we examine the extent to which bursts of pageview activity also drive bursts of editing activity on these distal articles. Finally, we examine whether bursts of pageview and editing activity have strong regularities in the patterns of hyperlink creation and local network structure among ego, alter, and distal articles. These findings have implications for understanding users’ behavior and how socio-technical systems are driven by bursts of activity.

Analysing Clustering Structure in a Large-scale Wikipedia Category Network
Klaytsr, Thidawan, Fenner, Trevor, Lachish, Oded, Levene, Mark
Birkbeck College, University of London, Computer Science and Information Systems, London, United Kingdom

The analysis of large social networks for big-data has been a topic of significant recent interest. An ideal goal of our research was to be able to handle and analyse a very large-scale social network. We also aimed to discover global category clusters in the form of well-connected components that are naturally clustered together by Wikipedians (a network of Wikipedia volunteers). The entire 2012 English Wikipedia category network was analysed. This network is constructed by inserting one edge between a pair of categories for each wiki-page that is assigned to both categories. The resulting multi-graph (or edge-weighted graph) was transformed into a simple graph by retaining just a single edge linking each pair of categories for which the multiplicity (or weight) of the edge exceeded some specified threshold m. The large size of the dataset necessitated first partitioning it and then reassembling the final simple graph from a collection of smaller graphs. The techniques for handling the whole graph for the analysis, the algorithms to transform the intermediate graphs into the final graph, and those for constructing the connected components are illustrated in our experimental framework. The results obtained regarding the structural properties of the network are presented and discussed in the paper. Significant findings were that both the number of nontrivial components and the size of the largest component both appear to follow a power law in the threshold m.
Network Analysis for Big Data in Resource-constrained Environments

Pfeffer, Juergen, Carley, Kathleen M., Schmerl, Bradley, Garlan, David
Carnegie Mellon University, Pittsburgh, PA, United States

Network analysis for big data demands a great deal of computing resources, i.e., working memory, processor speed, and broadband data links in the case of distributed data. This makes network analytical strategies and tools inappropriate for big data in resource-constrained environments, e.g., first responders after a natural disaster using hand-held devices. In this paper, we present an architectural framework that covers different approaches to tackling the challenges arising in such settings. On the one hand, lightweight algorithms can be created by optimizing (faster, incremental assessment) or approximating (k-centralities) metrics. When approximating results, the challenge is to estimate the trade-off between timeliness and fidelity. On the other hand, smart caching (pre-calculation of parts of metrics) and user-guided data filtering (geographical, temporal), data binning (collapsing nodes), and data sampling can reduce required resources dramatically; but, they may bias the results. Finally, smart analytical workflows that incorporate knowledge about available resources and timeliness/fidelity options (what can be accomplished within which time period), as well as optimized user interfaces can assist the user in deciding what analytic strategy to follow and which data compromises to accept given both the strategic goals, and the time and resource constraints.

Inferring Spreads on Twitter

Raux, Stéphane¹,², Prieur, Christophe³
(1)Linkfluence, Saint-Denis, France, (2)Univ. Paris-Diderot, CNRS, Paris, France

Information diffusion over social networks has been extensively studied during the last decade especially with the development of social media services. It is also one of the main uses of Twitter, thanks to the RT (‘retweet’) functionality, enabling message forwarding. In 2010 though, Twitter has changed the way retweets are recorded, making diffusion paths impossible to follow: retweets give credit to the author of the initial message and lose track of intermediate retweeters. Research done about diffusion cascades based on data before this change is impossible to replicate with data from present messages. Our aim here is to show retweets may be explained in high proportion from past interactions between users and by triadic closure (A is retweeted by B, then by C who follows B). This provides a way to reconstruct diffusion paths with good probabilities, and gives new insights on user influence. We work on a set of urls. For each url, we build three graphs between all twitter users having posted it (including retweets): the retweet graph, the friends/followers graph, and the past interaction graph (from all the tweets posted before the first tweet containing the url). The urls have been collected from July to September of 2012 from the top-30 list of Hackernews, an online tech news aggregator. This makes a dataset of 3000 urls retweeted at least 50 times, with 1 million total tweets containing them, among 400k total users.
Large Scale Networks Analysis 2

Methodological Specifications for Application of the Mean-field Model for Large Scale Social Networks

Birkholz, Julie M., Lungeanu, Alina, Bakhshi, Rena, Groenewegen, Peter, van Steen, Maarten, Contractor, Noshir

(1) Vrije Universiteit Amsterdam, Network Institute, Organization Sciences, Amsterdam, Netherlands, (2) Northwestern University, Evanston, IL, United States, (3) Vrije Universiteit Amsterdam, Network Institute, Computer Science, Amsterdam, Netherlands

The statistical modeling of the emergence of social networks is most commonly undertaken using two models: Stochastic actor-orient models (using SIENA) and p*/ERGM. However, both models have scaling limitations due to computational challenges. We propose the use of a mean-field approach to study large scale social network dynamics (1000s nodes). A mean-field model, originating from physics, enables consideration of a large number of nodes through the aggregation of classes of nodes into “nodal buckets.” The analysis then computes the interactions/communication between buckets. The mean-field model has been successfully applied to estimate attribute and network parameters on large social networks (Birkholz et al. 2012). Here the nodes were aggregated into buckets based on shared attributes. However, the inferences from such models hinges crucially on the selection of the shared attribute used for classification of nodes into buckets. To overcome this limitation, we propose a methodological specification (based on equivalence classes) for the aggregation of nodes into buckets. We apply this technique to study the the co-authorship network of 1,354 researchers in the Oncofertility scientific field over a four year period. We estimate the extent to which collaboration networks are influenced by multiple factors such as cosmo-politanism, visibility, scientific age, and institutional affiliation.

A New Network Analytical Method for Analysis of Social Mobility

Toubøl, Jonas, Jensen, Carsten Strøby

University of Copenhagen, Department of Sociology, Copenhagen, Denmark

This paper presents a newly developed method aimed at analysing various forms of mobility. We concentrate on examining the method itself and discussing how the use of network analysis enable us to overcome some fundamental problems in the hitherto model driven studies of intergenerational social mobility and labour market mobility/segmentation. Most mobility studies are model driven: The modalities of the variable under examination, for instance occupation of father and son, are ordered in accordance with a theory of mobility and then the models ability to explain statistical variance is tested. One major weakness of this approach is that it heavily relies on theoretical considerations instead of taking the observed mobility as its starting point. This method use network analysis techniques to identify the proper clusters of for instance occupational categories. This is done by observing mobility between occupational categories at an as disaggregated level as possible. The method clusters the categories together by identifying the occupational categories between which the individuals are relatively more mobile than they are to other occupational categories. Thus, the method derives the correct clusters of occupational clusters forming for instance categories of social strata. By the use of classical network graphs the complex structure of the mobility can be presented in a manageable way. In this paper we exemplify the method by analysing the segmentation of the Danish labour market. The dataset contains micro-data of 3.5 million, comprising the entire Danish workforce in the period 2000-2007.

Utilizing Archival Internet Data to Understand the Growth of Organizational Networks

Weber, Matthew

Rutgers University, School of Communication and Information, New Brunswick, NJ, United States

The Internet Archive contains the largest single record of the history of the World Wide Web from 1995 to the present—a wealth of untapped research data. The problem, however, is a significant lack of research-ready databases and tools available to the scholarly community to access and use this enormous, dynamic, and ever-growing resource. This paper provides an overview of HistoryTracker, a first-of-its-kind research initiative focused on developing a prototype data extraction tool for extracting data from the Internet Archive. Tapping into the potential of Big Data, the HistoryTracker tool provides an interface for extracting social network data, website attributes, and eventually content, from the Internet Archive in a research ready format. In addition to providing an overview of the HistoryTracker tool, this paper outlines a framework for incorporating Internet Archive data into social science research. This framework focuses on (1) designing clear research questions; (2) using the appropriate filters to select data; and (3) selecting appropriate methods for analysis. This presentation concludes with a series of examples highlighting the potential of research conducted via the Internet Archive. A preliminary case study demonstrates the application of archival Internet data to examine the growth of online news in the United States. An evolutionary framework is used to illustrate the pattern of evolution from
one generation of organizations to the next. Data from this research has the potential to fuel studies such as examination of the evolution of personal narratives on the web and political discourse over the course of the campaigns.

**Complex Social Science (CoSSci) Gateway: Autocorrelation Modeling, Kinship Network Modeling, k- and Pairwise Cohesion in Large Networks & Open Opportunities for Online Education**

White, Douglas R.¹, Oztan, Tolga B.², Sinkovitz, Robert³, Menezes, Telmo⁴

(1)UC Irvine, IMBS, La Jolla, CA, United States, (2)UC Irvine, MBS, Irvine, CA, United States, (3)SDSC San Diego Supercomputer, Gordon Applications Lead, San Diego, CA, United States, (4)French National Center for Scientific Research (CNRS), EHESS, CAMS, Paris, France

The UC Complex Social Science (CoSSci) Gateway (portal implementation 2003 at UCI/SDSC@UCSD) provides remote access for researchers and classrooms or online classes to do advanced computing. (Large) network k-cohesion (White et al.) and pairwise cohesion (Oztan et_al.) return linked lists of all k-connected subsets and k-connected pairs. Menezes’ Synthetic tools analyze and perform evolutionary modeling of complex networks, including the 90+ kinship networks in *net format hosted at the Kinsources website, and return variables for societal databases such as those below. Causal graphs modeling for rectangular databases with network W matrices for inclusion of autocorrelation effects are available on-line for a growing number of datasets. Currently these include the Ethnographic Atlas (n=1500 societies), Standard Cross-Cultural Sample (n=186), Binford’s Foragers (n=339), Jorgensen’s Western Indians (n=172), and will eventually include many new cross-national, cross-polity, cross-corporate and comparative psychology datasets. Each new dataset requires its own W-matrix networks, and if missing data are to be imputed, with principal components of fully coded data suitable for multiple imputation. These datasets are intended for use in online courses (Coursera; Moodle) on Complex Networks, Cross-Cultural/Polity/National/Economic studies, quantitative methods in the Social Sciences, and a great variety of topical courses. Results of early studies are reported. A Wiley 2013 textbook, Companion to Cross-Cultural Research (Eds. White, Eff, Dow, Gray), will be useful for instructors and contains chapters published on-line that are useful guides for students learning complex network and comparative approaches in the Social Sciences. Principal keywords: Causality, Complexity.

**A Flexible Sampling Method for Large-scale Online Social Networks: Self-adjustable Random Walk (SARW)**

Zhu, Jonathan J. H.¹, Xu, Xiaoke², Zhang, Lun¹, Peng, Tai-Quan Winson³

(1)City University of Hong Kong, Media & Communication, Kowloon, Hong Kong, (2)Dalian Nationalities University, College of Information and Communication Engineering, Dalian, China, (3)Macau University of Science and Technology, Faculty of Arts & Humanities, Macau, Macao

Online social networks (OSNs) have become an increasingly attractive gold mine for academic and commercial researchers. However, research on OSNs faces a number of difficult challenges. One bottleneck lies in the massive quantity and often unavailability of OSN population data. Sampling becomes perhaps the only feasible solution to the problems. How to draws samples that can represent the underlying OSNs has remained a formidable task because of a number of conceptual and methodological reasons. On the one hand, the existing theories and methods of probability sampling are not practical for sampling of OSNs. On the other hand, most of empirically-driven studies on network sampling are confined to simulated data or sub-graph data, which are fundamentally different from real and complete-graph OSNs. Therefore, no single sampling method has been able to generate unbiased samples of OSNs with maximal precision and minimal cost. In the current study, we propose a flexible sampling method, called Self-Adjustable Random Walk (SARW), and test it against with the population data of a real, large-scale OSN. We evaluate the strengths of the sampling method in comparison with four prevailing methods, including uniform, breadth-first search (BFS), random walk (RW), and revised RW (i.e., MHRW) sampling.
Leadership Networks

Holding Out for a Hero? Team Social Network Structures Affect Attributions of Charismatic Leadership to Men and Women
Brands, Raina¹, Menges, Jochen¹, Kilduff, Martin²
(1) University of Cambridge, Judge Business School, Cambridge, United Kingdom, (2) University College London, London, United Kingdom

When it comes to charismatic leaders, do people hold out for a hero or a heroine? We propose that charismatic leadership attributions depend on the social network context within which the prospective leader - man or woman - is embedded. In three studies, two field and one experimental, we show that when team advice networks are characterized by high power concentration, individuals tend to attribute women (relative to men) leaders with less charisma. But when these power-concentrated team networks are also characterized by a high level of cohesion, the bias against women as charismatic leaders attenuates. Our results emphasize the need to consider the psychological effects of social networks in explaining women's leadership disadvantage.

The Ties that Lead Teams: Social Network Metrics of Collective Leadership
Braun, Michael T., DeChurch, Leslie A., Carter, Dorothy R.
Georgia Institute of Technology, Atlanta, GA, United States

The rapid reorganization of work into teams has prompted a corresponding need to understand the nature of leadership in small collectives. Recently, a great deal of research attention has focused on understanding leadership as a distributed or collective phenomenon whereby multiple members of the collective mutually and dynamically enact leadership functions. Despite widespread agreement about the utility of network analytic approaches to represent the patterning of leadership in collectives, no such consensus exists regarding the most appropriate way to operationalize collective leadership using network analysis. Prior empirical studies employed a plethora of approaches, including density, reciprocity, centralization, coefficient of variation, and qualitative coding of sociograms. In this paper, we use simulation as a basis for systematically evaluating the relative utility of 15 social network metrics that researchers could use to operationalize collective leadership. Specifically, we simulated all possible networks of 3-, 4-, 5-, 6-, and 7-member teams (nodes are individuals), connected by 20%, 50%, and 80% of the total possible number of directed leadership ties (i.e., leadership relationships) of each size network. We then evaluated the relative validity of each of the 15 leadership network metrics in predicting four important aspects of leader influence under conditions of stable team membership and team member turnover. Correlations reveal that no single best representation of collective leadership utilizing network metrics exists. Rather, team size, leadership network density (i.e., the overall amount of leadership influence), and member turnover all influence which leadership network metric best represents collective leadership.

Influence and Work Engagement: The Effects of Social Networks and Knowledge Diversity
Gopalakrishnan, Gopakumar¹, Holgin, Daniel², Ganesh, Jai², Akhilesh, K.B.³
(1) Infosys Ltd., Bangalore, India, (2) University of Kentucky, LINKS Center for Social Network Analysis, Lexington, KY, United States, (3) Indian Institute of Science, Bangalore, India

How does one become influential in the workplace is an important question in the field of organization science. As work is increasingly organized around distributed teams comprised of individuals with heterogeneous skills and experiences, interpersonal-influence and leadership skills have non-trivial implications for team performance. In this study, we pursue three interrelated set of questions. First, we examine whether individuals who occupy influential network positions are indeed identified as influential team members by their co-workers. Second, we test how co-worker perceptions of individual differences in knowledge areas and expertise sway who they see as influential. We test both positive and negative influence. Finally, we analyze how network position, perceived differences in knowledge areas, and reported influence shape an individual's engagement at work. We analyze complete networks linking 71 geographically distributed employees with diverse knowledge areas who are part of an R&D group in a high technology firm. The data contain work and non-work consultation networks, perception of similarities in knowledge areas and expertise, perceptions of influence of each member in the way team functions, and work engagement. We discuss contributions to interpersonal influence and leadership literature and outline practical implications for managers.
Using Networks to Transform Gender Balance in the Business Community: A Case Study of the 30% Club in the UK

McGregor, Heather¹, Christopoulos, Dimitris²
(1)Taylor Bennett, London, United Kingdom, (2)MODUL University Vienna, Public Governance and Management, Vienna, Austria

The 30% Club is a group of Chairmen and organisations committed to bringing more women (a minimum of 30%, hence the name) onto UK corporate boards by 2015, without legislation. Having declared their voluntary support for the 30% goal, its members working to achieve a better gender balance at all management levels in a way that encourages real, sustainable and faster change. The 30% Club was founded in 2010 by Helena Morrissey and a steering committee of senior business women who then set out to recruit chairmen to join. The agreed strategy was to recruit a few ‘founding chairmen’ to the cause who would act as super-connectors, and then work through those chairmen to recruit others. Indeed, the 30% website states that its members are “…committed to recruiting other Chairmen to support its mission”. There are currently 55 chairman members representing sixty organisations and they were all recruited personally via the founding chairmen, a steering committee member or a member chairman. Women are now being appointed to boards in unprecedented numbers within two years of launching the initiative, which has received recognition nationally and internationally. The authors believe that this success has been achieved by employing the reputational elements of a cohesive group of executives and the high levels of reciprocity in their ties to each other. This paper will examine the network paths used to recruit the current members and identify network strategies that could be used to replicate the 30% Club in other countries.

Leadership Networks at Catholic Parishes: Applications for Faith-based Health Interventions

Negron, Rosalyn
University of Massachusetts, Anthropology, Boston, MA, United States

Through two case studies of Catholic parishes in Boston, MA, this study explores the implications of distributed versus centralized leadership at Catholic parishes for the implementation of evidence-based interventions (EBI) for cancer control. The two parishes considered in the study differ from each other in several ways. In the first, parishioners are less engaged in leadership activities at the parish and a small group of lay leaders work with the parish priest and other clergy on parish activities. In the second parish, a large and active lay leadership have forged an organizational structure that allows more independence from the head priest's direct authority. In this parish, lay leaders are the prime drivers of organizational programs and events. Through a network analysis of both parishes, this study examines the extent to which these differing characteristics of the parish leadership affect the pattern of relationships among parish leaders and their organizational capacity for EBI implementation.
Direct Generation of Random Mixed Graphs with Specified Degree Triples with Applications to Triad Counts and Regular Equivalence

Boyd, John P.
University of California at Irvine, Institute for Mathematical Behavior Research, Laguna Beach, CA, United States

The degree triple for each vertex in a mixed graph is defined as (1) the degree of the symmetric part, (2) the outdegree for the asymmetric part, (3) and the indegree, also for the asymmetric part. The degree triples sequence is a far stronger constraint than, say, the MAN statistic. Generating random digraphs with a fixed constraint such as the sequence of degree triples can easily be conceptualized with MCMC techniques, but the mixing time can be excessive with large data sets. An alternative approach is to directly generate random digraphs with the given constraints. Two areas of application are triad counts and regular equivalence. The degree triples sequence can have a strong effect on the probability of individual triads. For example, if sum of the symmetric degrees is less than expected under the Bernoulli model, then so will be the number of symmetric triads will also be less. Similar remarks apply to the correlation between in- and outdegrees. Regular equivalence fails to be confirmed if the number of ones in each 1-block is fixed, but this does not control for row and columns sums, much less the degree triads. These concepts are applied to a number of classic data sets and compared with MCMC results.

Common Misunderstandings about MR-QAP

Dekker, David¹, Krackhardt, David², Borgatti, Steve³

¹University of Greenwich, Center for Business Network Analyses, London, United Kingdom, ²Carnegie Mellon University, Heinz School of Public Policy & Management, Pittsburgh, PA, United States, ³University of Kentucky, Gatton College of Business and Economics, Lexington, KY, United States

The Multiple Regression-Quadratic Assignment Procedure is a statistical inference approach for OLS and NLS-regression analyses developed to deal with the intrinsic dependence of observations in network data. As an early developed approach in social network analyses, which allows dealing with this serious violation of the independence assumption in the OLS and NLS framework, it has found a broad application base covering many fields. Although new approaches to analyze social network data have been proposed, MR-QAP remains an attractive alternative in many practical situations. It has been brought to our attention that unfortunately also some misunderstandings about the applicability seem to have developed among some reviewers of papers that utilize the approach. It is therefore mainly that it is prudent to elaborate on some common misconceptions we came across. To show the usefulness of MRQAP (and related tests) in this paper we explain the vulnerability of MRQAP to violations of some assumptions underlying classic OLS regression analyses. If problems with MRQAP occur it is mostly, because indirectly the exchangeability assumption is violated. We use theory as well as simulation results to bring nuance to the misconceptions that may exit about the MRQAP approach. Also, some ad hoc criticisms are discussed. For example, one misconception that was brought to our attention is that the approach is archaic, implying that newer and other approaches work better. Through a simulation study we show that even an MRQAP applied to the clearly misspecified Linear Probability Model could be preferable to other more recently developed approaches.

A Few Applications of a Theorem for Matrix Operation for Transitivity

Kishida, Akishige
ARK Internationals, Kobe, Japan

The present study shows a few applications of a theorem for counting the number of transitive triples in terms of matrix operations. The original theorem was previously derived by the present author (Kishida, 2012) and then generalized to the case of transitive triads of Holland and Leinhardt, which was presented at the Sunbelt conference at Redondo Beach, California last year. The first application shows how to count the number of various intransitive triads in terms of matrix operations. The second application shows that using the original theorem, we obtain a new theorem related to maximal acyclic digraphs which are equivalent to tournament without cyclic triples.

Why your Friends Are More Popular than you Are - A Revisit

Kumar, Vineet¹, Krackhardt, David², Feld, Scott³

¹University of California at Irvine, Institute for Mathematical Behavior Research, Laguna Beach, CA, United States, ²Carnegie Mellon University, Heinz School of Public Policy & Management, Pittsburgh, PA, United States, ³University of Kentucky, Gatton College of Business and Economics, Lexington, KY, United States

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People in a friendship social network are likely to have fewer friends than their friends do: This structural property of social network graphs in general is often cited in fields as disparate as public health and marketing to identify and target individuals. The result was stated in Feld (1992), but has not yet been rigorously proven. We explain how prior work fails to demonstrate this result, and provide a comprehensive and general result that does not make strong assumptions on the network structure. We also examine whether taking this process further, i.e. using “friends of friends” instead of friends results in a further increase in the number of friends, and compare its effectiveness to a random walk over the social network graph. We also use simulation results to demonstrate the effectiveness of using this structural property in applications.

Random Stub Matching Models of Multigraphs
Shafie, Termeh
Stockholm University, Statistics, Stockholm, Sweden

Network data involve relational structure representing interactions between actors and are commonly represented by graphs where the actors are referred to as vertices and the relations are referred to as edges connecting pairs of vertices. A multigraph is defined as a graph where loops and multiple edges are permitted and appear natural in many contexts, for instance social interactions between people during a period of time, or business contacts between companies in a region or industry. The local and global structure of multigraphs under random stub matching with fixed degrees (RSM) are studied. The local structure is analyzed by marginal distributions of edge multiplicities, and the global structure is analyzed by the simultaneous distribution of edge multiplicities. The distributions under RSM and IEA are used for calculations of moments and entropies, and for comparisons by information divergence. The modified distributions are obtained by ignoring the dependencies between edges and assuming independent edge assignments to sites (IEA), and by ignoring the dependencies between stubs and assuming independent stub assignments to vertices (ISA). The main results include a new formula for the probability of an arbitrary number of loops at a vertex, and a more intricate expression for the probability of an arbitrary number of edges at any site. Further, simplicity and complexity of multigraphs under RSM are investigated and a new method of approximating the probability that an RSM multigraph is simple is proposed and shown to perform well for multigraphs with small numbers of vertices and edges.

Modeling Bivariate Dependence in Multiple Social Networks with the p2 Model
Zijlstra, Bonne J.H.; Van Duijn, Marijtte A.J.; Snijders, Tom A.B.
(1)University of Amsterdam, Amsterdam, Netherlands, (2)University of Groningen, ICS, Groningen, Netherlands

A multivariate p2 model is introduced for the analysis of multiple directed dichotomous social networks. The p2 model is a statistical model for one digraph. The proposed model includes additional parameters for bivariate associations between multiple dependent digraphs. The association parameters represent tendencies toward multiplexity, exchange, partial reciprocity and full bivariate reciprocity, and can be regressed on covariates. Random effects are used to model differences between actors and the dependence between tie observations coming to and from the same actor, both within and between networks. The use of random effects and the possibility to include covariates, expand this model beyond log-linear models for multiple dependent digraphs. It is illustrated with an application investigating the reliability of reported practical support by adolescents in a school network and an application investigating the effect of status on the co-occurrence of advice, cowork and friendship networks within a law firm.
Mathematical and Statistical Network Models 2

Mathematical Generalization of Binary Mutually Exclusive Choice Social Influence Network Models

Hollander, James Fisher
Independent Researcher, Little Rock, AR, United States

Changes in decisions of agents, changes in valued-network ties, and changes in the agent’s decisionmaking D=+1/-1 (Yes/No) in binary mutually-exclusive-choice social influence network models. Parameters of such model include positive/negative influence matrix W and motivations U. Agents interact via valued network ties W signifying influence of each other’s Yes/No choices in decision modes (indexed k or m) of each agent (indexed i or j) over time steps t. The particular constellation of choices constitutes the decision states in each decision mode by agents and thus the overall network state from a model given by the matrix equation D-ik:t+1 = SIGN[U-ik:t + Σ-j,m[W-ikjm:t D-jm:t]]. Such mutually-exclusive choice is embedded in a more general non-mutually-exclusive choice model expressed in lowercase: d-ik:t+1 = STEP[ u-ik:t + Σ-j,m[w-ikjm:t d-jm:t ]] coding for decisions d={ “Yes” [1 0], “No” [0 1], “Neither” (non-salience) [0 0], and “Both” [1 1]]. The embedded mutually-exclusive choice model is D-ik:t+1 = α*STEP(U-ik:t xα + Σ-j,m [(W-ikjm:t- x(α σ'))×([1] + D-jm:t xσ)/2]), where σ’ = [1 -1], d= ([1] + D-jm:t xσ)/2, w=W-ikjm:t- x(α σ’), and u = U-ik:t xα. Apostrophe ‘ means transpose. Matrix multiplication is “•” blockwise or “blank.” “x” signifies scalar multiplication of a second matrix by each given element of a first matrix to form each respective block of a product matrix of blocks arranged in the element pattern of the first matrix. Σ-j,m[ ] sums over the agents and modes. STEP[ ] is element-wise step function.

On Effect Sizes in Stochastic Actor-oriented Models

Indlekofer, Natalie, Brandes, Ulrik
University of Konstanz, Konstanz, Germany

When interpreting Stochastic Actor-oriented Models (SAOMs), the focus is on testing statistical significances indicating whether an effect plays a role in the network dynamics or not. Effect sizes, i.e., the importance or magnitude of effects, are mostly ignored. One reason might be that it is not obvious how to define the size of an effect in a SAOM. The complexity of the model and the strong correlation between network effects make it difficult to understand the relation between parameter sizes and relative impact of associated effects. To approach this problem, we formulate and discuss requirements a measure of effect size for SAOMs should fulfill. Based on these considerations, we propose possible measures, characterize them, and evaluate to what extent they comply with the stated requirements. We illustrate the practical utility of the proposed measures of effect size by application examples.

Co-evolution of Networks and Continuous Actor Attributes

Niezink, Nynke M. D.1, Snijders, Tom A. B.2,3
(1)University of Groningen, ICS, Sociology, Groningen, Netherlands, (2)University of Oxford, Statistics, Oxford, United Kingdom, (3)University of Groningen / ICS, Sociology, Groningen, Netherlands

The stochastic actor-oriented model is a powerful tool in studying the co-evolution of networks and the attributes of network actors. In its current specification, the dynamic actor attributes are assumed to be ordinal categorical variables. However, many dependent variables, like human and organizational performance and many monetary and health outcomes, are measured on a continuous scale. For these cases the current model is too restrictive, its use, by the discretization of continuous variables, leading to loss of information. Therefore, we propose an extension of the model for continuous dependent attribute variables, using stochastic differential equation (SDE) models. SDEs model the evolution of continuous variables in continuous time and have been applied extensively, for example, in econometrics and financial mathematics and, more recently, to non-network panel data in the social sciences in general. In the paper, we will discuss this extension of the stochastic actor-oriented model and illustrate its applicability by an example study on the relationship between friendship and obesity, focusing on BMI as a continuous co-evolving attribute.

Algebraic Methods for the Analysis of Multiple Networks and Actors Attributes

Rivero Ostoic, Antonio
University of Southern Denmark, Slagelse, Denmark
An integrated treatment of three measured relations (cooperation, friendship and competition) among firms operating in business communities, and their adoption of two innovative utilities from the Web is made through the algebraic perspective. With this type of analysis innovation adoption is treated as an acquired attribute by the actors where the cumulated role structure consists of actors with equivalent algebras, i.e. an expression of their similar interlocking pattern in the system. Based on the resulted structure, significant algebraic constraints are detected, which include a hierarchy in the relations, certain sets of equations among the ties, and aggregated role tables with the essential patterns in the empirical networks. Such constraints permit to make a substantial interpretation of the multiple structures in terms of relations among relationships and to perform a comparison across systems as well.

Empirically Grounded Network Models for Studying Epidemics. What Matters?

Rolls, David A., Wang, Peng, Robins, Garry, Pattison, Phillipa

University of Melbourne, Melbourne School of Psychological Sciences, Melbourne, VIC, Australia

The features of contact networks which are relevant to modelling epidemic dynamics remains unclear, although the node degree distribution and clustering have both been shown to be important. Configuration models are one method for simulating contact networks, fitting the degree distribution, and possibly other configurations such as triangles, cliques, and other subgraphs, by defining node “roles” at each node and connecting corresponding “stubs” and “corners”. Exponential random graph models are another method, providing parsimonious models that capture many network features simultaneously. Starting from empirical contact networks we explore how each of the two network modelling frameworks affects conclusions about epidemic dynamics. For configuration models, we also explore which additional subgraphs might be included to improve the fit with simulated epidemics on the empirical network itself.

Analysing Network Dynamics as Interdependent Tie Survival

Steglich, Christian

University of Groningen, Sociology, Groningen, Netherlands

Statistical inference for network dynamics often is done under the classical Markov assumption that at any point in time, the future development of the network is conditionally independent of its past development, given the present state of the network. This is unsatisfactory when one has binary network data and wants to study effects related to the age of relationships, e.g., the social capital idea that old relationships are more crucial for many individual-level outcomes (resource and information access) than young relationships. A class of models constructed for capturing such non-Markov effects are those of survival (or event history) analysis. In this presentation, a framework is developed for estimating survival analysis models for interdependent, longitudinal network data collected in a panel design (>=2 observations). Central to the model are two hazard functions, one modelling the survival of existing ties and another modelling the birth of new ties. Survival analysis for relational tie data is complicated by the interdependence of dyadic observation units that characterizes network data. This interdependence invalidates the usual estimation methods employed in survival analysis. Here it is proposed that simulation-based inference, working with a state space preserving the complexity of the entire network, is a way of taking care of these interdependencies. This approach, and an equation-based estimation algorithm (Robbins-Monro approximation), are adopted from stochastic actor-based models for longitudinal network data. The method is illustrated in empirical applications.
Measurement 1

The Weakness of Tie Strength: The Importance of Capacity, Latency and Redundancy to Understanding Social Networks

Brashears, Matthew E.
Cornell University, Sociology, Ithaca, NY, United States

In 1973 Mark Granovetter revolutionized social science with his argument that “weak” ties provide more novelty than “strong” ties. The vast resulting literature has linked tie strength to a wide variety of outcomes including economic success, acquisition of jobs, and happiness. Yet, throughout this literature tie strength is often defined intuitively and metaphorically rather than theoretically. As a result, what constitutes a strong or weak tie is often at the discretion of the researcher, and the endlessly protean metaphor of tie strength is increasingly an obstacle, rather than an asset, to the study of social networks. This paper unpacks Granovetter’s original argument to identify three factors that determine the capabilities of a network tie: capacity (the ability of a tie to transmit content), latency (the average amount of time between activations of a tie), and redundancy (the extent to which a tie reaches the same others). This multidimensional approach includes classically defined “strong” and “weak” ties as special cases, allows researchers to precisely describe the characteristics of a given network tie, and permits the identification of critical, and currently understudied, relationship types.

Mixing in Large Populations: Some New Measures - Part II

Klovdahl, Alden S.
University of Texas, School of Public Health, Houston, TX, United States

More often than not when we obtain ‘real’ network data (i.e., allowing us to map overall patterns of connection) it is with a view to measuring structural properties to ascertain their effects on individual actors, groups of actors, or on some characteristic of the network as a whole. Where possible, we also try to understand effect-producing processes. Rarely, however, do we recognize that these network data can be employed to develop measures of population characteristics for use when network studies are not appropriate, feasible or cost-effective. One important characteristic of populations is the degree of ‘mixing’ (homophily/heterophily) (within/between groups similar/different on some feature(s). Examples: mixing between infected/ susceptible individuals in epidemiological studies, between various ethnic groups in studies of potential conflict, … and so on. Previously some new measures of mixing were introduced, their theoretical justification provided, and then they were validated with supercomputer simulations [n = 753,571 and n = 20,791,225]. Here, these measures are applied to empirical data related to social networks and the spread of infectious diseases. Advantages over previous measures of mixing/homophily/heterophily are discussed. These measures allow meaningful comparisons within and across epidemiological, policy, social and other research studies. As well, they provide a uniform basis for parameterizing relevant mathematical models.

Applying Weighted and/or Two-mode Metrics to the Small-world Question: The World is Not Small

Opsahl, Tore, Vernet, Antoine
Imperial College London, London, United Kingdom

Small-world networks have been found to exist in abundance. Most studies classify a network as a small-world if the network distance is comparable to the distance found in corresponding classical random networks. Two issues are worth considering when comparing observed network properties to random ones: (i) what is a corresponding random network, and (ii) how close should an observed value be to the random one to be deemed comparable? Using networks from a range of domains and randomization procedures, our results demonstrate that only a few networks have comparable network distances. This suggests that small-worlds networks are far less prevalent than previously believed, and that networks are governed by special organizing principles that increase distance between individuals.

Dealing with Null Models in Network Analysis

Schlauch, Wolfgang E, Zweig, Katharina A.
University of Kaiserslautern, Computer Science, Kaiserslautern, Germany
To understand the significance of a peculiar network pattern the use of the appropriate null model is crucial. To test the significance, one of two approaches can be used: either graphs from the null model are sampled and a distribution of the occurrence of the pattern is computed, or there is a mathematical abstraction that allows to directly compute the expected distribution. In this talk we aim to point out some hidden pitfalls in choosing the right approach. The classic random graph models fix the degree sequence and randomize the connections between the nodes. One simplifying assumption is that, in a totally random graph, the probability that a node with degree a is connected with a node with degree b is proportional to a times b. This mathematical assumption allows to compute expected values for the assortativity of the null model, the expected clustering coefficient, or the average degree of neighbors. Our results indicate that there are cases in which it does not make any difference which of the approaches is used but that there are other measures that are strongly influenced by the chosen approach. The main problem is that the simplifying assumption is not valid for all kinds of degree distributions because it disfavors nodes with high degree. Measures that are computed individually for all nodes will thus in general deviate more from the assumed expected values, thereby resulting in false-positive or false-negative findings.

**Political Position Generator: A New Tool for Assessing Voters’Segmentation**

Tardos, Róbert¹, Fábián, Zoltán², Kmetty, Zoltán³

(1)Corvinus, ELTE University, Social Science Faculty, Budapest, Hungary, (2)TÁRKI Group, Social Research Institute, Social Science Data Base, Budapest, Hungary, (3)ELTE University, Social Science Faculty, Budapest, Hungary

Political homophily/heterophily, wider patterns of communication or the polarization of the electoral field are salient topics of the emerging research domain of political networks. Though conceptually these matters relate to a higher level, egocentric techniques among available SNA facilities yield plausible ways for their approach. One of the now classic methods, the Lin-Dumin instrument of position generator has the capacity of handling network resources outside the reach of core contacts. While the original version concerned occupational ties, its application may go beyond that aspect (this flexible potential is treated by Lin-Erickson 2008 and exhibited on a different, but related line deriving from McCarty et al 2001, with extensions by DiPrete et al 2011, embracing ideological categories, too). Building on the position generator format, Angelusz and Tardos (2005, 2010) introduced a party-based version for assessing voting bloc milieus, configurations with structural holes (Burt 1992) and folds (Stark-Vedres 2010) as outlined by the existence or lack (or possible overlap) of acquaintanceship ties with supporters of various political forces. A newer version with extensions of explicit communication and negative ties aspects has been elaborated by Tardos and Kmetty to be realized as part of a 2014 online tracking module of the German Longitudinal Election Studies. Furthermore, a personal interview version of the latter set will be applied by a project on ideological-political cleavages in Hungary led by Z. Fábián, the launching of which by early 2013 may also permit the presentation of some first findings.

**Blockmodeling: Are Structural and Regular Equivalence Equally Stable with Introduced Measurement Errors?**

Žnidaršič, Anja¹, Ferligoj, Anuška², Doreian, Patrick¹,³

(1)University of Maribor, Faculty of Organizational Sciences, Kranj, Slovenia, (2)University of Ljubljana, Faculty of Social Sciences, Ljubljana, Slovenia, (3)University of Pittsburgh, Department of Sociology, Pittsburgh, PA, United States

One of the purposes of social network analysis is to detect from large and seemingly incoherent networks a simple description of the fundamental structures of relationships. One widely used technique for finding such structural patterns is generalized blockmodeling. The result of a blockmodeling procedure is a partition determining positions of actors and an image matrix that represents the relationship among the obtained positions. Actors are partitiomed into clusters based on some type of equivalence. We say that actors are structurally equivalent if they are connected to the rest of the network in identical ways, while actors are regularly equivalent if they are connected in equivalent ways to other actors that are also equivalent. All techniques for gathering social network data are prone to measurement errors. In binary networks a measurement error occurs when there is an extra tie or an absent tie according to the true underlying structure. The impact of measurement error on identified blockmodel structures is studied by simulations based on extended set of artificial networks. For the simulations of starting networks well known models are used, e.g. core-periphery, cohesive subgroups, hierarchical,... Beside the starting models different probabilities of ties in blocks, sizes of networks, and number of clusters are used. The presented results will help us to determine which type of equivalence produces correct blockmodels in the face of measurement error and which network properties (and/or blockmodel properties) have an impact on correctly identified blockmodel structure.
Measurement 2: Centrality

Which Centrality Index to Choose?
Brandes, Ulrik
University of Konstanz, Computer and Information Science, Konstanz, Germany

The question of which centrality index is the most appropriate for a given study has plagued researchers ever since. While the literature is filled with all kinds of advice and even some comparative analyses, we argue that it is the wrong question to begin with. Picking a centrality index from those available, or proposing yet another variant index, is essentially a deductive trial-and-error approach. Among other things, it leads to a justification problem showing between the lines of many published studies. We posit that more reliable insight is obtained by turning the process around; in an inductive approach starting from the data, we can test whether there is a centrality-type effect at all, independent of any particular index. If the initial test is passed, its specificity may be increased by checking for additional properties. The approach is almost surprisingly elementary and easy to understand, despite its roots in the relational theory of measurement. More importantly, it offers ways to resolve several very general issues for centrality analysis, including the notorious lack of theoretical justification and detailed empirical testability.

Iterated Negative Weighted Centrality
Everett, Martin G.; Borgatti, Steve P.
(1) University of Manchester, Manchester, United Kingdom, (2) University of Kentucky, Lexington, KY, United States

Centrality measures have been designed to work with positive data or in a small number of cases with data that contains both positive and negative ties. Degree centrality is the only measure that can be applied meaningfully to purely negative data and this is really because it is a local measure. Borgatti in a recent article characterised a number of centrality measures by looking at what flows through the network. It is true that for positive valued data we commonly discuss flows of information etc and view the network as providing opportunities for the flow of resources or information and this model is the basis for most of our centrality measures. However it is clear that in negative networks the flow model breaks down and with the exception of degree none of our measures make much sense. Recently Everett and Borgatti suggested a negative weighted centrality measure (Sunbelt 2012) for use on negative data. We extend this measure to an iterated form and show how it is related to beta centrality and Katz type measures.

Some Properties of Centralization in Small Graphs
Mehta, C. Christina; Hertzberg, Vicki S.
Emory University, Biostatistics and Bioinformatics, Atlanta, GA, United States

Centralization is a measure of how much one node dominates others in a network. However, very little work has been done describing basic properties of closeness, betweenness, and degree centralization. This paper aims to describe the relationship between these centralization measures, calculate the correlation between them, and evaluate two prediction models, one based on centralization and the other on maximum centrality. Graphs of size 5-20 nodes that span most of the theoretical range of centralization values are generated. A scatterplot of the three centralization measures shows that many combinations of centralization < 0.6 are obtained while there are noticeable gaps in combinations above this level. Interestingly, as graph size increases, there are a broad range of graphs with low closeness but high degree and betweenness centralization and fewer graphs with high values for all three centralization measures. The Pearson correlation between each pair of measures is high (~0.81) for five node graphs and decreases to moderate levels (~0.60) for 20 node graphs. Linear regression models with one measure as the outcome and the remaining two as predictors suggest that for all three measures centralization is hard to predict. However, a quadratic model of the single maximum centrality value for each graph fits the centralization data reasonably well for all three measures and all graph sizes. It is hoped that an increased understanding of the properties of centralization will provide a background for applied researchers to interpret their results and also encourage the reporting of centralization measures in real networks.

Anomaly Detection in Centrality Computations
Mutschke, Peter
GESIS - Leibniz Institute for the Social Sciences, Knowledge Technologies for the Social Sciences, Köln, Germany
Many studies have shown that the reliability of basic network measures such as centrality is a critical point in network research that may affect its validity immensely. This is in particular true for large or vague networks as well as sampled or “errorful” network data. A further important observation are large disproportions between the results of different centrality measures for the same vertex (status inconsistencies) that in some cases yield considerable problems of plausibility, such as a coincidence of high betweenness and low degree centrality. However, little work has been done so far as regards structural properties of valid centrality measurements under consideration of robustness and status consistency. Anomaly detection, on the other hand, aims at characterizing normal patterns in a data set and then classifying events that do not conform to a normal behavior. The paper discusses a model that applies this approach to the case of centrality measurement in network research and shows that status inconsistency is not a sufficient criterion to classify a centrality value as anomalous (as some authors suppose). The paper rather argues that aspects of network robustness are also needed for valid anomaly detection in centrality measurements. To avoid centrality anomalies the anomaly detection model proposed can be used for preprocessing to remove or skip anomalous data in centrality computations.

**Network Analysis Literacy**

*Zweig, Katharina A.*

TU Kaiserslautern, Computer Science, Graph Theory and Complex Network Analysis, Kaiserslautern, Germany

Measures from social network analysis have lately been transferred to other complex networks from, e.g., biology and economy. In a first step, many of these measures have been used as a mere structural quantity, without a contextual interpretation. But recently, more and more data is displayed as a network and, once transformed, various measures are applied to it and their results are interpreted within the context of the data. However, often the methods and the data do not seem to match. In this talk I will show some of the pitfalls that occur if data, network representation, and method are not finely matched to each other. I will finally discuss whether there are relational data sets with a clear network boundary that should nonetheless neither be represented as a social network nor as a complex network. In summary, I will discuss aspects of literacy in network analysis: a better understanding of when to use network analysis as a tool, and when to use which method in this context.
Mechanisms of Change in Organizational Networks

The Semi-formal Organization

Biancani, Susan¹, Dahlander, Linus², McFarland, Daniel²
(1)Stanford University, Stanford, CA, United States, (2)ESMT, Berlin, Germany

Knowledge intensive organizations rely heavily on emergent collaborations that generate innovations. Most firms seek to create new spaces for collaborations through formally prescribed departments and divisions. However, we find firms also strategically alter what could be called, the “semi-formal organization”, so as to guide the creation of new work relations. These secondary memberships are extra-curricular and voluntarily joined, and they have certain benefits to a firm over and above the primary, formal memberships they frequently regulate. We find that firms allocate primary and secondary departmental memberships to employees as individual exceptions and collective enticements. Extensive longitudinal network analyses of one large knowledge-intensive organization finds that primary formal memberships greatly guide the formation of collaborations and worker innovation, but when exceptions are made where individuals can hold multiple memberships, they induce membership dilemmas and productivity tradeoffs. Only semi-formal memberships contribute to tie formation and worker productivity in additive ways. This paper draws attention to a new dimension of organization, the semi-formal organization, and it reveals how the allocation of different membership forms can render knowledge intensive firms more flexible and exploratory in their knowledge creation efforts without sacrificing the functions stably enacted via the formal organization.

Tools to Build Ties

Brandt, Philipp, Whitford, Josh
Columbia University, New York, NY, United States

In this article, we explore the changing face of industrial policymaking in the United States by way of analysis of activities of the Manufacturing Extension Partnership (MEP) housed in the National Institute of Standards and Technologies. We show that the agency is regularly forced, for political reasons, to justify its existence by showing that it remediates identifiable "market failures," but that the activities that would in fact be most likely to condition the location of benefits from production-related innovation in fact require the mitigation instead of "network failures" (Schrank and Whitford 2011). This generates tensions, as "street-level bureaucrats" in charge of the implementation of industrial policy find themselves looking for ways to mitigate network failures, but to do so in ways that can -- if necessary -- be reframed in terms that give the necessary political cover. By tracing the network formation over 10 years, and in 60 regions across the US, we show, in particular, that a substantial proportion of the agencies' resources and competencies are devoted to the generation of ties between third parties even as formal accounting systems ignore these activities. Using dynamic models for analyzing networks, we capture moments of tie formation between small- and medium-sized firms in the American industrial economy. Our findings develop network analysis methodology, advance theory, and inform policy-making because we can formally describe a set of tools able to identify and remediate previously invisible problems in the organizational structure of the manufacturing economy.

Labor Markets as Complex Systems: A Study of the Role of Social Networks in Segregation Processes

Collet, Francois¹, Hedström, Peter²
(1)ESADE Business School, People Management and Organisation, Barcelona, Spain, (2)Institute for Futures Studies, Stockholm, Sweden

Numerous empirical studies have documented how the networks in which individuals are embedded influence their pay and job attainments, for example, but hardly any studies have considered what these findings imply for macro-level outcomes such as segregation patterns, network dynamics, or various forms of inequalities. The focus of this article is on the segregation of organizations along ethnic and gender lines, and the role of networks in the processes that bring about segregated labor markets. We take advantage of a unique longitudinal data set on the entire population of the Stockholm metropolitan area to focus on a specific type of mobility-induced inter-organizational network through hard-to-observe information about employers and employees is likely to spread. In order to systematically bring the micro-to-macro link into the analysis we use a large-scale agent-based simulation model calibrated with parameters derived from an econometric model. Our results show that contrary to what may be expected, an increase in the effect of social ties between former colleagues on future movements of employees has a desegregating effect at the macro level. This result
is explained by the frequency of desegregating events that network effects contribute to amplify. By contrast, if there were a majority of segregating events social networks would reinforce segregation.

**Social Network Formation and Shared Professional Beliefs**

*Moolenaar, Nienke M.¹,², Daly, Alan J.¹*

(1)University of California, San Diego, Department of Education Studies, La Jolla, CA, United States, (2)University of Twente, Educational Organisation and Management, Enschede, Netherlands

Since its rise in organizational literature, studies on organizational social networks have predominantly focused on outcomes of social networks. Recently, a push for increased understanding of factors shaping social network structure can be noticed. An interesting theoretical framework for thinking about factors that shape, and are shaped by, social structure is shared cognition, and in specific, the concept of cognitive consensus. Cognitive consensus reflects shared the (dis)similarity of belief systems between group members that may support sense-making and align interpretation and communication in teams (Mohammed & Dumville, 2001). In this study, we will test whether (dis)similarities in teachers' professional beliefs may explain social selection and social influence among teachers, resulting in clique formation and 'fault lines' in social structure. Data were collected in a single Elementary School District in Southern California in 2012 where new teaching standards are currently introduced (the Common Core Standards). A total of 412 educators from 18 schools participated in the study by completing a survey on social networks and professional beliefs reflecting a response rate of 81%. Using multilevel p2 modeling and HLM, our preliminary findings suggest that the network structure of communication around the Standards, and its development, is dependent on the extent to which teachers have similar beliefs about these Standards. This suggests that (dis)similarities in teachers' professional beliefs may result in 'fault lines' in social structure, fissures that may offer opportunities for brokerage but also a potential origin for group conflict on how to effectively implement the Common Core Standards in schools.

**Production and Communication in Autocatalytic Networks**

*Padgett, John F.*

University of Chicago, Political Science, Chicago, IL, United States

This presentation summarizes the agent-based model of economic production developed in Padgett/Powell, *The Emergence of Organizations and Markets*, chapter 3. Depending on time, I will also sketch the agent-based model of communication developed in Padgett/Powell, chapter 4, and also sketch a sequel to chapter 4, entitled "The Evolution of Language in Autocatalytic Networks."

**When Do Entrepreneurs Change their Network?**

*Volk, Beate¹, Schutjens, Veronique A.J.M.², Mollenhorst, Gerald W.¹*

(1)Utrecht University, Sociology, Utrecht, Netherlands, (2)Utrecht University, Geosciences, Utrecht, Netherlands

Networks of entrepreneurs can be studied from two angles. An instrumental perspective, focusing on conditions of success, such as social capital and other resources and a more dynamic perspective, focusing more on the network itself and taking into account that some aspects of networks are constantly changing. Literature on the first perspective is huge; many studies focus on network resources, their conditions and consequences. The second perspective is less popular, however. The time-dependency of networks is highly unexplored, partially due to the lack of longitudinal data. In this paper we address the changes of entrepreneurs' networks. We argue that local networks in the neighborhood might be in particular important when an enterprise is started and loose value later on. Our research questions are: to what extent and in what respect do social networks of entrepreneurs in residential neighborhoods change over time? And can these changes be explained by the theory of social capital, in relation with characteristics of the entrepreneur, the firm, the social network or the (social) context? We use data from two waves of The Survey of the Social Networks of Entrepreneurs (referred to as SSNE1, respectively SSNE2). The first wave of this panel study (SSNE1) contains information on 385 firms and their entrepreneurs, collected in 2008 in 119 Dutch residential neighborhoods. The survey contains questions on characteristics of the firm (such as its product/service, age, size, turnover, turnover development, etc.), as well as the local attachment of the entrepreneur (such as having (non-)local customers).
Migrants and their networks 1

Migrant Networks and Poverty

Heizman, Boris, Böhnke, Petra
Universtität Hamburg, Hamburg, Germany

One of the most important forms of immigrant integration refers to their economic standing. Yet while we already know a lot about the labor market integration of immigrants, income poverty as a consequential lack of economic integration has generated less scholarly attention. In Germany, poverty levels have steadily been increasing over the last twenty years, and immigrants are a particularly vulnerable group in this regard. According to several integration paradigms, with regard to their networks, immigrants are faced with the choice between intraethnic, interethnic and autochthon contacts. That is, their networks can consist of members of their own ethnic group, of other ethnic groups, as well as members of the autochthon population. While there is disagreement on the (dis)utility of intra- and interethnic contacts, it seems to be the consensus that contacts with autochthon population members are beneficial in a number of ways. The question is, to what extent these assumptions hold for income poverty. We thus investigate to what extent the composition of immigrants’ social relations influences their propensity towards income poverty, and this question is approached by differentiating between intra-, interethnic and autochthon contacts. Using data for immigrants in West Germany we conduct panel analyses into the mechanisms that generate immigrant poverty, and the relative importance of the different types of network members.

Comparing the Personal Networks of Immigrants and Non-immigrants in New Suburban Gateways in the U.S.

Popielarz, Pamela, Cserpes, Tunde
University of Illinois at Chicago, Sociology, Chicago, IL, United States

This paper starts from two important points: the long stream of literature establishing that the structure and composition of personal networks matter for individual life chances, and prominent observations about how immigration to the U.S. has both increased and become quite a bit more complex in the past few decades. In the context of recent trends, including increased settlement in suburban areas, we ask whether and how the immigration experience shapes personal network structure and composition. We use data from the survey component of a multi-year, multi-method and multi-level research project addressing immigration in four suburban Chicago communities that recently experienced rapid immigration (particularly from Central and Latin America). Our slightly modified version of the GSS network name-generator module added two name-interpreters: whether the alter was born in the U.S., and whether the alter resides in the respondent's town, in the Chicago area, elsewhere in the U.S., or in another country. This allows us to build regression-based models that compare immigrants and non-immigrants in terms of personal network size, density, and composition (including proportion kin, proportion from the same geographic locale, proportion native-born, and proportion from the same racial/ethnic group). We define the immigration experience in a number of ways, including in terms of foreign birth, U.S. citizenship, immigrant generation, and length of time in the U.S. Early results indicate a number of effects of the immigrant experience on personal networks, some conferring lower life chances and others pointing toward more positive outcomes for immigrant social and political incorporation.

The Ethnic Composition of Individual Contacts, Relative Group Size and Differences in the Labour Market Integration of Immigrants

Scheller, Friedrich
University of Duisburg-Essen, Institute for Work, Skills and Training (IAQ), Duisburg, Germany

Regarding the labour market participation of immigrants in Germany, significant differences can be found between immigrant groups from the former “guest-workers” countries of origin. This finding affects members of the first generations as well as the second and following generations. While many studies focus on various aspects of immigrants' labour market integration, unexplained interethnic differences often remain. A possible theoretical explanation for this finding are differences in the ethnic composition of contacts between immigrant groups. These may be related to varying problems accessing jobs in the host society (see e.g. Granovetter 1973). An important determinant of intra- or intergroup contact can be the relative size of a group. The higher the share of members of the own group is, the higher is the probability of intragroup contact and vice versa (Blau 1977, 1994). A higher share of members of an ethnic group can also provide opportunity structures that simplify labour market access for group members in an ethnic economy.
Social Capital as a Resource for Self-employed Migrants
Sommer, Elena
Bremen International Graduate School of Social Sciences (BIGSSS), Bremen, Germany

Since the 1990s, the self-employment rate of migrants in Germany has been increasing. Social capital is an important resource for self-employment. Migration process often leads to the restructuring of the social capital and the access to different social networks in the new environment can strongly vary for the members of the same migrant group within the same destination country. The local structural framework as well as individual characteristics of migrants have an impact on incorporation pathways and can influence self-employment strategies of migrants. Based on the qualitative content analysis of 60 problem centered interviews with integrated network map data collection, the study explores the accessibility of migrants to different social networks within and outside their migrant community differentiating both between vertical and horizontal networking and examines different functions of bonding and bridging social capital as well as the role of transnational ties for the choice of the self-employment strategies. The study also analyzes to what extent social networks, their use and their functions for self-employment change over time and to what extent certain social ties can have negative effect on long-term growth of migrants' businesses. The theoretical framework of the study focuses particularly on the concepts „Social Capital“ (Bourdieu 1983; Coleman 1988; Portes 1995; Lin 2001) and „Mixed Embeddedness“ (Kloostermann/Rath 2001). The empirical research concentrates on economic activities of migrants from the former Soviet Union in two contrasting areas in Germany (urban vs. rural). The sample differentiates between start ups, established (more than 5 years) and former failed entrepreneurs.

Integration of Immigrants and the Role of Host Persons in their Social Networks: The Case of Ukrainians in the Czech Republic
Vosat, Petr
Academy of Sciences of the Czech Republic, Institute of Sociology, Prague, Czech Republic

The aim of the presentation is to describe personal networks of Ukrainian immigrants staying in the Czech Republic. The research was designed not to collect just social support networks that are usually analyzed in these cases, but also weak ties that include various acquaintances and less known persons. For that reason, there were used two data-collecting strategies. The first one was a classic method of multiple name generator. In this case the generator was composed of six questions asking for persons who might be a source of money, intimate topics discussion, employment, housing, leisure or might be simply important persons in a different way. The second one was a less employed method of position generator. This generator was constituted by 19 professions. The data were obtained from 20 Ukrainians and analyzed using UCINET 6. The results are discussed in light of their integration to the host society. The data collection includes besides egocentric relations also structural features of the networks - relations among alters. This approach extends the analytical possibilities. Besides common egocentric measures (e.g. multiplexity, closeness or frequency), also structural ones (e.g. closeness centrality, betweenness centrality or cluster analysis) are used. It should increase the potential of the analysis to uncover various aspects of structural integration of Ukrainians. In general, the presentation assumes that more host persons in personal networks of immigrants indicate a higher degree of integration. A higher degree of integration will be also displayed in the role of host persons in the social networks of immigrants.
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Transatlantic Vs. Local Networks in the Spanish Empire: Did Marriage Promote Spanish Immigrants’ Integration into the Colonial Elite?

Eyal, Hillel
Tel Aviv University, Tel Aviv, Israel

In late colonial Spanish America (18th-century), Spanish immigrants - arriving early in their careers mostly as young, single men - formed an extremely wealthy elite, which perpetuated itself through transatlantic networks for recruitment of new blood from the mother country. These immigrants usually married into wealthy local families, presumably as a channel for entry into merchant networks and thus, social-economic enhancement. This paper inquires if and how Spanish immigrants' marriage choices were a cause or a consequence of their entry into the colonial elite. In other words, it considers the weight of immigrant networks with regions of origin versus their networks within colonial society to explain the extraordinary predominance of Spanish immigrants in Spanish American elites. The paper employs mostly quantitative evidence from marriage petitions and censuses from Mexico, but also looks at other major locations in the New World for comparative purposes. The findings suggest that marriage, seen from an economic perspective, did not enhance immigrants' integration and success. What seemed to have mattered more were transatlantic networks through which immigrants arrived in the New World in the first place.

Interethnic Partnering and Integration: A Comparison of the Personal Networks of Immigrants in Mixed-nativity and Same-nativity Couples in Catalonia, Spain

Lubbers, Miranda J.1, De Miguel-Lukken, Verónica2, Rodríguez-Garcia, Dan1, Solana-Solana, Miguel3
(1)Autonomous University of Barcelona, Department of Social and Cultural Anthropology, Cerdanyola del Vallès, Spain, (2)University of Málaga, Department of Sociology, Málaga, Spain, (3)Autonomous University of Barcelona, Department of Geography, Cerdanyola del Vallès, Spain

Interethnic partnering (cohabitation or marriage) has often been regarded as the ultimate phase of integration or assimilation of immigrants into the mainstream society, and it is a common indicator of integration in survey research. However, several scholars urged for more in-depth research, arguing that interpartnering does not automatically signal integration. In this paper, we explored whether immigrants in mixed-nativity couples exhibit higher levels of social integration than immigrants in same-nativity couples, and if so, which causal mechanisms produce this relation. We specifically focused on immigrants’ personal networks and applied a mixed-methods approach to obtain a better understanding of their social integration. Our findings are based on interviews with approximately 100 first-generation immigrants in Catalonia. We selected respondents from seven countries of origin in both mixed-nativity (i.e. with Spanish partners) and same-nativity couples, and matched these two groups on background characteristics. Social integration was measured among others with compositional and structural characteristics of the respondents’ personal networks (name generator of 30 members) and their social capital (position generator). In order to understand to what extent interpartnering is a consequence or a cause of other dimensions of integration, we also considered the timing of events (emigration to Spain, formation of the couple, and relationships with network members), and the partner’s role in the network formation process. Semi-structured interviews with the same respondents complemented our understanding. Our results show that interpartnering is associated with higher levels of integration, but the mechanisms that produce this outcome are more complex than is often theorized.

Family and Kinship based Chain Migration of Turks in Europe - Results from the LineUp-study on 2000 Turkish Genealogies

Nauck, Bernhard
Chemnitz University of Technology, Sociology, Chemnitz, Germany

One of the issues of the migration of populations of Turkish origin to Europe is to which extent such movements are triggered by family and kinship networks. The more classical pioneering labor migration loses importance, the more chain migration through established transnational networks comes into the fore. The paper will analyze the migration processes in kinship settings. For this purpose, it uses the data set of LineUp, which provides complete 3-generation-genealogies of almost 2000 Turks, being born between 1921 and 1946 in five areas of Turkey with high rates of classical Turkish labor emigration to Europe. By design, about 80 percent of these male anchor persons/family heads were migrants, one fifth were non-migrants from the same areas. In total, the data set comprises information about the
migrants and their networks 2

The Interaction of Social Networks and (Im)mobility in the Situation of Transit: Sub-Saharan African Migrants in Istanbul

Suter, Brigitte
Malmö University, Malmö, Sweden

My presentation sheds light on the interaction of (im)mobility and social networks as specific to the situation of transit. It will present and account for various trajectories of mobility and immobility in transit with a specific focus on social networks dynamics that are both formed by and shape transit movements. An in-depth look is casted at Istanbul, which at least for migrants from Sub-Saharan African countries is commonly identified as a transit location. The ethnographic study has been conducted during a total of 9 months in Istanbul between 2007 and 2009. Drawing my vast ethnographic material, I will point at some specific characteristics of the state of transit. Both social networks and mobility are impacted by uncertainty, insecurity and rightlessness which are inherent to transit and permeates all aspects of everyday life. For a long time, social networks have been hailed for the positive effects on migrant’s incorporation as they have been portrayed as a source of material and emotional support and a locus of solidarity. As has emerged from my ethnographic material, social networks in transit are changing over time, they are highly unstable, and they are both a source of solidarity but also of exploitation. Mobility is highly conditional and dependent on the social and economic location of each individual. The presentation will point out that possibilities for social mobility are accessible for some individuals even in transit, while others experience immobility both in terms of existential as well as physical mobility.

Immigrant Children and their Parents: Is There an Intergenerational Embeddedness of Integration into Social Networks?

Windzio, Michael
Bremen University, Bremen, Germany

The paper analyses integration of immigrant children in multiplex social networks, particularly in the case of birthday parties. By attending birthday parties, children’s friendships are publicly reinforced and membership in a social circle is signified. Intergenerational embeddedness of social integration means that contact among parents is a source of trust between families. This facilitates the circulation of children and presents in birthday networks. During these events, communication and social exchange drive the process of social integration at the micro-level, and ethnic boundaries can be shifted or blurred. It will be shown that ethnic segregation in parents’ networks has an impact on children’s participation in these events and thereby on children’s integration in social networks. Multivariate probit p* models with instrumental variables, controlling for important indicators of homophily, will be estimated for 76 social networks of 1266 children in school classes in the city state of Bremen, Germany.
International Student Communities and Cross-cultural Adjustment

Gallagher, H. Colin, Robins, Garry, Kashima, Yoshihisa, Pattison, Philippa
University of Melbourne, School of Psychological Sciences, Melbourne, VIC, Australia

International students constitute an important and growing presence, leading to increasingly complex cultural and linguistic settings across campuses around the globe. However, although notions of cross-cultural contact, relations, and social networks have long been an important theoretical tool within the study of international students as both cross-cultural sojourners and second language learners, the use of social networks as an analytical tool has lagged behind. This research addresses network factors contributing to the cross-cultural adjustment of international students studying in Australia, with a particular focus on the role of network processes in the formation of both within- and cross-cultural ties, and the subsequent impact on sociocultural functioning and psychological stress. The current paper details and discusses an ongoing longitudinal investigation of social relationships among academic cohorts of international students studying English in Australia. Social networks composed of various types of ties - including trust, practical assistance, socialization in English, and difficulties in communication - are investigated. Using exponential random graph models (ERGM) for social networks, we examine initial results of one such student cohort for associations between network processes and adjustment-related variables. Analyses cover various network processes by which the individual either integrates into the wider cross-cultural milieu of the community, or remains segregated within a monocultural enclave. Implications that such acculturation outcomes may have on adjustment and communication-related variables will be discussed, along with the potential for viewing the individual as situated within a local culture of joint activities, using multi-level modeling approaches.

Ethnic Brokerage in Friendship Networks

Mollenhorst, Gerald1,2, Edling, Christofer1, Rydgren, Jens1
(1)Stockholm University, Sociology, Stockholm, Sweden, (2)Utrecht University, Sociology, Utrecht, Netherlands, (3)Lund University, Sociology, Lund, Sweden

Because direct as well as indirect (or extended) interethnic contacts have various positive consequences for immigrants, especially ethnic brokers play an important role for the social integration of immigrants: They build bridges between different ethnic groups. We describe and explain the occurrence of ethnic brokerage (i.e., open multi-ethnic triads) in friendship networks of young native Swedes and (2-nd gen.) immigrants from Iran and former Yugoslavia currently living in Sweden. We show that, although brokerage occurs to the same extent in the networks of natives, Iranians and former Yugoslavs, for native Swedes brokerage largely means intra-ethnic brokerage, whereas for immigrants brokerage largely means inter-ethnic brokerage. More specifically, we observe that although some immigrants do play the role of ethnic broker between a native Swedish friend and a co-ethnic friend, substantially more immigrants are the bridge between two of their unconnected native Swedish friends. This suggests that immigrants build bridges to multiple groups (networks) of native Swedes, which may result in access to varied sources of valuable information. We use various subsequent analyses to explain these network configurations in terms of characteristics of the respondents, of their friends(-hips), and of the friendship triads, including socio-demographic similarity and meeting opportunities.

Studying the Effects of Immigrant Integration Policies on Social Cohesion: A Network Approach

Pavan, Sara
Queen's University at Kingston, Political Studies, Kingston, ON, Canada

Immigration fluxes are altering the social fabric of most Western democracies, making it increasingly diverse. The question of whether ethnic heterogeneity constitutes a challenge for successful democracy has thus become a crucial concern in contemporary social science. Two main scholarly approaches have emerged. The American approach has focused on the effects of ethnic diversity on social capital, measured most frequently as generalized trust. The European approach, on the other hand, has emphasized how different citizenship regimes influence both the civic and the electoral participation of immigrants. Both approaches present methodological and theoretical weaknesses. This paper suggest an original way to study the effects of ethnic diversity on social cohesion in Western democracies. Following Erickson, it defines social capital as ego-centered network diversity. It suggests that proactive immigrant integration policies stimulate social cohesion by enhancing social capital in diverse societies. It proposes that multiculturalism policies facilitate more diverse immigrants’ networks, including bridging ties to other ethnic groups. Network diversity, in turn, is
positively associated with the civic and electoral participation of immigrants. The paper proposes a strategy to empirically analyze the effects of immigrant integration policies on social cohesion. It suggests the implementation of a position generator study in two ethnically diverse polities characterized by different immigrant integration policies, Toronto and Los Angeles. It details how to modify traditional position generators to study the bridging social capital of immigrants and its association with their political and generalized trust as well as their political participation.

Social Networks as Drivers of Regional Migration
Zarnekow, Nana, Henning, Christian
University of Kiel, Kiel, Germany

This study investigates the importance of social networks as determinants of migration decisions. The research interest becomes apparent by a number of different interaction possibilities between networks and migration behavior. In form of social capital networks can reduce transaction-costs, as information about the potential place of migration can be received easier and searching-costs can be reduced. But beyond this supporting character, networks can also have a migration hindrance character in form of leading people to stay because they do not want to lose the given social-network embedding. Furthermore, networks can influence the belief-formation of potentially migrants; i.e. the evaluation of regions. In all, the possible push- and pull effects of social networks can be outlined by the affinity-, information-, facilitation-, conflict-, and encouragement-hypotheses. Data-base is a household-survey. It includes around 400 heads of households in four different rural communities in Slovakia and in Poland, respectively. For the purpose to investigate individuals’ migration-decisions a choice experiment is conducted. A latent class approach as a micro-econometric model is applied to take care for preference heterogeneity. Results show that structural components of EGO-centered networks, e.g. size and density, in particular, the spatial location of EGO’s network contacts determine his propensity to migrate. Furthermore, the asked individuals can be divided into different sub-groups caused by socioeconomic and social network characteristics. These subgroups differ in the way their migration-decision is determined: e.g. a group which is characterized by open-networks is more likely to move than a group which members have a local network.
Mixed Method Network Studies 1

Bridging Structural Holes in Cross-border Policy Networks: A Comparative Analysis of the Cases Basel and Luxembourg with Mixed Method Network Studies

Dörry, Sabine
CEPS Luxembourg, Geography and Development, Esch-sur-Alzette, Luxembourg

We analyse two case studies of cross-border policy networks in public transportation, Basel and Luxembourg, with SNA and qualitative interviews. Based on this comparison, we discuss how mixed method network studies can illuminate both formal structures and relations but also explain network characteristics and meanings in necessary detail. Our empirical results reveal dissimilarities between both networks that seem to be significant when considering and evaluating policy measures. ‘Border effects’ in these policy networks have been prevailing despite the promotion of multi-level governance approaches (Hooghe and Marks 2010) and the intensification of functional integration as well as de-bordering processes in cross-border regions by the EU. Public transportation is a vital cross-border policy field in its capacity for providing necessary preconditions for the targeted economic development of the region itself. For this reason, purposive policy networks have been formed. We seek to reveal and explain empirically found structural holes (Burt 1992) in these policy networks.

The Impact of Equality among Participants on Process and Performance of Governance in Aboriginal Health

Kelaher, Margaret¹, Lock, Mark², Sabanovic, Hana¹, Labrooy, Camille¹, Pattison, Phillipa¹, Brown, Larry³
(1)University of Melbourne, Melbourne, VIC, Australia, (2)University of Newcastle, Newcastle, NSW, Australia, (3)Columbia University, New York, NY, United States

Equal respect among participants is a key criterion for deliberative democracy. Equal representation, equal opportunity and equal time are among the different approaches to measuring equality in deliberative processes. We apply these measures to understanding the extent to which regional governance forums in Aboriginal health achieve equal respect and its impact. Methods: The sample included organisations involved in planning in two Australian States Victoria (n=191) and WA (n=111). The response rates were 73% and 81% respectively. A multi-method approach was used to assess equality of respect including: Semi-structured interviews to capture information on the nature and content of the deliberations. Computer survey to collect social network and governance data. The composition of forums, the form and content of deliberations and the social relationships between participants were analysed. We also assessed whether achieving equality of respect lead to more successful deliberation in terms of both satisfaction with the process by participants and the delivery of beneficial programs to Aboriginal and Torres Strait Islander people. Results and conclusions: The results suggested that while Aboriginal organisations were under-represented in most forums they had a privileged position in terms of formal structures. This was reflected in a strong focus on the priorities of Aboriginal people in the content and a central positioning in social network analysis. The result suggested that the engagement of Aboriginal community members and Aboriginal organisations were both associated with greater satisfaction with the governance process. The engagement of Aboriginal organisations was associated with greater confidence of successful implementation.

Networking Strategy for Community Cohesion and Immigrant Social Support in a Neighborhood

Liu, Li-Wen
Tunghai University, Department of Social Work, Taichung City, Taiwan, Republic of China

This study presents a qualitative analysis of how a Chinese immigrant nonprofit organization, St. Louis Chinese Academy (SLCA), develops its social support network in a local community in the US. The paper traces how SLCA has dealt with socio-political tensions and developed strategies to build up social support networks at both individuals and community levels. Some fundamental issues, such as power, trust, competition and collaboration, cultural identities, and community identifications are discussed. Longitudinal data for this study are gathered from three sources, including: (1) on-site observations, (2) in-depth interviews with pupils, parents, teachers, administrative staff, and community residents, and (3) archival documents, including minutes from meetings, annual reports, organization memos, local biography, and others. Results of this study indicate key roles in strengthening organizational capacity and developing community cohesions are to develop community network. Other important elements include cultural resilience and organizational re-engineering. Findings from this study also show external forces, including (1) geographic accessibility, (2) community networking, (3) the blurring of social boundaries between ethnic groups in communities, and (4) multicultural
participation and cohesion, have reduced tensions and facilitated mutual trust between ethnic groups and local residents in the community. This study suggests that collaboration between community workers and immigrant educational institutions could be extremely valuable for developing multicultural understanding. Finally, this study raises an interesting issue: whether or not immigrant educational institutions are more likely to develop social support network and resolve ethnic tensions with local communities than other immigrant groups which focus, specifically, on ethnic identities, economic advancement, and welfare reform.

Network Theory and Collective Educational Leadership: Cross-Disciplinary Lessons
Nordengren, Chase
University of Washington, College of Education, Seattle, WA, United States

Current research in collective models of educational leadership, especially distributed leadership, emphasize that leadership activities are a process of transferring information, that leadership roles are situational, and that various interpersonal skills are implicated in leadership practice. This essay will explore connections between educational leadership theory and social network theory, drawing on lessons learned from an ongoing network study of teacher leadership in schools. It maps a conceptual framework for conducting qualitative, bounded analysis of school leadership networks, which includes emphases on differentiating multiple types of influential relationships, the role of formal power on the flexibility of informal leaders (social capital), and the social meaning of leadership roles for both leaders themselves and for an organization. The history of quantitative network analysis in schools is discussed, and the need for greater qualitative network research on the content of school social ties is emphasized. The advantages and disadvantages of bounded, as opposed to egocentric, network analysis are considered in relation to leadership and organization theories. Finally, the essay reflects on how research in schools might influence social network theory, emphasizing the flexible nature of influence and power, the use of ideas as capital and how dyadic relationships aggregate into more significant forces in organizations.

Exploring Power, Influence and Evidence Use in Policy Networks by Combining Hubs and Authorities
Network Measures with Qualitative Data
Oliver, Kathryn A.1, Everett, Martin2, Money, Annemarie3, de Vocht, Frank3
(1)University of Manchester, Manchester Business School, Manchester, United Kingdom, (2)University of Manchester, School of Social Science, Manchester, United Kingdom, (3)University of Manchester, Centre for Occupational and Environmental Health, Manchester, United Kingdom

Introduction: Research suggests that policy actors often access knowledge through interpersonal relations, but current perspectives in the literature do not analyse relational aspects of finding evidence and influencing policy. Identifying powerful and influential actors (in terms of personal characteristics, strategies, and network properties) offers a method of exploring the policy process and evidence use. Methods: Network data were gathered from a public health policy community in a large urban area in the UK (n = 152, response rate 80%), collecting relational data on perceived power, influence, and sources of evidence about public health policy. Hubs and Authorities analyses were used to identify powerful and influential actors. Qualitative data from semi-structured interviews (n = 24) were analysed using a framework approach to describe characteristics of powerful and influential actors, the use of evidence in the policy process, and roles and strategies used to influence policy. Results: Hubs and Authorities measures identified overlapping sets of actors, corroborated by themes from the qualitative data. Describing the different sets, and the overlap revealed new insights into the policy process. Influential actors used strategies (ranging from providing policy content, to finding evidence, to presenting policy options to decision-makers) to influence the policy process. Conclusions: Combining network and qualitative data allowed influential actors to be identified, and explanations for their success described. This study presents empirical evidence to support the suggestion that recognition of network structure assists individuals to be influential, and proposes a framework to categorise their activities.
Mixed Method Network Studies 2

Scholars’ Adoption of E-science Practices - Results from a Qualitative Study of Network and other Influencing Factors

Albrecht, Steffen
Dresden University of Technology, Media Center, Dresden, Germany

The increasing use of information and communication technologies (ICTs) by academic scholars has stimulated a debate about the potentials and pitfalls of “e-science”, the emerging forms of academic practices afforded by ICTs. While innovation theory points out the relevance of interpersonal influence in adoption processes, little is known about the influencing factors in the still young and ongoing process of scholars’ adoption of e-science practices. This paper presents results from a qualitative study of e-science adoption among scholars in the social sciences and humanities. Based on systematic online research of online presences of 860 scholars in political science, history and German language in the German state of Saxony, twelve early adopters were identified and interviewed about their academics practices and how these have changed in the course of ICT usage (ongoing research, interviewing ends in March 2013). A specific question of the study is the role of social network factors in the adoption process: What influence do academic peers have vis-à-vis other acquaintances, the local institutional context, the discourse within the discipline, social-structural and individual factors? And what characterizes interpersonal influences in terms of disciplinary or institutional context, the history and strength of the relationship, and socio-demographic factors? The answers to these questions provide knowledge about the influencing factors of e-science adoption and should permit to strategically influence the process. The results also show the potential of qualitative, exploratory social network research in fields where theory-building is not developed at a level that justifies confirmatory research designs.

Re-reading Personal History through Facebook Status: How to Use Online Data in Qualitative Interviews?

Bastard, Irene1,2, Raux, Stéphane3,4
(1)Orange Labs, Issy les Moulineaux, France, (2)Telecom ParisTech, Paris, France, (3)Linkfluence, Saint-Denis, France, (4)Liafa, Université Paris Diderot, Paris, France

Social interactions deal now on different supports and media, from physical discussions to asynchronous posts and comments on Facebook. Analysis of social networks encounters new opportunities through availability of data like Facebook ties (Ellison et al., 2011), and new challenges due to accumulation of heterogeneous contexts (Prieur et al., 2009) and undetermined transitions (Espeland, Sauder, 2007). In this communication we are interested in building a mix interview framework that enhances observations and analysis. More precisely, how can we use data collected from Facebook, including personal networks and their structure, to work within qualitative interviews on social activities? We propose a protocol to collect Facebook activity of a large sample of people thanks to an application. The application enables users to explore visually and dynamically their personal network, and to provide additional information about their contacts. This may then lead to interviews with selected respondents, using the collected data to complete their verbatim and challenge the accumulation of their interactions. We plan to launch the application with two major groups of respondents: a panel of about 1000 people selected to be representative of french facebook users, and a group of all the students from a french high school. Our aim is to ask which metrics and indicators provide the best description of social online activities and which are used in verbatims to relate personal social history. The large sample allows to include the determinants of respondents’ network structure in analyzing both online activities and offline sociabilities as described in interviews.

Performing Innovative Activities in an Aerospace Industry Network: ICT Tools Versus Face-to-Face Meetings

Corallo, Angelo1, Lazio, Mariangela2, Ceci, Federico2
(1)Università del Salento, Lecce, Italy, (2)Università degli Studi ‘G. d’Annunzio’ Chieti e Pescara, Pescara, Italy

The rising of the ICT has improved the collaboration among firms and decreased the problems associated with geographic distance. Different actors, also far located, work together in the design of a new product and the workflow is easy accessible to check the state of each phases and actors. The advancements and actions in the production are signed and elaborated in complex ICT systems available to each partner. In such context seems that there is no room for personal and face to face interaction. A large variety of scholar contributions highlighted the important role of personal relations, trust, shared vision and values ADDIN EN.CITE ADDIN EN.CITE.DATA (Granovetter, 1985; Good, 1988; Ibarra, 1993; Feld, 1997; Grabher and Ibert, 2006; Ceci et al., 2010). We want to further explore the topic finding a solution of the current
debate exploring the aerospace industry. In the aerospace industry, it is evident the increasing role of ICT and the strategic role of collaboration gives to interpersonal communication a central relevance. A case study is realized based on the analysis of open-ended interviews with managers and engineers of an aerospace company. The interviews were transcribed in their entirety to apply content analysis; on resulting data, statistical analysis were also performed. Objectives of the study are to prove under which circumstances personal communication is still a valid and not substitutive method for communication to support innovation activities and what are the other conditions that make technologies of communication effective in increasing the efficacy of the information sharing process.

Social Integration, Social Media Usage, and Ethnic Background of Teenagers

Goetztenbrucker, Gerit, Schwarz, Vera, Pfeffer, Juergen
(1) University of Vienna, Vienna, Austria, (2) Carnegie Mellon University, Pittsburgh, PA, United States

We are interested in differences and similarities of teenagers’ personal networks and social activities (offline and online) in respect to their gender, age, and ethnic backgrounds. What are the patterns of their support, friendship, and leisure networks? Who and what is important for their everyday life? What roles do Social Media and music play? What are teenagers’ social attitudes as well as their collaboration strategies? How do teenagers typically experience multiculturalism and cultural/ethnic diversity? Data in this project was collected threefold. First, semi-structured interviews with 100 adolescents in Vienna (Austria) were conducted. Secondly, we gathered ego-network maps from all interviewees using a computer-based network generator (funnel instrument). Thirdly, we invited our interviewees to play the positive impact game "YourTurn! The Video-Game", a music-related Facebook game that encourages collaboration and that was created especially for the purpose of our project. In this paper, we present analysis concerning network size, homogeneity (age, gender, ethnicity), multiplexity, special and temporal concentration, and shared interests. Our analysis also includes longitudinal aspects as 40 adolescents were interviewed a second time one year after the main interviews and after playing the positive impact game.

Subsumption or Blind Spots? How to Mix Methods While Analysing Organizational Environments via Qualitative Interviews and Network Maps

Herz, Andreas, Peters, Luisa, Truschkat, Inga
University of Hildesheim, Hildesheim, Germany

When using the approach of ego-centric networks, a common method to analyze the embeddedness of actors in social structures are network maps which are often combined with qualitative interviews. Structural approaches in the interpretation of visual data collected via open network maps represent, so far, a desideratum. Furthermore, combined methodological approaches relating narrative material from interviews with visual data from network maps, are to be developed. Based on a study on the organizational networks of agencies which carry out transfer of employees, we introduce strategies for the qualitative analysis of data from network maps in combination with data from narrative interviews. In order not to subsume results from the network maps to results from the narratives (and vice versa) each type of data should be interpreted on its own before undertaking a joined interpretation.

Socio-economic Process and Network Structure - Integrating Network and Qualitative Analysis

Sloane, Alan, O'Reilly, Seamus
University College Cork, Food Business and Development, Cork, Ireland

The processes underlying the formation and evolution of business networks have been less studied than those underlying other types of networks, e.g. friendship networks. This paper reports on our research into networks formed by two groups of small startup businesses. The research was conceived explicitly as mixed-method in order to combine a macro view from SNA with a micro view from thematic analysis. Our intent was to integrate the traditional graph-theoretic methods of SNA with qualitative methods in order to explore the subjective meaning of "networking" activity among these actors and to develop theory on how and why actors choose particular alters and how patterns arise in the networks. Data was collected from the founders of 60 SME’s on their business connections - “vertical” and “horizontal” - to construct two “whole networks”. These were subjected to within-case and cross-case analysis. Concurrently we collected, using semi-structured interviews, descriptions of how these relations were initially formed, how they were maintained, and how these actors more generally made connections (“networking”). Because we conjectured, based on the literature, that processes of information-search and knowledge-formation - in particular, codified knowledge and tacit knowledge - were critical here, we also inquired into their use of ICT’s and socially- and geographically-proximate mechanisms. While aspects of method and findings have been outlined in our previous publications, we focus here on
techniques used to integrate our network and thematic analysis. We show examples of how we related socio-economic process to network structure such as triads and cohesive sub-groups.
Reconfiguring Bourdieu: Observing Ties in a Youth Gang
Bellotti, Elisa
University of Manchester, Sociology, Manchester, United Kingdom

The presentation aims to discuss the strength and limits of Bourdieu's field theory, by engaging with the theoretical advantages in adopting a social network approach in the study of social fields. While Bourdieu has always been critical toward the focus on concrete relationships, here I recall some attempts of mediation between the two traditions both from a theoretical and a methodological perspective. The argument is supported with an ethnomethod study of two connected youth gangs in a peripheral suburb of Milan. Data were collected via six month participant observations, informal and ethnographic interviews, and a focus group. The structure of the groups, their relationships with other youth and the adult's world, and the social fields they play in, delineated by the stakes they aim for, are formalized in networks. The analysis shows how the concept of social capital, which is considered by Bourdieu as a cumulative and strategic resource, function as the social infrastructure in which cultural and economic capitals are transmitted across the networks. Overall symbolic capital, explicitly expressed through material culture, play an opposite role in competing social fields: what in the illegal field grant them the possibility of gaining central positions, in the legitimate field relegate them to the margins, stigmatizing the fakeness of adoption of material symbols and unmasking the inability to speak the dialects of class distinctions.

Coleridge, Chris
London School of Economics, Management, London, United Kingdom

This qualitative study of 40 venture capital partners examines the microdynamics of broker decision making, pursuing the question of on what strategies, (or more precisely on what sequences of social capital building mechanisms) they rely to achieve their goals, and the logic underlying these sequences. The growing brokerage and network dynamics literature (Burt 2005, 2010, 2012; Obstfeld 2005, 2011; Fernandez-Mateo 2007; Greve et al 2011; Vissa 2012; Baum et al 2012; Powell et al 2012) presents various accounts of broker ‘entrepreneurship’ (recombination), connection, facilitation, rivalry-promoting, and co-ordination behaviour. These behaviours are argued to be effective through their influence on structural (Burt 2000) and dyadic (Levin et al 2011) social capital. The present study inductively examines how brokers combine and sequence such behaviours and advances a set of theoretical propositions as to the incentives underlying these sequences and their impact on broker performance (which has been found to vary widely among individuals (Burt, opera citata)). I find five strategies/sequences of mechanisms regularly pursued by venture capitalists, who seek, in a world of high-uncertainty projects, to communicate the value of their social capital across domain boundaries to cue others’ decisions.

The Role of Human and Social Capital in Dairy Farming
Greve, Arent1, Hansen, Bjørn G.2
(1)NHH Norwegian School of Economics, Bergen, Norway, (2)Tine, Oslo, Norway

We explore the effects of human and social capital on productivity among dairy farmers. Farmers have different educational backgrounds, some have a lower or higher degree in agronomy; some farmers have higher university education. Others have learned technical or craft skills that are not directly aimed at agriculture. During their work farmers interact with other farmers to solve problems, and they learn to deal with a host of problems that most farmers experience. However, browsing a database of biological production and financial data we notice that there are substantial differences among farms in both the quality of the milk and the economic outcomes from their farms. We first selected the five most important dairy farming areas in Norway and then randomly drew a sample of farmers. During the late fall of 2007 we visited and interviewed 90 farmers. First we did a qualitative analysis of the data and then we merged the interview data with the existing database on biological and financial data from the years 2007 and 2008 to do a statistical analysis. We find that education (or human capital) has clear effects on the financial outcomes of farmers. There are direct and interaction effects of social capital. Access to social capital lowers veterinary expenses, and interaction effects with education shows that people with agronomy education and social capital have substantially larger incomes.
than farmers without relevant education. We find no effects of social capital among farmers without formal education in agronomy.

The Compartmental Evolution of Social Support
Small, Mario L1, Deeds, Vontrese2, McMahan, Peter3
(1)University of Chicago, Chicago, IL, United States, (2)Northwestern University, Evanston, IL, United States

Studies of social support have suggested that people tend to turn to different alters for different kinds of support, a practice researchers have referred to as differentiation or compartmentalization (Wellman 1990, Bearman and Parigi 2004, Small 2009). However, most empirical studies have addressed this question based on cross-sectional data, implicitly conceiving of compartmentalization as a static phenomenon, rather than a dynamic process. In what follows, we examine the evolution of compartmentalization based on qualitative and quantitative data on a group of first-year graduate students followed over the course of their first year. We focus specifically on who respondents turn to when discussing sensitive matters, and conceptualize compartmentalization as involving two separate components: the extent to which, for a given topic, ego turns to some alters more than others; and the extent to which, for a given alter, ego confides with respect to some topics more than others. Based on differing assumptions about how people make decisions about confiding in others and how much intimacy people are comfortable with, we derive hypotheses about the evolution of compartmentalization over time. Combining qualitative analyses of interview data with ERGM-based quantitative methods, we find that, while there are moderate amounts of both types of compartmentalization when students first meet and they differentiate more across alters than across topics over time, such that ego trusts fewer alters with more topics. We develop the implications of these findings and propose ideas for future research on the evolution of social support.

Religious Networks of Occupational Mobility
Steinhof, Ruth
Graduate School of North American Studies, Freie Universität Berlin, Berlin, Germany

North America is unique in its religiosity, its income inequality, and has a government that encounters difficulties implementing a net of social benefits. Where does that leave the individual seeking work in a society distressed by financial crisis where receiving governmental help is often stigmatized? Whereas the benefit of churches serving the poor is without question, it is not clear to what extent they can be useful as networks of status attainment and resources for more elaborated economic needs. Can churches function as structural loopholes for occupational mobility? Do they offer opportunities to form networks and chances to get ahead for the otherwise socially deprived, overcoming social inequality? American churches can be seen as enterprises - dependent on the tithing of their members. It is assumed that through this dependency, churches should have a somewhat heightened interest in keeping their members employed and connected with each other allowing them to bridge otherwise irreconcilable social gaps, attaining resources and agency options beneficial on the job market. All this in dependency of the respective belief system of the church. It is not probed if churches actively foster opportunity structures and if and how their members perceive these as opportunities when it comes to getting a job. To open up this yet unexplored field in my dissertation project a qualitative approach was chosen, observing six different congregations in Virginia and Indiana. Furthermore 68 interviews with members, leaders and members of employment institutions were conducted. I’d like to present some of my current findings.

Personal Social Networks of Female Sex Workers and their Non-commercial Male Sex Partners in Tijuana, Mexico: Implications for HIV/STI Risk
Wagner, Karla D1, Verdugo, Silvia R2, Suyvertsen, Jennifer L3, Rusch, Melanie L2, Rangel, Maria Guadelia4, Morris, Martina4
(1)University of California San Diego, Division of Global Public Health, La Jolla, CA, United States, (2)University of California San Diego, La Jolla, CA, United States, (3)Mexico-US Border Health Commission and El Colegio de la Frontera Norte, Tijuana, Mexico, (4)University of Washington, Seattle, WA, United States

Female sex workers who inject drugs (FSW-IDUs) and their non-commercial male sex partners (i.e., spouses) are at risk for HIV/STIs. We collected mixed methods personal network data with 16 FSW-IDUs and their non-commercial male sex partners in 2012. Eight social support name generators elicited network contacts, followed by name interpreters and qualitative follow-up. Analysis investigated gender differences in network characteristics and the role of networks in shaping HIV risk. Couples had known each other for approximately 9 years (SD 7.4). Networks ranged from 2 to 15 contacts; median was 5.0 for women and 5.5 for men. Women’s networks were comprised of fewer family members than men’s (median: 1 vs. 2). Both women and men listed a median of 1 sex contact (usually the primary partner); the range for women was larger than for men (1.5 vs. 1-2, respectively). Few reported using condoms with their non-commercial
sexual partner in the past six months. Women and men listed a median of 1 IDU contact (range 0-3 and 0-4, respectively). Women reported sharing syringes with fewer contacts than men (median 0.5 vs. 1, respectively). Qualitative data suggest that women may deliberately isolate themselves from family (especially children) due to drug use-related stigma, and highlight the role of economic competition in creating distrust and isolation among FSW-iDUs in Tijuana. While women's networks were about the same size as men's, important differences in composition were observed. The relative lack of social support from family members and other sex workers may heighten vulnerability to HIV/STIs.
Multi-level Networks Analysis 1

From the Embeddedness to the Multilevel Problem - A Case Study of the Audiovisual Market in Eastern Europe

Brailly, Julien¹, Favre, Guillaume¹, Chatellet, Josiane¹, Lazega, Emmanuel²
(¹Université Paris-Dauphine - IRISSO, Paris, France, ²Sciences Po CSO-CNRS, Paris, France)

Since Granovetter’s (1985) and White’s (1981, 1992) work about the interactions between economics and social relations, economic sociologists have shown that it is important to know the social structure of a specific milieu to understand its economic structure. In order to explore the complex interactions between these embedded spheres, we provide a multilevel reading (individual and organizational) of an economic market by modelling its underlying social ‘meta-system’. We reconstruct a multilevel network (in the sense of Lazega & al. 2007, 2008) in an economic market. We consider two levels of action: the first is measured by an advice network among individual actors; the second is measured by a contracts network among the organizations in which the individuals belong. The issue is to model the global structure as generated by these two levels of agency that are partially nested. A traditional ERGM at each level shows a difference of structuration and of temporality between these two levels. To manage this diachrony, the organizations must develop some specific mechanisms of learning and knowledge transmissions (through affiliations links). Results show that embeddedness is not only a dyadic process or a tetradic multilevel configuration. It is also a global structural interaction.

Bayesian Hierarchical Stochastic Actor-oriented Models for Networks Observed in Time Across Different Settings

Koskinen, Johan H.¹, Snijders, Tom A.B.²,³
(¹University of Manchester, Social Statistics DA, Manchester, United Kingdom, ²University of Oxford, Oxford, United Kingdom, ³University of Groningen, Groningen, Netherlands)

In a number of empirical cases we are faced with the problem of having observations on multiple networks across different contexts where the actor sets are not overlapping. We may for example be interested in inferring the effect on network and behavioural dynamics of an intervention in one setting; or we may collect actors based on the nominations of a number of sampled egos. Analysing the extent to which different contexts affect the network dynamics may also be of theoretical interest in its own right - to what extent are network processes generalizable and to what extent are they particular to certain settings. The problem these type of data structures introduce stem from us wanting to make a joint inference across systems of different sizes that all have different initial conditions. We explore the implications of these issues in the context of a newly developed hierarchical inference scheme for multiply observed networks over time. This is a multilevel model in the sense that networks are nested in both time and contexts. In particular we address the role of prior distributions that try to balance retaining estimability - allowing for networks that on their own may carry too little information - while not introducing systematic errors in our inferences.

Inter-organizational and Inter-individual Networks in Biotech: An Application of Multi-level ERGMs

Schierjott, Irena², Brennecke, Julia², Rank, Olaf N.¹
(¹Georg-August-University of Göttingen, Organization and Corporate Development, Göttingen, Germany, ²Albert-Ludwigs-University of Freiburg, Organization and HRM, Freiburg, Germany)

There are large bodies of research on formal organizational-level networks on the one hand as well as on managers’ informal networks within and between firms on the other. However, even though it can be expected that networks at the organizational level and at the individual level do not emerge independently, the link between both has attracted little attention so far. We try to bridge this micro-macro gap by investigating multi-level structures that link the networks between organizations to the networks between their respective managers. As theoretical knowledge on multi-level network structures is practically non-existent, we take an exploratory approach. On the organizational level, we empirically study collaboration ties among organizations that participate in a regional bio-tech cluster located in Germany. On the individual level, we investigate the advice network between managers nested within these companies. We take into account the exchange of advice within and across firm-boundaries. Applying a class of exponential random graph models (ERGMs) for multilevel networks, we show that both network levels are interdependent and affect each other in various ways. Our study extends existing research by providing a first insight into the interplay between managers’ individual-level networks and their respective organizations’ formal collaboration ties. It is of theoretical
Advantages of using a multilevel representation in studying organizational network processes. First, seeking for new ideas follows two different mechanisms based respectively on weak ties within units, and strong ties between units. Second, heterogeneity in individuals’ activity is largely due to heterogeneity in their unit’s structure. A multiple membership multiple classification (MMMC) model can be specified and applied to situations where there is a single set of social network connections, and interest focuses in variations in an individual level response variable for individuals and networks, possibly in the context of groups such as schools or areas. In this situation, the social network is assumed to be a dependency, and we may be interested in the extent to which people who know one another have similar values of their response variables. The data used here comprise a set of French cancer elite researchers. We know which cancer researchers know one another. We also know the way in which the laboratories in which the cancer researchers work are connected. Hence, we have two levels of network: networks of individuals, and networks of laboratories. In addition, we have information about the cancer researchers: age, speciality etc., and about the laboratories in which they work: size, etc.. For each of the cancer researchers, we have an individual level response variable: their “impact factor” scores as researchers. We explain how the MMMC model may be extended to allow for two levels of network connection. Thus, we show how variations in the impact factor scores of the cancer researchers may be assessed at the individual level, for the networks of individuals, and for the networks of laboratories. We explain how the model framework could be used more generally to study dependencies in an individual level variable at several different network levels.

Social selection models (SSMs) incorporate nodal attributes as explanatory covariates for modelling network ties (Robins et al. (Robins2001)). The underlying assumption is that the social processes represented by the graph configurations without attributes are not homogenous, and the network heterogeneity maybe captured by nodal level exogenous covariates. In this paper, we propose SSMs for multilevel networks as extensions to exponential random graph models (ERGMs) for multilevel networks (Wang et al. 2012). We categorize the proposed model configurations by their similarities in interpretations arising from complex dependencies among ties within and across levels as well as the different types of nodal attributes. The features of the proposed model are illustrated using a network dataset collected among French elite cancer researchers and their affiliated laboratories with attribute information about both researchers and laboratories (Lazega et al., 2006; 2008). Comparisons between the models with and without nodal attributes highlighted the importance of attribute effects across levels, i.e. the attributes of nodes at one level may affect the structure of the within level network structure at the other level.

This paper applies newly developed Multilevel Exponential Random Graph Models (MERGMs) to examining organizational behaviour in a multilevel perspective. In particular, the paper deals with the idea of ‘duality’ of people and groups and looks at how informal networks of individuals and formal networks of organizations with which they are affiliated affect one another. MERGM’s capability to uncover and simplify complex mechanisms of dependency and interdependency across levels is demonstrated in studying the exploration of new ideas, which is the first phase of the innovation process, within a multiunit organization. Different hypotheses on the influence of organizational routines on seeking for new ideas among employees are specified and tested fitting nested ERGMs and MERGMs. Results indicate that interaction among individuals depends on their affiliation and on their unit’s position within the organizational structure. First, seeking for new ideas follows two different mechanisms based respectively on weak ties within units, and strong ties between units. Second, heterogeneity in individuals’ activity is largely due to heterogeneity in their unit’s collaboration ties. Third, the exploration process strictly mimics the organizational chart. The study illustrates the advantages of using a multilevel representation in studying organizational network processes.
Macro-modeling of Knowledge Development in Wikipedia

Halatchliyski, Iassen, Cress, Ulrike
Knowledge Media Research Center, Tuebingen, Germany

Based on longitudinal data from Wikipedia we study the process of knowledge development in a massively collaborative setting. With the help of betweenness and eigenvector centrality we define the concept of pivotal knowledge at the macro level of two adjacent knowledge domains with thousands of interlinked Wikipedia articles and authors. According to our main hypothesis, pivotal knowledge, that is, the central articles existing at a point in time, significantly influences the development of new knowledge in later stages of the process. The analysis is comprised of two levels—articles and authors. The network analysis is done at the level of interlinked articles and the resulting indices are then aggregated at the level of authors according to their contribution activity. The data set contains seven yearly measurements at equal intervals between the years 2006 and 2012. The repeated measures allow for a flexible modeling approach with fixed and random effects. Accounting for the impact of the covariates age in Wikipedia, article length and author experience, the models calculate the additional effect stemming from article centrality and aggregated author centrality on indicators of new knowledge in subsequent periods. This modeling approach contributes to the understanding of knowledge development as a dynamic process over longer periods of time. In this process experienced authors create pivotal knowledge, setting the stage for further development of new knowledge.

Pareto Distance for Multilevel Network Analysis

Rossi, Luca¹, Magnani, Matteo²
(1)University of Urbino Carlo Bo, Communication Studies and Humanities, Urbino, Italy, (2)Aarhus University, Computer Science, Aarhus, Denmark

Online social network sites (SNSs), where users spread their identities over multiple services and accounts, emphasize and reveal the stratified structure of our social experience. However the recent introduction of layered network models to study these phenomena (extending previous work on multiplex networks) has determined new research problems related to the extension of traditional single-layer network measures. In our work we take a step forward over existing approaches by defining a new concept of geodesic distance between two nodes in a multilevel network with very limited assumptions regarding the strength of the connections. This is achieved by exploiting the concept of Pareto efficiency: intuitively, a Pareto-efficient path between two nodes on a multi-layer network is a path that cannot be shortened by exploiting any connections on any of the existing network layers. Pareto distance provides a basic network measure that can be used to compute more complex network centrality metrics such as Multilevel Betweenness Centrality. The limited assumptions on the nature of the connections required by the Pareto distance may theoretically result in a large number of potential shortest paths between pairs of nodes. However, in our lecture we will show how the number of shortest paths tends to be stable despite the increasing complexity of the analysed networks. The proposed idea of Pareto distance and its application to a wide range of synthetic and real networks constitute a promising direction to develop feasible methods for the analysis of real-world multilevel networks.

The Actor Process Event Scheme (APES) - A Software Tool Conceptualizing Process Network Data

Serdült, Uwe I.
Centre for Democracy Studies Aarau- ZDA, Aarau, Switzerland

We assume that it is possible to derive a structure - understood as relations between nodes - from process. Every process, conceptualized as a sequence of linked events, contains the information necessary to derive an underlying structure. The Actor Process Event Scheme (APES, see also: www.apes-tool.ch) is a software tool helping to visualize multi-level process network data. It consists on one level of a two-mode event participation network and on another level on the event networks as such. APES does standardize qualitative case study data by visualizing public policy processes within a particular political system. By doing so, it gets not only possible to compare different cases on a more generalized level, but qualitative data can be converted into quantitative data, and used for further research. In the paper the tool and its data model is presented and applied to political decision-making processes. Furthermore the potential of the underlying data structure for an extention in the direction of event network modelling is explored and discussed.
Changes in the Relationships of Macro-groups in Multiple Dimensions: An Analysis of the 1985 and 2004 General Social Survey Datasets

Varga, Attila V.
University of Arizona, Department of Sociology, Tucson, AZ, United States

Survey data is rarely considered as a suitable data form for network analysis. However, there are various approaches to considering attribute level data as networks. Generally and frequently survey results can be viewed as a 2-mode network of cases and variables. This paper, by building on this approach, takes the results of the name generators in the General Social Survey 1985 and 2004 datasets as a starting point and presents an analysis of multiple networks of a wide variety of variables and social positions resulting from name generators. Name generators inquire about the constitution of one’s ego network in terms of macro-groups. The distances of positions within and between these macro-groups in social and various attitudinal dimensions are the focus of this study. Using this perspective, the paper presents the methodological challenges and possible solutions that arise from such an analysis, and identifies key social changes that took place between the two time periods. In general there is found to be a diminution in categorical bases for social relations.

Correspondence Analysis of Multilevel Networks

Zhu, Mengxiao¹, Contractor, Noshir², Wasserman, Stanley³
(1)Rutgers University, New Brunswick, NJ, United States, (2)Northwestern University, Evanston, IL, United States, (3)Indiana University, Bloomington, IN, United States

Social actors are often nested within a priori subgroups, thus giving rise to affiliation data. Such data can be viewed as multilevel, and is complex if the actor-nesting is not mutually exclusive. The actors are the lower level; the subgroups are the upper; actors can be in more than one subgroup. At the same time, actors may also maintain other types of social interactions with each other. One such example is the working teams assembled to solve complex and difficult tasks. These teams often share one or more members with other teams. In addition, the team members are embedded in prior communication and collaboration networks. The dependencies among overlapping teams violate the basic assumption of statistical independence common to many traditional statistical methods. This study uses affiliation networks to represent teams and individuals, with “links” representing team membership. The social relations between individuals can then be easily represented using one-mode networks. To analyze the data, we propose the use of correspondence analysis, which enables us to incorporate multiple relations and attributes at both individual and team levels. This preempts concerns about independence assumptions. The results from correspondence analysis can be presented visually using a plot rather than only by numbers. We illustrate this method with an example focusing on combat teams from a fantasy-based online game, EverQuest II. The results of our analysis in addition to offering important multilevel insights, also serve as a stepping stone for more focused analysis using techniques such as p*/ERGMs.
Crowds, Bluetooth and Rock’n’Roll: Understanding Music Festival Participants’ Behavior
Larsen, Jakob Eg, Sapieżyński, Piotr, Stopczyński, Arkadiusz, Theodorsen, Rasmus, Mørup, Morten
Technical University of Denmark, Lyngby, Denmark

In this paper we present a study of sensing and analyzing an offline social network of participants at a large-scale music festival (8 days and 130,000+ participants). Data on spatio-temporal traces of participant mobility and interactions was collected from 33 Bluetooth scanners placed in strategic locations at the festival area to discover Bluetooth-enabled mobile phones carried by the participants. We analyze the data on two levels. On the micro level, we use a community detection algorithm to reveal a variety of groups formed by the festival participants. On the macro level, we employ an Infinite Relational Model (IRM) in order to recover the structure of the social network related to participants’ music preferences. The obtained structure in the form of clusters of concerts and participants is then interpreted using meta-information about music genres, band origins, music stages, and dates of the performances. We show that most of the concert clusters can be described by one or more of the meta-features, effectively revealing preferences of participants (e.g. a cluster of US bands) and discuss the significance of the findings and the potential and limitations of the methodology. Finally, we discuss the possibility of employing the described method and techniques for creating user-oriented applications and extending the sensing capabilities during large-scale events by introducing user involvement.

The Art Worlds of Punk Inspired Feminist Networks
O’Shea, Susan
University of Manchester, Manchester, United Kingdom

This research explores how music and art created by women is produced, distributed and received by local communities of feminist activists, taking into account contemporary issues for feminist music based communities. The historical and international context of these overlapping and developing social movements are reviewed and include Girls’ Rock Camp and Riot Grrrl movements. Howard Becker’s concept of ‘Art Worlds’ is used as an operationalisation tool focusing on the under researched distribution aspect of art worlds. Empirical work focuses on UK ‘Ladyfest’ case-studies examining the evolution of festival networks 2009-2012 in Manchester, Oxford and London. Data collection and analysis benefits from a mixed-methods research strategy, combining quantitative and qualitative methods. Primary data sources include on-line social media, surveys and qualitative data. Findings indicate that those involved with Ladyfest tend to be motivated by a desire to challenge gender inequalities at a local level while drawing on similar local and international movements spanning different time periods and drawing on the works of feminist and pro-women musicians. Participants show an awareness of intersecting inequalities such as race, class and disability yet homophily, multiplexity, sub-groups and cliques play important roles in developing relationships within the networks. For some, Ladyfest involvement is a gateway into feminist activism, and for many it tends to lead to lasting friendships and new collaborative art based ties.

In Search of Cultural Taste Patterns: A Network Analysis on the Clustering of Music Preferences
Vliegels, Jef1, Lievens, John2
(1)Ghent University, Sociology, Gent, Belgium, (2)Ghent University, Gent, Belgium

Research on cultural consumption typically identifies different cultural patterns which allow researchers to sort cultural practices into categories. These patterns are based on a perceived similarity among cultural ‘genres’. Typical examples are the ‘highbrow’ vs. ‘lowbrow’ dichotomy and omni-versus univores. Numerous studies have used these cultural patterns to investigate their link with social strata and all kinds of different personal attributes. There is however an important issue concerning the operationalization of these cultural taste patterns. Researchers typically use a list of pre-defined genres to capture the (dis)liking of the genres they consider as important. Obviously, there is a risk to impose a normative classification. The list of genres can be, outdated, out of context, incomplete, inspired by commercial institutions, etc. Furthermore, cultural genres do not necessarily have strict boundaries resulting in discrete and exclusive categories. We present an alternative method to identify music taste patterns based on an open question for artist and/or band preferences. We use the ‘Participation in Flanders 2009’ dataset to construct a matrix of persons (y-axis) and band/artist preferences (x-axis). This bipartite network allows us to identify bands/artists that have a similar relationship to the same set of persons and thus to construct music taste patterns from the bottom up, without using a normative list of genres. The main research questions are: (1) how are people clustered in a matrix of persons and band/artist preferences? (2) how are bands clustered in a matrix of artists and band preferences? (3) how are persons clustered in a matrix of tastes and person preferences?
preferences (2) how do the resulting music preference patterns correspond with the existing classifications methods based on music genres.

Webs of Music: Omnivorous Tastes, Network Position and the Role of Social Capital

Widdop, Paul A.¹, Cutts, David²
¹University of Manchester, Institute for Social Change, Manchester, United Kingdom, ²University of Bath, Department of Politics, Languages and International Studies, Bath, United Kingdom

It is now generally acknowledged that a shift has occurred in cultural consumption patterns of the middle and upper classes. Where once tastes and preferences were based around rigid rules of exclusion, they are now based on an openness to a variety of cultures across both the high and popular genres. Social and educational gradients in omnivorousness have been found across Europe, Australia, and North and South America: having broader tastes is associated with higher social status, social class and education, gender, youth, and geographical location. What is less understood is how an individual's position within social networks, and their social capital, affect their cultural tastes. It seems plausible that musical omnivores benefit from having a broader and more diverse social network, within which they display their cultural knowledge for social approval and to access the social resources embedded in their social networks (social capital). Using large-scale social survey data on cultural participation, we test whether this relationship between taste and network diversity and density exists. In sum, we establish whether there are well defined omnivorous patterns in music consumption in England, whether they are socially stratified, and the effect of social capital and social network position on musical taste. We model this through a latent class analysis and using Nan Lin's position generator as a measure of network.

Jazz Worlds: A Network Study of British Jazz

Widdop, Paul A.¹, McAndrew, Siobhan², Stevenson, Rachel¹
¹University of Manchester, Sociology, Manchester, United Kingdom, ²University of Manchester, Institute for Social Change, Manchester, United Kingdom

This paper provides a study of British jazz using data on some 900 musicians, representing the most central figures in British jazz from its genesis to 2003, with network members ranging from Lonnie Donegan to Jamie Cullum. Jazz is a notable example of a genre where the organisational model is one of loose networks: the majority of professionals and semi-professionals build careers as freelancers with a variety of regular and irregular gigs in different bands, as well as private teaching, post in the formal education sector, and related work. There have been a couple - not wholly successful - attempts by network and complexity scientists to model American jazz networks, with such work limited partly by the quality of data, and partly by the highly technical approach taken to its interpretation, relatively uninformed by historical or musical knowledge. We use an excellent source, the reference standard Who's Who of British Jazz, compiled by jazz musician and writer John Chilton. We exploit its detail on individual career histories and musical backgrounds. With information on the ties between individual performers and their ties to bands, the network diagrams present the data in the form of two-mode networks. We identify communities within the network, describing stylistic, temporal and spatial clusters, and the musical characteristics of different network members, communities within the network, and the most central bands.
Difficult Relationships and Diverging Professional Beliefs

Daly, Alan J., Moolenaar, Nienke M.1,2

(1) University of California, San Diego, Department of Education Studies, La Jolla, CA, United States, (2) University of Twente, Educational Organisation and Management, Enschede, Netherlands

This study focused on 'difficult' professional relationships among school staff, meaning those relationships in which one has to exert significant extra effort to communicate, share perspectives, and/or come to a common understanding about important topics. We examined whether the likelihood of being engaged in such difficult professional relationships was dependent on individuals' formal position, and if this affected other types of relationships and clique formation during a school year. Moreover, we examined whether being engaged in difficult professional relationships was related to having distinct beliefs about teaching that differ from other team members. Our inquiry was conducted in a Charter Management Organization (CMO) located in Southern California. A total of 278 educators from 11 schools participated in the study by completing a survey on demographics and social networks reflecting a response rate of 83%. Using multilevel p2 modeling and longitudinal social network analysis, our preliminary findings suggest that the pattern of having difficult professional relationships was reflected in other types of social interaction among educators. Additionally, we found that educators in formal leadership positions are more likely to be identified in difficult professional relationships. Interestingly, it appears that those educators that are being regarded as highly expert and innovative, as well as who have divergent beliefs about teaching, have an increased risk of being identified as difficult to work with. This suggests that difficult professional relationships may evolve around individuals ‘pushing the boundaries’, and as such, offer opportunities for school improvement and educational innovation. Theoretical and practical implications are discussed.

Negative Ties in the Classroom: A Social Network Study of Adolescents in Germany, the Netherlands, Sweden and England

Jaspers, Eva, Van Tubergen, Frank

Utrecht University, Department of Sociology, Utrecht, Netherlands

With unique sociometric data comprising 20,000 students in over 1,000 classes in four European countries, this study aims at answering why pupils differ in the number of negative ties with peers in class. The prevalence of negative ties differs considerably, on the individual level, but on the classroom and country level as well. For instance, the number of alters that pupils report not wanting to sit with is 3.06 in Germany, 2.35 in the Netherlands, 1.82 in England, and only 1.68 in Sweden. To explain the observed individual and contextual variation in negative ties, we investigate individual level factors, as well as dyadic characteristics and classroom diversity. The data contain extensive individual level and school level information, as well as three types of negative ties. We derive hypotheses on the role of problem behavior, communicative skills, network effects (e.g. homophily) and school conditions (e.g. ethnic diversity, segregation). Examples of central hypotheses: (1) Pupils with more externalized problem behavior are more likely to be named by other pupils as being mean; (2) Pupils prefer alters who are similar to them, so negative ties exist mainly within dyads of different gender and ethnicity; (3) Alternatively, pupils have status disputes within same gender and ethnicity based groups, so negative ties exist mainly within dyads of the same sex and ethnicity; (4) Negative ties are more likely to occur within diverse classes. We use multi-level p2 models to test our hypotheses.

Path Dependency Reinforces Positive and Negative Ties

Kominek, Jasmin1,2

(1) University of Hamburg, Research Group Climate Change and Security, Hamburg, Germany, (2) University of Hamburg, Sociology, Hamburg, Germany

Whenever a particular event takes place such as a bankruptcy of a company that is listed on a financial market, a political decision, or a public action, many agents receive the information and are potentially affected by the consequences of the event. Recognizing the event, the topic-related social network structures around each agent gain influence on his associated future action (Kominek/Scheffran 2012). Therefore, the agent’s positive as well as negative ties get reinforced, and potential alliances or conflicts arise. Considering, for example, the political intervention in Greece during the financial crisis in the recent past, the offers for additional credits by the European Union may be considered in part to be positively related to the Greek government, while the demonstrating people in the streets of Athens are generally negatively tied
to the Greek government. Thus, each international action in support of the Greek government reinforces the local conflicts. This presentation will provide theoretical analyses and exemplary applications to demonstrate the importance of the path dependency concept for the debate on positive and negative ties. Kominek, J. and Scheffran, J. (2012): Cascading Processes and Path Dependency in Social Networks, in: Soeffner, H.-G. (ed.), Transnationale Vergesellschaftungen, Wiesbaden, VS Verlag für Sozialwissenschaften.

**Individuals’ Formal Power and their Social Network Accuracy: A Situated Cognition Perspective**

Marineau, Joshua¹, Brass, Daniel J.², Borgatti, Steve², Vecchi, Patrizia³, Labianca, Giuseppe⁴

¹North Dakota State University, Fargo, ND, United States, ²University of Kentucky, Lexington, KY, United States, ³University of Modena and Reggio Emilia, Modena, Italy, ⁴University of Kentucky, LINKS Center for Social Network Analysis, Lexington, KY, United States

Individuals differ in the accuracy of their perceptions of the social environment, but research and theory provide conflicting predictions on whether those with power are more or less accurate than others. Drawing on social network theory and the situated focus theory of power, we examine the relationship between individuals’ formal power and their perceptual accuracy of social network relationships. We propose that individuals’ perceptual accuracy is affected by: 1) their formal power in the organization 2) the type of relationship being perceived (expressive/instrumental, positive/negative) and its relevance to task and goal completion, and 3) the dependence relationship with the target of perception (whether the perceiver is dependent on the perceived to get their work done). Predictions were tested using cognitive social network data collected from a technical call center within a division of a large corporation in the US. Results showed that formal power was linked to increased accuracy for some relationship content (negative expressive relationships), and managers tended to be more accurate than non-managers when perceiving their own personal incoming relationships.

**Effects of Friendship Ties and Negative Ties on Employees’ Perceptions of Psychological Safety**

Pauksztat, Birgit

Hanken School of Economics, Management & Organization, Helsinki, Finland

Psychological safety - employees’ perceptions that interpersonal risk taking will not lead to negative consequences for themselves - has been found to be essential for team learning, creativity, and employee voice. In this paper, the focus is on the antecedents of psychological safety; more specifically, on the effects of employees’ positive and negative relationships with their managers and peers. Two research questions will be central. First, what is the relative importance of positive and negative ties for employees’ perceptions of psychological safety? Second, what is the relative importance of ties with managers and with peers? To address these questions, I will use data on social networks (friendship ties and "difficult" relations) and perceived psychological safety from two waves of employee surveys in several small and medium-sized private and public sector organizations in Finland.
Negative ties in networks 2

Women in the Middle: Centrality in Negative Affective Networks as a Function of Brokerage in Positive Affective Networks
Carboni, Inga
College of William & Mary, Mason School of Business, Williamsburg, VA, United States

Can positive affective brokerage trigger negative affective centrality? Brokers in positive affective networks have friends in different social groups. As such, they can play an important role in integrating systems and building communal social capital. Yet affective brokerage may also stimulate interpersonal processes such as distrust, misunderstanding, and fear, all of which increase the likelihood of negative tie formation. For example, brokers cannot be easily monitored and sanctioned via reputation, reducing interpersonal trust. They may act in different ways with different people, increasing the potential for misunderstanding. They also do not depend upon any one individual in their network for the fulfillment of their social needs, giving them more power relative to their friends. Gender role expectation theory (Eagly, 1987) suggests that the relationship between affective brokerage and negative centrality will be stronger for women than for men. Although the control and relative independence associated with brokerage are congruent with gender role expectations for men, they are not congruent for women, potentially provoking negative evaluations. Women may also face increased pressure to conform to gender role expectations. Their response, as expressed in the pattern of change in their positive affective networks, may mediate the relationship between affective brokerage and subsequent negative centrality. This study presents a model of the relationship between affective brokerage, gender, network change, and centrality in negative affective networks. Causal hypotheses derived from the model are tested using longitudinal network data on 139 individuals in a community development organization. Preliminary results indicate support for the model.

Towards a New Theory of Balance: Psychological Distress and Triads
Kalish, Yuval
Tel Aviv University, Tel Aviv, Israel

Structural balance in social networks of positive and negative ties is one of the most important concepts to migrate from psychology to social network theory. Support for the theory, however, has been inconclusive. Some fifty years after structural balance was first formulated by Cartwright and Harary, I examine whether unbalanced triads are stressful for those embedded in them. In three separate studies I examine specific theoretical points that pertain to the relationship between different triadic configurations of positive and negative ties and stress. In study 1, respondents are asked to rate the level of stress they will experience from different triadic configurations. Study 2, an egocentric network study of 332 participants, shows that proportions of unbalanced triads are not related to individual stress in ways entirely consistent with balance theory. Based on these two studies, we propose a new theory of balance in networks. In Study 3, I simulate networks of positive and negative ties over time and show that results are more consistent with the new theory than with structural balance.

Negative and Positive Ties: The Role of Actor Attributes
Lusher, Dean 1, Robins, Garry 2, Koskinen, Johan 3, Gorman, Sean 4, Reeves, Keir 5, Mackenzie, Caitlyn 1
(1)Swinburne University of Technology, Hawthorn, VIC, Australia, (2)University of Melbourne, Melbourne, VIC, Australia, (3)Manchester University, Manchester, United Kingdom, (4)Curtin University, Perth, WA, Australia, (5)Monash University, Melbourne, VIC, Australia

An intriguing feature of negative ties is how they can be linked to the presence of positive ties in a given social context. Importantly, ties - negative or positive - may not just depend on the presence or absence of other ties, but also on actor attributes. These attributes may include political leaning, attitudes towards minorities or psychological predispositions, and can significantly shape social interaction. This paper provides an examination of the relationship between actor attributes and positive and negative ties. We utilize multivariate exponential random graph models (ERGMs) because of their capacity to analytically delineate purely structural explanations of tie formation from explanations related to actor attributes. We present results from a number of empirical contexts, showing that both positive and negative ties can be associated with actor attributes, sometimes in complementary, but at other times contradictory, ways. For instance, in one context network members holding a certain attitude are likely to receive positive ties, whereas those that do not are likely to receive negative ties, suggesting a consistency across the network with respect to that attitude. Yet in another
context we find that network members holding a certain attitude are likely to receive both positive and negative nominations from others, indicative of a network in contestation. We conclude that the inclusion of actor attributes can provide valuable additional information to help understand negative tie networks, and the social contexts in which they are embedded, in ways that cannot be gleaned by only examining the network structures themselves.

Reasons to Hate Mates: Effects of Status Considerations on Disliking Relations in the Classroom

Páli Judit, Grow, André, Stadtfeld, Christoph, Takács, Károly
(1)MTA TK ‘Lendület’ Research Center for Educational and Network Studies (RECENS), Budapest, Hungary, (2)Corvinus University of Budapest, Budapest, Hungary, (3)University of Groningen / ICS, Groningen, Netherlands

Disliking relations (i has negative feelings towards j) are often explained with structural balance theory. If, for example, i dislikes j then i’s friends may decide to dislike j as well. Eventually, tendencies towards balanced structures may segregate communities into two antagonistic groups. However, the theory does not explain the emergence of initial disliking and ignores alternative structural explanations of disliking relations. In this paper, we argue that disliking ties frequently occur as a consequence of status-related frustration and competition. We differentiate personal status attributions (i respects j), perceived status attributions (i thinks that j is respected by other group members) and friendship based in-degree popularity. This allows us to test three hypotheses on how status considerations may influence the formation of disliking relations. First, the frustration hypothesis suggests that asymmetric disliking ties are more likely to develop from i to j when i has a high in-degree on perceived status attributions, but does not receive a personal attribution from j. Second, the competition hypothesis holds that reciprocal disliking ties are more likely to develop when both i and j have a high in-degree on perceived status attributions, but they do not nominate each other directly. Third, the tension reduction hypothesis states that disliking ties are more likely to develop when j’s status considerations are dissimilar among friends, but they agree on having a disliking tie toward the same j. We test our hypotheses using SIENA analyses on three waves of network data, recently collected in Hungarian secondary schools.

Signed Networks and the Evolution of Cooperation

Righi, Simone, Takács, Károly
MTA TK ‘Lendület’ Research Center for Educational and Network Studies (RECENS), Budapest, Hungary

We examine how cooperation can be supported by negative ties and structural balance mechanisms. Previous research demonstrated that cooperation in the Prisoner’s Dilemma evolves more likely, if the game is played in dynamic networks. Studies that analyzed the co-evolution of network structure and cooperation, however, assumed only positive relations between the players. Negative ties are potentially even more relevant, as they could have a direct strong effect on cooperation because individuals might defect only with disliked partners and might dislike those who defected. If this is in general the case, at the triadic level, signed relations signal cooperative intentions reliably and hence guarantee for spreading appropriate reputational information that result in confirming expectations about cooperation. We incorporate these dyadic and triadic mechanisms in an agent-based model in which the signed network and cooperation co-evolve. We analyze the evolutionary success of different strategies and demonstrate the efficiency of those strategies that make full use of reputational information and punish defectors emotionally. We show how the consideration of negative relations enlarges the window of opportunity for the evolution of cooperation and illustrate the emergence of stable signed networks.
Network Evolution

Selection Processes in Social Networks. An Empirical Study of Desires, Moves and Selection Pathways in Classrooms

Baerveldt, Chris¹, Vlegels, Jef², Steglich, Christian³
(1)Utrecht University, Faculty of Social Sciences (Pedagogiek), Utrecht, Netherlands, (2)University of Gent, Gent, Belgium, (3)University of Groningen, Groningen, Netherlands

Friendship selection in social networks is usually investigated by studying the development of realized friendship nominations. The selection processes behind the development, including activities to acquire friendships (moves) and intentions, are often taken for granted, but rarely studied empirically. In this study we contribute to the understanding of selection processes by investigating activities ('moves') meant to develop certain friendship ties in social networks, and desires to become friends with certain network members. Based on two waves of Dutch school classroom network data (n=741 students aged 12-15 years in 27 school classes), we investigated the students' desires for friendships with specific fellow students (candidates), their attempts (moves) to become friends with candidates, and the combination of desires and moves (pathways). Most desires for a candidate were not followed by a move. Most moves were not preceded by a desire. Moves were much better predictors of the onset of new friendships than desires. Student’s attributes like gender, the need for friendship, network knowledge, friendship motives and personality traits, determined which pathway was followed. However, the effect sizes differed strongly between classrooms, and often went in different directions. This suggests that individual effects on selection processes are mediated by classroom level variables. Investigating moves is probably more worthwhile than investigating desires, and might even provide for better tests of network theory than actual friendship changes. Also, while a network member apparently cannot control a large part of the selection process, she still seems to have an independent influence on the process.

International Media Networks and Terrorism Shocks

Barnett, George A.¹, Hammond, Jesse²
(1)University of California, Communication, Davis, CA, United States, (2)University of California, Political Science, Davis, CA, United States

This paper examines the international media network of terrorism coverage. Using original data based on a set of international news articles from a variety of sources from around the world, which mention terrorism between January 1, 2000 and December 31, 2011, a longitudinal network of nation-state co-occurrences was created. The network is unimodal and non-directed: nations are linked with each other based on the number of times each dyad is mentioned daily in a news articles dealing with terrorism. The goal of the research is to understand how the structure of the network responds to perturbations (major incidents of terrorism), in particular the events of September 11, 2001. The 9/11 attacks had a major effect on the structure of the international media network: not only did the attack cause a massive short-term shift in the structure of the network, but it appears that a new equilibrium has been formed in the following 10-year period. Also, other events affect the network as well: for example as U.S. military efforts have been redirected from Iraq to Afghanistan, the network centrality of Iraq decreased sharply and Afghanistan become much more prominent, to the point where the two states seem to be exchanging roles. However, noticeable shocks to the system are fairly rare. Using data on terrorism events for the same time period, no significant relationships between the frequency or severity of aggregated terror events and the rate of change in the structure of the network were found.

The Co-evolution of Distance Structures within Networks - A Network Level Study

Broekel, Tom
Institut of Economic and Cultural Geography, Leibniz University, Hanover, Germany

Besides trying to understand the fundamental dynamics of network development, economic geographers are interested in whether geographic distance remains a significant factor for knowledge link formation when taking other forms of distances into account. This especially concerns social, cognitive, institutional, and organizational distances, which are argued to be substitutes for geographic distance (Boschma, 2005). In addition, it has been shown that the effects of knowledge links on organizations’ innovation success depend on how distant the linked organizations are in these dimensions (cf. Fornahl et al., 2011). Hence, the benefits a knowledge network offers for its member organizations are related to its structure with respect to the cognitive, geographical, social, institutional, and organizational distances between linked organizations. Despite the growing number of empirical studies in the field, still little is known about how
such network structures, i.e. the (aggregated) distances between linked organizations, develop when networks evolve over time. The present paper seeks to fill this research gap. It is argued that the different types of distances are interrelated and that their developments are potentially characterized by co-evolution dynamics. An empirical investigation tests these arguments using information on the evolution of 280 networks, which are observed for two to thirteen years. Amongst others, it is shown that institutional and cognitive distance structures co-evolve in the short as well as in the long run. Institutional and social distance structures are found to be related in the long run. Moreover, temporal auto-correlation dynamics characterizes the development of cognitive distance structures in networks.

Evolution of what? A Network Approach to the Definition of Evolving Populations

Hilbert, Martin
Oh, Poong
Monge, Peter

(1)University of Southern California, Annenberg School of Communication, Los Angeles, CA, United States, (2)United Nations ECLAC, Santiago, Chile

The concept of evolution implies the definition of a population. The concept of a population implies an exclusive and exhaustive criterion to separate the total into distinctive parts. In evolutionary theory these parts are often referred to as “species” or “types”. Each type has a particular growth rate (“fitness”). The resulting dynamic reshapes the constitution of the population: the population “evolves”. Historically, qualitative and subjective criteria have traditionally been used to distinguish between “types”. In the tradition of Nelson and Winter (1985) we argue that in social organizational units, so-called “routines” and social procedures lead to superior fitness. This concept implies that several pieces of the total population are linked together and perform some kind of mutually dependent “fitness task” together. In order to identify these “linked” components of the total population we argue that identifiable network components (clusters-communities) contribute to the identification of meaningful “types”. Our hypothesis suggests that individuals that are linked to each other share (or create) a characteristic that determines the survival chances of the group. We show that network measures allow separating the total population into exclusive and exhaustive components which provide meaningful types to analyze evolutionary dynamics. We take network data from international telephone traffic and of telecommunication capacity, and well as international trade data, and test the resulting components for evolutionary meaningfulness by using the well-established Price equation from evolutionary biology (Price, 1970; Frank, 1998). We draw conclusions about the nature and adequacy of using network population criteria to study evolutionary dynamics.

Formation of Multiple Networks

Rossi, Luca
Magnani, Matteo

(1)University of Urbino Carlo Bo, Communication Studies and Humanities, Urbino, Italy, (2)Aarhus University, Computer Science, Aarhus, Denmark

Network formation models are among the most important tools to understand social networks - notable examples are the Barabasi-Albert and the Watts-Strogatz models for random networks. However, existing formation models focus on the evolution of single networks. While this is undoubtedly very relevant, recent empirical studies have emphasized how real-world social systems are often made of multiple stratified networks influencing each other. For example, the same individual can create multiple accounts on different social network sites to reach different audiences, and on-line information propagation is typically characterized by the traversal of different networks. In this lecture we will introduce the problem of multi-layer network generation. This is a challenging task, because models describing the formation of multiple networks should still generate network layers compatible with existing models and experimental observations on single networks, but should also consider the mutual relationships between different layers. Therefore, we will propose and describe a model where network evolution may be characterized both by internal dynamics, as described by existing single-network models like Preferential Attachment, and by external dynamics, where events like the creation of a new connection are influenced by the structure of other networks. Real multi-network data will also be used in the analysis of the model. To the best of our knowledge our model is the first to deal with the generation of multi-network data. As such, it raises many new questions regarding the parameters and processes to be used to represent the dynamics underlying the formation of multiple networks.
Network perspectives on adolescent peers and delinquency

Does Deviant Behavior Increase the Social Status in The Peer Group? an Application of Complete Social Network Analysis

Baier, Dirk, Bergmann, Marie Christin
Criminological Research Institute of Lower Saxony, Hannover, Germany

Adolescence is characterized by a relatively high willingness to violate behavioral norms. Keeping this in mind, it seems logical to assume that those adolescents who do not behave in a conform way are more popular compared to peers who follow societal norms. However, this might not hold true for all forms of norm violation. Especially severe violent disorder seems to be rather status limiting. Using complete network data of 145 school classes of the 9th grade, this presentation aims to reveal which deviant behaviors reduce or increase popularity. Here, popularity is measured by the number of classmates who denominated a fellow pupil as a friend. Deviant behavior is captured by school absenteeism, consumption of alcohol, carrying a gun and school related aggressive behavior. The results indicate that predominantly the consumption of alcohol increases the popularity among peers. Regarding the other forms of deviant behavior no or a negative relationship with the number of friend nominations is found. Analyses regarding gender differences confirm the results.

Social Status in Class and Delinquency: The Impact of Sociometric Position on Truancy and Violence

Dunkake, Imke
University Wuppertal, School of Education, Wuppertal, Germany

Influential studies like the “High School and Beyond Study” have shown that aspects of social capital are important predictors of delinquency. Focusing on social capital, one important socialization agent transferring social capital is the school class. Considering that classes are social systems where students take different sociometric positions - as for example “popular” - it is obvious to ask which factors have an impact on these different positions and how these positions may affect delinquency. Based on a theoretical model combining assumptions of educational research (Baumert et al. 2001) and criminology - especially the General Theory of Crime by Sampson and Laub (1993) - the current study analyses the direct and indirect effects of socio-demographic variables (e.g. broken home) via cultural and social capital in family and via sociometric status in class on truancy and violence. The sample for the present study is 250 adolescents in grade 9 from secondary schools in Germany. Measuring the sociometric status, we used peer nomination from all classmates and transferred these nominations referring to the typology of social peer status by Coie, Dodge and Coppotelli (1982). This typology enfolds five categories of social status: popular, rejected, neglected, controversial and average status. To proof the theoretical assumptions, a structural equitation model was used. Results suggest that next to socio-demographic variables (especially broken home) and family characteristics like parental control, rejected students truant more often and controversial students seem to act more violent.

Delinquent Friends or Friends of Delinquents? A Social Network Perspective on Peer Influence

Gerstner, Dominik, Oberwittler, Dietrich
Max Planck Institute for Foreign and International Criminal Law, Criminology, Freiburg, Germany

Recent research has demonstrated that traditional measures of students’ delinquent friends based on the respondent’s information may overestimate the influence of delinquent peers (e.g. Haynie 2001, Haynie/Osgood 2005, Weerman/Smeenk 2005, Meldrum et al. 2009). Because perceptions of peer behavior may be affected by own behavior, it has become an advantageous practice to measure peer delinquency by using data generated by social network analysis. In our paper we use data from a recent school survey on adolescent delinquency conducted in two German cities, including network data from about 300 classes from different types of schools. Using nominations in classroom networks, we build a measure of peer delinquency considering also the mutuality of friendships, the level of intimacy and time spent together outside of school. We then focus on comparing these measures to conventional measures of delinquent friends in models explaining delinquency. We also discuss the problems arising from the limitation of networks which are confined to nominations within school classes and look at proxy variables of friends outside class and outside school.
Social Network Theory and Adolescent Substance Use - Developing an Analytical Framework for Studying the Combined and Separate Effects of Personality, Participation in Daily Life Activities and Peer Network

Sznitman, Sharon R., Romer, Daniel, Mesch, Gustavo, Engel-Yeger, Batya

(1)University of Haifa, School of Public Health, Haifa, Israel, (2)University of Pennsylvania, Communication and Health Communication Institutes, Philadelphia, PA, United States, (3)University of Haifa, Dept of Sociology and Anthropology, Haifa, Israel, (4)University of Haifa, Occupational Therapy Dept, Haifa, Israel

In order to develop successful school and community intervention programs, there is a need for a comprehensive understanding of the factors that influence substance use. Previous research has shown that personality vulnerabilities, peer social networks and participation in extracurricular activities separately influence adolescent substance use. It is, however, unclear to what extent, and in what ways, these factors interact in the development of different levels of adolescent substance use behaviors. In this presentation we develop an analytical model based on social network theory which enables an investigation of whether adolescents with different vulnerable personality tendencies are associated with participation patterns that place them in risky social networks which in turn increases their risk to different levels of use.

Cognitive Consistency, Structural Balance, and Delinquency: A Longitudinal Analysis of Attitudes toward Delinquency Using Bipartite Graphs

Young, Jacob, Weerman, Frank

(1)Arizona State University, Phoenix, AZ, United States, (2)Netherlands Institute for the Study of Crime and Law Enforcement, Leiden, Netherlands

In criminology, the interconnections between relational, ideological, and behavioral structures in groups serve as the pillars of informal social control. Yet, there remains imprecise conceptual definitions as well as the identification of dynamic mechanisms. Building on these limitations, we develop a dynamic relational model of definitions of delinquency, delinquent behavior, and social relationships by integrating two mechanisms of change (cognitive dissonance and structural balance) with existing theories of social learning and social organization. We use stochastic actor-oriented models of two-mode networks to understand the coevolution of definitions toward delinquency, delinquent behavior, and social relationships among adolescents from the Netherlands Institute for the Study of Crime and Law Enforcement “School Project”.
Network Theory

On a Conflict Theory of Social Relations

Brichzin, Jennifer
LMU Muenchen, Institut für Soziologie, Muenchen, Germany

In recent years, social network analysts witnessed the striving for a new theoretical perspective on social relations. Following the lead of Harrison C. White and his work “Identity and Control”, this new perspective aims to shed light on the formation of cultural entities through processes of relationship formation. This has led to a much broader understanding of the influence of relations on society, but has not yet brought forward a lot of really operative theories of social relations. I argue that this is due to the abstinence of macro-social theory and a strong anti-categorical impetus which prevents theorist from developing analytically inevitable definitions of specific dimensions of relations, related entities, and contexts of relating. By reviving the bond of network theory and role theory, I try to overcome these obstacles of current approaches on network theory: In differentiating between personal and role relationships, a bridge is built to connect general societal structure and concrete relationships between individuals. Especially in societal areas that can be described as containing a variety of contexts in which personnel circulates constantly (as e.g. in interlocking organisations or parliamentary politics), interaction between personal and role relationships is assumed to be unavoidably conflictual: While the bond of a personal relationship across contexts presses towards consistent behaviour, role relationships in contexts press towards different behaviour in different contexts. This relatively new line of conflict between two levels of relationships and its possible solutions could be one step towards describing an increasingly multiplex formation of society.

From Social Geography to Networks and Back: The Effect of Organizational Competition on Social Networks

Genkin, Michael, Brashears, Matthew, Suh, Chan S
Cornell University, Sociology, Ithaca, NY, United States

We contend that organizational competition exerts a dramatic effect on the network topography of both organizational members as well as the much larger pool of the member’s associates. It does so by creating areas of dense ties and high tie turnover. Individuals who come to occupy positions in these areas develop distinctly different local network structures than individuals located elsewhere. We develop an analytic framework using Blau space and affiliation ecology models that allow us to describe these positions and to specify how organizational competition affects micro-level processes. We focus on two mechanisms in particular - network catalysis and network agitation. Our arguments are tested using the Add Health dataset, which has sociometric network data, organizational membership, and various demographic, behavioral, and attitudinal measures. First we confirm hypothesis that test the above two mechanisms. Second, we show how organizational competition affects a variety network measures. Finally we show the implications of network competition for behavioral outcomes as well as various attitudinal measures. Wider implications for using this kind of analysis is then discussed.

Learning from Georg Simmel to link Structure and Meaning in Network Research

Hollstein, Betina
Universität Hamburg, Hamburg, Germany

The question of agency of networks and the question of how structural network features and the meaning actors attribute to relationships can be integrated are challenging questions in network research. In my presentation I will illustrate that Georg Simmel, who is considered one of the fathers of the network idea already provided an approach for combining structure and actor-theoretical perspectives. Simmel defined the object of sociology as “the pure forms of sociation” (1908). These “forms of sociation”, like the stranger, a group of travelers, secret societies or modern marriage, refer to rule-guided and solidified patterns of interaction, which although initiated by individual actors may in turn affect their actions and even contradict their intentions. As it will be shown, all forms of sociation can be decomposed into seven “basic structural properties”, like group size, space, time or degree of institutionalization of a relationship (cf. Hollstein 2001). The constellation of these basic structural properties limits the performance of relationships and networks. However, which functions actually come into effect depend also on individual orientation (i.e. interpretations, norms, and preferences). In the first part I will present a rough outline of Simmel’s conception of social relationships and networks which enables an accounting of structural features of social relationships as well as of the actors’ individual
orientations and the interplay of these factors. What is gained by such a perspective will be exemplified in the second part by drawing on examples from previous studies on personal networks in different stages of the life-course.

**Comparing Personal Networks in Blau Space**

*Nagel, Uwe, Brandes, Ulrik*

University Konstanz, Konstanz, Germany

Personal networks consist of attributes that characterize egos, alters, and their relations. Their comparison is usually based on attribute composition and graph invariants, since differences in their detailed structure are difficult to assess. We propose a new approach to personal-network comparison that takes both, actor and dyad attributes, into account. This is achieved by generalizing the concept of Blau space, in which actors are viewed as points with coordinates defined by their attribute values, to include dyads. Each personal network in a given ensemble is thus represented by a point configuration in the same, shared space. By using, e.g., Earth Mover’s (or Wasserstein) distance in this space, composition and structure of personal networks are captured simultaneously. Since the approach is flexible with respect to attributes and their relative weight, we demonstrate by means of an example how it is adapted to a specific research question. This adaption to a specific context, however, involves only qualitative decisions, i.e. the parameters to be adapted are not of technical nature but can be determined on the basis of the research question.

**Boundary (Mis)Specification in Multiple Case-study and Social Network Research: Interdependence and Theory-building**

*Oliveira, Nuno*

LSE, London, United Kingdom

We expose the limitations in current practice of boundary specification within social network and multiple case-study research; and show its implications for theory-building given an increasing interest in the combination of both methodologies to test an develop new theory. Generalization from multiple case-studies hinges on the treatment of cases as series of independent experiments (Eisenhardt, 1989) where each case is used to try hypotheses. We caution that one cannot take the assumption of cross-case independence for granted due to the boundary (mis)specification problem. Indeed, assessment of social influence is critical if cases are to be treated as “independent” experiments. Having developed our argument based on prior research, we are currently designing a network experiment to test interdependence among cases. We outline strategies for theorizing under cross-case influence. This paper contributes to the broader social network and multiple case-study research deployed to test or build theory within an array of fields, such as sociology, development studies and management.

**Situational Networks: The Emergence of Culture in Micro-Networks**

*Stiegbauer, Christian¹, Rausch, Alexandre²*

¹Goethe-Universität Frankfurt, FB Gesellschaftswissenschaften, Frankfurt, Germany, (2)Goethe-Universität Frankfurt, HRZ, Frankfurt, Germany

Networks are based on situations. It can be said that these situations are crucial to the emergence of positions. Most explanations of network analysis take effect on the level of situations. We know that behavior is dependent on the position and the corresponding toolkit in order to interpret a situation. Knowledge of similar, prior situations flows into the negotiation of every new situation. The situation is the level where new behavioral elements can be tested and behavioral adjustment takes place. New interpretations and new behavior emerge, in other words cultural change appears in situations. In the present study, behavioral adjustment and cultural inventions were investigated in two different experiments. In the first, the correspondence of cultural and consumer preferences in a micro-network model (table model) was analyzed. The micro-network consisted of people eating together at table in a university dining hall. The degree of conformity at table was clearly not a random result. The second experiment was conducted with people who did not know each other. In a wine test, three people had to judge whether the wine served in black glasses was white or red wine. Through this experiment it was possible to observe the emergence of positions and the alignment of behavior in such a situation. Both experiments showed how the content of the cultural toolkit is dependent on experiences acquired in micro-network situations. These situations are a basic prerequisite for the efficacy of networks.
Networks and Society

Network Publics in Societal Fields: The Case of Political Discourse
Fuhse, Jan
University of Bielefeld, Bielefeld, Germany

The presentation advances the claims that a number of societal fields (not all of them) are organized around a particular type of social structures: “network publics”. Following relational sociology (by Harrison White and others), social networks are structures of meaning, with the identities of the nodes symbolically related to each other in stories. This basic model can easily be transferred to competitors on economic or political (even academic) markets. Unlike regular networks, network publics do not consist of “relationships” of expectations about the behavior of actors in relation to each other. Rather, “relations” between the identities prevail that are constructed for third parties: the audience. These (“public”) relations are constructed in claims of similarity and difference. Thus a company producing high-end consumer-goods might stress its uniqueness, while others might claim comparability of quality. In political, the relations between actors are crucial in making for the possibilities of cooperation among them, for example by forming a government. Thus when political parties debate, they celebrate their identities as uniquely qualified to solve certain problems. But they also place themselves in relation to others, opening up opportunities for participation in coalition governments and closing others down. We can observe these dynamics in electoral campaigns, but also in news interviews and political debates, looking at the identity claims and the relational positioning of debaters in communication.

The Old Boy Networks that Were? Evolution of Power Networks in a Globalized and Europeanized France
Godart, Frederic Clement
INSEAD, Organisational Behaviour, Fontainebleau, France

France’s political, economic, and intellectual power is usually thought to be in the hands of a small number of “Old Boy” networks from the élite “Grandes Ecoles” such as Sciences Po, HEC, Polytechnique or the ENA. The alumni from these schools have been shown to control national places of power such as the Government and the Parliament, the main corporations of the CAC 40 (the French stock index), and the intelligentsia. However, recent theories of globalization as well as the rise of a federal European entity have put the idea forward that national élites are now embedded in what is seen as the shared interests of global business and political communities. But to what extent is this true? To what extent do local power networks still control local business and political entities? The case of France is used as a way to assess the impact of globalization on local power élites. Data consist in board interlocks and the social network analysis of the government, and related powerful entities. A historical perspective is adopted that describes the evolution of the power networks within the national entity. Cases of other countries are discussed to put the French example into perspective.

Locating Culture in Less-institutionalized Structure
Gondal, Neha
Rutgers University, New Brunswick, NJ, United States

I conceptualize a general category of relationally-defined social locations with ‘undeveloped’ or emergent cultural aspects but to which we can nevertheless attribute relational order. I call such locations less institutionalized positions. These positions stand in contrast to roles that entail both concrete relational order as well as normative schemas of behavior. I argue that less-institutionalized positions take different forms depending on whether or not the structural contingencies implicated in the position pose themselves as uncertainties for their occupants. When faced with uncertainty-inducing less-institutionalized positions, occupants engage discursively with those positions in order to resolve uncertainties. In other types of less-institutionalized positions, occupants act ‘automatically’ on the basis of their practical consciousness. I contend that irrespective of whether they act discursively or practically, the mechanism producing order in less-institutionalized positions is similar - actors transpose rules from their involvements in multiple other networks of interaction and domains of shared meanings. I elaborate upon three such transposition mechanisms - analogizing, switching, and network spillovers. Thus, even though these locations are not culturally meaningful categories, I argue that culture nevertheless matters causally in the organization of occupants’ action and cognition. I conclude with a discussion on how ‘less-institutionalized positions’ as a form of social organization offers a unique window into disentangling the cultural repertoires of individuals from those of social locations.
Network Societies and Networks in Society
Holzer, Boris
Bielefeld University, Faculty of Sociology, Bielefeld, Germany

As a methodology with universal aspirations, social network analysis is predicated upon the belief that almost any social phenomenon can be analyzed in terms of sets of relationships between persons or other social entities. From the perspective of social theory, that begs the question whether networks actually are the basic elements of society. Empirical research may use the network perspective as a heuristic device - and therefore tend to 'see' social networks everywhere. But that does not mean that society itself is best understood (or, as it were, necessarily describes itself) as a network. In my paper I want to argue that there are indeed societies in which interpersonal networks are the dominant form of social structure, but those 'network societies' differ from the basic template of modern society, particularly in terms of their social differentiation. A closer look at such societies brings into sharp relief that networks have emerged as particular social forms in (and distinguishable from) society but so have specific alternatives or functional equivalents, namely generalized means of communication.

Contributions to a New Relational Sociology: The Role of Articulations in Institutional Forms
Mohr, John W.
Univ. of California, Sociology, Santa Barbara, CA, United States

One of the most general problems of social theory concerns the problem of articulations between one domain of social existence and another. For critical theorists of the Hegelian tradition this was theorized as the problem of dialectics, (think of the dialectic of materialism and idealism in Marxist traditions). In contemporary sociology, this crossing from one domain to another continues to be a focal concern — one sees it in the social scientific problems of linking body and mind, culture and practice, structure and agency, self and institution, to name a few of the dualisms that plague our disciplines. In recent years, a new school of work has begun to apply network models of analysis, especially different forms of duality analyses, as a way to empirically explore what might be described as articulation problems across a variety of different types of institutional settings. In this paper, I review some of the types of work that has been done under this mandate and also seek to develop a few more general theoretical points regarding this style of work and the more general project of analyzing institutional articulations within the framework of a new relational sociology.

Fields or Netdoms - Explorations into the Scaling of Network Research to the Level of Society Considering Scientific Production Communities
Schmitt, Marco
Georg-August-Universität Göttingen, GCDH, Göttingen, Germany

The contribution will outline the multiple links between the network level of a scientific production community and the societal contextualization of such a network based on the notion of fields (Lewin, Martin, Fligstein/McAdam) and based on the notion of netdoms in the sense that Harrison White tries to elaborate. We show the implications for further research by bringing societal notions into the analysis of the heterogeneous networks forming a scientific production community based on a field-oriented and a netdom-oriented approach. What are the conceptual differences between a field and a netdom (e.g. what is the implicated vision of society) and how did they translate into different research questions for network analysis? The main thrust of the argument is that both concepts share a lot of similarities, but entail a shift in focus. While both describe a dynamic relational embedding of social units, the field concept focuses on objective relations defined by the distribution of resources and the rules for enacting these resources, whereas the netdom concept draws directly on actual social relations (common to network analysis) and the story sets relating them to certain domains of evaluation. A scientific production community is crosscutting different fields and netdoms and can be described by an embedding profile into these societal contexts.
Online Political and governance networks

Fragmentation of Online Political Deliberation in the Aftermath of the Polish Presidential Airplane Crash

Hnatiuk, Mikolaj¹, Batorski, Dominik²
(1)Educational Research Institute, Warsaw, Poland, (2)University of Warsaw, Interdisciplinary Centre for Mathematical and Computational Modelling, Warsaw, Poland

In this paper, we ask a question about the change in structure of political debate in the aftermath of the death of the Polish president Lech Kaczyński (and 95 other people mostly high-ranking officials) in 2010 Polish Air Force Tu-154 crash. These kinds of events tend to reshape political scene, which indeed was the case in Poland, but did it change the attitudes and behaviours of individuals as well? We have collected the data from the biggest political blogsite in Poland - Salon24.pl. Our analysis focuses mainly on the structure of conversations that take place in the discussions under the blog posts. We ask the following question: Have those discussions become more segregated as a result of the crash? After dividing bloggers into categories according to their political views and views towards the causes of the presidential airplane crash, we use Coleman’s Homophily Index to find that the bloggers in question did in fact become more segregated. However, not every analyzed group was subject to the process of segregation. That was true only for the right-wing group of bloggers, who tend to believe that the crash wasn’t in fact an accident, but an assassination.

Competition and Influence amongst Online Environmental Social Movement Organisations

O’Neil, Mathieu¹,², Ackland, Robert³
(1)Australian National University, Australian Demographic and Social Research Institute, Canberra, ACT, Australia, (2)Université Paris Sorbonne, UFR d’Anglais, Paris, France

We analyse competition amongst online environmental SMOs in terms of how leadership (the capacity to influence terms of debate) affects frame diffusion. We hypothesise that newer entrants on the field will be more likely than incumbents to adopt a new risk issue in order to gain influence, and examine how actors respond to exogenous shocks. Ackland and O’Neil (2011) built a dataset of 161 environmental activist websites to test their conceptual framework, which posits that hyperlinking and framing generate SMO online collective identity. The VOSON webcrawler was used to identify hyperlinks between the environmental ‘seed sites’, the total number of inbound hyperlinks from all sites to each seed site, and to collect meta keywords and text content. Our statistical approach now aims to jointly investigate the impact of SMO attributes (e.g. new entrant or incumbent status, sub-field) and of network structure on the probability of adopting the nanotechnology risk frame. We use the social influence variant of exponential random graph (ERG) or p* models. Our preliminary finding is that time in the field significantly impacts the probability of adopting the nano frame. New entrants to the online SMO field have a 17% probability of having nano-related content on their website, actors in the field for one year have a 12% probability, and this declines to 6% for organisations in existence for 5 years. Reference: Ackland, R. and M. O’Neil (2011): Online collective identity: The case of the environmental movement, Social Networks, 33, 177-190.

Rethinking Power in Supra-national Communication Governance. Norms Evolution through Online Networks

Padovani, Claudia¹,², Pavan, Elena³
(1)University of Padova, Department of Politics, Law and International Studies, Padova, Italy, (2)University of Padova, Next Generation Global Studies Project, Padova, Italy, (3)University of Trento, Department of Sociology and Social Research, Trento, Italy

The connections and disconnections between gender and communication have been on the international and scholarly agenda for almost forty years, yet few studies have focused specifically on those policy debates and interventions (especially at the supra-national level) aimed at promoting a social agenda for change based on gender equity in and through any form of mediated communication. Furthermore, in the contemporary context, where digital communications are pervasive, Internet has not yet entered these reflections in a systematic manner, either as an object of study or as a tool that creates new spaces for political interaction and negotiation also on frames and meanings, controversial issues and related normative frameworks. To contribute filling these gaps, we propose a methodological framework that includes the online space as a relevant site for inquiring contemporary normative discourses and we apply it to Gender-oriented Communication Governance in the supra-national (and trans-national) context. As discourses are grounded in actors’ interactions and exchange of ideas, the paper adopts a network approach to investigate both social and cognitive elements of online discursive dynamics on the nexus between gender and media. Hence, it investigates - both separately and in conjunction - the online social fabric rooting gender and media discourses by
mapping social networks between websites of relevant organizations working transnationally in this domain; and the
cognitive associations between websites and normative references derived from internationally adopted policy
documents. The final goal is to identify and explore different forms of influence and power at play in online networked
interactions.

**Occupy, Forever! Examining Youtube Tag-sharing Dynamics as a Proxy for Collective Memories Formation in Contentious Dynamics**

*Pavan, Elena*

University of Trento, Sociology and Social Research, Trento, Italy

In a context where social media are becoming one of the principal communication tools, their connective and ideational potential profoundly affects one of the most relevant processes for collective action efforts, i.e., the creation of collective memories. Collective memories are fundamental for mobilizations as they feed the creation of a collective identity, which in turn is crucial for the survival and the success of contentious dynamics over time. It becomes then crucial to explore how social media influence they ways in which collective memories of collective contentious dynamics are shaped. To this aim, the paper focuses on one specific platform, i.e., YouTube, and considers tag-sharing patterns as indicators of collective memories formation. As tags are attributed with the explicit intention of making a video retrievable (hence, of making a certain piece of experience accessible) they can be considered as proxy for the content of a specific piece of memory. The more videos share the same descriptors, the more they can be thought as part of a shared symbolic/cognitive systems. Looking at the network formed by a sample of videos uploaded on YouTube after the manifestations organized in Italy in February 2011 by the platform on gender issues “Se non ora, quando?”; the paper will elaborate on the dynamics that underpin the mediated construction of a shared reminiscence, looking in particular at the clusters of videos and descriptors that stand at the core of the mediated memory and those which are, instead, on its periphery.

**The Politics of Sustainable Development: Exploring Dynamic Informal Networks on Water Resource Development**

*Stratton-Short, Samantha*

University of Cambridge, Cambridge, United Kingdom

The purpose of this research was to explore informal influences on the debates about sustainable development through the study of hyperlink networks. Hyperlinks between 1300 organisations around 9 sustainable development events were examined. SNA was used to map the sub-issues identified by the various organisational missions, and the relationships between them. These were captured at 4 different time points to find relationships between changes in the networks and changes in the issues. Contrary to expectations, the results revealed that the issues were probably driven locally rather than by international agendas. It also pointed to the importance of brokering roles of sub-issues. The suitability of Hyperlink Network Analysis for this research was reviewed. The main challenges were that not everyone uses the internet the same way - which is problematic when trying to look at a diverse range of actors, and that the use of the internet is constantly changing, making interpretation of the results difficult.

**From Government to Local Governance**

*van de Wijngaert, Lidwien*

Twente University, Media, Communication and Organization, Enschede, Netherlands

Goal: As a consequence of the economic crisis, there is a desire to create a more compact and decentralized government. More tasks are transferred from central government to municipalities who can work more closely (and supposedly more efficient) with organizations and citizens regarding topics like child welfare and public transport. The goal is to cut costs by achieving a situation in which local governments act as a facilitator rather than as a player in the field. Research questions: Who are the key organizations? How are these central players connected to other organizations? How do citizens and civil servants relate to the central players? Method: We define five different social networks that together provide insight into the social structure of a municipality. Online network: map which organizations are linked online through a webcrawal to obtain insight into who collaborate. Network of Cooperation: map which organizations communicate and/or collaborate through a network survey to obtain insight into the central playersNetwork of similarity: map similarity between organizations through a survey and computing proximities to obtain insight into who competeNetwork of citizens: map how organizations related to citizens to obtain insight into how citizens can be reached (two-mode network)Network of officials: map how civil servants are connected to the organizations in order to make the
network more efficient. Results: This presentation will provide insight into the details of each network. We will also present results from a study in The Netherlands.
Online Social Networks 1

Online-to-Offline Interactions in Elite Online Communities: Exploring the Emergence and Evolution of Social Networks

Angelopoulos, Spyros, Merali, Yasmin
The University of Warwick, Warwick Business School, Coventry, United Kingdom

This paper presents the results of a longitudinal study of an online community of cigar smokers, elucidating the dynamics of the social networks and interactions associated with the emergence and evolution of the community. The study is distinctive in covering the structure and dynamics of the online network and its associated offline interactions. The paper elucidates i) social processes underpinning the observed development of online communities and ii) how offline relations affect the online interactions. The online community of cigar smokers was created and populated using an invitation system to enable identification of the initial relations among members. Our analysis covers a continuous period of eighteen months from the initiation of the community, enabling us to track the growth of the community and the interactions between members. In contrast to extant studies focusing primarily on interaction data to analyse structural features of social networks in online communities, our study combined social network analysis with content analysis of the individual communications between members to i) generate a more nuanced account of the emergence of roles and relationships associated with recorded activities and observed structural features of the social networks and ii) explore the relationship between online and offline interactions and observed patterns of online sociability across the community. The combination of network and content analysis identified six distinctive types of social interactions affecting the emergence and evolution of social networks between members, and we analyse the effect that such interactions had on the online sociability of members over time.

Are Online Networks Local and Social Communities? Closure and Geographical Proximity of a Dutch Social Media Network

Corten, Rense1, Völker, Beate2
(1)Tilburg University, Sociology, Tilburg, Netherlands, (2)Utrecht University, Sociology, Utrecht, Netherlands

Online networks are, in principle, independent of spatial boundaries and this freedom is still enhanced by the fact that new social media provide opportunities for creating new relationships. However, is it really true that online networks are not affected by geography and proximity? We know a lot about the importance of space for offline social networks, but much less about the extent this matters for online networks. We argue that, as in offline networks, many ties will be relatively local and that locality also affects the odds that a tie exists between two alters in an ego-centered network, i.e. the larger the geographical proximity between ego and alter, the lower the likelihood that this alter will be connected to another alter in ego's network. We argue furthermore that common conditions for offline social networks are also of importance for online relationships. We use a random sample of online social networks using a Dutch Social Media platform (Hyves.nl) in 2010 and study differences in geographical distance and closure among Dutch regions. Because of the large n of the complete population (N=10,431,075) a random sample of ego-centered networks (N=5,000) is drawn for the analyses. Preliminary results show a large but non-linear impact of locality on closure. Furthermore, we investigate how network closure differs between regions in the Netherlands, and how the composition of a region affects the composition of online networks.

Social Media Participation Types: Activity and Degree Distribution within Online Protest Communities

Dokuka, Sofiya
Russian State University for the Humanities, Sociology, Moscow, Russian Federation

Many movements are facilitated by the social networking sites such as Facebook (Kavanaugh, 2011, Lysenko, 2011). Given the presence of so many protest groups on social media sites, we distinguish different participation types through both social network analysis and content analysis. Focusing upon Russian protest groups on Facebook, we gathered data on participation friendship ties, locale, language and gender. We distinguish participation type based upon degree centrality and group activity. We found three main types of members: readers, or persons who just obtain content and without contributing, talkers, who are persons that communicate among one another and occasionally post news, and key actors or "influencers" who can be characterized as those with high degree centrality and also actively post, comment and communicate. Our findings show that key actors are usually lesser-known political agents. These key actors are civil activists who are usually uninhibited in terms of their personal reputation and readily espouse radical ideas.
Further, we analyze the degree distribution within these groups and reach additional conclusions regarding the mechanism(s) behind their formation.

**A Multi-theoretical, Multi-level Investigation of the Structure of Social Relationships in Virtual Worlds**

*Foucault Welles, Brooke*
Northeastern University, Communication Studies, Boston, MA, United States

Social relationships are a major component of online communities and are among the chief motivations for using virtual worlds and massively-multiplayer online games. While prior research has focused on individual and dyadic motivations for forming online social relationships, the literature on network-level influences on social relationship formation is underdeveloped. This paper builds on prior work, examining the relative influence of individual, dyadic and network-level pressures on the emergence of social relationships on the Internet. Specifically, using Monge and Contractor’s (2003) multi-theoretical, multi-level network modeling and data drawn from logs of social behavior inside the virtual world Second Life, I test the relative influence of homophily, proximity, triadic closure, popularity, and a number of individual differences on the emergence of social relationship ties. The results of predictive network analyses reveal that electronic proximity and triadic closure best predict the emergence of social relationships, controlling for individual and dyadic differences. I discuss these results in light of existing research on online social relationships, and propose a new theoretical model for predicting online social relationship formation.

**Facebook: Between Freedom and Coercion. A Study on the Correlation between Network Structure and Its Impact on the Members of Online Groups**

*Hennig, Marina*
Johannes Gutenberg Universität Mainz, Institut für Soziologie, Mainz, Germany

Since the establishment of Facebook many organizations and companies have begun to display their networks online. These Facebook-Groups serve as contact and information-exchange platforms, which customers and employees use to socialize online. Communication networks are becoming more dense, hence some companies make the participation in online groups mandatory for their employees. These groups give their members countless advantages, such as socializing, exchanging shifts with each other, etc. The premises on which the Internet campaigned in its early days included autonomy and anonymity. However, these premises are in danger of becoming obsolete in the virtual world of these groups. By posting messages and participating in group discussions the members become visible and vulnerable to others. This paper focuses on participation in such groups, in particular the question as to whether it results in an increase in social control in work contexts and the negative and/or positive impact this will have on the members of such groups. To what extent do Facebook users experience a positive or negative impact on their lives through participation in a group? Are they excluded from a group or are they accepted? To answer these questions, I analyze the network structure in two working groups on the basis of Facebook data, and use data about the effects of group membership on the lives of Facebook users, collected through a survey of the group members. This makes it possible to identify the relationship between network structure and its impact on the members of online groups.

**The Invisible Hands of Time: How Timezones Shape Online Communities**

*Wiersma, Wybo*
University of Oxford, Oxford Internet Institute, Oxford, United Kingdom

A popular view of online communities is that they transcend time and place. As threads and comments are posted, however, the ensuing online-discussions unfold over time. Not only does timing determine which threads participants will see first when they arrive, but also which comments have not already been extensively replied to. By affecting who interacts with whom during the circadian cycle, time-pressure at the level of threads could in turn shape the social ties that form. Coupled with time-zone differences, this could make online communities not as global as generally believed. A case-study of the Hacker News community was conducted to measure time-effects. Hacker News caters to people interested in web-startups. It has approximately 100,000 unique daily visitors from all over the world, and receives about 2,500 posts per day. Forty days of data was collected, and geo-locations were acquired for three thousand users. In a preliminary analysis, strong time-pressure effects were found at the thread-level. For social ties between users, moderate, but statistically significant effects were found as well; especially for users at the edge of the network. Even the two-week gap between the introduction of daylight savings time in the US and UK, was found to have an impact on peoples network distance during that time. These findings might limit the validity of purely social interpretations of online reply structures, as well as the extent to which (large) on-line communities can be considered real communities, rather than imagined communities that are primarily shaped by the flow of conversation.
Models for Micro-forces: Application to an Online Friendship Network

Memic, Haris; Skvoretz, John
(1)International University of Sarajevo, Sarajevo, Bosnia and Herzegovina, (2)University of South Florida, Tampa, FL, United States

The goal of this study was to begin to examine the presence and relative magnitude of directed local micro forces in friendship online social networks. For this specific purpose, an online social network was developed and administered for a significant period of time, from which network data for this study was then collected. In order to verify the presence and the magnitude of the local forces, recently reformulated biased net framework for stochastic modeling of local forces in social networks was used, with an extension that also incorporated a bias for cyclicality. A set of nested biased net models was specified and estimated, each incorporating different combination of local dyadic and triadic forces together with a bias for density. The results of best fitting models verified the presence of reciprocity, transitivity, structural similarity and closure, as well as probable counter-tendency for cyclicality. Reciprocity was estimated to be about 8 times stronger than transitivity, which was estimated to be about 2 times stronger than structural similarity, which was estimated to be almost 6 times stronger than closure. Not considering the probable counter-tendency for cyclicality, the density bias, which modeled the random chance of connection (or the summation of all other non-modeled network forces), was found to have the smallest influence on the creation of friendship links in the online social network, out of all considered local forces.

Triadic Cohesion in Social Networks

Nick, Bobo; Lee, Conrad; Cunningham, Pádraig; Brandes, Ulrik
(1)University of Konstanz, Computer and Information Science, Konstanz, Germany, (2)University College Dublin, CLIQUE Research Cluster, Dublin, Ireland

Connected actors are considered a group if they are internally more cohesive than externally. Common formalizations of cohesive groups such as the modularity index are based on the tradeoff between aggregated density measures. With modern means of communication, like Facebook or Twitter, however, the potential to maintain significantly more weak than strong social relationships is in direct contradiction to densely connected actors that are only sparsely connected to their structural environment. We argue, therefore, that structural embeddedness is a superior proxy for community structures. By weighting dyadic relationships according to their Simmelianess we replace density as an indicator of cohesive groups by an individual-level attachment to groups corresponding to Burt’s notion of constraint. Although we exploit more detail than aggregate density-based approaches, fast triangle-listing algorithms make our method scale to sparse networks with millions of actors.

Rejection in Online Social Networks

Posegga, Oliver; Donath, Martin; Fischbach, Kai; Putzke, Johannes
(1)University of Bamberg, Bamberg, Germany, (2)University of Cologne, Cologne, Germany

An extensive amount of research has been conducted on link formation in online social networks (OSN), but less attention has been paid to the phenomenon of rejection, that is, the denial of a user’s friend request by the recipient. Taking a structural perspective on social networks, our goal is to understand this phenomenon using methods of social network analysis. In cooperation with a large OSN provider, we analyze a social network comprising approximately 7.4 million users and examine their friendship and interaction patterns. We explore the chain of events leading to the acceptance and rejection of friendship requests. Based on a discussion on the role of trust in OSN, we argue that in absence of explicitly designed reputation mechanisms, a user’s decision to reject a friendship request is influenced by two factors: the distance between the involved users in the social graph and the amount of interactions preceding the friendship request. Our results show that more than one third of all observed friendship requests are neither answered nor rejected. Further, we find that the distance between users has a significant influence on the outcome of a friendship request. Friendship requests between distant users are more likely to be rejected. Moreover, our findings suggest that this effect is mitigated by interactions prior to the request. While such interactions could be observed only rarely, we conclude that both discussed factors play a crucial role in understanding the rejection of friendship requests in OSN.

Sentiment Dissemination among Users in Online Social Networks: Polarizing or Balancing Out?
How are participants in online networks influenced by the sentiment of exchanged messages and how can social theories help to explain evolving patterns of large scale online interaction? To address these research questions we apply the approach of event-based dynamic network analysis and the corresponding software framework Commetrix (Trier, 2008) to study over 12000 online interaction networks of users and the sentiment of their exchanged messages in newsgroups, social bookmarking and micro-blogging platforms. The focus was on actor reactions to incoming messages (actor level), on the evolving dyadic relationships between two actors (dyad level), and on ego-networks (network level). Our quantitative analyses suggest the applicability of Interpersonal Behavior Theory, Emotional Contagion Theory, Balance Theory and Attachment Theory to explain online interaction patterns: People participating in online networks are likely to be influenced by the sentiment of exchanged messages and react by adapting their response accordingly. Communication partners tend to establish reciprocal relationships with either positive or negative valence (polarization). Network topologies of positive or negative sentiment dissemination are hence likely to be disjoint. At the level of actor’s ego-networks, however, actors are likely to develop a balanced bundle of positive and negative relationships. Our research contributes to a more precise empirical understanding of sentiment propagation in large online groups and the role of multiple parallel micro-level social influence processes. The talk will introduce event-based dynamic network analysis and the SNA software Commetrix, partially public online interaction datasets with sentiment annotation and discuss the applicability of social theories.
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Comment-based Communities in the Russian Livejournal and their Topical Coherence
Koltsova, Olessia, Koltcov, Sergei
National Research University - Higher School of Economics, Laboratory for Internet Studies, Sankt Petersburg, Russian Federation

Online discussions and networking have proved vitally important in the political life of contemporary societies, and sometimes have been crucial for political regime change. The structure of those discussions and communities that presumably arise around them presents an important and relatively new research question for social scientists. For Russia, most such discussions have been until recently housed by Livejournal blogging service. Most network analysis of Livejournal has been devoted to the networks of friendship, while real discussions develop in threads of comments that may also be represented as comment-based networks. Our goal in this study has been to determine if such networks form discussion communities based on a shared topic, or around an author (opinion leader), or neither. We have collected several datasets containing all posts of top-2000 Livejournal bloggers - those that are most lavishly commented and may be regarded as opinion leaders - and all their comments. Two posts were considered connected if they had comments written by the same blogger, each dataset thus acquiring 10E5 edges. Wakita-Tsurumi algorithm of community detection was used, creating subsets (clusters) of posts commented roughly by the same set of users. Measuring distances between vectorised texts of posts allowed us to compare inter-cluster dispersion with the average dispersion, which gave us a ground to judge if clusters commented by the same bloggers are topically (lexically) closer than random posts. We have also calculated a number of measures of association between cluster attribution of a post and its authorship, detecting positive correlation.

Impact of Personalized Audio Social Media on Social Networks
Lukacs, Gergely1, Pethesné Dávid, Beáta2, Madocsai, Bea3
(1)Pázmány Péter Catholic University, Faculty of Information Technology, Budapest, Hungary, (2)Semmelweis University, Institute of Mental Health, Budapest, Hungary, (3)Hungarian Catholic Radio, Budapest, Hungary

The presented work is part of a larger project to create an audio social media platform based on smartphones and mobile internet for supporting different kinds of communities. Audio media has various differences from and several advantages over other electronic (text or video) media. With recent technical advances, the preconditions for a widely available audio social media are set. In our pilot study the impact of the audio social media is tested on a group of fifty-two university students. The closed network of the students was measured in three situations (knowing by name, communication about personal and about professional topics), supplemented by some personal data. This was followed by a test-period of the audio social media with 25 students randomly selected: personal interviews and personal music recommendations were prepared and edited, extended by some editorial content ranging from music and talks, interviews and discussions on communities, conflict resolution to poetry and fiction. After this preparation, a smartphone app connected to our server and (for those not having) simple smartphones were provided for a test period of 3-4 months. At the end of the test period, the survey on the social ties is repeated for the whole group and is compared to the results of the initial wave.

Modeling of Online Behavior: Understanding Profiles of Technology and Social Media Used by PhD Students
Mohamed, Bahaaeldin, Pscheida, Daniela, Koehler, Thomas
Technical University Dresden, Dresden, Germany

Facing the future challenges in scientific work, there is a real need of establishing and supporting scientific communication networks for doctoral scholars in academic everyday practices. These networks should allow a wide variety of online communication and collaboration fitting the special requirements of young scientists. This study employed a proprietary collaboration-model- (Mohamed, B.; Pscheida, D. & Koehler, T. (2012). The Fish Model: a conceptual framework for enhancing e-research collaboration. (Under reviewing))- to examine how doctoral students evaluate their own scientific practices and academic needs and establish communication networks by building their own social media profiles. Data was collected via online questionnaires of one project (Survey A, n1=140) that is running in the frame of the “eScience - Research Network Saxony” project (http://www.escience-sachsen.de/) as well as within a survey run by the central coordination of the project (Survey B n2=275). The results indicate that how doctoral students define everyday research practices and which tools/social media they use to run these practices can be described by the following dimensions (1) an academic daily task done in a particular time, (2) an individual activity guided by students'
beliefs and values, (3) the use of particular tools/social media supported by culture discipline and context, (4) the incentives and motivation for doing a research that is protected by ethics. Overall, the findings illustrate a new understanding online behavior of doctoral students in terms of coping with their daily tasks, activities and the individual usage of tools/social media in an academic context.

Emerging Communicative Patterns in a Scientific Blog Network

**Puschmann, Cornelius**
Humboldt-University of Berlin, School of Library and Information Science, Berlin, Germany

Among other areas of society, digital media is impacting how academics publish, communicate, and exchange information. In addition to innovation such as Open Access publishing and the sharing of research data, this also engenders the proliferation of new formats of scholarly discourse, such as blogs and Twitter (Shema, Bar-Ilan, & Thelwall, 2012; Weller, Dröge, & Puschmann, 2011). In this paper I present an exploratory study of hypotheses.org, a peer-reviews scientific blog network funded by the French National Center for Scientific Research (CNRS). In total 45,528 posts from 456 different blogs posted over a period of 8 years are analyzed, with special focus on how blogs link to one another, to other content on the Internet, to formal publication available digitally in sites such as arxiv.org, and to resources such as Wikipedia. I also examine how blog networks inside the platform differ by language, and what patterns emerge over time. Shema, H., Bar-Ilan, J., & Thelwall, M. (2012). Research blogs and the discussion of scholarly information. PloS one, 7(5), e35869. doi:10.1371/journal.pone.0035869 Weller, K., Dröge, E., & Puschmann, C. (2011). Citation Analysis in Twitter. Approaches for Defining and Measuring Information Flows within Tweets during Scientific Conferences. In M. Rowe, M. Stankovic, A.-S. Dadzie, & M. Hardey (Eds.), Making Sense of Microposts (MSM2011) (pp. 1-12). Heraklion: CEUR Workshop Proceedings. Retrieved from http://files.ynada.com/papers/msm2011.pdf

“ Disorderly Conduct” On the Unruly Rules of Public Communication in Social Network Sites

**Wagner, Elke, Stempfhuber, Martin**
JGU Mainz, Sociology, Mainz, Germany

In Social Network Sites (e.g. Facebook, MySpace, Youtube, Twitter) emerges a decidedly disorderly style of communication and connectivity. There appear a variety of communicative offers that produce an indefinite and vague content: videos and pictures or statements about emotions and perceptions. As a result, a diverse number of speakers are able to add their comment to these disorderly communication offers. But how is communication possible under these conditions? The paper argues that indeterminacy is a solution to the problem of speaking privately in public and to an indefinite audience. On the basis of an ethnographic case study of the SNS Facebook, it can be shown how the communicative order here is produced not by arguments or reasons, but by indeterminacy, ambiguity, and constant irritation. The empirical data consists of qualitative interviews with 30 Facebook users and screen-shots of the daily using-practices on Facebook selected over a period of two years. The paper uses these finding to problematize the insights of network theory and Niklas Luhmann’s systems theory that order can only be generated out of noise - it can also be generated through noise. As order undermines itself through the creation of ambiguous communicative possibilities, a new kind of public sphere is created. To show this the paper discusses typical styles and practices of public communication on social network sites (SNSs) in order to confront the traditional concept of publics as machines for creating order.
Organizational behavior and social networks

Affective Outcomes of Network Positions. A Field-study Research Using RFID Sensors of Physical Proximity

Barzotto, Mariachiara, Comacchio, Anna, Rigato, Giulio
University Ca' Foscari of Venice, Department of Management, Venice, Italy

Research on organizational networks has recently been showing traces of an interest in joining structural sociology and psychology in the study of organizations. On the one hand, network scholars are increasingly using individual differences and psychological processes to explain organizational phenomena, thus taking a step away from the purest view of structuralism. At the same time, psychological theories gain from incorporating the advancements of structural analyses. With existing research having demonstrated the importance of affect in network formation and individual performance, this project aims to uncover the relationship between micro-interactions among people in organizations and the specific emotions they experience in those interactions. Specifically, we look at which interactions elicit different emotions. Drawing from existing literature on social interactionism (Collins, 2006) and affective-events theory (Weiss and Cropanzano, 1996), we investigate the relationship between topological positions in the network of face-to-face encounters and individuals’ affective states. More specifically, we suggest that individuals’ degree centrality in the network of fleeting, short-lasting face-to-face encounters will elicit an emotional reaction characterized by low levels of affective activation. Conversely, we hypothesise that degree centrality in enduring, long-lasting face-to-face encounters will elicit an emotional reaction characterized by high levels of affective activation. We test our hypotheses in a private business incubator. By using Radio-Frequency Identification badges, we recorded data of direct interactions among 31 employees over an observation period of 4 working days. Our results show that there is a relationship between the number of encounters in fleeting F2F communication network and individual’s affective activation.

The Alliance Disease: An Empirical Application of Regular Equivalence in Stock Photography

Glückler, Johannes¹, Reinelt, Gerhard², Panitz, Robert¹, Wiesberg, Stefan²
(1)University of Heidelberg, Geography, Heidelberg, Germany, (2)University of Heidelberg, Computer Science, Heidelberg, Germany

This paper contributes to research on regular equivalence. It offers an empirical application of the concept and explores its utility for the development of network strategies in inter-organizational relations. The global trade of stock photography has undergone a radical change through the introduction of digital technology, leading to price reductions in visual content, lower entry barriers for amateurs and the necessity to create new business models. In this historical phase of restructuring, picture libraries have increasingly established strategic partnerships among each other to multiply their distribution channels. We argue that the excessive growth of these sales partnerships over the last decade has led to a phenomenon that we call alliance disease. It refers to situations in which the creation of ever new partnerships yields increasing redundancies between the image stocks of picture libraries. It raises the question in which way a picture library should connect to the existing network and which partnerships it should avoid. We apply Borgatti et al’s (2002) measure of regular equivalence to the network of sales partnerships between picture libraries in Germany and identify four empirical roles of equivalence: while two ideal roles of suppliers and traders are found to establish a clear division of labour along the value chain, the two remaining roles are found to represent rather redundant patterns of distribution being potential sources of the alliance disease. Finally, we develop an alternative algorithm to compute regular equivalence and to validate our findings.

The Effects of Newcomers’ Social Networks and Information Giving on Innovative Performance

Jokisaari, Markku
Durham University Business School, Durham, United Kingdom

Many scholars of organizational socialization have argued that the interaction between newcomers and more experienced members in the organization is a main channel for newcomers to learn their roles in the organization. This paper examines to what extent newcomers’ information giving and the characteristics of their social networks are related to innovative performance. A sample of new employees completed questionnaires which included social network (density, strength of ties, status) and information giving measures. Their supervisors rated their innovative performance. The results suggest interactive effects of newcomers’ social networks and their information giving on innovative performance. For example, newcomers’ information giving is related to innovative performance when their social networks are characterized by high density.
The Coevolution of Organizational Identification and Friendship Networks

Schulte, Mathis, Yong, Kevyn
HEC Paris, Management and HR Department, Jouy-en-Josas, France

Do people identify with their organization because of their friendship network within the organization, or does their organizational identification shape their friendship network? We argue that organizational members’ friendship ties and their identification with the organization coevolve over time. Drawing on theory and research on social identity and network formation, we examined the specific processes and conditions that lead from organizational identification to tie formation and from tie formation to organizational identification. To test our hypotheses, we collected survey data from a complete cohort of full-time MBA students (n=181) at a European business school. Students indicated their friendship choices among their peers and their identification with the university over a 9-month period. We used the SIENA framework to analyze the co-evolution of friendship ties and identification. Our main results suggest that organizational identification predicts friendship ties. The more a student identifies with the university, the more peers the student will see as good or close personal friends, and the more diverse the friends will be in terms of their nationality. But students who indicate many friends among their peers will not identify with the university more than students who indicate few friends. Yet, friendship ties influence students’ identification through contagion: Students tend to adopt the organizational identification of their friends over time. Our findings contribute to the understanding of intra-organizational network formation and organizational identification. They also question managerial practices that rely on fostering personal networks within the organization to increase members’ attachment to the organization as a whole.

Who Benefits from Social Media? Network-biased Technical Change

Wu, Lynn
University of Pennsylvania, The Wharton School, Philadelphia, PA, United States

Technology innovation is not often factor-neural. In fact, recent waves of technological change, such as the rise of information technology, has lead to skill-biased technical change (SBTC), in which technology complements skilled workers, enabling them to earn higher wages than low-skilled workers (Card and DiNardo 2002). This type of bias often puts technology at the center of the income distribution debate. Similarly, with the recent rise of social media and their increased adoption in organizations, it is possible that social media could also engender biases similar to SBTC. We argue that similar to skill-biased technical change, social media could also enable some workers to do better while biasing others to do worse. Observing the network and performance characteristics before and after the adoption of an enterprise social media tool, we find that social media has the potential to provide even more performance advantage to whose who are already endowed with superior network positions, and thus reinforcing the existing social structure. Interestingly we find social media also provide a leveling effect in that junior consultants disproportionately benefit more from using social media than senior consultants.
Policy Networks

Assessing the (Changing) Structure of Organised Interest Networks: Evidence from UK Public Policy Consultations

Halpin, Darren R., Ackland, Robert
Australian National University, Canberra, ACT, Australia

For decades, group scholars have traded characterisations and debated about the complexion of populations of organised interests that mobilise across policy domains. We examine two aspects of this conversation here. Firstly, there has been the suggestion that the 'explosion' of organised interests brings with it increasing fragmentation or policy 'balkanization'. While we see evidence that, in aggregate, there is no more policy specialisation among organised interests, we do not know if the networks of organised interests active in policy domains are less interconnected (and which actors may or may not span such domains). A second area of debate concerns the changing complexion of domain-level populations. Key is the proposition that producer interests are less central, and at the least they have been joined by citizen groups. This narrative is shared across the US and UK literatures, with agricultural policy the paradigm case. In this paper we utilise records of responses by organised interests to Scottish public policy consultations over a continuous 25 year period to assess the structure of the organised interest populations that mobilise around policy issues. We utilise the tools of network analysis to test the above propositions.

Career Concerns and Strategic Leadership in the European Parliament: Committee Networks and Report Accumulation

Schneider, Michaö1, Kiel, Marcelö2, Thurner, Paulö3
(1)University of Munich, Munich, Germany, (2)University of Munich (LMU), Munich, Germany, (3)University of Munich (LMU), Political Science, Munich, Germany

The assignment of committee seats and reports reveals at the same time the political ambitions and reputations of Members of the European Parliament (MEP), as well as the strategic coordination efforts of (national) party (group) leaders. Thus, different types of MEPs contribute to different degrees and ways in co-constructing formal and informal authority structures within an rapidly evolving legislature. We advance a new theoretical perspective which highlights the dynamics of cumulative advantage in the field of legislative politics. For the first time, we investigate multiple memberships in EP committees connecting members and committees in a very complex, so far hidden way. Using network analysis, we identify latent structures of the organization in this parliament. Developing a new index of MEPs' social capital, we are able to show that the multiplicity of committee assignments, but to a much higher degree the actual involvement (attendance) therein constitutes an intermediate investment leading to a higher chance of getting legislative reports. Conceiving highly prestigious reports as a 'within-legislative-period-performance-indicator' for important legislative action, we are able to determine the relative value of (specific) committee memberships.


Suerdem, Ahmetö1, Pedrazzani, Andreaö2
(1)Istanbul Bilgi University, Istanbul, Turkey, (2)University of Bologna, Department of Political and Social Sciences, Bologna, Italy

Political research increasingly devotes attention to legislative debates. There are interesting studies for determining policy positions of legislative actors from their discursive positions by using text analysis methods (Laver, Benoit and Garry 2003; Slapin and Proksch 2008). Furthermore, recently political researchers have started to discover social network analysis for determining the positions of legislative actors. For example, Fowler (2006) analyses how co-sponsorship behaviour inspires social networks among legislators. Similarly, Agneessens & Skvoretz. (2009) show how party membership, legislative activity, and exchange of favours effect co-sponsorship behaviour from a bi-modal network analysis perspective. However, the relation between discursive positions and social network positions is not studied till now. We aim to fill this gap through a dynamic network analysis perspective where the dependent variable is the change in tie variables (co-participating in the same debate) and independent variables are discursive positions, closeness to the party leader, committee membership, geographic area and control variables such as profession, tenure, and gender. We operationalize ties between legislators in terms of their co-participation in same debates. We postulate that debates will involve just those legislators representing the constituencies with an interest in the piece of legislation at issue. Furthermore, we operationalize discursive similarities in terms of semantic proximities of the word vectors occurring in
the speeches. We test the effects of hypothesized parameters on the network dynamics by means of stochastic actor-based model (Snijders, van de Bunt et al. 2010) We are using R-Siena software for this purpose and still experimenting with the data.

Ethical Banking in the UK - Networks in Mixed-methods Policy Research

Tischer, Daniel
University of Manchester, CRESC, Manchester, United Kingdom

The research project investigates how UK ethical banks interact with other ethical banks and if, and how, they organise collectively. Moreover, their connections to mainstream financial institutions are investigated. Both sets of results are used in this paper to inform policy-making for the ethical banking sector as a subsector of UK banking. Whilst policy-making for mainstream banking has received significant attention from academic researchers and policy-makers, the ethical banking community has been largely ignored, or mainstream policy approaches used to organise retail banks have been used to regulate and legislate ethical banking. This paper develops an understanding of ethical banking as a subsector of banking using UCNet to examine relationships and structure through, for example, Hubs- and Authorities, brokerage and E-I Index. The network findings signal why mainstream policy initiatives are unsuccessful in promoting ethical banking in the UK, which will be discussed in some detail in the paper. Alternatively, findings showcase how perceived networks explain niche efforts in the industry dominated by large retail conglomerates. Results highlight that a more focused approach to regulate the subsector is needed to promote individual and collective needs of the sector, as highlighted in the network structures, and to limit the impact of mainstream financial actors on sector regulation and firm strategy.
Political networks

Balance in Election Campaigns: What Does it Represent?

de Nooy, Wouter
University of Amsterdam, Amsterdam, Netherlands

Political parties attack and support each other in the media during election campaigns in multiparty systems ruled by coalitions. From a network analytic perspective, it is natural to conceptualize a supportive statement as a positive arc between two parties and an attack as a negative arc. Balance theory can then be used to predict how parties respond to previous support and attack, that is, how the network evolves. This paper presents an application of balance theory to support and attack statements among political parties that appeared in the media during the 2006 national election campaign in The Netherlands. Parties seemed to apply the principles of balance when choosing between support and attack. Multivariate statistical analyses, however, reveal that the effect of balance is largely eliminated when party characteristics are added to the model, notably the difference between incumbents and opposition. It is well-known that consistent application of balance principles creates adversary factions within a network but we should realize that the opposite is also true. If network members systematically adjust their support and attacks to existing divisions, e.g., opposition versus incumbents, the resulting network is balanced even if members do not pay attention to the pattern of support and attack in the network. In a context where strategic action is likely, such as politics, balance may be an artefact rather than a driving force of network evolution.

Social Networks as Determinants of Voting Behavior and Government Performance: An Estimation of Spatial Voting Model Using Latent Class Analysis

Henning, Christian, Petr, Svetlana
Christian-Albrechts-Universität zu Kiel, Agrarpolitik, Kiel, Germany

Microeconomic foundation of government capture is inherent in voter behavior, i.e. the more the relative importance of non-policy versus policy oriented voting varies across socio-economic groups the more biased are governmental policies in favor of special interest groups. In this paper we derive a theoretical model, where voter’s relative weight for non-policy voting depends on his information status. Moreover, the information status depends on voters EGO-centric network structures, i.e. density and network size. We test our theory estimating a probabilistic voting model for Slovakia using own election survey data. In particular, to be able to deal with potential heterogeneity we estimate a latent class model. Based on estimation results we are able to calculate group-specific relative weights of the policy-oriented and the expressive voting motives, respectively, which have direct implications for government capture. Estimation results of the latent class model we are able to identify the relative importance of EGO-centric network structures as well as personal characteristics, e.g. age, gender, education income, and institutional factors such as membership in stakeholder organizations determining the relative importance of the two motives for observed voting behavior. We show, first, with kernel density estimation that the farmer-class votes less ideological than non-farmer-class. Second, Ideological indicator for non-farmer rises with increasing network density and decreases with increasing network size. In contrast, ideological voting of farmers is nearly constant with increasing network density and network size.

Identifying the Latent Money Networks in Politics

Lazer, David, Goodman, Sasha, Airoldi, Edo
(1)Northeastern University, Boston, MA, United States, (2)Harvard University, Cambridge, MA, United States, (3)Northeastern University and Harvard University, Boston, MA, United States

What social processes mobilize money in politics? Here we examine the temporal, spatial, and organizational burstiness of contributions to particular candidates in Boston, Washington, and New York City. In the first analysis, we demonstrate the powerful tendency for individuals who contribute to the same candidates on the same day tend to be from the same geographic areas and employers. In the second analysis, we demonstrate that we can partially recreate the latent social foci around which money is politics is mobilized through an analysis of co-occurrence of individuals within bursts.

Networking for European Smoke-free Policy

Weishaar, Heide B, Amos, Amanda, Collin, Jeff
Policies that reduce exposure to second-hand smoke have proven to efficiently increase public health. Respective policy debates, initiated by the European Commission, resulted in the adoption of the 2009 European Council Recommendation on smoke-free environments. Whilst the final decisions to adopt European legislation remain the authority of European institutions, policy networks have been recognised as crucial determinants of European policy. Previous social network studies have investigated policy networks, but no study has applied social network analysis to the investigation of networks in European public health policy. The project applies quantitative and qualitative methods to analyse stakeholder engagement in the development of European smoke-free policy. It draws on data from policy documents, including consultation submissions and policy drafts, and 35 semi-structured interviews with political elites. The paper describes the engagement of network actors (including governmental bodies, non-governmental organisations, commercial actors and academics) in the policy process, their position on the initiative and reasons for political participation. The most prominent actors are analysed, focusing on actors’ centrality, leadership and position within the network’s subgroups. Exploring different types of relationships, the study examines patterns of collaboration and coalition-building. By analysing the network of actors with an interest in European smoke-free policy, this paper increases understanding of the factors which facilitate and constrict the development of effective European public health policy. It provides an insight into the engagement and importance of stakeholders in the policy process and critically assesses current practice of advocacy in European public health.
Political networks of international cooperation and conflict

Proliferation of Unmanned Combat Air Vehicles (UCAV): Combining SNA and Spatial Analysis

*Burilkov, Alex*<sup>1,2</sup>, *Mohrenberg, Steffen*<sup>1</sup>

(1) University of Hamburg, Hamburg, Germany, (2) GIGA German Institute of Global and Area Studies, Hamburg, Germany

The last decade witnessed rapid proliferation of unmanned aerial vehicles (UAV). UAVs, used in conjunction with other systems, grant more comprehensive and sustained surveillance and network capability. Building on these perceived advantages, some states have chosen to arm UAVs for combat, now used extensively in recent conflicts in the Middle East and Southeast Asia. UCAVs remain relatively simple aircraft armed with light missiles, but advances in drone technology make them increasingly capable. UCAVs are preferred for military missions considered too “dull, dirty, and dangerous” for human pilots, and the systems can run for very long periods of time; however, the proliferation of UCAVs impacts not only state security, but also raises thorny questions on the changing nature of warfare in a world where the line between civilian and combatant fades. To understand global UCAV proliferation, we combine SNA and spatial regression. In the first section of the article, we describe the theory of proliferation, meaning the reasons and likelihood that a state would choose to acquire drones. In the second section, we conduct a spatial regression of UCAV possession. This will uncover whether there is any spatial dependency in UCAV possession; what it does not clarify is whether that is indicative of state-to-state proliferation, or whether states acquire UCAVs because their neighbors have done to. To clarify this point, we turn to SNA, and to a descriptive network analysis of UCAV proliferation; we focus on the key actors that actively transfer UCAV technology to other states across the network.

Pos. and Neg. Ties among States and Rebel Groups. Civil Wars in a Transnational Perspective

*Carnehl, Charlotte*, *Mohrenberg, Steffen*

University of Hamburg, Hamburg, Germany

We study civil wars in Africa after 1990 as networks of state and non-state actors. For five-year-intervals, we look at the relations “support” and “armed conflict” between states and rebel groups. We provide a description of these networks of transnational conflict and cooperation focussing on triadic structures and two-paths. First, proxy interventions show up frequently: A state supports a rebel group which, in turn, fights another state. Second, full-blown proxy wars can be observed less frequently: in this case, two proxy interventions mirror each other and two states seem to fight each other indirectly via their support for rebel groups that operate on their opponent’s territory. Our goal is to test the expectation of Loveman and others who predicted the frequency of such proxy interventions to increase over time after the end of the cold war.

From Conflict Management to Collective Conflict Management: The Raise of Networks Forms of Conflict Management between International Organizations

*Pellon, Gaëlle*

Université Catholique de Louvain, Louvain-la-Neuve, Belgium

Existing IR studies have underlined how much international organizations’ strategies have evolved. The most obvious transformation is the increase of networked forms of conflict management arrangements such as simultaneous peace operations, ad-hoc coalitions, joint programs or joint opinions. These forms of interventions, characterized by the co-involvement of several types of actors challenge both realistic views of third parties’ cooperation in conflicts and methodological approaches of this phenomenon. In this paper, I propose to use the new Database on Inter-Organizational Relations in Conflicts (DIORc) in order to compare, with a social network perspective, the interplay between inter-governmental organizations in two conflicts. The aim of the paper is twofold: first, the network perspective is used to open the black box of multipartite intervention. Cooperation is designed as an affiliation network where ‘actors’ represent the IGO’s institutions (parliaments...) and ‘events’ are conflict management activities in which actors are involved. Secondly, this paper seeks to contribute to the understanding of cooperation in peace and conflicts. The contemporary conflict management doctrine is based on a comprehensive approach that includes two aspects: First, all the dimensions of a conflict should be addressed and second, institutional overlapping should be avoided through the division of labor between conflict managers. However, analysis of the level of coordination temper the comprehensive argument, suggesting that collaborative advantage rather linked to legitimacy than efficiency. Second, following Putman (2000)’s distinction between ‘bridging’ and ‘bonding’, this paper shows that transorganizational actions occur more frequently between homogeneous groups of institutions than across divers groups.
Climate Change and Social Networks: Conflict or Cooperation?

*Scheffran, Jürgen¹, Kominek, Jasmin²*

(1)University of Hamburg, Institute of Geography, Hamburg, Germany, (2)University of Hamburg, KlimaCampus, Hamburg, Germany

Climate change is a macro phenomenon that simultaneously affects natural and social systems all over the world, e.g. through weather extremes, water and food insecurity, migration and conflict. New approaches are needed to understand the complex dynamics of climate-society interaction (Scheffran et al. 2012ab). Multi-agent settings and social networks are relevant when multiple regions, countries, businesses or citizens are affected by and respond to climate change through multi-level processes between local and global decision-making. Structural effects such as path dependency in social networks influence the social dynamics in opposing directions, leading to conflict or cooperation, the cascading breakdown of social structures or the transformation towards sustainable societies (Kominek/Scheffran 2012). For instance, in natural disasters, international aid may help the affected people to survive and thus stabilize the social system, but may also lead to competition among or even struggle between those in need. As another example we discuss the impact of climate change on conflict and cooperation in water, food and energy use of social networks in the Mediterranean region. Kominek, J., Scheffran, J. (2012): Cascading Processes and Path Dependency in Social Networks, in: Soeffner, H.-G. (ed.), Transnationale Vergesellschaftungen, Wiesbaden. Scheffran, J., Brzoska, M., Kominek, J., Link, P.M. & Schilling, J. (2012a): Climate change and violent conflict, Science, 336, 869-871. Scheffran, J., Brzoska, M., Kominek, J., Link, P.M. & Schilling, J. (2012b): Disentangling the Climate-conflict Nexus, Review of European Studies, 4 (5), 1-13.
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Small Fish in Big Ponds: The Interdependent Structure of Multilateral and Bilateral International Fisheries Agreements

Hollway, James¹, Koskinen, Johan²
(¹)University of Oxford, DPIR and Nuffield College, Oxford, United Kingdom, (²)University of Manchester, SSDA, Manchester, United Kingdom

Why and when do some states establish multilateral treaties instead of bilateral treaties? This question is consequential for vital issues such as international fisheries management, for while multilateral treaties tend to represent attempts at establishing collective fisheries management and conservation policies, bilateral treaties tend to be geared towards gaining access to coastal fisheries resources. However, although the nature of the ties differ, we argue that they are not structured independently. The first, meso-level network consists of an affiliation network of state ratifications to multilateral fisheries treaties. The second, micro-level network consists of states' dyadic bilateral treaty commitments. Lastly, treaties succeed each other or deal with partially overlapping issues and regions, and as such treaty references express additional dependencies giving us a third unimodal, macro-level network. To interrogate the resulting complex set of networks simultaneously, we draw on the conceptual tool of multilevel networks (Lazega 2008; Breiger 1974) and apply recent advances in analysing multilevel networks using exponential random graph models (Wang et al 2012; Wasserman/Iacobucci 1991). Multilevel exponential random graph models offer a way to model how intra-modal relations mediate or facilitate inter-modal relations. We find that a relatively parsimonious model that takes the multilevel dependencies into account explains the overall structure better than one that ignores these dependencies. Furthermore, the structural dependencies best describing 'big fish' (high bilateral or multilateral degree states) differ to that of the remaining 'small fish' in both 'big ponds' (multilateral treaties) and 'small ponds' (bilateral treaties).

Political Power and the Global System: Can Political Globalization Counter Core Hegemony?

Jacobs, Lindsay Marie, Van Rossem, Ronan
Ghent University, Sociology, Ghent, Belgium

The ongoing globalization of political relations has raised the question whether integration in the international political scene could enhance the power and influence of smaller and poorer nations. Accordingly, we ask whether 1) there is a discernible departure away from the structure of the classic economic world-system and 2) the global political system follows the stratified structure of the economic hierarchy or if it cross-cuts this stratification, offering an alternative power source in the world-system. Our blockmodel was based on import and export relations between 1965 and 2005 and was compared to the structure of the world polity (diplomatic, alliance and IGO ties) over this period. First, we analyzed the ongoing integration of relationships in the political network, while the structure of the economic world-system was kept constant over time. Results showed a strong increase in political relationships within the economic semi-peripheries, implying divergence away from the dominance of the economic core on political relations. However, this disappeared when mobility within the economic world-system was allowed for. Political relations are thus mainly formed between - rather than within - the blocks of the economic world-system. As political integration is associated with economic upward mobility, political and economic integration in the world-system coincide. This confirms that the international political system remains stratified according to core power hegemony and political relationships remain dominated by the economic core. Political integration has not fundamentally altered the structure of the world-system nor has it proven to be a viable alternative power source for non-core countries.

Roles and Positions in the International Field of Visa Policy: A Network Approach

Laube, Lena¹, Heidler, Richard²
(¹)University of Bremen, Sociology, Bremen, Germany, (²)University of Wuppertal, Sociology, Wuppertal, Germany

Globalization is characterized by a significant increase in persons' mobility across state borders. Many Western countries have reacted to this development by restricting territorial access towards immigrants. But also visa policies have turned out to be important measures to regulate entry. Worldwide, states have introduced visa requirements for foreign citizens. Nevertheless, all states tend to trust certain countries more than others and cooperate with them in the field of international visa policy. To grant citizens of another state visa free travel and access means establishing a positive relation. Such relations can be one-sided or reciprocal. By means of social network analysis (SNA), we examine the structure of the international network of visa policies. Who is allowed to travel to which country without applying for a
tourist visa first? Drawing on two datasets ("Global Visa Net") generated from secondary documents, we are able to compare the structure of bilateral relations on visa exemptions at two points in time (1969, 2010). We are interested in the change of the overall structure of the network (1), in the available positions (2) as well as in the roles that determine state's positioning (3). Making use of the blockmodel approach, we show which countries behave in a similar way and how they are interrelated. That way, we find that not only attributes like wealth or the political system structure behaviour as assumed in the literature, but also relational aspects such as the colonial history of two countries or being part of a political alliance.

Mohrenberg, Steffen
University of Hamburg, Political Science, Hamburg, Germany

I advocate a social network perspective for the study of global diffusion processes; in particular, of the global diffusion of democracy. Pairs of states, which are more similar to each other in their regime characteristics, have been found to be interconnected through diplomatic ties more frequently. According to one possible explanation for this observation, diffusion of democratic norms and liberal institutional arrangements through international networks fosters democratization in individual states. If this argument holds, nondemocratic or less liberal states which are well connected to democracies or more liberal states should be more prone to liberalization. Connected countries should develop similar regimes over time. A second explanation postulates a causal relationship in the opposite direction: States with similar regime characteristics are theorized to be more likely to connect with each other over time and establish bilateral diplomatic relations, for example. A stochastic actor-oriented model (SAOM) for the simulation of the co-evolution of diplomatic networks and of countries' Freedom House scores is applied. Based on my results, firstly, both explanations are supported. Countries with similar FH values become diplomatic partners and the FH values of a country's diplomatic partners do influence its own FH score. Secondly, these findings support the idea that regime characteristics diffuse between countries via diplomatic connections. All in all, my results back the idea that individual countries' political regimes are interconnected and democracy diffuses globally. SAOM are adequate for studying global diffusion processes, especially those with channels of diffusion that change over time as well.

Core-periphery Structures and the World Economy: Bridging Historical Conceptualizations with Contemporary Network-analytical Operationalizations
Nordlund, Carl
Central European University, Center for Network Science, Budapest, Hungary

Does the contemporary global commodity trade resemblance a core-periphery structure? Rudimentary as such a question might seem in light of existing network-analytical methods and heuristics for identifying such, this paper draws attention to how core-periphery structures have been conceptualized within network analysis. Two drawbacks with existing topological conceptualizations and heuristics are identified. First, although the perceptions of dense cores and internally sparse peripheries are in line with historical descriptions and conceptualizations, contemporary heuristics tend to ignore or downplay the structural properties of ties between core and peripheral actors. Building on qualitative discussions as well as formal topological specifications as found in the post-war dependency and world-system traditions, this paper argues that a particular pattern of such inter-categorical ties are equally characteristic of core-periphery structures as the density differential postulate. Secondly, whereas many international relations indeed can be modeled as dichotomous, the value span found in international trade flows does cause methodological dilemmas. Dichotomizing such data using an arbitrary network-wide threshold tends to emphasize strengths, rather than patterns, of ties. Combining blockmodeling modified for possible “overfitting” with an actor-based dual-normalization technique, it is argued that the heuristic for identifying core-periphery structures presented in this paper is more in line with how such structures are perceived in the historical literature. Testing this heuristic, the original question is addressed, i.e. whether contemporary global commodity trade resembles a core-periphery structure.
Sexual/romantic Networks

Exploring Sexual Networks and HIV-related Risk Behaviors in Young Men Who Have Sex with Men in Chicago

Birkett, Michelle¹, Kuhns, Lisa², Muth, Stephen Q.³, Latkin, Carl⁴, Garofalo, Robert⁵, Mustanski, Brian¹

(¹)Northwestern University, Medical Social Sciences, Chicago, IL, United States, (²)Lurie Children’s Hospital of Chicago, Center for Gender, Sexuality, and HIV Prevention, Chicago, IL, United States, (³)Quintus Ential Solutions, Colorado Springs, CO, United States, (⁴)Johns Hopkins University, Baltimore, MD, United States

Young men who have sex with men (YMSM) are at increased risk for multiple negative health outcomes, most notably HIV infection. Research with older MSM and other high risk populations suggest that network information is important for tailoring HIV interventions. However, little is currently known about the network connections of YMSM. This study examines the social, drug, and sexual networks of 175 YMSM in Chicago. Participants were between the ages of 17 and 23 at time of the network interview. The sample was 53.7% African American and 82.9% identified their sexual orientation identity as completely or mostly gay. Rich network data was captured via a method modified from Hogan and colleagues (2007). Each participant reported on average 14.7 social network members, 8.0 sex network members (within the previous 6 months), and 10.9 drug/substance use network members. Concurrent sexual relationships were common within the sample. Biological testing was administered at the time of the network interview with 10.9% HIV positive, 5.1% positive for Chlamydia, and 2.9% positive for Gonorrhea. This study will provide additional descriptive details of the sexual networks of these young men including sexual degree, concurrency, and assortativity. Additionally, individual, network, and partner-level variables will be examined within a multilevel framework to predict HIV-related risk behaviors.

Sexual Networks and Racial Differences in HIV Prevalence

Boylan, Ross¹, Gregorich, Steven¹, Paul, Jay¹, Choi, Kyung-Hee¹, Ayala, George¹

(¹)University of California, Center for AIDS Prevention Studies, San Francisco, CA, United States, (²)University of California, San Francisco, CA, United States, (³)Global Forum on MSM & HIV, Oakland, CA, United States

Background: The United States has longstanding, perplexing racial/ethnic disparities in HIV infection among men who have sex with men (MSM). In 2008, estimated HIV prevalence was 35%, 19%, 16% and 9% for Black, Latino, White and Asian MSM in Los Angeles. Yet Blacks are no more likely to engage in risky sex than other groups. Objectives: To determine whether racial/ethnic differences in HIV infection can be explained by network differences, specifically differences in the chance that a sexual partner is HIV+ given partner’s race and age. Data: Egocentric network data for 403 Black, 393 Asian/Pacific Islander (API), and 400 Latino MSM from Los Angeles during 2008-2009, using chain referral, including detailed information on up to 10 sexual partners, supplemented by 2008 Public Health estimates of Los Angeles HIV prevalence by age and ethnicity for MSM. Methods: Predicted risk per respondent assumed each reported sex partner was an independent risk. Risk per partner was 0 if there was no unprotected anal sex, otherwise the probability the partner was HIV+ given partner race and age, times probability of transmission. Analysis used the subsample that was not self-reported HIV+. Results: The predicted chance of infection during the 6 month recall period was 0.88% for Blacks, 0.59% for Latinos, and 0.45% for APIs. Differences in the number of unprotected partners were small (0.96, 0.92, 1.02 for Black, Latino, API, p=0.6) and inconsistent with the order of HIV prevalence. Conclusions: Differences in partner HIV rates contribute to the observed racial/ethnic differences in HIV infection.

The Sexual Network of their Sex Partners: How Well Do Swingers Know their Swing Partners and their Sexual Network?

Niekamp, Anne-Marie¹,², Spauwen, Laura W.L.¹, Dukers-Muijers, Nicole H.T.M.¹,², Hoebe, Christian J.P.A.¹,²

(¹)South Limburg Public Health Service, Center for Sexual Health, Geleen, Netherlands, (²)Maastricht University, CAPHRI, Maastricht, Netherlands

For sexual networks to give insight in how sexually transmitted infections (STI) spread, collecting complete network data is preferred. However to collect complete sexual network data is hard for both ethical and practical reasons. Information given by respondents about their sex partners, e.g. if they were infected with an STI, and information of the sexual network of their swing partners, e.g. the number and gender of their sex partners, can be useful for research of ego networks. However how well do respondents know their sex partners and their sexual network really? Is using information given by respondents about their partners reliable? The objective of the present paper is to examine this...
question for swingers: How well do swingers know their swing partners regarding STI infection, sexual network, and sexual behaviour. We compare the data given by 298 respondents during our swingers cohort study with the information given by their sex partners during their visit at the STI clinic and the actual outcome of STI testing. We focus on how well the respondents predict for their swing partners if they had an STI infection and the size of their network, e.g. number and gender of their sex partners. We examine associations between these predictions and characteristics of the respondents and their swing partners, e.g. their gender and age and characteristics of their relation, for example if they met at a club or home party; if they are casual or regular swing partners; and how often they dated.

Utilizing Digital Communication Networks to Infer Sex Behavior in Emerging HIV Epidemics

Schneider, John A.¹, Kapur, Abhinav¹, Heard, Dan², Mukherjee, Sayan³, Schumm, Phil⁴, Oruganti, Ganesh⁴, Laumann, Edward⁴

(1) University of Chicago, Medicine and Health Studies, Chicago, IL, United States, (2) Duke University, Statistics, Durham, IL, United States, (3) University of Chicago, Health Studies, Chicago, IL, United States, (4) SHARE-India, Hyderabad, India, (5) University of Chicago, Sociology, Chicago, IL, United States

Inaccurate self-reporting of sex behaviors limits our ability to use correlations between these behaviors and HIV status critical for guiding policy in emerging HIV epidemics. In order to determine actual sex behavior we utilize a hybrid network analytic approach to integrate: (1) the plurality of reports from others tied to individual(s) of interest within a cell-phone network; and (2) structural features of the network generated from those ties. Network data was extracted from cell-phone contact lists of a purposeful sample of 241 high-risk men in India and these data were integrated with interview responses to describe the corresponding individuals and the ties between them. We found that network-based model predictions of sex behavior and self-reported sex behavior had limited correlation (54% agreement) and these findings varied by behavior type and network typology: social (61% agreement) or sexual (36% agreement). Additionally, when respondent sex behaviors were re-classified from self-report to network model predictions, there was a 30.7% decrease in HIV seroprevalence among groups of men with lower risk behavior which is consistent with HIV transmission biology. Combining the completeness and objectivity of digital network data with the substantive details and interpretation of classical interview data permitted new analyses and insights into the accuracy of self-reported sex behavior.

Schools as Network Foci: Institutional and Racial-ethnic Homophily in Adolescent Romantic Relationships

Strully, Kate
University at Albany, State University of New York, Sociology, Albany, NY, United States

Institutions are often assumed to be important focal points for organizing people’s relationships. In this vein, institutional integration—namely, integration of schools—has been a cornerstone of U.S. policy efforts to reduce social distance and improve relations across racial-ethnic groups. While existing studies show that the relative odds of forming a cross-race tie are substantially higher within more diverse schools, the overall rate of cross-race ties typically remains quite low, even in diverse schools, and the frequency of homophilous relationships far exceeds what would be expected from proportionate mixing based on the composition of student bodies. This study seeks to explain the persistence of race homophily in adolescent romantic/sexual relationships, despite frequent race heterogeneity within schools, by exploring two questions: (i) Are racially diverse schools weaker foci for adolescent relationships? And, (ii) do some adolescents in diverse schools “work around” local race heterogeneity by forming more same-race relationships outside of institutional boundaries? This analysis uses individual- and dyadic-level data from the first and second waves of the National Longitudinal Survey of Adolescent Health. Using multi-level models, I find that white and black respondent who are in more diverse schools, and, consequently, have fewer opportunities for forming same-race-ethnicity relationships within the schools, are more likely to form romantic/sexual relationships with individuals from outside their schools, particularly with individuals from their own racial-ethnic group. In supplemental models, these associations are conditional on the race composition of the respondent’s residential neighborhood. School racial-ethnic composition has a much weaker association with Hispanic respondents’ relationships.
Online Student Perceptions of Social Network Position Feedback

Dennen, Vanessa P.
Florida State University, Educational Psychology & Learning Systems, Tallahassee, FL, United States

A common activity in online courses is asynchronous discussion, often involving discussion questions to be addressed during a set time period. In addition to responding to the question or prompt, there often is the ancillary expectation that students will interact with each other. Developing a community of learners and a class sense of intersubjectivity is, in essence, a course objective in these instances. Social network analysis can be used as one form of assessment in these instances, providing insight into who is interacting with whom and how often. Combined with content analysis (assessing the content and quality of messages), comprehensive learning analytic data may be generated. These learning analytics may be used in either a formative or summative sense. In this study, students were provided with samples of discussion participation feedback based on social network information and they were asked to indicate their preferences for which types of feedback they would like to receive and why. In general, students found simple sociograms confusing, even when accompanied by a thorough description. Additionally, they were split in their perceptions of usefulness between receiving information about the whole network (relative benchmarking) versus information solely about their own performance in the network (course benchmarking). The findings also illuminate some diverse beliefs students hold about the purpose of online discussion activities and the value of peer interactions and class communities.

Training through the Learning Curve: How Information Acquisition Affects Team Formation in a Massively-multiplayer Online Game

Leavitt, Alex, Clark, Josh
Annenberg School for Communication, University of Southern California, Los Angeles, CA, United States

New participants situated in a network often find themselves subject to the "liability of newness" due to poor information and a lack of experience with other participants (Stinchcombe 1965; Krackhardt 1996; Shen, Monge, & Williams 2011). This paper examines a case study of how new players within a popular massively-multiplayer online game, EVE Online, overcome this liability and integrate themselves into the broader community. In the context of the game's extreme difficulty and the need for player collaboration to navigate the game's diverse set of mechanics, we look in particular at how players enter this complex ecosystem through either formalized training lead by trusted, party-based organizations ("corporations") or trial-and-error tie formation. Using data aggregated from server-side logs over the course of eight years, we compare team and friendship networks with a snapshot of activity data for players enrolled in both structured and less-formalized training corporations. This comparison demonstrates how varying approaches to overcoming issues of initial information acquisition results in different patterns of network formation and players' social networks, ultimately leading to particular levels and experiences of gameplay. These results have implications for how particular team formation strategies mediate member acculturation and retention in complex systems.

SNA Pedagogy: Hooking Students into the Field

McCulloh, Ian
Curtin University, Information Systems, Perth, WA, Australia

What is the best way to teach social network analysis (SNA)? This is more than providing an interesting undergraduate elective. It is about developing social network analysts. In the fall of 2010, a survey on the SOCNET list-serv identified almost 100 courses in SNA taught at the graduate and undergraduate level. Despite the number of formal courses in SNA, there is surprisingly little published on the pedagogy of this complex material. What teaching methods allow students to retain an understanding of SNA concepts beyond the formal course? What concepts empower students to more quickly embark upon independent research? Which SNA software is easier for students to learn? What balance between software, mathematics, and social theory is ideal for student learning? How should students be assessed on mastery of SNA? Empirical research on SNA pedagogy collected from over 30 SNA courses is presented. Conclusions are drawn for introductory course content, student learning objectives, instructional methods, and the use of software.

Social Network Analysis: A New Method to Manage Continuous Professional Development of Teachers

van Staden, Christina Johanna
The rapid changing 21st century emphasizes the need for continuous professional development (CPD) of teachers. Several South African legislation urge teachers to participate regularly in formal and informal professional development activities to enhance own performance and learner results - (CPD). The lack of sufficient opportunities for participation in these activities and the lack of an effective method to gather relevant, reliable information about CPD prevent the state from identifying the barriers that can hinder the effectiveness of the work of teachers (outcome of CPD). This also prevents the monitoring of CPD. This paper is based on my PhD research (2012), which assumed that Social Network Analysis provides both the theory and an effective method to enhance and monitor CPD. Teachers rely on their social ties used to get access to information, knowledge, advice, leadership, support, experience and concrete sources to do their work effectively. This set of seven social ties, coined as personal development networks weave the teachers in a larger whole network (social network) coined as development networks. The key to the enhancement, monitoring, and management of CPD is weaved in these social networks. The study further assumed that Web 2.0 technologies can develop into Learn 2.0 technologies if used to get access to content, create own content, co-operate, and form social ties. This tool stores the content of the social ties and allows the identification of social ties. The goal of this paper is to show how Social Network Analysis can be used to manage CPD effectively.

Analyzing Facebook Friendships within SNA Courses
Zeini, Sam\(^1\), Krempel, Lothar\(^2\)
\(^{1}\)University Duisburg-Essen, Computer Science, Duisburg, Germany, \(^{2}\)Max Planck Institute for the Study of Societies, Cologne, Germany

The analysis of personal facebook friends networks is a motivating exercise when teaching Social Network Analysis. With the wide diffusion of Facebook and the availability of applications that allow participants to retrieve their individual “friendship” connections, students can analyze their “own” ego- and like- networks. Given the consent of the respective owner’s, certain data formats allow to merge these individual networks into larger sets that can be analyzed to confront the empirical data from the facebook platform with topics of classical small group research. In our presentation we give an overview about ways of how to extract and process network data from facebook by using different tools and their limitations. Finally we give examples how this allows to address the role that facebook networks play for today’s university freshmen.
SNA meets QCA: 2-Mode and Full networks - Methodological considerations and applications

**Qualitative Comparative Analysis (QCA) as a Two-mode Network Analysis Technique**

*Breiger, Ronald L.*, *Schoon, Eric*, *Asal, Victor*

(1)University of Arizona, Sociology, Tucson, AZ, United States, (2)University at Albany - SUNY, Political Science, Albany, NY, United States

Increasingly, connections are being made between qualitative comparative analysis (QCA) and social network analysis (SNA). As well indicated in the Call for Papers for this session, social networks have been studied as a condition or as an outcome in QCA, and typologies of networks have been studied by using QCA. The basic argument put forward in this presentation is that how QCA works—the mechanism of the method—is closely and informatively related to techniques of two-mode network analysis. Therefore, for some important analytical purposes QCA should be viewed in relation to standard SNA (social network analysis) techniques for two-mode network analysis, including lattice analysis and correspondence analysis. The benefit for QCA includes new and helpful search procedures for discovering multiple QCA solutions that discover key configurations of variables while also indicating the sets of cases for which each configuration is relevant. The benefit for SNA includes extension of existing network-analytic techniques to new types of data that are usually but unfortunately not conceptualized as dual (two-mode) networks, as well as the incorporation of dependent variables within two-mode analyses. We develop the arguments listed above for crisp-set and for fuzzy-set QCA, and we illustrate them by application to some datasets that have previously been studied by leading developers of QCA (including a study of comparative economic performance in 14 largely European countries) as well as to a major dataset on the use or pursuit of radiological or nuclear weapons on the part of 395 violent extremist organizations.

**Measuring Sense of Community Using Network Structure**

*Cabrera, Joseph F.*, *Witham, Monica*

(1)Marywood University, Social Sciences, Scranton, PA, United States, (2)University of Arizona, Sociology, Tucson, AZ, United States

The study uses network data from a liberal arts university to determine which network structures and properties are more likely to be present in residence hall floors with a strong sense of community (measured using Nasar & Julian's Psychological Sense of Community Scale (1995)). The study uses the QCA method (Ragin, 2000) to examine how different network structures and properties affect sense of community, including network density, betweenness, percent of within and without group ties, tie strength and interaction frequency. Preliminary data suggest that resident hall floors with a stronger sense of community have more activity between nodes and are characterized with a balance of strong and weak ties, rather than a preponderance of either type of tie. Floors with a higher percentage of within floor ties have a stronger sense of community, while those with a higher percentage of out of floor ties have a weaker sense of community. In addition, floors in which residents have a similar number of ties (i.e., fewer stars) have a stronger sense of community than floors that contain a more unequal distribution of ties (i.e., more stars).

**Social Network Comparison between Urban and Rural Neighbourhoods Pre, during and Post Bushfire in Western Australia**

*Condon, Sharon K.*, *Morrison, David*, *Skinner, Timothy*, *McNeill, Ilona*, *Dunlop, Patrick*

(1)University of Tasmania, Rural Clinical School, Burnie, TAS, Australia, (2)Murdoch University, Research Office, Perth, WA, Australia, (3)University of Western Australia, School of Psychology, Perth, WA, Australia, (4)University of Western Australia, School of Business/School of Psychology, Perth, WA, Australia

Since 1851, bushfires in Australia have taken 800 lives and cost a total of $1.6 billion. Finding ways to better prepare people in bushfire prone areas is a high priority for neighbourhoods, emergency workers and governments. This paper reports on data collected from 400 interviews that followed two bushfire outbreaks in the metropolitan region of Perth, Western Australia. The affected areas were quite different in character with one a peri-urban suburb and the other a rural setting on the very outskirts of the City, separated by some 40 kilometres. We hypothesised that the nature and type of social networks and the degree of bushfire preparedness would differ, depending on whether participants resided in an urban or rural neighbourhood. Through the application of Qualitative Comparative Analysis (QCA) as both an approach and analysis technique, facilitated by fsQCA 2.5 software, we analysed participant social reality through the classification of set relations, made obvious through identified communication events, on multiple dimensions. Kinship,
social and organisational networks emerged across three key time periods: pre-bushfire; during bushfire; and post-bushfire. Results revealed differences in the nature, size and extent of the networks between urban and rural neighbourhoods in terms of crisp-set and fuzzy-set QCA computations. Rural suburb networks reflected a more proactive orientation to preparation whereas the peri-urban suburb was less ordered (more chaotic) and reflective of a reactive approach to bushfire outbreak. It is argued that bushfire preparation and management needs to observe and better utilise the patterns of communication as highlighted in this study.

Using SNA and QCA In whole Network Research

Raab, Joerg
Tilburg University, Organization Studies, Tilburg, Netherlands

In the paper, I will focus on inter-organizational networks understood as consciously created groups of three or more autonomous but interdependent organizations that strive to achieve a common goal and jointly produce an output (Provan, Fish and Sydow 2007), be it the appropriate care for mentally or chronically ill people, the realization of large infrastructure projects, care for troubled families and youth or crime reduction. Two characteristics of the research on whole networks make the joint application of SNA and QCA especially attractive. First, since the unit of analysis is the network, detailed relational and attribute data has to be collected for every network with often 20-30 organizations. These difficult data requirements make scholars mostly tend to conduct studies as comparative case studies. QCA can help to more systematically analyze and combine relational and attribute data. Second, especially when it comes to the effectiveness of networks, we currently see a configurational theory emerging. QCA seems a promising tool in this respect to develop and test hypotheses. The paper will present two empirical studies on the effectiveness of inter-organizational networks and evaluate the joint application of SNA and QCA in this area of research.

Networks and Configurations in Political Theory: A Mixed Method Approach

Schneider, Volker1, Wagemann, Claudius2, Rinscheid, Adrian1
(1)University of Konstanz, Politics and Public Administration, Konstanz, Germany, (2)Goethe-Universität Frankfurt, Dept. 3, Social Science, Frankfurt, Germany

The paper will use network analysis and QCA to describe, analyze and explain influence and prominence of philosophers and political scientists in political theory. Based on a systematic content analysis of 100 international readers and textbooks in political theory and political philosophy, a sample of major philosophers (top 25/top 50) will be identified and analyzed with respect to relational contexts and categorial attributes. Network analytical methods and visualization tools will be used to describe and analyze network data on philosophers and theoreticians based on influence relations, acquaintance links, master-pupil ties, and conflict configurations, etc. In a further step QCA will be used to combine various relational data with personal attribute data in the form of causal configurations to explain current influence and prominence of the various philosophers.
**SNA meets QCA: Individual and organizational social capital**

**Is Social Capital More Than the Sum of its Parts? Taxonomies of Ego-network Position of Employees as a Predictor of Individual Performance**

_Agneessens, Filip_

University of Groningen, ICS, Sociology, Groningen, Netherlands

According to the social capital literature, people can benefit considerably from the position that they occupy in their informal social network. In an organizational context in particular, the informal relations with colleagues has been argued to be beneficial for the job performance of employees. Numerous social network studies have tried to understand which aspects of a person’s network position might generate beneficial outcomes. Some of the aspects that have been focused on include a person’s centrality (e.g., Brass, 1984; Sparrowe et al., 2001), their brokerage position (e.g., Burt, 1992), and the resourcefulness or diversity of their personal network. Whereas these approaches have tended to focus on single aspects (dimensions) of a person’s network position, this paper takes a configurational approach towards explaining individual performance. I.e., rather than consider social capital as the sum of different (linear) dimensions, it is argued that the social capital of a person’s network position can better be understood if one considers different dimensions simultaneously and in combination. It is furthermore argued that different combinations of aspect can generate equally beneficial outcomes. Following this logic we develop a taxonomy of (prevalent) ego-network positions for employees (N=201) using both structural properties from the advice and the (dis)trust network (as well as the combination of advice and trust network). We subsequently analyze the differences in performances between the obtained types to understand which combinations of aspects of a person’s network are essential for high performance.

**Causal Complexity in Corporate Venture Capital Performance: Qualitative Comparative Analysis (QCA) and the Relational View**

_Bauke, Boris, Weber, Christiana_

University of Hanover, Hanover, Germany

This study uses Qualitative Comparative Analysis (QCA) to shed light on the relatively under-researched relational embeddedness in network structures (Batjargal, 2003; Moran, 2005). It has three major goals: a theoretical, a methodological, and a substantial. First, theoretically, we want to contribute to Dyer and Singh's (1998) Relational View (RV), an approach taking a network perspective on explaining competitive advantage in interorganizational relationships. The approach states that four determinants within network relations drive relational rent, i.e. supernormal profits which could only be jointly generated. Those determinants are (1) relation specific assets, e.g. in form of relational capital (2) knowledge sharing routines (3) complementary resources/capabilities and (4) effective governance. We want to investigate in the inner mechanics of the RV and refine this often cited, but seldom empirically operationalized approach. The RV's inner mechanics are postulated to be characterized by complex causality, which is best described by necessity and sufficiency of the theories five forming elements (relational rent and the four determinants). Second, methodologically, QCA enables us to describe the properties of the relationships between the theory's elements in such terms and to analyze whether our propositions on the conjunctural, the equifinal, and the asymmetric causation inherent in this theory may be valid. Third, substantially, we aim at uncovering the conditions explaining Corporate Venture Capital (CVC) investments' success by using the RV as a theoretical lens, while introducing QCA to CVC research by highlighting the strength of the method to explain complex interactions between actors as well as between theoretical elements.

**Jump Start or Road Block? Network Resources and Labor Market Entry of Lowly Educated Women. A Fuzzy-set Analysis**

_Behrmann, Laura, Toepfer, Tom, Hollstein, Betina_

University of Hamburg, Hamburg, Germany

Entering the labor market marks a decisive juncture in setting the course for a young adult's career and future life. In this presentation, we analyse the conditions that affect these school-to-work transitions. We focus on the particularly vulnerable group of young women with less education. We ask under which conditions do these women, after a failed search for an apprenticeship, actually succeed in finding work? We investigate both individual characteristics (like search behaviour) and the network aspects, such as cognitive, instrumental and emotional support provided by members of the personal network. The database consists of qualitative longitudinal data collected by the Collaborative Research Center
Over the last decade, international studies in education (PISA, IGLU) found Germany among the countries with the most pronounced inequalities in school performance between students from different socio-economic backgrounds. However, at German universities a surprising 15 percent of students come from a low socio-economic background. I focus on this puzzle of intergenerational upward mobility, asking: How do these students achieve educational upward mobility? To tackle this question, I focus on aspects of the students’ personal networks. Based on 60 in-depth interviews with students
from low socio-economic backgrounds (covering biographical events, educational careers, social relations, and support), I analyze the combination and sequencing of factors in producing educational upward mobility. As an analytic technique for systematic cross-case comparison, I employ Qualitative Comparative Analysis (QCA). When using QCA to analyze in-depth life course data to identify (combinations of) conditions for a certain outcome, a number of methodological questions arise. My presentation will focus on two issues: First, how to construct fuzzy set conditions from in-depth interview data in a transparent way? I will present a heuristic for concept construction that translates directly into clear-cut fuzzy sets. Second, how to deal with the processual character of life course data in QCA? I will suggest different angles for coding fuzzy sets from life-course data. These issues will be examined using preliminary findings from my study as points of reference. This discussion will help us further the use of QCA in research that focuses on in-depth interview and life course data on personal networks.
Social Capital 1

Smart, but Shifty: Trustworthiness and the Contingent Appeal of Brokers
Gladstone, Eric, O'Connor, Kathleen M.
Samuel Curtis Johnson Graduate School of Management at Cornell University, Management and Organizations, Ithaca, NY, United States

A wealth of research documents the benefits of network brokerage both to the broker in the form of professional outcomes and to the network in terms of innovation (Burt, 2004; Burt, 2001; Kilduff & Brass, 2010; Gould, 1989; Gould & Fernandez, 1989; Marsden, 1987). We proposed that the act of brokering is also likely to carry significant and negative consequences for the actor in question. The behaviors necessary for brokerage—e.g., moving through a network opportunistically looking for structural holes, keeping parties apart as one facilitates the transfer of resources between them—can undermine the perceived trustworthiness of the broker. In three experiments, we tested this claim. Results showed that people perceived those who engaged in brokerage behavior as less trustworthy than equivalent people who did not. As we predicted, in situations that called for trust, people who had witnessed this behavior were less likely to choose the broker as a partner. However, this was not true for situations that did not require trust; in that case, brokers were preferred. Specifically, when diversity of knowledge and information were valued, brokers were preferred over their non-broker counterparts. Finally, in a trust game with relatively high stakes, people offered less of their endowment to those who were brokers than those who were not, and perceptions of trustworthiness accounted for this behavior. Together the results from these experiments indicate a clear risk for brokers—the real possibility of developing a reputation for untrustworthiness.

Explaining Access to Individual Social Capital
Petermann, Sören
Max Planck Institute for the Study of Religious and Ethnic Diversity, Department of Socio-Cultural Diversity, Göttingen, Germany

It is theoretically argued and empirically tested that social capital is advantageous in many spheres of life like educational and occupational attainment, health, and consumption. Thus, it is a crucial criterion of social differentiation of people’s life chances. Given this social relevance of social capital, the paper focuses on how people gain access to social resources and the resulting distribution of social capital across a population. The paper offers a resource approach to describe and explain differences in accessing individual social capital. People invest in social capital if they use different kinds of capital (economic, human, social) to form networks of personal relationships. Access to social capital is seen as transformation of other sorts of capital. The accumulation thesis predicts that people with more resources will gain better access to social capital. On the contrary, the compensation thesis predicts that certain structural conditions like availability of homophilous partners, time budgets or spatial contexts constraint the choices of social relations. Both effects are tested empirically with survey data from German cities. Access to social capital is measured with a resource generator. The measured social resources are subsumed to different dimensions of social capital. Access to these dimensions varies considerably over the population. Our results show strong support for the accumulation thesis albeit with varying influence on different dimensions of social capital. On the other hand, compensational effects are rather weak and only significant in some dimensions of social capital.

Szejda, Jacek
Educational Research Institute, Warsaw, Poland

The notions of power and social capital are among the most important concepts in sociological research. From the social network analysis perspective, their importance has been examined mostly in studies of exchange networks, interlocking directorates etc. With the dawn of the World Wide Web as the most important communication system of the global network society, problems of power in electronic communication networks have gained a new empirical and theoretical momentum. Wikipedia is one of the most prominent examples of such networks (and, due to its openness, one of the most important data sources upon such phenomena). Its organizational problems of, among others, coordination, vandalism detection or consensus building require designation of explicit access controls to community’s most trusted individuals. Rules describing their qualification cover, most of all, long-term productivity — which is easily quantified with the number of edits. On the other hand, the question whether these individuals are trusted and respected members of
the community is answered with the means of discourse-based consensus. This research tries to quantify the latter using the tools of social network analysis. The analysis shows that centrality measures in communication networks of co-edits in the discussion namespaces are statistically significant factors in the event history and logistic regression models of the occurrence of Request for Adminship events in Wikipedia elections. The results are interpreted in terms of Burt’s, Castells’ and Coleman’s notions of power in social networks.

Bearing the Burden of Social Capital

Teodoro, Ronnie
Rutgers University, Communication, New Brunswick, NJ, United States

Most social capital research focuses on the benefits of social capital and its positive effects on mental health and physical wellbeing. However, there exist inherent burdens or pressures that frequently fall on highly centralized or influential nodes within a social network. While some studies allude to this paradox of social capital, there are no studies that explicate a nuanced understanding of the “burdens” of social capital. Through a systematic review of the literature, this study characterizes (1) the different types of burdens within social capital, and (2) the extent to which burdens of social capital vary across contexts. Findings led us to propose that the burdens of social capital operate within two key classifications: social capital as burden of power and social capital as burden of responsibility. Social capital as a burden of power suggests that while actors can leverage diverse access to resources, it can also impose more stress on actors and produce greater demands for adept gatekeeping skills. Social capital as a burden of responsibility considers more of the ethical dilemmas placed on actors and the expectation that those with more social capital “pay it forward” and provide opportunities for others to share in resources. Overall, this research has implications for work on tie formation, tie maintenance, and tie disintegration, flow and control of social capital within a network, and norms around social capital.

The Best of Both Worlds: The Benefits of Specialized-brokered and Diverse-closed Syndication Networks for New Venture Success

ter Wal, Anne 1, Alexy, Oliver 2, Block, Joern 3, Sandner, Philipp 2
(1)Imperial College London, Business School, London, United Kingdom, (2)Technical University Munich, Munich, Germany, (3)University of Trier, Trier, Germany

The social capital literature has featured a long-lasting debate on whether brokerage or closure represent higher-value information advantages. We maintain that this tension cannot be fully resolved without recurring to explanations of actor diversity, arguing that brokerage is of most value in networks with high actor similarity, whilst closure is most beneficial in networks with high diversity. In the context of newly funded ventures attempting to attract additional funding, we argue that they are most likely to succeed if their first-round investors have either specialized-brokered or diverse-closed networks. These balanced representations of social capital allow the venture to simultaneously reap in-depth and broad information from their investors’ syndication networks. By contrast, advice emerging from diverse-brokered or specialized-closed syndication networks is of limited value to the venture, representing situations of under- and overembeddedness respectively. Our empirical setting is based on CrunchBase data that covers all venture capital investments in the US Information Technology Industry between 2005 and 2010. Controlling for the quality of the venture, we find strong support for our predictions.
Social Capital 2

Social resources and the position on the labour market: evidence from survey of residents of large metropolitan area
Batorski, Dominik, Bojanowski, Michał
University of Warsaw, Warsaw, Poland

The relationship between social capital and the position on the labour market has long been studied. However, the concept of social capital is ambiguous and it is variously defined. In this paper, we assume that social capital consists of resources embedded within and available through social networks. Using data collected with the use of the resources generator, in a large study conducted on a sample of 9063 inhabitants of one city (Warsaw, Poland), we verify what is the relationship between social capital and the position on the labour market. (i.e. form of employment, subjective assessment of the chances of finding another job, income, amount of time devoted to work, having additional sources of earnings, length of unemployment). We analyze the importance of the availability of different types of resources and the circles through which they are available (family, friends, acquaintances, neighbours). Finally we discuss whether the resources available in social networks are a good predictor of labour market position.

Key Drivers of Social Capital Use: A Qualitative Study of Knowledge Workers in Geographically Dispersed Firms
Biseda, Marlene
Pepperdine University, Los Angeles, CA, United States

As more firms become both knowledge-intensive and geographically dispersed (or virtual), it is critical to transfer knowledge across internal and external organizational boundaries. Organizational interactions are key to the success of knowledge-intensive enterprises (Drucker, 1999), because people rely upon informal relationships to find information and solve problems (Cross, Borgatti, & Parker, 2002). Social capital is an important perspective for understanding an individual’s network of relationships as well as how individuals use the resources they can access (via their networks) to perform work. Effectively using social capital is a way to enable the productivity of knowledge workers in virtual environments. This paper identifies factors important for the use of social capital by knowledge workers in geographically dispersed firms. Using grounded theory, the researcher studied three cases, including auditors in a regional practice of a Big Four accounting firm, project managers in the professional services practice of a global technology company, and executive managers in a business unit of a global manufacturing company. Thirty-seven knowledge workers were asked a series of open-ended questions about how they used social capital at different points in time. The results of the qualitative assessment revealed several themes and factors, some of which varied over time. This paper presents the key drivers of social capital use. It also discusses similarities across cases and differences based on firm context.

Relational Patterns of Local Productive Specialization: A Personal Network’s Typology of Entrepreneurs and Workers in Mexican Textile Enclaves
Garcia-Macias, Alejandro
Universitat Autònoma de Barcelona, Universidad Autónoma de Aguascalientes, Departamento de Comunicación, Aguascalientes, Mexico

It is possible to hypothesize that in a Local Productive System, characterized by a strong concentration of family-based enterprises highly specialized around a single branch or productive sector within a defined geographical space, personal networks of productive actors tend to be occupationally homogeneous -both by simple demographic probability and by homophily effects-, primarily based on close ties, and significantly constrained to local space. This paper describes a typology of personal networks, built using a cluster analysis model based on several variables of network composition and structure from a personal network’s sample (n = 75, fixed size of 30 Alter) of employers and workers from three localities in central-western Mexico, all of them highly specialized in textile and apparel industry. The six clusters identified show processes of social and occupational differentiation, and therefore an unequal distribution of social capital, which are not only related to occupational or socioeconomic Ego’s positions, but also to specific characteristics of their personal networks, such as translocality and occupational heterogeneity levels, labor condition and socioeconomic status of Alter, type of relationship they have with Ego, and density of interconnections between them.
The Impact of the Social Web on Emotional and Functional Support in Professional Networks of Freelance Translators

Gross, Marie-Luise
University of Vienna, Vienna, Austria

The number of self-employed workers is constantly rising and new organizational forms emerge accordingly. Self-employed workers rely heavily on their personal and professional social relations. These network structures ensure emotional and functional support and the access to various benefits. With the nascent World Wide Web and its evolution to Web 2.0, featuring the enduser as prosumer and supporting social interaction, network structures of individuals are being reported to have changed gradually. Social software and social media allow to easily maintain relationships with other persons across spatial and temporal boundaries, the world becomes a global village. The paper discusses the results of a study conducted with a group of freelance translators investigating the structures of their personal and professional networks using ego-centered network analysis methods. Surprisingly and despite research findings from previous studies on translators' participation in online communities and their perceived benefits, the participants of this study report a rather negative influence of online communities for freelance translators for various reasons. Social capital is mostly generated from strong ties within personal and professional networks. Building strong ties with select customers is an objective but difficult, due to low status and job prestige. Trust and attributed competency are the main drivers of relationship building and maintenance among colleagues. The WWW has become the main source of information, which caused a dramatic decrease of weak ties, as relationships with domain experts who may be contacted in case of translation problems turn obsolete.

Social Capital in Large-scale Projects and its Impact on Innovation: A Social Network Analysis

Sharma, Puja, Phillips, Peter W.B.
University of Saskatchewan, JSGS of Public Policy, Saskatoon, SK, Canada

Contemporary era is witnessing a systemic transition in science and innovation paradigm. Research world is shrinking in response to modern technological developments, commercial and regulatory integration, faster communications, proactive science management, and innovation policy frameworks. It is increasingly challenging to make competitive progress in world-class innovation or to gain global leadership in science. Large-scale projects are now globally proposed as one of the means to realize national innovation goals and international competitiveness. Keeping pace with international developments, Canadian governments’ financial support towards large-scale networked innovation projects has significantly increased. However, there is not enough empirical evidence to sustain this policy level transition. In such circumstances the federal decision to channel public funds into large-scale projects appears unsubstantiated. This paper applies Social Network Analysis to examine Genome Canada's large-scale research project operationalization, in specific its social capital outcome with its downstream residual results, to assess the evidence base for directing federal funds to large-scale networked innovation projects. A group of 139 investigators that raised financial capital in Genome Canada’s Applied Bio-products and Crops (ABC) Competition (2009) are assessed for their network engagement through 2000-2009. The investigations reveal that maximum social capital benefits accrue in large-scale networked innovation projects that: have minimal requirements for project actor co-location/real-time interactions and encourage hybridization/cross-disciplinary exchanges through personnel mobility, knowledge production, and partner research grants. Public fund allocated for innovation projects supporting co-publication opportunities and partnered research grants, such as Genome Canada programming, appear to positively sustain national research and innovation leadership and competitiveness agendas.
Social Capital in Entrepreneurial Networks

An Empirical Analysis on Social Capital Composition of Managers of Industrial Enterprises in Northeast China - A Survey on 30 State-owned Enterprises in Jilin Province

Bu, Chang Li
(1) Changchun University of Science and Technology, Sociology, Changchun, China, (2) Jinlin University, Sociology, Changchun, China

Currently, though Studies both at home and abroad on the concept of social capital have witnessed the trend of analysis from multi-faceted perspective, few people have paid attention to the multi-level of the concept of social capital of managers, not to mention a comprehensive study in this aspect. This study tries to group the social capital of managers into three levels: micro-level, middle-level and macro-level and conduct a comprehensive theoretical analysis and empirical study. Based on the 30 state-owned industrial enterprises in Jilin Province, the survey shows that the nature and composition of state-owned industrial enterprises in northeast China are unbalance, which is an important factor for the development of state-owned industrial enterprises in northeast China. This paper comes to the conclusion that the multi-level composition or nature of social capital of managers should be in intercoordination and are of mutual complementation and interlined to each other in managers' activities. Social capital which is of only one type or nature while the other types are impaired is detrimental to the development of the enterprise. The accumulation and reconstruction of social capital of the enterprise is not a one-dimensional process but a dynamic process featuring the mutual influence, interaction and coordinated development of the multi-level composition of social capital.

Entrepreneurial Networks in Frontier Markets

Evans, Daniel
West Point, Network Science Center, West Point, NY, United States

Our research team has recently developed network models of capital markets in Frontier Markets. During the course of these visits, especially in Africa, our teams observed a culture of vibrant entrepreneurship as we met with owners and founders of Small and Medium Enterprises (SMEs). Because of the impact of our discussions with these entrepreneurs, we have decided to explore the importance of these SMEs and their potential impact of economic development, at large, and their potential contribution to the development of these frontier capital markets. Our team is completing a pilot study in which we utilize an innovative variation of the positional generator technique, as pioneered by Lin, Erickson, Van der Gaag, and Snijders, in order to developing network topologies of the environment in which entrepreneurs operate in these frontier markets. The current process involves a simple 6-question survey that addresses the following areas: Business Registration, Start-Up Capital, Equipment, Legal Issues, Infrastructure, and Human Resources. Our initial data set includes data from the entrepreneurial environment in Addis Ababa, Ethiopia, Manhattan, Kansas, USA and will include data collected from Dar es Salaam, Tanzania in March 2013. We will demonstrate our data collection methodology and share our initial findings in regards to the social capital topologies of these three entrepreneur networks.

A Multilevel Approach to the Relationship between Economic Exchange and Social Exchange: The Case of a Trade Fair for TV Programs in Africa

Favre, Guillaume1, Brailly, Julien1, Lazega, Emmanuel2
(1) Université Paris Dauphine, IRISSO, Paris, France, (2) Sciences Po CSO-CNRS, Paris, France

One of the main results of economic sociology is that informal social exchanges among members of firms are important for the creation of partnerships or transactions between these firms. One could look at this process as the creation of multiplex ties, but in reality, while a social exchange involves two persons from these firms, a transaction involves the two companies as well. We therefore propose to use a multilevel framework (in the sense of Lazega & al. 2008) to look at the superposed structure of the two networks. Based on an analysis of an information exchange network between sellers and buyers in a trade fair for TV programs in sub-Saharan Africa and a contract network between their companies, we explore the interdependencies between the different levels. With use an ERG Model at each level to test for different sub-structures and reconstitute a different process at each level.

The Promotion of Private Finance Initiative in France. Legal Innovation or New Kind of Embedding of Public Service in Private Markets

Penalva Icher, Elise1, Lazega, Emmanuel2

(1) Université Paris Dauphine, IRISSO, Paris, France, (2) Sciences Po CSO-CNRS, Paris, France
Private Finance Initiatives has been introduced in France in 2004 through 'le contrat de partenariat' (partnership contract). Since its inception, it has been encouraged by the government because it represents an innovation as the ideal-type of Public-Private Partnership (PPP). This new form of contract forges long term (30 years) relationships between public and private sectors. So it creates interorganizational networks composed of civil servants and different types of private actors for the construction, maintenance, but also the financing of public buildings. In this paper we question the scope of these networks. More than a legal or technical innovation, 'contrats de partenariat' advocate a new kind of link between private and public sectors. We base our results on both a qualitative and quantitative methodology. Our qualitative part consists in 19 in-depth interviews and 32 semi-directive interviews. Our quantitative part uses a multilevel network questionnaire that includes interorganizational networks of discussion ties and business ties among 88 PPP’s key players. Our research examines the nature of the embeddedness of these contracts and its effects. Analyses if these networks lead to a structure that can be summarized as a multiplication of sub-contracts on the private side, isolation of the public sector, and the eviction of some categories of actors as architects. Last but not least PPPs in France give the banking industry a central role and a dominant position in the pecking order characterizing this milieu, a position from which this sector is able to impose its terms of the contracts.

The Effect of Entrepreneurial Orientation on Brokerage in Interorganizational Networks

Rank, Olaf N., Strenge, Michael
University of Freiburg, Department of Business Administration, Freiburg, Germany

Though scholars have devoted great attention to explore the direct effect of entrepreneurial orientation (EO) on increased company performance, theory and research addressing the managerial processes that allow entrepreneurial companies to be ahead of the competition are limited. To address this research gap, we develop and test a model that links EO research to companies' embeddedness in networks of interorganizational ties. This study explores whether risk taking and proactivity affects companies' propensity to acquire brokerage positions in interorganizational networks. We analyze the strength of the effects of risk taking and proactivity on brokerage in light of a possible moderation of competitive intensity. Survey data was taken from an industrial cluster in the German photonics industry. Applying a class of exponential random graph models (ERGMs), our results suggest that risk taking is positively associated with brokerage. In detail, the findings show that competitive intensity moderates the relationship between risk taking and brokerage.

Evolution of Embeddedness of a Firm’s Business Network in its Owner-manager’s Personal Network

Schott, Thomas
University of Southern Denmark, Department of Entrepreneurship and Relationship Management, Kolding, Denmark

The network around a firm is formed by the firm’s business relations, such as its buying and selling and collaboration with other enterprises. The network around the owner-manager of the firm is formed by the owner-manager’s personal relations, such as getting advice from other persons. The two ego-networks are not independent. The embeddedness-proposition is that the firm’s network is embedded - evolving from, based on, intertwined with, constrained and facilitated by - the network around the owner-manager. We hypothesize that the owner-manager’s network is formed in the earliest entrepreneurial phase, when the person gets an entrepreneur intention to start a firm; that the firm’s network is formed in its earliest phase, when the firm is starting; that each network is evolving; that the firm network is facilitated by the owner-manager network, overall; that the firm network specifically is facilitated by the owner-manager’s networking in the work-place, professions, market and internationally, but hampered by networking in the private environment; and that this embedding evolves. Data are from the Global Entrepreneurship Monitor surveys of the world population, with a sample of 41.682 firms whose business relations were reported, a sample of 71.736 entrepreneurs reporting personal relations, and their intersecting sample of 19.162 entrepreneurs in firms with data on both entrepreneurs’ and their firms’ relations. Hypotheses are tested by coefficients in hierarchical mixed linear models. The modeling largely corroborates the hypotheses, but also offers a more detailed account of the dynamics of embeddedness.
Social Capital: social networks of specific professional fields and concerning gender differences

Career Advancement in Dual-earner Couples: Comparing the Effect of Weak and Strong Ties

Broeckel, Miriam1, Golsch, Katrin1, Busch, Anne2, Pruiksen, Henrik1
(1)Bielefeld University, SFB 882, Faculty of Sociology, Bielefeld, Germany, (2)Universität Hamburg, Hamburg, Germany

Social capital is an important determinant of career opportunities. Weak ties have been shown to be fruitful for career advancement. The extent to which social support from strong ties - particularly the partner - determines individual chances of being promoted is not yet clear. If partners are willing to share, they provide an important stock of resources for the partner’s occupational advancement, which differs somewhat from resources received by weak ties. The paper is based on research on “coupled careers” and pays attention to partners’ social support as a beneficial aspect for career advancement. Using data from the German Socio-Economic Panel Study 2006-2010, partners’ social support is measured in terms of received support for career advancement as well as instrumental support in form of help with the household. We compare partners’ social support with support received from colleagues to evaluate if weak or strong ties count more for the career - and if that works in gender-specific ways. First results of the analysis reveal that only for women partners' social support is of significant importance: Women are more often in leadership positions if they report that their partner supports their career. Neither for cohabiting women nor men, weak ties alone increase chances of being promoted. But the combination of weak and strong ties heightens career opportunities for both genders. The open question is whether the results differ when focusing on general career advancement on different hierarchical positions, not only on reaching a leadership position on top of the hierarchy.

Occupational Gender Segregation and Perceived Workplace Support: The Role of Gendered Work Content

Busch, Anne
Universität Hamburg, School of Business, Economics and Social Sciences, Department of Socioeconomics, Hamburg, Germany

This study examines differences in work-related social capital, measured by perceived workplace support, in gender-segregated occupations. The assumption is that persons working in gender-atypical occupations (“occupational minorities”) perceive lower workplace support than persons in gender typical occupations: in line with expectation states theory, “occupational minorities” are faced with biased performance expectations since they are expected to be less competent to fulfill the occupational demands. We argue that this leads to isolation at work for these persons. Further, we hypothesize that these isolation mechanisms are mediated by gendered work content for which the related gender is expected to be especially competent. Quantitative analyses of German data confirm lower perceived workplace support for women as well as for men working in gender atypical occupations. The dependency is not linear though, especially men perceive lowest workplace support not in women’s, but in gender balanced occupations. This is explained by conflicts between women and men about competence and status in these less gender typed occupations. Furthermore, for men, required math skills increases workplace support while for women, feminine work content increases workplace support. Including these variables into the models lowers the impact of occupational minority status. The results have a high societal relevance because poor workplace integration indicates a lack of work-related social networks, which has a negative effect on labor market success. This is shown in a second analytical step: besides occupational sex segregation, low perceived workplace support lowers the probability of having a leadership position for men as well as for women.

Adopting Medical Technologies in Organizations: The Impact of Professional Networks and Social Capital on the Alignment of Individual Perceptions

Cicchetti, Americo, Iacopino, Valentina, Mascia, Daniele
Università Cattolica del Sacro Cuore, Rome, Italy

Over the last decades, the role of technologies in healthcare organizations has become increasingly relevant for the enhancement of healthcare outcomes and the achievement of clinical goals. However, the effectiveness of medical innovation largely depends on healthcare professionals’ perception of its usefulness and impact on the activities and practices they run within organizations. Previous contributions documented that the interaction among individuals plays a major role in the creation of their attitudes and beliefs, and contributes to create similarity in judgments and opinions toward innovations. The aim of this study is to explore the extent to which perceptions toward technological change emerge in the healthcare sector. In detail, we investigated the role of social networks and social capital in the formation
Social Capital: social networks of specific professional fields and concerning gender differences

of perceptions toward a highly innovative robotic surgical system. A sociometric questionnaire was submitted both to physicians and nurses working in three hospital wards belonging to an Italian healthcare organization in order to collect attributional data and information about adoption and impact of technology, as well as data on professionals’ relations. We considered a sample of 50 professionals and assumed an Ego-network perspective. We tested our hypotheses via MRQAP regression analyses and we found that both professional networks and ego-network structure and composition were positively related to the similarity of perception toward the newly adopted technology. Our findings confirm that social networks and social capital are strongly associated with individuals’ opinions regarding technological change, and that these attitudes and beliefs converge to similar perceptions.

Group Social Capital and Group Effectiveness on an Online Collaboration Platform

Reus, Bas1,2, Moser, Christine1, Groenewegen, Peter1
(1)VU University Amsterdam, Amsterdam, Netherlands, (2)Favela Fabric, Amsterdam, Netherlands

There is an advance in online collaboration tools, such as online collaboration platforms, in knowledge intensive organizations where groups of people organize themselves to work towards a collective goal. Studies have revealed that group effectiveness benefits from closure and bridging within groups and bridging between groups. Knowledge on the effect of group social capital on group effectiveness in an online environment is important because group collaboration increasingly shifts from offline to online. Online group social capital often results in different outcomes of group effectiveness which in turn affects organizational performance. In order to bridge this knowledge gap, we ask the question ‘To what extent does group social capital influence group effectiveness in an online environment?’ We define group effectiveness as the ability of the group to accomplish the collective goal, and group social capital as the set of resources made available to a group through group members’ social relationships within the social structure of the group itself, as well as in the broader social structure. This study uses data from an online collaboration platform within a Dutch health insurance company in particular from a specific part of the online collaboration platform where every member can start a group and determine the group’s collective goal. First, we find that group effectiveness benefits from an optimal inverted U-shaped configuration of group social capital in online environments. Second, we find that this optimum depends on group characteristics such as size, duration, reciprocity and activity.

Using Co-author Networks to Measure the Influences of Social Capital on Research Performance

Schulz, Jan
TU Bergakademie Freiberg, BWL, Freiberg, Germany

The measured research performance is important to a researcher as most career decision (tenure, promotions), awards and access to scarce re-sources (money or technical equipment) depend on getting papers published in top journals and hence gaining reputation (Frey, 2003; Honekopp and Khan, 2012; Bedeian, Fleet, and Hyman, 2009). Social capital (Bourdieu, 1986; Burt, 2005) is an important influence on innovation performance (i.e. Hansen, 1999) and as such it is expected that it also influences the research performance of a researcher as measured by such publications performance measurements. Network position is a measure of social capital (Pezzoni, Sterzi, and Lissoni, 2012; Barabasi et al., 2002; Acedo et al., 2006) and has been observed to relate to publication performance in academic co-author networks (Abbasi, Altmann, and Hossain, 2011; Abbasi, Chung, and Hossain, 2011; Elisa, 2012; Casanueva and Gallego, 2010). Using Scopus data provided by Elsevier within the framework of the EBRP, this study analyses the effects of different social capital measurements in co-author networks on the different measurements of publication performance (e.g. numbers of papers, citation counts, h-index, and numbers of publications in top journals) in two different fields of science.
Social Influence 1

Positive and Negative Acceptances in a Collective Decision Makings Setting

*Faye, Malick*
Carl von Ossietzky Universität, Oldenburg, Germany

In this paper, a process of collective decision making (board session) in a board composed of 33 members is analyzed under a structural aspect. The board members are elected in a community of seven villages in Northwestern of Senegal for the management of their water supply. The collective decision making process is characterized by three verbal acts: proposals, acceptances, and confirmation. These are depicted in a process diagram. Proposals are made by some actors and accepted (A+) or rejected (A-) by others before they are finally confirmed. Valued and signed networks are derived from the process diagram of one board session and related to collected social networks in the board in order to show the interplay between argumentative and structural power. How behave actors or subgroups in the process of decision making? This analysis shows that central actors in the social networks dominate the process of collective decision making. Further, subgroups which are segregated in the social networks do not shape the decision process. Finally, structural equivalent actors have the same argumentative behavior. Not only interactions between single actors, but between subgroups according to location, speech, and status in the board are covered in this paper to show that (structural) social influence plays an important role in the output of decision making processes.

Opinion Diffusion on a Network of Commuting Agents: Confrontation with Election Data

*Fernandez-Gracia, Juan*, Ramasco, José J., Suchecki, Krzysztof, Eguíluz, Víctor M., San Miguel, Maxi
IFISC, Palma de Mallorca, Spain

We investigate a basic opinion model based on social influence with a network substrate that reflects the structure of society and captures the spatial features of election results. As a proxy for the social context of agents we use data on commuting behavior, which gives rise to a network of possible contacts among agents. Each agent is assigned a home and a work location, consistent with real data. We postulate that an agent can be influenced by anyone she can come in touch with either at their home or work location. The opinion model we investigate is based on a random imitation mechanism. Each agent can hold one of two equivalent opinions. Each time an agent is chosen for interaction, she copies the opinion of a randomly chosen neighbor in the network that represents her social context. This framework incorporates naturally the non trivial heterogeneities found in real demographic data through the use of commuting data. Furthermore this simple model is shown to capture spatial features from real elections from the US, such as the stationarity in the width of the distributions of voteshares for a given party and the spatial correlations of voteshares. Therefore we bridge the gap between theoretical investigations and empirical validation of social dynamics models, which has been mostly elusive.

A Bayesian Rationality to Follow Opinion Leaders? Belief Formation and Social Influence in Networks and their Impact on Macro-behavior

*Hedtrich, Johannes*, Henning, Christian
Christian-Albrechts-Universität Kiel, Kiel, Germany

We propose an agent-based model of belief formation of individual agents in the framework of fundamental uncertainty. Agents have to make a binary decision which has direct consequences for agents’ individual utility. Agents’ beliefs of the state of the world are crucial in determining agents’ choices. Agents receive decentralized signals which are informative regarding the state of the world, but signals are noisy. Agents have an incentive to communicate with each other. Communication can be biased. Simulation analysis show that communication networks are important determinants of the dynamics of belief formation and of agents’ decision-making. We identify specific network structures that closely mimic optimal decision-making based on a perfect rational Bayesian updating. Communication networks can be interpreted as social capital. Empirically a mismatch of belief formation strategies and the true informational value of agents’ communicated opinions might occur, i.e. collective belief formation via communication is not always efficient.

Social Networks as Determinants of Consumer Beliefs and Nutrition Behavior: Theory and Empirical Evidence from the Focus-project

*Henning, Christian H.C.A.*, Zarnekow, Nana
Following the path breaking Framingham study on networks and obesity the paper applies an integrated ABM-household production function approach to analyze the impact of different network structures on consumers' beliefs and demand for functional food. Based on our theory consumer's willingness to pay for health promoting attributes of functional food is crucially determined by households technical beliefs how these attributes translates into utility relevant z-goods, i.e. health, convenience and taste. Using own unique social and medical survey data of 1000 probands collected within the Focus-project we test our theory applying a two-stage latent class estimation of macro and micro food preferences. In particular, the approach allows a statistical testing of the impact of peer group network effects on consumer beliefs, preferences and nutrition behavior. The results have interesting implications for specific marketing strategies promoting demand for functional food as well as for specific political communication strategies preventing nutrition based illnesses and thus promoting public health.

Academic Performance and Students' Communities: Including Contiguity Effect in Structural Equation Models

Vitale, Maria Prosperina¹, Porzio, Giovanni Camillo²
(1)University of Salerno, Economics and Statistics, Fisciano, Italy, (2)University of Cassino and Southern Lazio, Economics and Law, Cassino, Italy

Several studies (e.g., Vermunt, 2005; Guàrdia et al., 2006; Rienties et al., 2012) have been devoted to the conceptual definition of students' performance at all stage of their education, and to the identification of the factors that influence it, with the goal of promoting the development of effective strategies to increase scholastic attainments. Aim of the paper is to evaluate the presence of any effect of interpersonal relationships on performance under the assumption that students adjust their own attitudes and behavior to that of others they are connected with (i.e., social influence or contagion). This aim requires to include network's effect within a structural equation model, in which the academic performance is dealt as an endogenous latent construct considering objectives indicators (e.g., mean exam scores or final grade) as well as students' perception of learning experiences. For this reason, a simple and intuitive two steps procedure is used: first, factor scores are derived for the latent constructs, and then an individual outcome regression model with proper contiguity matrices (i.e., network autocorrelation model, Doreian et al., 1984) is estimated. The effect of students' communities on performance is then studied by means of data collected through questionnaires filled by a sample of student enrolled at an Italian University in the academic year 2008-09.
Social Influence 2

Normative Influence in the Convergence of Social Network Analysis and the Reasoned Action Approach: Predictions from Norms of the Personal Network, Norms of Important Others and Norms of Similar Others

Busse, Peter
Instituto de Estudios Peruanos, Lima, Peru

Research about the influence of personal networks on people’s behaviors abounds (e.g. Hall & Valente, 2007; Haynie, 2001; Maxwell, 2002; Rice et al., 2005; Valente & Saba, 1998; Valente & Vlahov, 2001). It has been suggested that personal networks influence behaviors through norms, especially the norms of strong ties (Boer & Westhoff, 2006). Yet, a model of social influence such as the Theory of Normative Social Behavior (Rimal & Real, 2005) has established that perceived norms can have a strong influence on behavior, especially when these norms come from people that an individual regards as similar. Norms of these referents are conceptualized as descriptive norms. Further, following the Focus Theory of Normative Conduct (Cialdini et al., 1990), the Reasoned Action Approach (Fishbein & Ajzen, 2010) has already established that norms of important others are predictors of people’s behaviors, and norms of these referents are conceptualized as injunctive norms. While there is evidence linking networks, norms and behavior, one question remains unaddressed: are norms of the personal network the same as the norms of important others or the norms of similar others? Using data from two cross-sectional studies in the context of HIV prevention, this paper examines the differential predictions of (1) injunctive norms, (2) descriptive norms, and (3) the norms of the personal network of people one discusses health matters, on the intentions to get tested for HIV among Latinos in the United States.

Who Cares What Kind of Smartphone their Friends Have?
Canright, Geoffrey S.
Telenor ASA, Research and Future Studies, Oslo, Norway

In previous work we have demonstrated strong social effects in smartphone adoption. Comparing the two dominant operating systems (Apple and Android), we have found such social effects to be present for both types of OS—but consistently stronger for Apple users. The present work extends this picture further, by measuring (in a statistical sense) ‘brand indifference’—and its opposite, ‘brand significance’—among these two sets of smartphone users. We do this by measuring a number of measures of correlated adoption, and comparing the results to those obtained using a ‘brand-indifferent reference model’, in which the chosen OS (Apple or Android) is randomly reshuffled among smartphone users, while holding everything else unchanged: the set of smartphone users, the total number of each type (Apple/Android), and the underlying call graph. Using this test, we find that essentially all of the social correlations seen among Android users are also found among ‘brand-indifferent’ smartphone users—while the social circles of Apple users are strikingly different. In short, we find strong statistical evidence saying that, in general, Android users ‘do not care’ what OS their friends use—while Apple users care quite a bit.

Ego-networks of Converts to Islam
Erin, Sakin
University of Kentucky, Lexington, KY, United States

Although conversion to a new religion in the West has historically been conversion mainly to Christianity or its different denominations, this trend has been changing as conversion to Islam has arisen to prominence in the last two decades. This growth in conversion to Islam has been primarily due to a greater presence of immigrant Muslims and more publicity about Islam, which is the fastest growing religion in the United States of America. While this publicity is mostly negative and stereotypical, it is surprising that there is a significant number of Westerners who convert to Islam. Contrary to the theories of past research, this research by analyzing the ego-social network of converts to Islam will show that individuals do not form affective bonds with Muslims before they decide to convert to Islam, although some might marry Muslims either before or after conversion. This research will demonstrate that converts to Islam are more likely to revert back to their prior belief if they lose social ties to their prior to conversion ego-network since they will be deprived of social capital and emotional support provided by the alters in their network. In addition, converts to Islam cut social ties to their prior network in an effort to build up a new religious social network; a situation that frequently results in regression to prior belief. My study aims to address the puzzle of why cutting social ties to one’s prior social network results in going back to one’s prior to conversion belief.
The Dynamics of Contagion of Workplace Attitudes in the Context of Contradictory Influences

Floyd, Theresa¹, Borgatti, Steve², Soltis, Scott², Gerbasi, Alexandra³
(¹)University of Kentucky Gatton College of Business and Economics, Management, Lexington, KY, United States, (²)University of Missouri, Management, St. Louis, MO, United States, (³)Grenoble Ecole de Management, Grenoble, France

Workplace attitudes are known to be contagious through social networks, but less is known about how individuals resolve heterogeneous influences to determine their own attitudes. We investigate this question by analyzing at three time points the individual social networks of 161 Belgian MBA students who had friends with divergent attitudes towards their teams. We explore the extent to which an individual will adjust her attitude over time to become closer to that of her friends or if she will seek out new friends that reinforce her initial attitude. Finally, we examine a number of affective and cognitive criteria that might drive the extremity of either the attitude or network change.

How Did you Do that? Adaptation to New Information Communication Technology in Organizations through Advice Networks

Haseki, Muge, Weber, Matthew
Rutgers University, New Brunswick, NJ, United States

This study examines employee adaptation to social media tools within the context of large multinational organizations. Employees within these organizations face increasingly complex communication environments, and must adapt to a constant stream of new tools. Utilizing a social influence model of technology, this study examines how salespeople integrate the social media tools into their existing communication tools and make decisions regarding the use of tools during the sales process. Based on a mixed method use of survey, social network analysis and interviews within a large multinational organization, the findings show that employees make decisions regarding the social media tools that they utilize based largely upon mimicry as opposed to expertise. In other words, employees are likely to use a tool if their peers are using that tool, regardless of how successfully the tool is utilized. The findings have clear implications in both theory and practice. From a social influence perspective, the results illustrate the central role that peer connectivity has in adoption of technology, and for practitioners, the results provide insight into the learning and adoption mechanisms for social media tools used within the workplace.

How Social Information Influences Decision Making

Wang, Jyun-Cheng, Chang, Eunice Ching-Hui
National Tsing Hua University, Hsin-Chu, Taiwan, Republic of China

As social-based information become readily available, people are relying more on the members of their own networks, such as friends and peers, to guide their decision making. This research proposes a model to investigate social-based cues (online friends and “Like” volumes) as potential signals of product quality and consider the moderating effects of perceived product risk. We focused on the effect of the different information types, including positive and negative recommendation when manipulating social-based cues as signals of product quality. We conducted two field experiments on Facebook to test these hypotheses. The results indicate that online friends and “Like” volumes influence consumers’ perceptions of product quality, which subsequently affects purchase intentions. Additionally, perceived risks moderate the effect of online friends on perceived product quality. When the risks were high, the consumers tended to evaluate products carefully by focusing on their sources’ trustworthiness. When the risks were low, the consumers were less likely to evaluate the products carefully, so they paid less attention to their sources' trustworthiness. However, we did not find these effects for “Like” volumes. The effect of the types of information content is also studied.
Recent qualitative and quantitative research has identified different mechanisms of social network influence on fertility decisions. First, being able to draw on social support from social network members may facilitate fertility decisions; not only may parents assist their offspring financially, but they usually also serve as a source of emotional support and are regularly expected to provide childcare support. Second, network members may exert social pressure to enforce their respective expectations; parents may use their influence on offspring, for instance, to achieve their desire for grandchildren. In addition, some studies support the notion of social contagion processes concerning fertility behavior. Specifically, frequent contact with young children of friends or siblings may reinforce one’s own generative intentions. However, the social contagion effect may be spurious because Ego and the respective network members usually tend to be similar in age, gender or educational background (homophily). Moreover, previous findings are inconclusive as to whether births among network members cause Ego’s fertility intentions (contagion) or if Ego’s fertility behavior rather provides opportunities for becoming acquainted with couples with children (selection). The present study focuses on the latter issue of causation versus selection effects; we analyse data from the German Family Panel (pairfam) which comprises a detailed network module with elaborate descriptors along with primary respondents’ fertility biographies. Specifically, information on the duration of acquaintances is used to disentangle both directions of the effect. Similarly, considering the composition of networks (e.g., family versus friends) enables us to distinguish between predetermined and chosen network ties.

Bernardi, Laura, Elcheroth, Guy
University of Lausanne, LIVES, Lausanne, Switzerland

We are interested in the life trajectories of young adults in Switzerland, both those born from Swiss parents and those born from migrant parents from South East Europe. Young adults and especially those belonging to the relatively stigmatized population of South East Europe are notably hard to reach with conventional sampling designs. The latter are not cost effective and have proven to give poor results in terms of participation rates. To overcome these problems, we employ an extension of ego-centered network sampling, a controlled multiple-iteration network sampling strategy. In addition to be an alternative sampling approach, the collected network data enable relational data analyses and to better study young adults lives within (multilayered) social contexts. Last, they provide relevant individual level data to investigate issues of social capital and social integration of young adults.

Intergenerational Transmission of Religiosity in Immigrant Families in the Context of Social Embeddedness
Jacob, Konstanze
University of Mannheim, Mannheim Center for European Social Research, Mannheim, Germany

Religion underlies strong intergenerational transmission in Muslim immigrant families in Western European countries. In contrast to Christians - both immigrants and natives - that generally follow tendencies of declining religiosity predicted by secularization theories, Muslim immigrants show a considerably strong stability of religiosity over time and generations. However, an open question pertains how social embeddedness in a more or less religious social environment influences religious intergenerational transmission processes. Since general assimilation theory expects that exposure to the host society leads to an adaption to its values, social assimilation should promote a declining importance of religion in immigrant families. This contribution, therefore, aims at investigating religious intergenerational transmission processes in a broader social context, thereby taking into focus the role of social assimilation. Two research questions guide this contribution: First, does social assimilation influence (the strength of) intergenerational transmission of religiosity in immigrant families? Second, can social assimilation explain varying transmission patterns? The data from the new Children of Immigrants Longitudinal Survey in Four European Countries (CILS4EU) yield several major advantages to answer these questions. In 2010/11 14-year-old adolescents of native and immigrant origin were interviewed in schools. Additionally, interviews were conducted with one of their parents. Furthermore, sociometric data on class level were collected during school surveys. This allows simultaneously investigating the significance of parents (horizontal
transmission) and peers (vertical transmission). Additionally, I do not only consider proxy information about third parties. Instead, ethnic, social and especially religious characteristics of parents and peers can be simultaneously integrated into my analyses.

**Sibling Similarity in Family Formation**

Raab, Marcel\(^1\), Erola, Jani\(^2\), Fasang, Anette E.\(^3\), Karhula, Aleksi\(^4\)

\(^1\)Social Science Research Center Berlin (WZB), Berlin, Germany, \(^2\)University of Turku, Turku, Finland, \(^3\)Humboldt University Berlin & WZB, Berlin, Germany

Sibling studies have been the method of choice to study the effect of family background - everything siblings share - on socioeconomic and demographic outcomes. Recent research on family formation emphasizes that single fertility and partnership transitions are embedded in a holistic process of family formation that unfolds over time. The analytical contribution of this study is to combine a dyadic sibling approach with sequence analysis to disentangle the mechanisms that link family background to family formation trajectories. We use Finnish register data from 1987 until 2007 to construct family formation sequences for sibling dyads and randomly paired dyads from age 18 to 30. The empirical analysis employs sequence analysis and dyadic regression analysis. The sequence analysis shows that siblings’ family formation trajectories are indeed more similar than those of randomly paired dyads, particularly for same sex siblings. The dyadic regression analysis compares sibling dyads with randomly paired dyads in a fully interacted model by sibling status. Preliminary findings indicate that the same mechanisms that drive similarity in family formation in general, also generate sibling similarity in family formation but the effect sizes for siblings are larger. This applies to high education, stability of the parental marriage, and low age difference. However, regional proximity only generates similarity among siblings but not among randomly paired dyads. This supports local contagion as one of the main driving forces of sibling similarity in family formation.

**Transition into Partnership and Network Dynamics of Young Adults**

Toepfer, Tom, Hollstein, Betina

University of Hamburg, Hamburg, Germany

Young adulthood is characterized by a multitude of transitions which affect the individual set of orientations, resources and challenges. These changes also concern the network structure (composition, configuration), the network functions (social support, social control) and as well individual orientations. With specific transitions across the life course individual different changes within and between personal networks occur. The paper focuses on the transition into partnership and asks how this life event affects the composition of the personal networks of young adults. How do structure, function and orientations of single social relations change and how do different relations of a network interact? Which patterns of network change can be identified and what are mechanisms that explain network dynamics in young adulthood? To analyze these questions we draw on longitudinal network data collected over a five years period, with three survey waves with intervals of two years (Keupp et al 1999). Standardized instruments were combined with qualitative biographical interviews. We conducted a secondary analysis of these data by means of Grounded Theory (Glaser/Strauss). The paper presents (1) a typology of different patterns of network change at the transition into partnership and (2) identifies mechanisms explaining these differences in network changes.

**A Meta-analysis on how Social Networks Change When People Experience Life Transitions**

Wrzus, Cornelia\(^1\), Haenel, Martha\(^2\), Wagner, Jenny\(^3\), Neyer, Franz J.\(^4\)

\(^1\)Max-Planck-Institute for Human Development, Berlin, Germany, \(^2\)Leuphana University, Lueneburg, Germany, \(^3\)Humboldt University, Berlin, Germany, \(^4\)Friedrich Schiller University, Jena, Germany

For researchers and practitioners interested in social relationships, the question remains as to how large social networks typically are, and how their size and composition change across adulthood. Based on predictions of socioemotional selectivity theory and social convoy theory, we conducted a meta-analysis on age-related social network changes and the effects of life events on social networks. Information on network size and network change was obtained from 277 studies with 177,635 participants from adolescence to old age. Crosssectional as well as longitudinal studies consistently showed that (a) the global social network increased up until young adulthood and then decreased steadily, (b) both the personal and the friendship network decreased throughout adulthood, (c) the family network was stable in size from adolescence to old age, and (d) other networks with coworkers or neighbors were important only in specific age ranges. Studies focusing on life events that occur at specific ages, for instance transition to parenthood, job entry, or widowhood, demonstrated network changes similar to such age-related network changes. Also, global and personal networks were smaller in countries with more collectivistic value orientation, but family networks did not differ in size. Together the
findings are consistent with the view that a portion of normative, age-related social network changes are due to normative, age-related life events. We discuss how these patterns of normative social network development inform research in social, evolutionary, cultural, and personality psychology.
The Problem of Fit: Using a Spatially Explicit Network Approach to Investigate Mismatches between Management and Ecology
Bergsten, Arvid, Galafassi, Diego, Bodin, Örjan
Stockholm Resilience Centre, Stockholm, Sweden

We present a new network-centric approach to identify and quantify potential spatial mismatches between ecosystem patterns and how landscapes are being management. The problem of institutional fit in social-ecological systems has been empirically documented and conceptually discussed in decades, yet there is still a shortage of approaches to systematically and quantitatively identify the level of fit. In particular, spatial land use heterogeneity in human dominated landscapes often conditions both human activities and species population dynamics, and if land use is planned without regards to ecological processes, detrimental effects on species and ecosystem functioning can easily occur. Our approach focuses on identifying patterns of collaborations between managers of different areas in the landscape, and then relates these patterns to ecological processes in the landscape. We demonstrate our approach by comparing a inter-municipality social network focused on collaborative wetland management with the ecologically defined network of interconnected wetlands in the greater Stockholm Metropolitan Area in Sweden. Many wetlands are, in this system, either intersected by or located close to the border between two or more municipalities; all of which implies a need for dialogue and coordination of activities related to wetland management across municipality borders. We use our approach to first estimate the level of ecological connectivity between wetlands in neighboring municipalities, and then use that estimate to elaborate the level of social-ecological fit vis-à-vis intermunicipal collaboration. Our analysis and results are graphically illustrated using maps, which facilitates the potential application of this method in land-use planning practice.

Fisheries Management Outcomes in Chile: Do Social Network Structures Make a Difference?
Crona, Beatrice¹, Bodin, Örjan¹, Gencich, Stefan²
(1)Stockholm University, Stockholm Resilience Center, Stockholm, Sweden, (2)Pontificia Universidad Catolica in Santiago Chile, Santiago, Chile

This study compares seven fisheries management organizations along the Chilean coast to understand the factors that contribute to successful management outcomes. Previous work has shown social capital and leadership to be two important factors contributing to outcomes of collective action. However, Ostrom and others have identified a number of additional factors including group size, existence of conflict resolution mechanisms, information sharing, deliberation etc. In this study we therefore use a mixed methods approach to examine a range of plausible contributing factors. These include network structure and metrics for networks of communication of area management information and Local Ecological Knowledge, conflict resolution mechanisms, characteristics of leaders and a range of attitudinal variables related to the perceived function of the management organizations among users. Outcomes are measured as a multi-faceted index comprised of social and ecologcal variables. Results show equifinality - i.e. that multiple alternative causal pathways give rise to similar outcomes. We discuss these in more detail and examine the extent to which social network structure and metrics contribute to these causal pathways and to explanations of outcomes.

Describing Ethnic Groups in an Advice Network: A Case of Ethno-diverse Rural Communities in Southern Ecuador
Gonzalez Gamboa, Vladimir, Barkmann, Jan, Marggraf, Rainer
Georg-August-Universität Göttingen, Dept. Agricultural Economics and Rural Development/Environmental and Resource Economics, Göttingen, Germany

Studying the advice network help us to disentangle how information is shared in dense tied rural communities in southern Ecuador. The network actors behaviour is shaped by local actors attributes. For instance, there are mainly two ethnic groups related with changes in land use, namely Saraguro and Mestizo-colonos. The first group are indigenous people and the latter are migrants from other places of the country that went to settle the region during the agrarian reform. Therefore, they have different cultural patterns and land use practices. A previous work done by Gonzalez et al. (2010) showed that there may be differences in how the information related with agroforestry species is shared between and within these two ethnic groups. We analyze the search for advice of the main agricultural activities for the household. On this base, we prove that indeed there are structural differences on search for advice between ethnic groups. There are also some actors embedded in a cohesive group that govern the information related to agricultural
activities. High centrality of some actors demonstrate the vulnerability of the search for advice network. A cohesive block analysis and network statistics show that Mestizo-colono has the actors with highest degree centrality and betweenness. These are tied in the highest cohesive group in the cohesive block analysis. Furthermore, a high Burt’s constraint shows that low structural holes in the network are creating differentiation of information share between groups. Where the periphery of the network plays an important role as advice source.

**Examining Marine Resources Commoditization-(Un)Sustainability Nexus: Centrality Measures of Live Reef Food Fish (LRFF) Networks in Spermonde Archipelago, Indonesia**

*Radjawali, Irendra*

Institute of Oriental and Asian Studies, Bonn University, Bonn, Germany

Live reef food fish (LRFF) fishing is one of the most important livelihoods for the coastal and small island communities particularly within the Spermonde Archipelago, South Sulawesi Province, Indonesia. However, LRFF fishing and trade has been considered a threat to the reef ecosystem due to over-fishing and the use of cyanide as a method of increasing the LRFF catch significant demand mainly from Hong Kong and China is increasing. Driven by discourse of sustainability, there have been several studies focused on the study of social networks in understanding the dynamics of coastal social-ecological systems, but few have attempted to use social network analysis in understanding the nexus of resource commoditization and (un)sustainability. This paper identified that commoditization of LRFF has been possible through the establishment of LRFF networks which consist of: (1) fishing network characterized by socioeconomic interests where self-esteem and social prestige are present and influential through the patron-client relations, (2) trading network characterized by profit maximization, and (3) prosecution insurance network characterized by additional income maximization through corruption. The interplay of socioeconomic interests, profit maximization and maximizing additional income has been the foundation of LRFF fishing and trade. Using the data from ethnographic studies, this paper applies centrality measures of Social Network Analysis to examine the extent to which actors position in LRFF networks might provide important insights for better interventions of conservation and development initiatives particularly within coastal social-ecological system.

**A Relational Approach to Understanding Complex Water Management Problems**

*Stein, Christian*

Stockholm Environment Institute, Berlin, Germany

In this paper we applied social network analysis to systematically analyse cross-scale and multi-stakeholder governance networks from four rapidly transforming agricultural landscapes in Burkina Faso, Ethiopia, Tanzania and Zambia. Using questionnaires and semi-structured interviews, we generated social network data on collaborative relations between state agencies, NGO’s, private companies, farmers groups and traditional authorities. In each case study we generated social network data from between 70 to 100 organizations. We measure network properties at individual, group and network level to assess how existing social structures provide opportunities and constraints to manage water resources across scales, places and sectors. We will discuss emergent results, highlight how these collaborative networks shape governance dynamics, and why they need to be recognized and built upon.
Experimenting with Adaptive Co-management for Adaptation to Climate Change: A Social Network Perspective

Baird, Julia¹, Plummer, Ryan¹², Bodin, Örjan²
(1)Brock University, Environmental Sustainability Research Centre, St. Catharines, ON, Canada, (2)Stockholm Resilience Centre, Stockholm, Sweden

Adaptive governance, operationalised through adaptive co-management (ACM), is gaining recognition as a suitable approach in the governance of ‘wicked problems’; however, its application to the ‘super wicked problem’ of climate change has not been investigated to the same extent, nor has a focus been placed on the process and the influence of variables on the quality of ACM outcomes. In this study, social network analysis was used to investigate social structures and processes of an experiment to create adaptive co-management with stakeholders in the Niagara region, Canada for climate change adaptation. Meeting attendance over a one-year period was used to create a two-mode network for visualization of the structure of participation in the experiment, supplemented by qualitative records of events. A co-attendance network was created from these data and strong and weak sub-groups of participants emerged from the analysis. Participants in the ACM experiment also completed an organizational network survey at the outset of the study and again at its conclusion. Change in network size, density, and centralization over time was measured for the entire network, and ego network measures of size and centrality for participants were also compared for individuals and between strong and weak sub-groups. Whole network and ego network measures generally remained constant or decreased over time, prompting a follow up inquiry to participants about possible reasons for these results. Insights from using social network analysis for investigation of ACM are discussed and opportunities for future studies are explored.

How to Succeed with Collaborative Ecosystem-based Management: A Social Network Perspective on Deliberation, Coordination and Innovation

Bodin, Örjan¹, Crona, Beatrice², Sandström, Annica¹²
(1)Stockholm University, Stockholm Resilience Centre, Stockholm, Sweden, (2)Luleå Technical University, Luleå, Sweden

Ecosystem-based management (EBM), where the inevitable need for adaptive and trans-sectorial governance approaches is emphasized, is continually gaining interest in environmental research and policy. Among other things, EBM emphasis stakeholder involvement and collaboration involving actors of different types with different roles. The guiding principle behind this governance approach is that collaborative management systems are believed to, e.g. promote more equitable access to resources, mitigate conflicts and enhance legitimacy of decision-making. However, succeeding with such a complex task poses many challenges. For actors to agree on common goals and objectives when managing the natural environment, in spite of often occurring conflicts of interests, a great deal of deliberation and innovation is typically required. Also, accomplishing effective collaborative processes that are involving many issues and many actors, ranging from government officials to local landowners, require good coordination abilities. In this work we will apply a social network perspective in investigating these issues utilizing empirical data from five different collaborative EBM initiatives in regional coastal areas of Sweden.

Agrarian Information Networks and Socio-spatial Dynamics: Linking Network Structure to Land Use Change in Ghana

Isaac, Marney E.
University of Toronto, Toronto, ON, Canada

In contribution to the evolving literature on social networks and environmental resource management, specifically the effects of agrarian information networks on land management, a study was undertaken in the transition zone of Ghana. Previous research in this region has shown highly active and cohesive agrarian networks. These networks are dependent on a few strategic bridging ties; migrant farmers dominate these bridging ties, suggesting that recent migration plays a key role in locally transferred agricultural practices. More recently, we ask: do distinct information network topologies coincide with predictable patterns of land use? Land manager information networks were determined as well as their land management practices: in-situ species diversity, land use distribution and adjacent land use. Land use history was also charted. High variability in ego-network size and density was recorded. Actors in these information networks typically manage three distinct land use types [crop cultivation, timber plantation, and tree crop cultivation (cocoa)], resulting in irregular land cover. Further analysis will examine the network correlates of land use change by relating...
network metrics, specifically network size and density, to land use diversity and transformation. We speculate that the less dense and more efficient the network of an individual actor, the higher the species and land use diversity and the lower the land use change. As the transition zone of Ghana continues to fluctuate in vegetation cover, this region not only provides a unique study scenario but also requires detailed data on land use change to avoid the land degradation occurring in neighbouring regions.

The Role of Social Networks for Communities Facing Climate Change and Wildfire Risks

Jacobs, Derric B.
Oregon State University, Environmental Science Graduate Program, Corvallis, OR, United States

The Central Oregon forests of the United States evolved with high frequency low intensity fires, yet human development in the region has dramatically altered the ecology of the region's forest making wildfires much more dangerous. In recent years there has been increasing concern over impacts by climate change on wildfire dynamics in the Pacific Northwest and impacts to local communities. The uncertainty of local climactic impacts presents a problem to communities that could face an increase in wildfires. Community-based adaptive capacity to vulnerability and risks will require an informed and collaborative community. Information on climate change and wildfire risks can generate support or barriers to adaptive capacity depending on primary sources, diffusion dynamics in community networks and positions held by influential leaders. This study investigates the social networks in two socio-economically distinct rural communities geographically located within the same public forests. The purpose is to understand the information sources and diffusion into the communities by its citizens and variations on the networks found in socio-economic diversity. A two-mode network analysis approach with a name roster and interpreter is used to uncover primary information sources while an ego-network analysis with multi-relational name generators is used to generate the diffusion and influence of the social networks on information. Preliminary results of the mailed questionnaire will be presented.

Mobile Phones and Compost in Ethiopia: Reshaping Ecological Learning Networks by Text-messaging

Matous, Petr, Todo, Yasuyuki
University of Tokyo, Tokyo, Japan

The importance of social networks for natural resource management has recently become emphasized but causal mechanisms explaining the environmental consequences of networks are not yet understood. Therefore, we experimentally examine causal network mechanisms of adoption of conservation practices in Ethiopia, specifically focusing on the potential role of new information-communication technologies in diffusion of composting. We have conducted a randomized-controlled trial in a village of 265 households by donating phones to randomly selected 60 farmers. Furthermore, we sent weekly text messages about conservation agriculture to half of them for six months. Large changes occurred in the farmers’ learning networks but ICTs alone had no observable effect. Farmers who received a phone without text-messages behaved the same as the control group. On the other hand, the recipients of our messages about conservation agriculture became more central in the networks by increasing their information-seeking activity and also by becoming more popular as advisors. By stochastic actor-oriented simulations, we have untangled complex endogenous and exogenous mechanisms of the learning network evolution. We find some evidence for peer-effects in adoption decisions but not for diffusion of factual understanding of composting among farmers, as such information tends to be obtained from local institutions. Through uncovering the possibilities and the limits of social networks for diffusion of conservation practices, and by testing the role of new ICTs, effective strategies for socio-ecological interventions in resource-constrained developing countries can be conceived.
Social Resources

Social Resources of “Non-traditional” Students
Brändle, Tobias, Häuberer, Julia
Universität Hamburg, Department of Socioeconomics, Hamburg, Germany

Social Capital can be understood as social resources embedded in social networks of individuals (cf. Lin 2001). It is of special value as its mobilization facilitates individuals’ goal attainment. Therefore, we expect social capital to play a crucial role for an individual’s decision for university studies - especially for “non-traditional” students. This group of students does not have a university-entrance diploma, but was accepted for university studies by completing an entrance examination. Before studying, they often finished an apprenticeship and worked in their job for a couple of years. Our paper presents first results of a study of traditional and “non-traditional” students at the Department of Socioeconomics of the Universität Hamburg. To assess the students’ access to social resources, we applied a shortened and adjusted version of Van der Gaag and Snijders’ (2005) Resource Generator. We are going to compare the social capital access of traditional and “non-traditional” students. We have a close look at effects of social origin on the availability, accumulation and structure of social capital. As a result of different students’ biographies, our study shows if “non-traditionals” have more social capital than traditional students. We expect their social capital to center on acquaintances and colleagues, while the traditional students' social capital is supposedly made up by close-knit relations.

Explaining Social Resource Distribution among Czechs
Häuberer, Julia
Universität Hamburg, School of Business Administration, Economics and Social Science, Hamburg, Germany

Recently, various researches outlined positive as well as negative effects of social capital for individuals as well as whole societies. Social capital is understood as social resources accessed through social relationships. In the paper, I don’t ask for the effects of mobilized social resources, but where social resources exactly come from. Correspondingly, the paper’s research question is how social resources are distributed in the Czech society and how this distribution can be explained. According to Lin (2001), social resources are bound to the position of an individual in the societal strata. Thus, I expect that individuals’ characteristics like education and social class affiliation explain resource access. Furthermore, an individual’s embeddedness in social networks represents a precondition to resource access and resource exchange, respectively. Individuals with large and heterogeneous networks shall access more social resources than individuals with small and homogeneous ones. Here, I present results of the telephone survey “Social Relationships among Czech Citizens” conducted in 2007/8. Among other social capital measures, I applied a Resource Generator (cf. Van der Gaag, Snijders 2005) asking for the number of family members, friends and acquaintances that provide access to twelve different types of social resources. My analyses corroborate my expectations: especially high educated individuals and persons of middle and upper social classes (self-perception) access a broad range of social resources. Furthermore, large and heterogeneous networks provide extensive social resource access.

Understanding how Social Networks Inform the Problem of Science, Technology, Engineering and Math Workforce Preparation: Networks-driven Agent-based Modeling of Student Trajectories in Systems of Higher Education
Podkul, Timothy E., Cheng, Britte, Richey, Michael C.
(1)SRI International, Education Division, Menlo Park, CA, United States, (2)Boeing Company, Seattle, WA, United States

Education is a complex problem, with existing literature pointing to crucial elements that influence students’ decision-making about course selection and eventual career selection. Research and prior modeling exercises have identified identity, agency, social capital, and access to resources as critical factors that mediate student participation in certain courses and career trajectories. This paper is situated in a broader research project addressing the problems associated with the fact that the fastest growing occupations in the next decade are projected to be in the science, technology, engineering and mathematics (STEM) fields. Providing the needed supply of qualified candidates to fill those positions will be difficult due to the aging and retirement of the current STEM-educated work force and the inadequacies of the current STEM education system for preparing the next generations. This research builds on an existing, validated social dynamics model of the engineering career path and incorporates an agent-based model (ABM) that uses social network measures and concepts as the driver for uncovering valuable insights about the role of social interactions and collective characteristics in the production of engineering students and professionals. This paper presents our methodological
approach to merging SNA and ABM approaches, how we operationalize structural and compositional measures in the model, and explore some of the preliminary results and lessons learned from this research.

Role of Social Capital in Status Attainment: Generations Getting their First Job under the Socialism and Capitalism in the Czech Republic

Safr, Jiri
Charles University in Prague, Faculty of Humanities, Department Historical Sociology, Prague, Czech Republic

The paper focuses on the first job hunting in the broader context of intergenerational mobility/reproduction process in two eras represented by age cohorts entering labor market before and after the fall of the iron curtain (before/after 1989). Using national representative survey Networks and Mobility 2011 (N = 850) I focus on differences in method of finding the first job. In comparison before/after 1989, employing strong ties lessened (applies to family networks but close friends netw. increased) as well as formal channels diminished a little (with internal variety, e.g. workplace admittance weakened, personal agencies strengthened) whereas weak ties became more relevant. However these changes were not crossing all social classes. Preliminary results testing hypothesis of “growing stratifying effects of social networks after 1989” are showing that there are not big differences in job searching methods in service class, whereas intermediate professions use less formal channels and more weak ties, the same does working class which also utilize less strong ties. Further, the model of status reproduction mechanism is examined from a particular point of view of social networks. Besides effects of status of origin (parental ISEI) and academic achievement, mobilized social capital (ISEI of contact person) raises the first occupational status. An attempt to measure accessed social capital as network size (and utility contacts) of family of origin was made which proved to be rather very weak advantage in status attainment. However, social networks if individuals are partly inherited from their parents’ networks.

Personal Social Capital and Entrepreneurial Behavior: Results from a Survey in Russia

Tatarko, Alexander, Peter, Schmidt
National Research University - Higher School of Economics, Moscow, Russian Federation

In this paper we present results of the relationship between individual social capital and one’s intention to start own business (entrepreneurial behavior). Individual social capital was measured by a) number of friends, relatives, colleagues, who are willing to help the respondent in different situations; b) the frequency of contacts with friends, relatives; c) the number of groups and organizations to which respondent belongs. This was combined with the application of the reasoned action approach of Fishbein/Aizen (2010) to explain entrepreneurial activity by a wide version of rational choice. The study involved 269 respondents who intend to start a business in the next 2 years. It was found that individual social capital does not directly influence the intention to start one’s own business, as well as specific actions to implement this intention (personnel recruitment, buy equipment, search investments, etc.). Individual social capital influences factors that determine, according to the reasoned action approach, the intention to implement this action. In particular, relationships between elements of individual social capital and perceived behavioral control and attitudes toward starting one’s own business were found, by testing the model using structural equation modeling. The psychological mechanism by which individual social capital promotes intention to start one’s own business is then integrated into a mediation model which reflects the underlying social mechanism.
Social Support and Capability/Well-being

Building Networks, Supporting Mental Suffering: The Social Circles of Madness
Fontes, Breno Souto Maior
Universidade Federal de Pernambuco, Sociologia, Recife, Brazil

We aim to investigate the structure of social networks not anchored to the territory: these are interactions mediated by the worldwide computer network capable of structuring secondary (predominantly) and primary (occasionally) sociabilities. Similarly to the other structures of sociabilities (those anchored to the territory), these structures can also mobilize resources and provide social support. We will analyze information from internet discussion groups for people with mental disorders. It can be concluded that online mental health communities are an important instrument for the creation of social support networks, the dissemination of information on practices of care and the formation of public opinion.

Social Network Support Alleviating Workplace Conflict and Boosting Work Engagement: A Weekly Diary Study
Jungst, Martijn, Van Emmerik, Hetty, Blumberg, Boris
Maastricht University, Maastricht, Netherlands

Social networks are known to be important to maintain and improve work outcomes. In this study we distinguish between the instrumental and expressive function of social networks. While the former facilitates the achievement of work goals, the latter buffers against work demands (Lin, 2001; Van der Gaag & Snijders, 2005; Schaufeli & Bakker, 2004). More specifically, our study investigates how social networks affect work outcomes (i.e., employee engagement) when group processes are threatened by task and relational conflicts (Jehn, et al., 1999). Hence, we examine how social networks are used as resources to alleviate strain from workplace conflict in different phases of a team project. Weekly diary data gathered over five weeks from 191 graduate students (working on a group assignment) are analyzed with a hierarchical liner modeling approach. The results show that weekly fluctuations in task conflict negatively affect employee engagement. Moreover instrumental social networks moderate the intra-individual relationship between relational conflict and engagement, so that engagement suffered less from relational conflict if people have access to instrumental social networks. Preliminary findings underline the importance of indirect effects of social networks and suggest that task-oriented support during periods of conflict helps to maintain individual employee engagement with work.

The Effect of Family Policy on Reducing Inequality of Social Capital in Childbirth
Kanai, Masayuki
Senshu University, School of Human Sciences, Kawasaki, Japan

This paper examines whether the family policy by municipal governments contribute to leveling off the inequality of opportunity for childbirth due to the uneven distribution of social and financial capital among households. Theoretical models that include these factors are tested using 2011 data collected from young and middle-aged residents in Tokyo metropolitan area (n = 1,059). Our results indicate firstly that on the number of children family policy has negative effect, while social capital (support network size) and financial capital (household income) have positive effects. Secondly, a multinomial logit model shows that in case of having the first child social capital has no significant effect, but in case of delivering the second child social capital solely has significant (positive) effect. Thirdly, a multinomial logit model including interaction terms between family policy and social and financial capital indicates that in case of having the first child there exists negative interaction between family policy and social capital (i.e. under substantial family policy personal support network is not so important for the decision on giving birth) while in case of delivering the second child there exists negative interaction between family policy and financial capital (i.e. under affluent family policy household income is not so critical for childbirth). These findings advance our understanding of how family policy compensates for the unequal distribution of support network among households.

Geography, Gendered Social Networks and Well-being: The Case of Forced Migrants in the Republic of Georgia
Mitchneck, Beth 1, Joanna, Regulska 2, Carboni, Julia 3, Kabachnik, Peter 4
Social network analysis is a powerful analytical tool to understand the structure of social interaction and its impact on daily life. Relatively little work, however, directly links spatial processes with social network dynamics. Our purpose is, first, to conceptualize how space and place interface with social interaction to shape the formation and reformation of social networks for people living in post-conflict, territorial displacement and second, to analyze how gender interfaces with spatial-network processes. Using findings from a series of formal social network analyses conducted in the 2000s of IDPs due to violent conflict in the Republic of Georgia, we ask the following questions: in what ways do the spatial configurations of IDP personal social networks vary by gender, why, and what are potential implications for perceptions of human security and well-being? Using Sen’s capability approach, we link the gendered social networks to differing attempts to manage individual perceptions of well-being. We suggest that these processes combine to influence individuals’ abilities to develop sources of income and social support and thus their sense of well-being. Our findings suggest that network functions are not necessarily linked to place and that spatial behaviors may be linked to attempts to develop resources for improving well-being. Social networks are at the same time products of the gendered socio-cultural and socio-spatial practices and parts of gendered strategies to exert agency over well-being.

A Multi-methods Network Approach for Analysing the Structure and Dynamics of Relations in a ‘North-South’ Development Network Organisation

Petersen, Il-Haam
Trinity College Dublin, Sociology, Dublin, Ireland

Development network organisations (DNOs) have flexible lines of control for dealing with high levels of uncertainty and benefit from the sharing of resources. DNOs thus play a key role in development. DNOs are formally constituted structures consisting of autonomous organisations working together temporarily toward achieving common development goals. In the present study, a mixed methods social network analysis approach is proposed for analysing the structure and dynamics of relations in a DNO, a ‘North-South’ aid-funded project aimed at developing optometry capacity in Southern Africa. The approach draws on social constructionist and actor-oriented modes of analysis. It addresses the shortcomings in the social network analysis literature that tends to emphasise the structural components of networks and often neglect process components. Structural network analysis (Pajek) and qualitative analysis (grounded theory) of 19 semi-structured depth interviews and ethnographic research was conducted during the period May 2010 to December 2011. Utilising qualitative and quantitative analysis in a complimentary way provided a more complete picture of the complexity of the structure and dynamics of relations (power dynamics and negotiation of institutions) in facilitating cooperation than quantitative or qualitative analysis alone. A key question raised is: Is it possible for network consciousness to overcome inequalities inherent in ‘North-South’ DNOs? The social skill of strategic actors and exercising human agency (generally) in ensuring that the DNO served their needs were key in overcoming resource-related inequalities. Other findings: interdependency among actors was another currency of power; and decision-making should be based on the needs of the network.

Social Capital and Successful Ageing: Evidence from a Facebook Study

Raissi, Mahin, Ackland, Robert
Australian National University, Australian Demographic & Social Research Institute (ADSRI), Canberra, ACT, Australia

Social capital is one of the most important concepts in social science, however there is not common agreement on its definition or measurement. As part of a 3-year Australian Research Council project on social networks and successful ageing, the AuSON (Australian Seniors’ Online Networks) Facebook application collects information about the social networks, social capital and wellbeing of older Australians. In this presentation we describe AuSON and present preliminary findings that aim to contribute conceptually and methodologically to social capital research. AuSON automatically collects and displays the 1.5 degree Facebook personal networks of participants. Participants are then asked to provide information about: offline social contacts, types of relationships, potential/actual resources and mental and physical wellbeing. AuSON thus incorporates the Name Generator and Resource Generator approaches for identifying and mapping embedded resources in social networks while avoiding two major limitations of these approaches (since the network structure is collected automatically): 1) undue burden 2) bias toward strong ties. Our analysis has two parts. First, we present a descriptive analysis of the networks of older Australians who use Facebook, and the relationship between various measures of social capital and wellbeing. The second part of our analysis involves mapping resources into nodes in the partial networks, which are built by joining personal networks via common nodes. We use Exponential Random Graph models to understand the flow of resources via both direct and indirect connections and the mechanisms of social networking based on personal capabilities.
**Interdependent Migrations: Structure and Dynamics of the Global Migration Network**

Danchev, Valentin  
University of Oxford, Oxford Department of International Development, Oxford, United Kingdom

The paper explores the structure and dynamics of the global migration network (GMN) over the 1960-2000 period. Migration patterns across the globe can be represented as social links that connect spanning geographic locations in a network, the nodes of which are countries, some of them tied by migration. The study departs from the observation that contemporary cross-border migration operates at transnational scale. Yet, migration theories tend to assume that each migration flow between a dyad of countries is independent from other bilateral flows, and that migration can be explained solely by the attributes of the origin-destination dyads (see Skvoretz and Kim 2010 and Smith and White 1992 on international trade). The paper views places and flows as spatially interdependent and embedded in patterns of relationships. Thus, a bilateral migration pattern between a pair of countries faces particular opportunities and constraints depending on (i) how it is embedded in the GMN of interdependent - in both relational and geographic space - migrations and on (ii) the position of the origin and destination countries in the network structure. To analyse the structure underlying the GMN, we apply blockmodelling and cohesive subgroups (communities) detection. The two approaches offer different ways - positional vs. connectivity - of partitioning the network into meso-level structures. Based on migration stock data (Özden et al. 2011), the study reveals a set of blocks (countries with similar patterns of migration ties) and cohesive communities. We conclude by discussing the dynamics and functional implications of the identified network structures.

**The Impact of Time Zone Difference on Social Networks of Entrepreneurs**

Eriksonas, Linas  
International Business School at Vilnius University, Vilnius, Lithuania

The expansion of global social networks have been increasingly utilized by startup entrepreneurs who are in need of attracting capital in emerging markets. This coincided with the venture capital movement globally, across different time zones. The paper will argue that time zone difference is an important factor in the formation and development of social networks of entrepreneurs and investors. Due to the increased relevance of real-time interaction in social networks the time difference creates a time-hindrance in communication and this affects formation of trust between actors. The paper will present the social network analysis of selected Twitter-based entrepreneurial networks from the perspective of time zone difference. It will show that an even one time zone difference can markedly inhibit the dynamics of entrepreneurial social networks. Based on the empirical analysis of selected cases the paper will attempt to model a time zone-related function curve that could be used to compliment a social network analysis of trans-global actors.

**The Structure of Transnational Professional Networks in Global Environmental Governance**

Henriksen, Lasse Folke  
Copenhagen Business School, Dept of Business and Politics, Frederiksberg, Denmark

Who governs the 'sustainability' of a global transition to renewable fuels? This paper analyses transnational networks and careers sequences of professionals that work to define standards for the governance of biofuels. The paper visualizes the 'biofuels standardization problem complex' consisting of a dynamic set of inter-related issues relating to problems of aligning measurement methods, product specifications and the governance of socio-economic and environmental impact in the global biofuels industry. Building on ethnographic material and an original dataset consisting of peer recognition and advice networks as well as career sequences of policy professionals working within this ‘problem complex’ the paper develops network statistics for cross-border tie formation and develops a typology of different career pathways into standard-setting using Optimal Matching Analysis. These network structures and career pathways make up the experiential assemblages of professional actors involved in standard-setting, and they in turn also help shape the substantive organizational and professional practices of biofuels markets. The paper argues that a focus on the history of networks and careers allows us to move beyond models of interest-representation, where actors involved in market construction struggle to promote pre-established interests (e.g. two-level games), to models of interest-formation that aims at mapping the emergence of assemblages of expertise that in practice shape the content of standards and markets.
Ties that Bind International Research Teams: The Role of the Social Structure of Cross-border Interdisciplinary Collaborations on Early-career Academics

Kollasch, Aurelia
Iowa State University, Ames, IA, United States

It is assumed that the transfer of knowledge and creation of interdisciplinary networks facilitates positive effects on academics’ mobility and productivity (Granovetter, 1985). Through interdisciplinary international collaborations, academics can spread and increase their human and social capital (Becker, 1962; Bourdieu, 1986; Coleman, 1988). Despite the growth of this assumption in collaborative research, the scientific community continually struggles with overcoming challenges arising from this complex form of teamwork (Falk-Krzesinski et al., 2011). The main purpose of this study was to understand the role of social structure of the international research team and perceptions of team members on this structure by challenging social networks and social capital fields. By bridging social networks with social capital, the study examined social structures at different levels and added complexity to different levels of analysis by stressing context through qualitative research methods. It was found that the status of team members and career structure in different countries explained some of the challenges that the team members faced in their international collaboration. The social capital theory helped to examine how the team members managed their own individual and country-based groups’ boundaries. The results imply that hierarchical relations do not stand separately from the horizontal relations among team members in the international research team. Therefore, the construct of group social capital should be based on a multilevel model of combined moderate closure with horizontal bridging roles in international research teams.

Analysing Transnational Networking and Cooperation in EU Rural Development Policies

Marquardt, Doris
Leibniz Institute of Agricultural Development in Central and Eastern Europe, Agricultural Policies, Halle, Germany

Transnational networking and cooperation are seen as drivers for rural development and are financially and technically supported within the framework of European Union (EU) policies. The set of related interventions has developed and fine-tuned over two decades and includes, for instance the provision of funds for the formation of interregional partnerships as well as for establishing a European and national network units. Despite good-practice examples have been collected and the policy instruments are acknowledged as being useful, a major challenge remains the systematic evaluation of funded networking and cooperation activities. Based on surveys among rural regions in three EU member states and an EU-wide survey among national network units, structural and causal patterns underlying networking and cooperation activities are examined. Crucial points are, for instance factors influencing the kind and the degree of intensity of social relations, the partner choice and the results of such interactions. Then the paper introduces an approach to evaluate EU-wide networking and cooperation by applying quantitative Social Network Analysis (SNA). Examples for calculations with the software UCINET are provided. The possibility to use SNA in the formal programme evaluation is discussed considering, among others aspects of practicability, requirements for data collection, the explanatory power of potential results, and the application of means fruitfully complementing the quantitative SNA approach. Conclusions concentrate on a) factors influencing transnational networking and cooperation; b) the potential for improving the policy design; and on c) methods for evaluating support to networking and cooperation in the field of rural development.

Friends in Many Places: Mobility in Social Networks

State, Bogdan¹, Macy, Michael W.²
(¹)Stanford University, Sociology, Stanford, CA, United States, (²)Cornell University, Sociology, Information Science, Ithaca, NY, United States

The development of large-scale online platforms that gather information about geographic position as well as social relations and interactions over time has created exciting new opportunities to investigate the relation between spatial and social networks. We examine how inter-country spatial mobility covaries with position in social network. Our data comes from a very large, world-wide email network, where anonymized individual identifiers were matched against international mobility indicators extracted through IP-based geolocation, controlling for individual differences in Internet use. Our results reveal that mobile actors have higher degree, lower network constraint, higher betweenness centrality, and higher PageRank, while clustering seems to be unaffected by international mobility. These findings suggest the possibility that internationally-mobile individuals occupy brokerage positions in the world’s social networks.
Transnational Networks and Migration Decisions: The Case of Highly Qualified Turks

Aydin, Yasar
University of Hamburg, Fakultät für Wirtschafts- und Sozialwissenschaften, Hamburg, Germany

This paper aims at elucidating the role transnational networks play to migration decisions by using the example of highly qualified Turks who emigrated from Germany to Turkey. In recent years, the number of persons who migrate from Germany to Turkey is higher than those who migrate from Turkey to Germany. A significant part of the people who migrate from Germany to Turkey is highly skilled persons. This triggered a media debate about this migration movement and interpreted as brain drain. Why did Turks, born, socialised and educated in Germany, decided to migrate to a country which they know from holiday? Is it due to the situation that this people failed to integrate themselves into the German society? In contrast to such theses, I will develop this thesis: Transnational orientations, relations and transnational social networks play a central role by the migration decisions of highly qualified Turks: Transnational social networks were a source of information and facilitated migration decisions. Due to social orientations and relations, Turkish migrants developed and maintained a social capital which was transferable into the Turkish labour market. In this paper, I will substantiate this thesis on the basis of qualitative interviews conducted in 2011 in Turkey.

Transnational Protective Networks of Migrants across Europe

Bilecen, Basak
Bielefeld University, Sociology, Bielefeld, Germany

Transnational perspective positions mobile subjectivities within social spaces which connect numerous national territories rather than imagining them to commute between two restricted states in a dichotomous manner. As clearly defined by Faist (2000), ‘transnational social spaces are combinations of ties and their contents, positions in networks and organizations and networks of organizations that can be found in at least two geographically and internationally distinct places’ (p.197). Transnational social spaces are for the interaction, transaction, organization, and (re)construction of everyday life, practices and protective social networks. Through sharing not only emotional and personal matters, but also goods, services, social activities and financial remittances, transnational family networks span beyond the household of origin to members of the broader extended family members. Investigating the ties among transnational families reveals the relationships between migration and informal social protection strategies of migrants that are embedded in their social practices across borders. The protective strategies of Turkish migrants in Germany and their family members in Turkey and Europe will be used to illustrate their quest to improve and sustain their livelihoods which are embedded in extended familial networks. Drawing upon 20 qualitative interviews and 100 ego-centric social network maps collected and analyzed by VennMaker in Germany, this article illustrates how protective resources flow across borders.

A Transnational Approach to the Analysis of Personal Networks among Immigrant Populations in Catalonia (Spain)

Bolibar, Mireia, Martí, Joel, Verd, Joan Miquel, Lozares, Carlos
Centre d’Estudis Sociològics sobre la Vida Quotidiana i el Treball (QUIT), Universitat Autònoma of Barcelona, Sociology, Bellaterra (Cerdanyola del Vallés), Spain

Aims: The paper aims to identify the diversity of immigrant populations’ settlement and integration processes in Catalonia from a personal networks perspective and to provide explanatory patterns for the different configurations found. Methods: The paper uses quantitative and qualitative data. Quantitative data comes from a personal networks survey to 153 individuals born in North Africa and Latin America. Qualitative data comes from narrative interviews conducted with 18 informants, who were selected from the previous sample based on the composition of their personal networks. Quantitative data is exploited mainly by multivariate procedures. Specifically, cluster analysis is used to obtain a typology consisting of three sorts of networks: transnational, ethnic enclave, and mixed. After obtaining these three profiles, a logistic regression analysis is used to test the effects of the selected explanatory factors. Qualitative data is exploited by means of a computer assisted content analysis in order to identify other explanatory factors. Results: Changes in the composition of personal network are explained, first, by factors that establish the conditions under which migration occurs (migration project and economic and social resources prior to migration). Moreover, these conditions and the labor and biographic trajectory in Catalonia largely determine the spheres (family, work and community) where immigrants develop their social interactions, which finally affect the composition and development of the personal
network. Conclusions: The results obtained indicate that assimilationism explanatory models fail to completely explain the variety of immigrants' personal network configurations. Other explanatory models such as transnationalism provide useful insights to explain our results.

**Transnational Social Fields and Social Spaces from a Network Perspective: Measuring Cross-Border Social Structures**

*Molina, Jose Luis*, Peterman, Sören, *Herz, Andreas*

(1) Universitat Autonoma de Barcelona, Bellaterra, Spain, (2) Max-Planck-Institut zur Erforschung multireligiöser und multiethnischer Gesellschaften, Göttingen, Germany, (3) Stiftung Universität Hildesheim, Institut für Sozial- und Organisationspädagogik, Hildesheim, Germany

Transnational social fields and transnational social spaces are concepts used interchangeably in transnational literature. Both terms refer to the complex of social connections across borders. In this paper, it will be argued that though social network ideas are introduced by transnational studies, they inherit often a metaphorical understanding of social networks when referring to transnational social fields and transnational social spaces. As a result, the potential insights of a empirical and analytical network approach to transnational studies are hardly discussed. Therefore the first part of the paper recaps the network ideas that motivated the concepts of transnational fields and transnational spaces, closely related with the two major lines of social network analysis (ego-centered and whole network approach). The second part of the paper elaborates the potential wealth of social network analysis in researching cross-border social fields and spaces, offering different conceptualizations and measures (clustered graphs, index of transnational variation) to delineate transnational social structures. While clustered graphs allow assessing transnational embeddedness, the index of qualitative variation can be used to show variation in transnationality in personal networks. The measures will be exemplified with the data collected in Barcelona from three groups (Chinese, Sikh and Filipino, N=25 in each group, 30 alters by ego). Finally, the pros and cons of the proposal will be discussed.

**Transnational and Cross-border Networks in a Micro-state Context. The Particular Case of Andorra**

*Pampalona, Judith*

Universitat Autonoma de Barcelona, Social and Cultural Anthropology, Bellaterra, Spain

Research explaining the success of ethnic enterprises stresses the role of support networks exhibiting embeddedness in both local and transnational contexts. This paper contributes to the existing literature by highlighting the importance of the context in which support networks are formed for the structure, composition and size of these networks. Most studies about ethnic entrepreneurship were performed in macro-societies where multicultural phenomena are latent and constantly rising, but hardly any studies have investigated the same phenomena in micro-societies (Armstrong and Read, 2003; Jönsso and Saemundsson, 2006), where the national geographical area is smaller, creating different opportunity structures from those established in larger contexts. Migrations in a micro-state context tend to be only international, which could affect the business opportunity structure as well as the composition of the entrepreneur’s network. Using a mixed-methods approach, this paper investigates the support networks of ethnic and native entrepreneurs in Andorra, a small country in the border between France and Spain. The results show that the location of Andorra not only enhances international migration, but it also produces a cross-border phenomenon: many people live abroad but cross the frontier every day in order to go to work or other daily activities. In this context, it is necessary to differentiate between transnational and cross-border support because, as we have found, transnational aids are important only initial stage in which the business is created, but cross-border relations are crucial for other types of support during the whole process of running the business.

**Cohesion and Segregation in Transnational Migrants’ Networks: An Ego-network Approach to Transnationalism and Assimilation**

*Vacca, Raffaele*, McCarty, Christopher

(1) Università di Milano-Bicocca, Department of Sociology and Social Research, Milan, Italy, (2) University of Florida, Bureau of Economic and Business Research, Gainesville, FL, United States

Transnational social networks are a major channel for contemporary migration from Africa, Latin America, and Asia to Europe. Non-European immigrants in Europe have very diverse personal networks, in both the countries of residence and the nationalities of social contacts. Such geographical and national diversity is a characteristic of network composition, but it also interacts with network structure in various ways: some migrants are embedded in dense networks where people from (or currently in) different countries know each other, in a situation of “transnational cohesion” or closure; others are more of a “transnational broker” between separate groups of social contacts who come from, or currently live
in, different countries. This variation is examined in a sample of around 600 ego-networks (each of 45 alters) of migrants in Barcelona, Spain, and Milan, Italy, collected by separate surveys in 2005-2006 and 2011-2012. Cohesive subgroups are identified in the networks using the Girvan-Newman algorithm, whose results are combined to map the variation of migrants’ networks between more "core-centered" dense structures and more factional ones. Measures of segregation of alter attributes (country of residence and nationality) in cohesive subgroups are then used to index the degree of transnational cohesion versus transnational brokerage in the ego-networks. These network metrics capture unique characteristics of migrants’ social life and social capital, thus suggesting some of the benefits of a social network approach to transnational studies. Their association with migrants’ assimilation is explored, showing how network measures can improve our understanding of both immigrant transnationalism and social integration.
Twitter Networks

Surviving the riots: Social media networks, crisis response, and hashtag lifespan in the aftermath of the London riots
Glasgow, Kimberly¹, Fink, Clayton²
(1) Johns Hopkins University Applied Physics Laboratory, Applied Information Sciences, Laurel, MD, United States, (2) Johns Hopkins University Applied Physics Laboratory, Laurel, MD, United States

In addition to providing mechanisms for forming and maintaining social networks, social media is a powerful medium for rapidly sharing information and organizing response in times of crisis or extreme events. The Twitter microblogging platform is particularly well suited for this function. Using Twitter data from the 2011 London riots, we analyze emergent social networks directly relating to Londoners’ response to crisis. We examine two networks of riot response oriented around riot cleanup or prayer activities respectively, as indicated by use of relevant hashtags as markers in the communications of Twitter users. These networks differ in size, structure, general membership, and prominent actors. We explore whether temporal patterns observed in social media communication relating to crisis response, such as hashtag “lifespan,” may relate to observed social processes and behaviors in these networks. This network perspective provides an alternative to hashtag “stickiness” or user popularity to our understanding of the patterns of ongoing use and longevity of topical signals such as hashtags in crisis response related communications.

How Twitter Connects to Information Sources over Time: Examining the Sourcing Pattern of OWS-related Tweets
Liu, Wenlin
University of Southern California, Annenberg School for Communication, Los Angeles, CA, United States

With contemporary social movements increasingly characterized by the use of social media, it is not yet well understood how information sources are referenced surrounding the movement, particularly in the networked space online. In this paper, it conceptualizes the use of hyperlinks in Twitter as an information referencing activity that is jointly shaped by two processes: the process of intermedia agenda setting, and the process of strategic resource mobilization by social movement organizers (SMOs). Regarding mechanisms that shape Twitter’s sourcing networks longitudinally, it further hypothesizes that two evolutionary logics, homophily and preferential attachment, explain the change of sourcing networks over time. Specifically, the homophily logic posits that information outlets of the same type are more likely to stay connected over time. And the preferential attachment logic hypothesizes that popular and structurally central sources are more likely to be connected. Using the sample tweets surrounding the Occupy Wall Street (OWS) movement, hyperlink network analysis is first used to identify key information outlets emerging from the OWS-related tweets. A typology of major information outlets is thereby developed, including mainstream media, movement-oriented/activism sites, social networking sites, and peer content production sites. To further test the evolutionary hypotheses, simulation investigation for empirical network analysis (SIENA) is conducted through R. Findings partially support the preferential attachment but not the homophily attachment logic.

BigBird vs. Big_Bird: The Formation of Consensus in Response to Novel Information
Margolin, Drew, Lin, Yu-Ru, Keegan, Brian, Lazer, David
Northeastern University, Boston, MA, United States

This study explores the potential influence of network structure on the diffusion and legitimation of an emergent consensus. The study examines the emergence and selection of novel but similar hashtags during the 2012 presidential debates. The debates provide a unique opportunity to observe a collective response to novel phrases around which new hashtags are formed, such as the references to “big bird” or “binders full of women.” When candidates first introduce these concepts, many hashtags are created. Over time, tweets converge onto one or two “dominant” or “winning” hashtags in a process that appears to resemble the selection of biological species. How do twitter users decide which hashtags to send their tweets to? And how do they learn about these “winners” in order to get attention for their own tweets? This study considers the role of networks as facilitators of diffusion and legitimation amongst otherwise equivalent alternatives. Analysis compares the re-tweet networks of the “dominant” hashtags to those that are neglected or become extinct and asks: do hashtags gain dominance from generating interest within cohesive communities with dense cores or broad reaching communities with long path distances? Are there measurable differences between
hashtags (such as length, use of novel characters) that predict how these network structures form? Our study provides empirical evidence to answers of these and related questions.

**Mapping Social Networks on Twitter: The 'Retweet' as a Social Practice**


(1)University of Minho, Center of Physics, Braga, Portugal, (2)University of Minho, Institute for Polymers and Composites IPC/I3N, Guimaraes, Portugal, (3)University of Minho, Communication and Society Research Centre, Braga, Portugal, (4)Instituto Superior Miguel Torga, Coimbra, Portugal, (5)INL - International Iberian Nanotechnology Laboratory, Braga, Portugal

This paper aims to analyse the practice of retweet on microblogging service Twitter as a new social bond on asymmetric networks aggregated through indexed content. The present research explores the appropriation of computer-mediated interaction tools and the techniques of semantic indexation, in order to understand whether there is an emergence of new forms of sociability within the social practice of retweet on Twitter. The empirical study focuses on how retweet networks, materialised on Twitter, may represent structures that allow to analyse streamings of indexed content and interactions as networks of users through the appropriation of content and conversation. The corpus of this study is a data set of 13179 tweets indexed with #cablegate. The network drawn has 15388 nodes and 15493 edges (interactions among the users with retweets). The results have revealed speed of information transmission and virality, as well as potential for collective action. However, the network also demonstrates poor cooperation and reciprocity. The global results validate the hypothesis that retweet networks are social structures fragmented into small cohesive groups were there are a prevalence of weak ties. There is an emergence of new forms of sociability that arise from retweet as a social practice which create relationships based on content and mobilise various modalities of social capital. Therefore, Twitter promotes a network environment simultaneously based on collective intelligence and direct action as retweets promote a new kind of social practice and, in some sense, social relationships.

**Implicit Sentiment Analysis with Word Networks**

*Tsvetovat, Maksim*¹², *Kazil, Jaqueline*¹, *Kouznetsov, Alexander*³

(1)George Mason University, Fairfax, VA, United States, (2)DeepMile Networks, Falls Church, VA, United States, (3)Independent, San Francisco, CA, United States

Sentiment analysis is a “hot topic” in the analysis of social media, blogosphere and news sources; in many ways it is replacing more labor-intensive methods such as focus groups and polling. However, Internet sentiment analysis suffers from a number of inherent problems. As a replacement for polling, it has a significant selection bias - results are heavily biased toward large urban centers as the concentration of social media users is significantly higher in urban areas. As a replacement for focus groups, sentiment analysis lacks in-depth inspection of content of discourse - thus missing the reasons why sentiment tends to take a specific direction. Sentiment analysis itself is rather inaccurate. Even human coders perform badly in randomized trials, as sentiment is a subjective metric. Finally, it is rather distasteful that the entire rich, varied, poetic spectrum of human emotions gets reduced to a number between -1 and 1. It is an inelegant approach to a complex problem. In our new approach to sentiment analysis, online speech is decomposed into word networks by use of a simple, but fast and memory-efficient preprocessor (that can keep up with a Twitter firehose if needed). Sentiment analysis then becomes a metric of structural equivalence between two or more speakers in the two-mode speaker-to-speech graph. We use this technique to estimate support for political candidates, measure effectiveness of advertising campaigns, as well as attempt to detect media bias in coverage of world events. Open-source code for our algorithm is available on GitHub.
Visual, participatory network analysis

**SocialMapExplorer: Visualizing Social Networks of MMOGs in Geographic Space**

Cai, Y. Dora¹, Ahmed, Iftekhar², Pilny, Andrew³, Poole, Marshall Scott⁴

¹Univ. of Illinois, National Center for Supercomputing Application, Urbana, IL, United States, ²Univ. of North Texas, Communication Studies, Dallas, TX, United States, ³Univ. of Illinois, Communication, Urbana, IL, United States

Large social networks, such as friend networks, working-group networks, trading networks and communication networks, are built when playing Massively Multiplayer Online Games (MMOGs). We present a visualization tool which maps and explores those social networks over geographic space. Implemented on the GoogleMap framework, this web-based interactive tool applies visual features, including color, size, shape, weight and font, to represent various network features. Different from other tools, it visualizes data on the real map and tightly combines spatial information with other attributes. The tool has been used for (1) analyzing network dynamics by visualizing social networks in time series; (2) investigating group assembly and evolution by tracing groups in visualized data flow; and (3) studying the correlation between census variables (such as age, gender, race, population, income, education, occupation, and marital status) and game player behavior variables (such as time, frequency, aggressiveness, achievement, and leadership) by overlapping the measurements of census data and game log data. We performed this study on EverQuest - 2 game logs. This tool has allowed us visually viewing the hidden networks on a real map; helped us discover the interesting events that trigger a group or a sub-group to emerge, shrink, and expand; and also assisted us to explore the relationships between census data and game data. We will present the design of this visualization tool, demonstrate its functions on real game data, and discuss its applications to the analysis of general social networks associated with geographic space.

**Identifying Relevant Stakeholders for Agricultural Biodiversity Conservation at the Regional and Local Scale**

Hauck, Jennifer, Werner, Anja

Helmholtz Centre for Environmental Research - UFZ, Leipzig, Germany

In 2012 the EU launched the new EU biodiversity strategy to make another attempt to stop and possibly reverse the loss of biodiversity until 2020. Green Infrastructure is pointed out in the strategic document as one strategy to contribute to conservation in urban as well as in rural settings by connecting habitats in the wider landscape. For the implementation of such a measure it is of utmost importance to identify the stakeholders at the implementation levels (regional and local levels) and the relations that connect them. We used the NetMap tool for our stakeholder analysis as it combines measures of attributes of actors - especially concerning their perceived influence and their goals - with structural measures. The investigation started with interviews with key informants on the regional level in the German Bundesland Saxony-Anhalt such as regional planners, representatives of relevant federal ministries and continued at the local level with farmers and other members of the community. Results presented will include information on the actors and their respective relationships that influence agricultural biodiversity conservation as well as the way influence is asserted.

**Assessment of Governance Structures in Coastal Management: A Social Network Analysis**

Lempe, Friederike, Strehlow, Harry Vincent

Thünen-Institute of Baltic Sea Fisheries, Rostock, Germany

Social network analysis has proved itself as a powerful tool in assessing natural resource management practices. This study aims at analysing network structures in a coastal management setting in the southern Baltic. These coastal areas act as important spawning and nursery grounds while at the same time spatial use and anthropogenic impacts are increasing. A huge number of diverse actors with different backgrounds in policy-making, management, nature conservation and fishery compete for the use of coastal areas, while a holistic, integrated approach towards the sustainable development is lacking. Instead various regional responsibilities, which often lack sufficient coordination and which sometimes even pursue opposed targets, hinder an integrated spatial planning. Qualitative interview methods are used to identify the different stakeholders within the multi-level governance system. Based on SNA we examine and visualize interaction and communication processes between the stakeholders. By this mean, we answer the question of how political influence was distributed within the multi-level governance system. Furthermore it is possible to analyse network density as well as the centrality and prestige of different stakeholders. Round table discussions are meant to establish a constructive dialog leading to joint sustainable management practices in coastal areas of the southern Baltic. During these roundtables we discuss network maps together with the stakeholders to raise awareness of network functionality and asymmetries. At the same time our research focuses on criteria for “good governance” like
effectiveness, legitimacy and participation. Our results will underline the use of SNA as a method for improved resource governance.

The Quality of Ego-Centered Social Network Data in Web Surveys: Experiments with a Visual Elicitation Method
Matzat, Uwe, Snijders, Chris
Eindhoven University of Technology, Sociology, Eindhoven, Netherlands

Traditionally, the measurement of ego-centered social networks is done with the help of an interviewer who is available for assistance and who can motivate the respondent to continue with the answering procedure. The most often used method to collect ego-centered network data was proposed by Burt (1984): first a contact list, then name-interpreters, and finally the inter-alter response matrix. Nowadays, network data are often collected via web surveys using the same three kinds of questions. However, research has shown that this procedure leads to a reduction of data quality, probably because respondents tend to answer items mechanically (Matzat & Snijders 2010). Our study presents the results of an online experiment that tests the usefulness of a visual way of eliciting participants' responses to network items. The implemented web survey tool presents the name interpreter and the inter-alter-response matrix in such a way that the participants immediately observe their own social network emerging. We hypothesized that participants find the experience more enjoyable, leading to an improved quality of data. We tested our hypotheses on two student samples and a sample of members of a commercial opt-in internet panel, leading to a total sample size of 725 participants. The results support the hypothesis that the quality of data improved even though we found no evidence that participants enjoyed the visual elicitation procedure more than the standard procedure.

Newborn Survival in Nigeria: Using Network Mapping to Understand Budget Politics
Schiffer, Eva
World Bank, Washington, DC, United States

Nigeria has the highest number of maternal and newborn deaths of all African countries, with 33,000 women each year dying during pregnancy and childbirth and 251,000 babies dying in their first month of life - often due to preventable and treatable causes. Newborn survival and maternal health interventions receive limited attention in governmental planning and budgeting processes and even the money budgeted for these activities often is not disbursed in full to the implementing partners. The study presented was undertaken to understand the political logic of the planning and release of funds, with the goal of improving advocacy strategies. A pen-and-paper based network mapping approach (Net-Map) was used to visualize and discuss the formal and informal networks involved in the process (funding, formal hierarchy, political pressure) in individual and group interviews. Wooden blocks were used to visualize the perceived influence of actors as influence towers. The network maps and discussion showed that a very different set of actors is highly influential in the planning process than in the disbursement of funds. The biggest stumbling blocks were seen in the process of disbursement. The most influential actors in this step were all located outside the health sector, some of them even outside the government. This means that advocacy strategies focusing on health actors and arguments have limited capability of changing the situation.
Visualization

Triangulation of Analysis Utilizing UCinnet, Keyplayer & siroSOM

Clunn, Rebecca¹; Dowd, Anne-Maree²; Ramsay, Sheryl³; Poropat, Arthur²
¹Griffith University, Business School, Brisbane, QLD, Australia, ²CSIRO, Earth Science and Resource Engineering - Science into Society, Brisbane, QLD, Australia, ³Griffith University, Griffith Business School - Employment Relations Human Resources, Brisbane, QLD, Australia

While the growth of network analysis and its methodological approaches increase exponentially, there are few studies in which multiple methods of analysis are applied to the same data set in order to compare focus and efficacy. This presentation will demonstrate multiple methods of analysis upon a single data set and discuss the theoretical and practical implications thereof. The data examined is a longitudinal social network study of an unbound performance art network, thought to have commenced c1975 and consisting of more than 3000 artists. An historical / comparative, cross-sectional approach using archival data was utilized. Cross-sectional samples were taken from the earliest found archival trace of the networks existence [1975] to present; decade slices were selected to create bi-partite matrixes. Each individual matrix was compiled to a single matrix consisting of 943 nodes and 95 events. Three software systems; UCinnet, R and SIROSom were utilized to analyse and visualize the data. These packages were selected due to their unique and complementary strengths for network analysis and visualization. The findings from these three methods of analysis were then compared and triangulated in order to demonstrate a multifaceted view and provide a deeper understanding of the networks’ evolution and function. This paper offers a brief history to the network, outlines the quantitative methods undertaken to achieve the mapping results, demonstrates the strengths and utilities of each software system and presents results from a structural analysis, theoretical and practical implications, followed by plans for future research in this area.

Layout Algorithm for Clustered Graphs to Analyze Community Interactions in Social Networks

Cruz, Juan David¹; Bothorel, Cécile¹; Poulet, François¹
¹Telecom - Bretagne, LUSSI, Plouzané, France, ²Universite de Rennes I - IRISA, Rennes, France

One way to analyze a social network is by identifying and understanding the communities that can be found within it. This analysis can be done in different ways, for example by identifying the relationships between communities and the nodes that can be important regarding these relationships. To perform the analysis we want to use a visual approach that allows us to extract this information. Communities within a social network can be seen as a clustered graph, which is a structure composed by a set of nodes, a set of edges and a tree representing the inclusion hierarchy of each node in their groups. These clustered graphs contain both the structure of the original graph and the configuration of the partition. Most of the existing algorithms to lay out clustered graphs are designed to represent clearly the limits of each cluster which helps to analyze just the structure of each cluster, however the links between groups are not taken into account while drawing the clustered graph, discarding important information for studying the interactions between groups and the role of the nodes in these interactions. In this paper we propose a novel layout algorithm that divides the nodes according to their neighborhood into two types: border nodes, which have neighbors in other and in their own community, and inner nodes, which have neighbors only in their own community. This division allows representing the interactions between communities and to differentiate the different clusters in the graph.

Meta-vertex Creation in Online Community Building: An Extension of Dooley’s Meta-agents in the Context of Online Communities

Horsethief, Christopher
Gonzaga University, MBA-AIE, Spokane, WA, United States

This paper presents findings drawn from a Native American online community-building network. The Ktunaxa speech community exists in the physical space adjacent to Montana, Idaho, Washington, and British Columbia. It also exists in several online forums, which facilitate purposeful communicative and cultural interaction. The sites are dedicated to increasing the cultural intelligence and resulting cultural competence by fostering community members’ post-perturbation decolonization efforts. Specifically, the sites promote the dissemination of information necessary to mediate a continually evolving collective cognitive ecosystem reflecting the values, beliefs, and systems found in the Ktunaxa culture. The data is drawn from vertex activity, including symmetric and asymmetric conversations, atemporal status posts, and collaborative authoring threads. Analysis of the data revealed complex social phenomena emerging
from vertex interaction. These included collaborative reaction to historic colonial measures designed to fragment the Ktunaxa social network, purposeful realignment of fragmented components of the Ktunaxa’s cultural network, and the creation of network vertices to promote small world architectures and scale-free nodal distributions. The paper presents both visual and quantitative evidence of network instantiation of Dooley’s meta-agents, which facilitate complex adaptive processes and result in significant qualitative differences in pre- and post-perturbation network structures. The analysis demonstrates community resilience in the form of mediated emergent collective memory, increased resistance to cultural entropy, and collectively intelligent fitness landscape negotiation.

Mapping Topical Landscapes of Social Sciences and Humanities

Mayer, Katja
University of Vienna, Vienna, Austria

The European Research Council (ERC), with its mission to encourage the highest quality research in Europe through competitive funding and to support investigator-initiated frontier research, covers a broad range of research projects due to its bottom-up structure: researchers themselves identify relevant research fields. In order to keep track of the multitude of research topics available in the ERC Social Sciences and Humanities (SSH) domain, it is necessary to find tools to help with the identification and description of the topical landscapes. SSH are often described as especially difficult to map and to survey, since the fields and disciplines are embedded in diverse and often diverging epistemic cultures. Some are specifically bound to local contexts, languages and terminologies, and the SSH domain is lacking coherent referencing bodies, dictionaries or thesauri. Knowledge extraction and classification are therefore difficult and involve both manual and automatic approaches. Furthermore, mapping SSH requires a well considered combination of text based and network based approaches in order to cope with the diversity of the field. Besides the outline of our empirical study design, the presentation covers the fundamental question: how can we know? We will discuss selected theoretical and practical implications of triangulating content analytical and network analytical methods, as well as limitations of analysis. In particular we will focus on the potential of visual analytics in regard to network visualizations of topical landscapes in the ERC SH funding portfolio.

Trade Routes of the Mind: On Social and Semantic Networks from a Conceptual Bird’s Eye View

Windhager, Florian
Danube University Krems, Knowledge and Communication Management, Krems, Austria

Despite working with closely related methods, social and semantic network researchers are rarely crossing their paths, let alone: their graphs. While social network research is analyzing and visualizing configurations of individual or collective actors, semantic network research is shedding light on configurations of concepts, as they are interwoven by thoughts, speeches and texts. Yet, the essential interdependencies between both subject matters are obvious: As trading routes of cognitions and emotions - usually expressed by interconnected concepts - social networks are simultaneously distributors and dependents of the semantic networks, which are sequentialized and channeled through their ties. To discuss some options of how these wide-ranging subject matters could be interconnected on a visual-conceptual level, the presentation will introduce a stereoscopic bird’s eye view on graph-based sociology and graph-based linguistics - and will outline a possible application within a generic knowledge visualization framework.
Creativity of ...Structures? The Effects of Semantic and Communication Networks on Artistic Communities

Creative Styles
Basov, Nikita1,2, Nenko, Aleksandra1,3
(1) St Petersburg State University, Faculty of Sociology, St Petersburg, Russian Federation, (2) St Petersburg State University - Bielefeld University, Center for German and European Studies, St Petersburg, Russian Federation, (3) National Research University - Higher School of Economics, St Petersburg, Russian Federation

The influence of social structures on creative style represents an attractive research subject. This is particularly the case when we focus attention not on individual creative styles, but on creative styles of artistic communities - groups of artists involved in intensive and expressive interaction with each other. Unique creative styles of different artistic communities develop in constant (re-)interpretation of the essence of art, discussions on the themes and formats for artworks, continuous interaction during collective creative process and representation of artworks in the city space. These processes are, no doubt, conditioned by knowledge and communication structures of artistic communities. We question to what extent and how creative styles depend on particular properties of such structures studying four diverse artistic communities located in St Petersburg (Russia). Semantic networks of the communities are mapped using transcripts of dialogues between the artists and of semi-structured interviews with the artists, as well as their textual works (articles in papers and magazines, poetry, novels, etc.), and posts in social media. Communication networks are mapped through network surveys run in each of the communities. Then we calculate quantitative measures of semantic and communication networks, such as density, centralization, average tie strength, etc. and identify positions of particular nodes in the networks. Further, we analyze the relations between the two types of networks of each artistic community. Finally, throughout comparative qualitative analysis across artistic communities we attempt to trace the complex impact on different features of creative styles made by semantic and communication networks properties.

Structural Balance in Story Structures
Kim, Jinseok, Diesner, Jana
University of Illinois at Urbana-Champaign, Library and Information Science, Champaign, IL, United States

What makes a story compelling? A plot, a combination of agents and events, arranged to achieve literary effects, is one element contributing to the immersive effects of stories. The relationship between characters is one of the most integral parts of a stories' structure. Several scholars from different disciplines have attempted to map the relations among characters. Despite their contribution to the understanding of stories from a network analytic view, the common prior approach has been limited in that conflicts between characters are often not adequately captured. This is because most previous studies have focused on positive relationship such as co-occurrence, friendship or conversational relation, while negative relationships such as conflicts or animosity are often disregarded. To address this limitation, this study aims to capture the characters' relationship in terms of conflict as well as positive relationships, and to describe how negative relationships co-evolve with positives ones as the story unfolds. Based upon the theory of structural balance suggested by Heider in the 1940s and extended by Cartwright and Harary in the 1950s, this study looks into ten plays by Shakespeare. Through this conceptualization, story structures of Shakespeare plays are defined in terms of structural balance and then compared within the plays and with previous research outcomes to reveal author's consistency in story construction strategy. In this way, combined with other network analysis techniques, structural balance approach may shed a light on common aspects of prominent stories in history.

Constructing Social Space: Narrative and Discourse Analysis
Meindl, Claudia1, Rausch, Alexandre2
(1) Goethe-Universität Frankfurt, Center for Empirical Research Methods, Frankfurt/Main, Germany, (2) Goethe-Universität Frankfurt, Frankfurt/Main, Germany

According to Atkinson (2007), “we are a storytelling species”. The importance of stories as scripts has also been emphasized by Harrison White (1992). Natural narratives as examples of social action help constitute our realities, but it is unclear how social space is constructed by the reader/listener in such temporal-spatial settings. Graph theory can provide technical tools for analyzing narratives by bridging the gap between performative and structural standpoints. We use experimental and corpus based data to explore the whats and the hows in the social discourse of elderly people. In doing so, we offer a synthesis of structuralist and cognitive approaches in the domain of aging studies.
Virtual Mirroring of the Collaborative Chronic Care Network: A Longitudinal Social Network Analysis

**Provost, Shannon M.**, **Gloor, Peter**, **Grippa, Francesco**, **Pace-Scrivener, Molly**

(1)The University of Texas at Austin, Austin, TX, United States, (2)Massachusetts Institute of Technology, Center for Collective Intelligence, Cambridge, MA, United States, (3)Northeastern University, Boston, MA, United States, (4)Cincinnati Children's Hospital Medical Center, Collaborative Chronic Care Network, James M. Anderson Center for Health Systems Excellence, Cincinnati, OH, United States

Previous SNA research has depended on time-invariant theories and correlational designs with self-reported data on the nature and intensity of relationships. Through analysis of primary email communication data over two years, we characterize emergent structural and semantic dynamics of the evolving Collaborative Chronic Care Network (C3N). The C3N is a multidisciplinary incubator of patients, clinicians, and researchers designing a new system for chronic illness care; we study patterns of language and interaction within and between twenty innovation teams working on diverse aspects of this project. We introduce virtual mirroring, a network intervention with team-based feedback sessions drawing on SNA tools along with data-mining and clustering algorithms for content and sentiment analysis. We thereby participate in the creation of a self-organizing feedback loop that serves to: visualize knowledge flows, explore a project-specific vernacular, reveal ongoing opportunities for improvement, and re-engineer team structures and processes. Virtual mirroring may encourage individuals to change behaviors in pursuit of targeted outcomes as well as identify opportunities for team leaders to support ongoing cycles of innovation and execution. We also draw on survey data from C3N team members and project leadership panel ratings. The main research questions leading this study include: What are the salient mechanisms by which virtual mirroring may enhance innovation team performance? To what extent can fluid structures, generative communication, distributed leadership, focused language, valence symmetry, and/or linguistic variation enhance innovation team performance? How the processes around virtual mirroring help us to design and manage emergent networked systems such as the C3N?

Detecting Thematic Patterns in Movies: Network Formalization of Semiotics

**Sonmez, Sirma**, **Suerdem, Ahmet K.**

Istanbul Bilgi University, Istanbul, Turkey

Cultural artefacts such as movies are packed with empirical evidence about the mentality of a community. These artefacts are habitually analysed by means of semiotic methods. However, classical semiotic analysis is a qualitative exercise. The aim of this paper is to offer a method for quantifying semiotic patterns in terms of network analysis indicators. According to the semiotic theory, signs do not contain any meaning by themselves but they signify in terms of their relations to the other signs. Semiotic signification is not a simple aggregate of representational elements with fixed meanings but is a network where signs are the vertices where meaning flows. Signs constitute meaning as they follow each other. For operationalizing semiotic network, we analysed the movies most influential for a certain generation. We coded each scene with a certain theme. We obtained a matrix where the rows are the representations (representamen) and columns are their interpretations (interpretant) in terms of the sequential occurrence of the themes. The relation here is signification since a playwright arranges events usually as a plot of themes. In total, the probability distribution of sequence of events is asymmetrical since they follow a pattern. Some interpretants are more probable than others to follow a certain representamen. An arrangement is a pattern. Sequential organization of themes can be represented as a network. Network measures can give us important information about the flow of signification as the meaning value of a sign occurs in terms of its position in the semiotic structure.

The Effects of Embeddedness in Online Social Networks for Patients of Chronic Diseases

**Tilly, Roman**, **Posegga, Oliver**, **Gloor, Peter A.**

(1)University of Cologne, Department for Information Systems and Information Management, Cologne, Germany, (2)University of Bamberg, Information Systems and Social Networks, Bamberg, Germany, (3)Massachusetts Institute of Technology, Center for Collective Intelligence, Cambridge, MA, United States

The goal of this project is to better understand the effects of increased embeddedness among patients in chronic illness populations who participate in online social networks. We present an experimental community building platform (YouMelIBD). Initially targeted at patients of inflammatory bowel disease (IBD), the platform can be extended to other chronic disease groups. Our hypothesis is that facilitating connections among patients through homophily will result in greater embeddedness, which will increase a sense of social support and self-efficacy, and ultimately improve outcomes like the individual wellbeing of patients. In the paper, we will present the detailed study design of an experiment to test the hypotheses. Our initial research shows that Facebook users who comment on IBD-related discussion boards do not
necessarily friend one another, while posters on interest-based discussion boards often become friends. Therefore, we argue that allowing IBD patients to discover their shared interests will trigger friendship requests based on homophily, and will hence increase the embeddedness in the IBD patient community. Accordingly, the core of our platform is a recommendation system, which uses personal and structural attributes of patient users to suggest to them like-minded patients with similar backgrounds and symptoms. Moreover, YouMeIBD extends Facebook and is thus able to include attributes and networks of its users’ Facebook profiles in the recommendation algorithm. In addition, users can take a game-like quiz where they can answer matchmaking questions defined by other users and create their own questions.
Words and Networks: Journalism Public Opinion

Exploratory Discourse Analysis of an Emergent Field - Massive Open Online Courses

Dolgova, Evgenia
Leeds University Business School, Leeds, United Kingdom

Massive open online courses (MOOCs) rapidly change the landscape of higher education. To understand the major drivers of change in an established field, I apply exploratory semantic network analysis to determine the key actors and major issues that lie at the heart of the debate around MOOCs. For that purpose, I analyze the discourse arising around the MOOCs in the major newspaper specialized on news from higher education. First, using Automap I conduct automated text analysis to extract the major organizational players involved into this discourse, and then apply ORA to construct a network of these organizational actors to depict the relationships among them and to determine their relative prominence. Second, I also conduct a semantic network analysis to determine which central concepts dominated the discourse over the different time periods.

Wikipulse - Automatically Generating an Online Newspaper from Wikipedia Articles

Futterer, Tobias¹, Gloor, Peter², Malhotra, Tushar³, Mfula, Harrison¹, Packmohr, Karsten¹, Schultheiss, Stefan¹
(1)University of Bamberg, Bamberg, Germany, (2)MIT, Cambridge, MA, United States, (3)Aalto University, Helsinki, Finland

More and more, user-generated content is complementing conventional journalism. While we don't think that CNN or New York Times and its professional journalists will disappear anytime soon, formidable competition is emerging through humble Wikipedia editors. In earlier work (Becker 2012), we found that entertainment and sports news appeared on average about two hours earlier on Wikipedia than on CNN and Reuters online. In this project we build a news-reader that automatically identifies late-breaking news among the most recent Wikipedia articles and then displays it on a dedicated Web site. Our task consists of three parts: 1. find relevant articles, 2. reformat the articles in news style format and 3. display them on a Web page. The core of our system consists of an algorithm that automatically finds the most news-worthy articles on Wikipedia grouped by news related categories (e.g. Current Events, Sports, Politics etc.). Besides obvious selection criteria such as the most recently edited and searched articles, in the first step, we also employ algorithms from earlier work (Fuehres 2012), where we discovered that building an article network based on “shared-editorship” links - two articles obtain a link if the same editor edits both of them - points out the most important recent articles. In the second step we reformat the Wikipedia articles, which are written in factual history-style, into a more journalistic-style, using automatic abstract generation techniques. The final step consists of displaying the articles in a reader-friendly online newspaper.

Predicting Customer Satisfaction through Social Network Analysis

Gloor, Peter A.¹, Giacomelli, Gianni²
(1)MIT, Center for Collective Intelligence, Cambridge, MA, United States, (2)Genpact, New York, NY, United States

Measuring the long-term health of customer relationships is key for any vendor of goods and services. This is particularly true for organizations engaged in providing enterprise services such as administrative support, account payable, payroll, and other back office support. The traditional way to monitor these issues is through customer satisfaction surveys, but they are neither timely nor granular enough to provide detailed information to the service provider. In this paper we discuss first results obtained comparing the social network structure of the e-mail interaction between a provider of global office support of information processing and its customers with customer satisfaction measured through Net Promoter Score (NPS), (Reichheld 2003). Analyzing e-mail communication patterns allows predicting customer satisfaction with much less effort than administering a survey to thousands of end users, and much more frequently than just once every six months as is currently the case with NPS. We have analyzed two groups of customers of the service provider. In the first project we collected the e-mail boxes of two to three account executives per customer, comparing their network structure with the NPS score of the customer. In the second project we collected the e-mail headers of the account executives from the firewall log, comparing their networking structure with NPS. In both projects we found significant correlation between network structure and NPS. We were also able to identify e-mail interaction patterns predictive of happy and less happy customers, leading to recommendations for improved communication between service provider and customer.
Spillovers in Networks of User Generated Content: Evidence from 25 Natural Experiments

Kummer, Michael
ZEW Mannheim, Mannheim, Germany

Content spillovers are a phenomenon that might be of central importance for explaining the high quality of user generated content that has puzzled researchers from both economics and other fields. However, the classical setting of user generated content typically takes the form a network of content provided by a network of authors. While correlations are abundant in such a setting it is typically very difficult to identify causal effects or even only shocks to the network. This paper proposes to use observable (to the econometrician) shocks to identify the content spillover that results from links between articles on the German Wikipedia. Such shocks are generated by ex-ante unpredictable but ex-post observable large scale events such as natural disasters. To identify the effect in question I focus on the effect of such events on articles that receive an indirect link from directly affected articles. I use only pages that were indirectly linked before the disaster hit and, in a later stage I hope to use text analysis to rigorously verify whether the newly created content in a page is related to the shock or whether it is fresh content that adds information beyond the shock. Knowing whether spillovers in content networks exist and how exactly they work would provide important insights into how humans provide and share content or knowledge. It is also relevant to newly created content platforms that are eager to acquire a minimum necessary level of content that guarantees the platform’s survival.

How the Guggenheim Museum Changed the Network Position of Bilbao - Evolution of a City Network

Plaza, Beatriz¹, Haarich, Silke N.²
¹University of the Basque Country UPV/EHU, Faculty of Economics, Bilbao, Spain, ²Regional Research Consultant, Datteln, Germany

“The Guggenheim Museum has put Bilbao on the map.” This metaphor has been applied numerous times to describe the process of physical and economic regeneration which took place in Bilbao in the 1990s and made the medium-sized city at the Spanish Atlantic, if not famous so at least popular among experts in museum management, urban renewal, and contemporary architecture. But, how exactly can the process of “putting Bilbao on the map” be described? The aim of the presentation is to review the international networking dynamics around Bilbao as influenced by the Guggenheim Museum Bilbao. This presentation presents the results and conclusions of a formal network analysis of Bilbao and a selection of international actors/elements and their relations among each other. The analysis focusses on the comparison of the Bilbao network in three different time periods: 1991-1995, 1999-2004 and 2007-2011. The research is based on approaches and tools (UCINET, Netdraw) applied in social network analysis (Freeman 2004) and inspired by the application of these tools to the analysis of the relationship between cognitive concepts (words, texts) and social, personal or organizational networks, especially in the tradition of textual analysis by Carley (1986 and 1994) or the co-citation analysis approach (e.g. Small 1973, Small and Garfield 1985, White and McCain 1998).
Status Orders in Task Groups as Precedence Networks: An Application of Author-topic Models to Discussion in Mixed Status Groups
Broniatowski, David Andre¹, Skvoretz, John²
(1)University of Johns Hopkins, Baltimore, MD, United States, (2)University of South Florida, Sociology, Tampa, FL, United States

The effects of exogenous status (gender, occupation, race, beauty) on rank in a task group's power and prestige order have been the focus of a long-standing research program in social psychology, expectation states theory. Network implementation of ideas from this program by Skvoretz and Fararo (1996) postulate that micro status orders emerge in task group interaction as precedence networks, specifically, tournaments of ties of status precedence. We focus on how this approach can be empirically evaluated by Author-topic modeling methods (Rosen-Zvi et a., 2004) used by Broniatowski and Magee (2012) to uncover structure and leadership style on expert panels of the US Food and Drug Administration. The data consist of transcripts from 79 six person groups, varying in status composition induced by experimental manipulation, assigned to discuss and rank fifteen items relevant to survival in a hostile environment. The key question is whether the Author-topic models produce precedence networks that exhibit transitivity at greater than chance levels as predicted by expectation states theory.

User-oriented Semantic Analysis: Construct Concept Similarity Networks Based on User Preference
Huang, Yun¹, Lee, Baozhen¹, Contractor, Noshir²
(1)Northwestern University, Evanston, IL, United States, (2)Jiangsu University of Science and Technology, Zhenjiang, China

Text semantic analysis aims at constructing concept similarity networks based on documents and included keywords. Previous studies are mostly based on linguistics or keyword co-occurrence. Linguistics approaches use lexical databases and grammatical rules to find thesaurus and word association. These approaches usually are useful for specific fields or languages but not adaptive. Keyword co-occurrence approaches such as the Latent Semantic Analysis (LSA) use document-keyword association relations and mathematic calculation such as Singular value decomposition (SVD) to estimate keyword similarity. Although it is context independent, the lack of semantics meanings makes it difficult to further improve the accuracy. With the development of social networking and data tracking technologies, individual persons are now connected with documents and keywords in many applications in triples such as (users, resources, tags) in social tagging and (authors, documents, keywords) in scientific papers. Users' repeated activities demonstrate their preferences and expertise and in turn reveal the semantic meanings of related documents and keywords. In this paper, we propose a User-oriented Semantic Analysis (UoSA), which uses user preference information to optimize LSA. Our model uses the patterns of user-document and user-keyword relations to justify the weights between keywords and documents and applies SVD to construct concept similarity. We evaluate the UoSA model using the dataset of social tagging activities on CiteUlike. Comparing to SVD and High-order SVD approaches, we show that our model has better consistency and more discrimination power in concept similarity networks that constructed.

The Different Topologies of Latent Semantic Analysis (LSA) and Social Network Analysis (SNA), and Their Relevance for the Generation of Discursive Knowledge
Leydesdorff, Loet
University of Amsterdam, Amsterdam School of Communication Research (ASCoR), Amsterdam, Netherlands

Positional and relational perspectives on network data have led to two different traditions in textual analysis and social network analysis, respectively. Latent Semantic Analysis (LSA) focuses on the latent dimensions in textual data; Social Network Analysis (SNA) on the observable networks of communications among agents. The two coupled topologies of information-processing in the network space and meaning-processing in the vector space operate with different (non-linear) dynamics. Meaning is provided at the systems level with reference to structures in the data; multi-dimensional scaling (MDS) provides an appropriate tool for visualizing the data from this perspective because MDS organizes the maps along eigenvectors. Graph-analytical approaches and force-based spring layouts, however, are appropriate for the analysis of network spaces. The historical dynamics of information processing in the observable networks organizes the systems dynamics into instantiations; the systems dynamics, however, can also be self-organizing in terms of fluxes of communication along the various dimensions that operate with different codes of communication. The codes can be symbolically generalized and then warrant the development of discursive knowledge at the supra-individual level (as a feedback). Thus, the development over time adds evolutionary differentiation at the systems level to historical
organization in the network. This double-layered structure can process more complexity and be explained in terms of word-author combinations (e.g., cited references) that emerge, bifurcate, and disappear. The next-order dynamic remains reflexively accessible to agents at the network level.

**Why So Similar?: A Social Theoretical Approach to Document Comparison**

Lin, Yu-Ru, Margoline, Drew, Lazer, David
Northeastern Universities, Boston, MA, United States

The abundance of digital textual archives has lead to a proliferation of techniques for comparing documents, the document comparison literature has not adequately considered the processes by which documents are produced. Drawing on communication theory we identify three broad processes by which two documents might be detectably similar in their textual features based on the length of the n-grams in which documents overlap. We describe these processes as authors sharing subject matter, sharing goals, and sharing exposure to the same sources. We hypothesize that these processes produce distinct, detectable signatures that can in the social space of the of the authors that produce the documents. To test this hypothesis, we use the known attributes of members of U.S. Congress, and construct social networks that reflect their underlying relationships in terms of ideological similarity and participation in common organizational structures such as chambers and committees. We then compare these known networks to networks we construct from similarities in their public statements. Our results support the hypothesis that these three processes are reflected in distinct kinds of document similarity. The computational approach employed in the analysis and future applications of the technique for the analysis of words and networks are also discussed.

**Document Corpus Analysis Based on Term Entanglement**

Melançon, Guy, Renoust, Benjamin, Viaud, Marie-Luce
(1)Université Bordeaux I, Computer Science, Talence, France, (2)INA, Paris, France

Developing strategies to browse and explore large document collections still remain a focus of attention. This task can be tackled using various techniques, typically combining term indexation and statistical analysis of term occurrences on the analysis side, and Euclidean embedding’s (MDS, graph drawing) and document clustering on the visualization side. The complexity of this task produces results of varying quality and inevitably carries noise. At any rate, users must be careful when interpreting Euclidean proximity or grouping of documents. Groups of documents output by algorithms may not be as cohesive as a layout algorithm displays them on the screen. We address this problem by computing a relevance feedback index for any group of documents (selected by the user, or forming a cluster) confirming/infirming whether a group of documents can be trusted to form a semantically coherent unit. The index is inspired from past work by Ronald Burt -- document visualization meets social network analysis -- and relies on the study of term entanglement between documents. Transferring Burt’s ideas to documents and terms leads to the computation of group homogeneity and intensity indices quantifying the interactions among documents through index terms.
Network approaches to text analysis implicitly assume that the resulting graphs mirror the semantic connections readers make between concepts presented in the text. However graphs derived from both n-gram and linguistic approaches contain paths that do not appear in the original texts, especially when they are produced for large texts or text collections. These “synthetic” paths may exist in the minds of readers, because of semantic activation spreading from nearby concepts. But if this is not the case, then such paths represent noise and raise doubts about the ecological validity of the approach. This study offers a test of these outcomes using a false memory paradigm commonly used in psychological research. Two stories were written on similar topics and two-mode, directed graphs were produced representing their content. Four types of statements were then constructed: (a) from paths representing actual events in the stories, (b) from synthesized paths that exist in the graphs but not in the actual stories, (c) from nodes in the graph that are not connected in any way, and (d) from nouns and verbs that do not exist in the graphs. After reading the stories participants were asked to indicate whether the sentences were “old” or “new” with respect to the stories. Results will show the probabilities of an old judgment in each of the conditions, and test the hypothesis that old (a) > old (b) > old (c) > old (d), both immediately following reading and with a delay.

Error Propagation and Robustness of Relation Extraction Methods

Diesner, Jana, Carley, Kathleen M.

(1) University of Illinois at Urbana-Champaign, The iSchool, Champaign, IL, United States, (2) Carnegie Mellon University, School of Computer Science, Pittsburgh, PA, United States

Extracting network data from natural language text data requires making several methodological choices. These choices relate to the pre-processing of text data and the identification and classification of nodes and edges. The impact of these choices on the resulting network data and analysis results is not well understood, but can have strong implications for practical applications. To address this limitation, we have conducted a series of empirical studies. We provide answers to the following questions; focusing on reference resolution and co-occurrence based link formation: First, what differences in the structure and properties of network data are due to different parameter settings for relation extraction sub-routines? Second, given that relation extraction is a sequential, multi-step procedure, how do error rates of these sub-routines propagate through this process? And third, how much of method-induced variations in relation extraction results can be eliminated by increasing the accuracy of these sub-routines? Our findings suggest that reference resolution on text data can change the identity and weight of 76% of the nodes and 23% of the edges in the retrieved network data, and causes major changes in common network metrics and the set of identified key entities. Minor changes in accuracy rates of reference resolution lead to comparatively huge changes in network metrics, while the set top-scoring key entities is highly robust. Co-occurrence based link formation entails a small chance of false negatives, but the rate of false positives is alarmingly high. We conclude with recommending strategies for mitigating the identified issues in practical applications.

Combining Social and Semantic Networks: Methodological Challenges in Social Network Analysis

Hellsten, Iina, Groenewegen, Peter

VU University Amsterdam, Organization Sciences, Amsterdam, Netherlands

Until recently, social and semantic networks have rarely been combined in network research. Yet, combining these two parts of networks - the social structure and the meanings embedded in the social networks - is crucial for overcoming structure-content tension within network research. We argue that networks can be considered as bounded entities consisting of both actors and shared meanings, i.e. both structural and semantic elements. In this paper, we will organize recent network literature combining content and structure in networks by focussing on three different strands of network literature: social network analysis, relational sociology and semantic network research that have all dealt differently with the tension between structure and content in networks. Each of these strands has approached networks from a different perspective. We will build upon the concept of actors as nodes from social network analysis, the focus on ties from relational sociology and the concept of meanings from semantic network analysis as key ingredients for our approach to actor-meaning networks as bounded entities. Our argument is that connecting actors and meanings as
bounded entities provides ways to overcome the underlying structure-content tension in recent network research. Untangling the dilemma between structure and content will enhance and stimulate a new research agenda for empirical analysis suited for the currently available wealth of large amounts of data in Web-based digital databases. We will suggest three strategies to overcome the content-structure dilemma in network research, in particular entangling questions of sudden avalanches in networks, community formation and dynamics of communication networks.

Sociosemantic and Social Networks in the Context of a Deliberative Forum

Robert, François P., Mongeau, Pierre, Saint-Charles, Johanne
(1)UQAM, Communication Sociale et Publique, Montréal, QC, Canada, (2)Faculté de Communication, UQAM, Montréal, QC, Canada

More and more deliberation forums are established with the aim to build a consensus between individuals holding divergent views on various topics. In this paper, we will explore the links between the sociosemantic network, constructed from the semantic similarities, and the discussion network of the participants at a deliberation forum. We will present the main steps of the data collection and procedure for the construction of the sociosemantic network and then proceed to analyze the links between this network and the discussion network of participants. Results show that people tend, in the context of this type of deliberative forum, to discuss with people who support ideas different from their own which result in a radicalization of their position. Implications of these results for deliberation forums will be presented.

Social and Sociosemantic Relationships: How Connected Are They?

Saint-Charles, Johanne, Mongeau, Pierre, Rioux-Pelletier, Marie Eve, St-Cyr Bouchard, Maude, François, Robert
(1)Université du Québec à Montréal, Cinbiose, Montréal, QC, Canada, (2)Université du Québec à Montréal, Faculté de Communication, Montréal, QC, Canada

A sociosemantic network may be conceived as a specific type of cognitive social network for which the relationships between individuals are based on their discourse similarities. That this network should be related to social networks is an accepted postulate although there is still a paucity of studies supporting it. Through the study of small groups, of deliberation fora and of larger transdisciplinary groups and communities of practice, we have been exploring the links between sociosemantic and social networks. Those links appeared not as straightforward as the postulate may seem to imply. In this paper will present an overview of our results, analysing the impact of different types of network analysis (types of relationship, centralities, similarities, etc.), types of semantic data collected and type of qualitative analysis (words, themes) and of different types of groups (homogeneity vs heterogeneity, size, goals, etc.).

Issue Spaces as Semantic and Social Networks: Does what you Know Determine who you Know and Vice Versa?

Young, Lindsay E., Narayan, Sneha, Contractor, Noshir
(1)Northwestern University, Communication Studies, Evanston, IL, United States, (2)Northwestern University, Computer Science & Communication Studies, Evanston, IL, United States

In a complex and crowded public sphere, we need a better understanding of the mechanisms that structure social issues and allow them to thrive within the competitive issue ecology. Unlike collaborative spaces that exist within the boundaries of a field or industry, an issue space is comprised of actors from a variety of contexts brought together by a common interest in the focal issue. This makes patterns in actors’ conceptions of the issue an important factor to account for when identifying processes underlying their social interactions. Therefore, we seek to determine the extent to which shared interpretations of an issue motivate collaborations amongst members of an issue space. To this end, we examine a population of professionals working in the gender and sustainability issue space. Drawing from actors’ responses to an open-ended survey question about their interpretation of this space, we use centering resonance analysis to capture the semantic similarities between actors. Then, using p*/ERGM techniques, we estimate the effect of semantic similarity on the collaborative structure of the issue space. Examining the relationship between semantic and social dimensions of an issue space shows how actors’ interpretations of the issue affect their strategic interactions to advance the issue. More broadly, delineating these two dimensions reveals an issue as being constituted by discourse and social interaction. In particular, the degree to which the semantic and social relationships within an issue space reinforce one another has implications for how the meaning of an issue is controlled and managed in the public sphere.
Transnationalized Discourses: The Emergence of Common Semantic Structure and the Synchronicity of Distinct National Debates on the Financial Crisis

Baden, Christian1, Motta, Giovanni2, Dimitrakopoulou, Dimitra3

(1)LMU Muenchen, Institute for Communication Science & Media Research (IfKW), Muenchen, Germany, (2)Columbia University, Department of Statistics, New York, NY, United States, (3)Aristotle University Thessaloniki, Department of Journalism & Mass Communication, Thessaloniki, Greece

Transnational crises have the potential to initiate communication between distinct national discourses (Meyer, 1999): Research shows that international public agendas sometimes converge to discuss “the same issues at the same time” (Eder & Kantner, 2000: 315). However, it is still unclear how deep this synchronization runs: To speak of transnationalized public spheres, these issues also need to be framed in similar ways in distinct debates. Existing strategies at measuring frame similarity, however, either proceed in a non-standardized manner, or use content-analytic measures that assume time-invariant frames and depend heavily on the abstraction level of coding. By contrast, semantic network analysis enables a reliable measurement of the amount of structural isomorphism between concept association patterns in distinct debates (Baden, 2010). It allows for an inductive detection of evolving frames, and registers also partial similarity of frames across debates. This paper advances a methodological strategy that enables the dynamic analysis of structural similarities in distinct debates’ semantic network representations over time. It draws upon Evolutionary Factor Analysis (Motta & Baden, 2013) - a innovative statistical approach to detecting time-varying latent structures in high-dimensional network data. Our analysis records the German and Greek debates on the current financial crisis in fine grain and models its time-dependent evolution in a theoretically grounded fashion. It applies several new extensions to EFA that allow a parametric estimation of global, regional, and local similarities between debates. Findings show that the synchronization between debates varies considerably over time, and only extends to specific parts of the semantic network.

How Do Political Institutions Structure Political Discourse?

Haunss, Sebastian
University of Bremen, SFB 597 Transformations of the State, Bremen, Germany

Public debates about politics take place in institutionally pre-structured arenas. The media reports more likely and more intensely about some actors and neglects statements from others. An actor’s role within national and/or international institutional systems affects his/her visibility in the public sphere. While these aspects are well-known in the political communications literature, research has so far mostly focused on the role of individual political actors or specific actor groups. The interaction between the overall structure of political discourses and institutional structures has not been systematically researched. In my presentation I will address this question by comparing across four countries (Germany, Switzerland, Great Britain, US) and across time (1998-2007) political discourses in which actors legitimize or delegitimize their respective national political systems as a whole or their political systems’ core values and institutions. Drawing on a large set of coded evaluative statements reported in two quality newspapers in each country between 1998 and 2007, I analyze how discourse networks that change over time nevertheless share stable underlying structures, and to which extent these structural features of the national discourse networks reflect or are independent of the idiosyncrasies of the respective institutional systems.

Evidence of Things Not Seen: Mapping the Ideological Networks of Agent Orange

Hopton, Sarah Beth
University of South Florida, English, Tampa, FL, United States

In the past five years, the United States has shown a greater willingness to fund ecological and environmental remediation activities in Vietnam. In fact, since 2007, the U.S. Congress has appropriated $59.5 million for dioxin removal and related health care activities in Vietnam, but for the last 35 years, the remediation of contaminated dioxin sites has been backburnered in policy talks. Why? And why has Agent Orange/dioxin remediation and remuneration now, rather suddenly, emerged as a regular topic in bilateral policy discussions between the U.S. and Vietnamese governments? This paper analyzes how the actors involved in the policy discussions of Agent Orange and the politics of risk and remediation are ideologically related. In it, I map the controversies surrounding policy changes concerning Agent Orange using a combination of actor network theory, discourse analysis and network visualization tools. I demonstrate one use of Philip Lefield’s Discourse Network Analyzer, a tool uniquely suited to analyze ideological networks. My results are visualized.
using GEPHI and ORA. This work "maps" ideological networks and shows how rhetoric shapes the ideas that become public policy. Making the networks of language, actors, and influence visible answers important questions about how scientific knowledge is created and communicated, and how international environmental policy is made and remade across time.

EU Regulators: A Structure and Content Analysis

Nerghes, Adina

Vrije Universiteit Amsterdam, Organization Sciences, Amsterdam, Netherlands

In this paper text documents will be used as data sources for social network analysis and semantic network analysis. By connecting Social Networks and Semantic Networks, in the particular case of crisis in society, the article aims to provide a richer model for analyzing the structure and communication content of social networks as a united element. With a focus on the debate relevant to the financial crisis that started in 2008, the article addresses content and structure of social networks during crisis in society. The analysis is focused on the European Union financial regulator’s network and their discourses. Using data from the archive of press releases of the Central European Bank and The European Commission, this study analyzes the use of language as well as the social structures in these documents. The ways in which the discourses of these regulators characterize the financial crisis, and the social structures that emerge from these characterizations can enable us to uncover and identify specific crisis patterns. While national states members of the European Union delegate some of their authority to these supranational organizations, we assume that this supranational feature makes their discourses more salient during crisis. The meanings and structures embedded into their discourses have an influential character in shaping the perceptions regarding the financial crisis, and these perception may further influence decisions and reactions of network actors. The results open up new approaches to the analysis of networks and discourses, revealing at the same time key representations of crisis in society.

Using Semantic Network Analysis to Examine Traditional and Social Media with NATO

Stephens, Kimberlie¹, Fann Thomas, Gail², Neff, Jessica¹

(1)University of Southern California, Los Angeles, CA, United States, (2)Naval Postgraduate School, Monterey, CA, United States

In today's global security environment, communication is central. Through social media, information spreads at an unprecedented pace. Because perception is reality, international security organizations such as NATO are increasing concerned with social media and its ability to support or thwart its strategic efforts. As a part of NATO's ongoing Strategic Communication planning, they are experimenting with multiple communication channels worldwide, including traditional media, internet-based media and public engagement, to build awareness and understanding; and thereby gain support to develop decisions and operations consistent with NATO's international policies and procedures. Our study analyzes various social and traditional media platforms relevant to NATO's strategic initiatives. Using Leximancer, a semantic network analysis software, and UCINET we compare semantic networks for twitter, blogs, microblogs, comments, and traditional media. Analyses show semantic similarities and differences between and within platforms over time.
Would you Like your Leader Sweet or Savory? Network Position of Followers and Leadership Behavior Preference
Aksehirli, Zeynep
Ozyegin University, Istanbul, Turkey

In its widest interpretation, leadership is recognized as influence of behavior towards a desired end. A large stream of research is devoted to making a distinction between leader's focus on building their relationships with followers and their focus on organizing task details to help their followers to get things done. The behaviors that support each of these approaches are labeled “consideration” and “initiating task structure”, respectively (Littrell, 2008). There have been extensive studies (Judge et al., 2004 for a meta-analysis) on the consequences of either leadership behavior cluster. However, the intersection between network structure and leadership behavior preferences is relatively unexplored (Dally and Molenaar, in press). This study aims to answer the primary research question whether leader's or followers' network position affects their preference for consideration versus initiation of tasks. As a preliminary step, seventy people were interviewed to determine their ego-networks and they were asked to complete the Leader Behavior Description Questionnaire (LBDQ-XII). In the second step, I collect data from managers and community leaders to investigate whether a leader's network structure affects the relative occurrence of consideration or task structure related behaviors. The results of both parts are comparatively discussed.

Multilevel Analysis of School Peer Effects
Alexandrov, Daniel¹, Ivaniushina, Valeria¹, Tranmer, Mark²
(1)Higher School of Economics - St. Petersburg, Sociology, St. Petersburg, Russian Federation, (2)University of Manchester, Manchester, United Kingdom

Peer group effects is well known and widely studied by sociologists of education. However “peer group” is a very loose concept. Very often for modeling purposes with school survey data peers are understood as school or grade cohort. While school composition influence is important, we believe that immediate student's friends within school are most influential. There is no doubt that schools are not homogeneous but divided into small groups with their own group norms and attitudes. The aim of our projects is to compare peer influence on different levels of social organization. We use data collected in a large school survey in St.-Petersburg in 2010 (104 schools, 7300 students) which has network component eliciting full networks in classes. We identify four levels of social organization and analysis: individual, egonetworks (immediate friends), cliques and schools, and we employ multi-level hierarchical regression analysis to differentiate the effects on different levels. Cliques (defined as tight social group within social network) were identified from complete network data using special Kliquefinder software (Frank, 1995, 1996). We investigate students' pro-school/anti-school attitudes on different levels and their relation with educational outcomes. We demonstrated that socio-economic differentiation of Russian schools does not lead to polarization of pro-school/anti-school attitudes in different types of schools; polarization of attitudes emerges and is maintained on the clique level; clique attitudes are significantly related to educational outcomes and cliques are better predictors than egonetworks.

Collaboration Networks at Work: Collecting Online Virtual Team Network Data with Socilyzer
Andersen, Jonas
Warwick Business School, Coventry, United Kingdom

Researching work networks presents a number of challenges of crossing organizational and technological boundaries. Traditionally work network analysis has been based on survey or communication data like email. Lately the increased adoption of cloud based apps and online collaboration tools with open APIs has brought unprecedented access to both work communication and actual work documents, tasks, and processes. This paper will present a discussion of the possibilities and ethical challenges that arise when extracting network data from an online work environment exemplified by a practical presentation of an early stage online data collection using Socilyzer to extract data from the online collaboration app Podio.

Comparative Analysis of Statistical and Expert Systems-based Speech Act Classification
Appling, Darren S., Briscoe, Erica J
Speech (dialogue) acts (Austin 1963; Searle 1965), a linguistic concept that represents basic categories of utterances in natural language conversations, is a powerful means of representing human conversations, especially for use in computational social science. Automatically understanding speech act interactions could give evidence for predicting personality, behavior, and influence strategy formulation. Carvalho (2004) experimented with supervised machine learning classification of speech acts in email messages to a custom speech act categorization. More recently unsupervised approaches have been employed by Ritter et al. (2010) and Paul (2012) that exploit the sequential nature of conversation. Even though unsupervised approaches offer an alternative to the labeled data problem for supervised approaches, they do not yet achieve high quality accuracy for the classification task. We contend that before attempting to solve the more general speech act classification problem, work should be done to solve an easier problem of speech act classification for parseable conversational utterances employing expert-based rankings via WordNet and strongly typed speech act verbs. We present cursory results from social media corpora comparing unsupervised approaches with an expert systems approach to labeling speech acts with explicit verb formulations.

Social Network Engineering Strategies for Marketing and Community Development Purposes

**Beattie, Ashley**
Social Impact Agency, Toronto, ON, Canada

Discussed in this paper is the practical implementation of varied Social Network Engineering Strategies using targeted offline engagement methods to realize community development results. A burgeoning, nightlife events influencer Facebook group in Toronto was analyzed longitudinally over 18+ months. Over the monitoring period targeted offline engagements were undertaken with individuals of interest that were identified via standard and custom-developed social network analytics of the network. The evolution in the network data was then compared and correlated with results from strategic influencer engagement events. Overall, strategic, targeted engagements with specific individuals realized much stronger revenue-generation, influencer participation, attendance and social capital generation at events than ad-hoc engagements. Measures which relate to network sustainability also improved considerably. This research has considerable implications for social network marketing activities. Social Network engineering, by identifying valuable members of social networks and pursuing offline engagement opportunities with them can drastically and cheaply increase the value that a firm can realize from their online social network marketing endeavors. By employing similar engagement strategies marketers can "work smarter, not harder" and realize a much lower cost of customer acquisition.

Serendipitous Versus Goal-directed Networks: Longitudinal Analysis of Youth Violence Prevention Organizations

**Bess, Kimberly D.**, **Speer, Paul W.**
(1)Vanderbilt University, Human and Organizational Development, Nashville, TN, United States, (2)Vanderbilt University, Nashville, TN, United States

Research on inter-organizational collaboration as a strategy for community change has gained salience in recent years. As globalization and neoliberal policies concentrate decision-making at larger scales, local solutions are increasingly advanced through collaborative and partnership processes. In this environment, funders, policy-makers and organizations are seeking ways to improve outcomes that often involve working across organizational boundaries and building collaborative networks using formal structures such as coalitions or partnerships. The proposed paper presents findings from a five-year longitudinal study of collaboration among 99 organizations involved in youth violence prevention (YVP) in a mid-sized U.S. southern city. Using SIENA we examine the impact that formation of a nascent YVP coalition has on the network dynamics of the whole YVP network of 99 organizations in the city under study. We draw on Kilduff & Tsai’s (2003) distinction between serendipitous and goal-directed networks to frame the relationship between the larger network, encompassing all 99 organizations, and the subset of organizations active in the coalition. Further, we view the advent of the YVP coalition in the first year of the study as a system intervention. This study extends current research that examines the impact of YVP coalitions on efficiency and effectiveness of service delivery or goal attainment by exploring the impact of this YVP coalition on the inter-organizational system in which it is embedded and seeks to change.

Using Customer Homophily for Marketing in Social Networks

**Birke, Daniel**
Aston University, Business School, Birmingham, United Kingdom
One of the most common observations when analysing social networks is that people who are connected with each other tend to be similar (McPherson et al. 2001), whether this is because those who are similar connect with each other or because those who are connected become similar. The paper discusses how this homophily principle can be used for marketing purposes and illustrates this with large social network datasets from mobile carriers. One of the ways the homophily principle can be used is by targeting customers based on information that the companies have about their friends. For example, I show that customers who are connected to each other are far more likely to use the same mobile handset and that the degree of homophily depends on the characteristics of the mobile handset. Put simply, more interesting handsets like the iPhone are more likely to be homophilous. Such information can then be used in marketing campaigns, for example, by targeting peers of people who have already adopted a particular handset. Furthermore, the homophily principle can be used to 'fill the gaps' in a company's data on their customers, as customers who are connected with each other are likely to share many observable and unobservable (to the econometrician) characteristics. Again, this is making targeting of marketing campaigns more effective. The presentation will illustrate these topics using actual data from mobile carrier marketing campaigns.

Social Capital during the Life Course

Boehnke, Petra, Gefken, Andreas, Valdes Cifuentes, Isabel, Zeh, Janina
University of Hamburg, Department of Socio-Economics, Hamburg, Germany

The project focuses on analyzing the impact of precarious life circumstances on social capital in personal biographies. Taking special account of risks that arise in an individual's life, it studies the ways in which social networks (informal social capital) and civic involvement (formal social capital) develop for that person over time. What form(s) does the network of family and friends take when one's job is eliminated or when a material emergency occurs? To what degree do people turn to social networks when their livelihoods are threatened? Or is social isolation and loneliness the result? The project addresses two sociopolitically significant debates. First, the policy- and decision-making communities are increasingly relying on volunteerism and functional private networks to complement public social services. Second, job insecurity and nonstandard occupational trajectories are both increasing. It remains to be seen whether that trend also means a decline in the conditions necessary for proactive involvement and personal commitment to social cohesion. The intention of the project is to provide empirically sound analyses and patterns of explanation bearing on this question. In more detail, four research areas can be introduced with first results: A) the long-term effects of atypical employment on volunteering with emphasis on corresponding gender differences; B) the link between atypical employment and social relationships in an European comparative perspective; C) the dynamics of ego-centered support networks in life situations affected by atypical employment; D) consequences of poverty for volunteering and social capital profiles with special emphasis on the role of personality traits.

Characteristics of the Drug-using and Sexual Egocentric Networks of Young Injection Drug Users

Boodram, Basmattee
University of Illinois at Chicago, Epidemiology and Biostatistics, School of Public Health, Chicago, IL, United States

Background: In recent years, non-Hispanic whites constitute the predominant racial/ethnic groups initiating illicit drug injection in the United States. Little is known about this new generation of injection drug users (IDUs). Methods: We present data from an on-going egocentric network study of 180 IDUs ages 18-30 from metropolitan Chicago, USA that examines the role of drug-using and sexual networks on the risk for HIV and hepatitis C (HCV) infections among young IDUs (egos). Network features evaluated include 1) structural characteristics, including size (e.g. number of injection and sexual partners), density, and member characteristics (e.g. demographic, behavioral). Results: Preliminary results on 50 egos (data collection will complete by 2/28/13) show that the characteristics of the drug-using and sexual networks vary widely by the ego's race/ethnicity. The largest group was non-Hispanic whites (72% of sample), most were from suburban (i.e. outside the Chicago city limits) areas (70%). Compared to urban non-Hispanic white IDUs, those from suburban areas had 1) slightly larger drug-using (median size=4.5 vs. 3.5) and sexual (median=2 vs.1) networks; 2) were more likely to have drug-using network members who were similar to themselves (e.g. age, race/ethnicity); and 3) engaged more frequently in risk practices with their drug-using network members (i.e. share needles). In contrast, the sexual networks of both urban and suburban non-Hispanic white IDUs were moderately heterogeneous on demographic and behavioral characteristics compared to their egos. Conclusion: Preliminary findings suggest the social networks of young IDUs are evolving toward greater risk for HIV and HCV infections.

Collecting Data for Social Network Analysis in a Group of Wild Monkeys with the Help of Miniaturized Data-loggers

Brockmeyer, Timo1, Kappeler, Peter1, Charpentier, Marie1
Social network analysis has become a valuable tool to study group-living behavior in animals. But in contrast to human social networks where data can often be collected in great quantities (e.g. through the internet or cellphones), data of wild living animal groups is often hard to come by and comparatively scarce. One way to overcome this limitation is to fit miniaturized data-loggers to animals that automatically collect data that can be used in a social network study. We present an example in which we equipped 50 individuals of a group of wild Mandrills (Mandrillus sphinx) with such small data-loggers in the rainforest of Gabon. Each of these loggers emits a unique ID through a radio signal that can be registered by every other logger within the radio range. Signal strength between loggers can be used to estimate distance between individuals and spatial association networks of the group can be constructed. Additionally, the loggers feature an accelerometer and a thermometer, the output of which can serve as a proxy to estimate individual activity levels and energy expenditure. Registration takes place every ten minutes during the day and every hour during the night over the course of a whole year, thereby giving temporally highly resolved data. We show how this data can be used to decipher the social network structure of the Mandrill group and how the integration of accelerometer and proximity data can be used to estimate possible costs and benefits for individuals occupying different positions in the social networks.

Social Media Networks of Museums
Brussee, Rogier1, Brussee, Arthur2, Hekman, Erik2, Waardenburg, Thijs2
(1)Univ of Applied Sciences Utrecht, FCI, Utrecht, Netherlands, (2)Univ of Applied Sciences Utrecht, Utrecht, Netherlands

Social media give rise to social networks in natural, and observable ways. Different communities have different social networks with different evolution, however. Here we report on the social networks of Dutch museums based on continuously monitoring the Twitter, Facebook, You Tube and Flickr data of essentially all Dutch Museums during a one year period. Museums use social media primarily as a PR instrument announcing exhibitions and events, and to get in touch with their public, the larger cultural heritage sector and influencers like (local) politicians and media figures. The resulting social network involves the museums and their public. We analyze our data based on linking data and shallow natural language processing to quantify the extent to which museums are successful in reaching their different target audiences and to reveal differences between different types of museums. We also compare the use of different media. This work is part of the in the Museumkompas project aimed at helping museums develop a crossmedial communication strategy.

Analyzing Quality of Care in Outpatient Clinics with Sociometric Badges
Bucuvalas, John C.1, Demko, Maegen2, Freeman, Laura2, Gloor, Peter A.3, Grippa, Francesca4, Olguin Olguin, Daniel2
(1)Cincinnati Children's Hospital, Medical Centre, Cincinnati, OH, United States, (2)Sociometric Solutions, Boston, MA, United States, (3)MIT, Center for Collective Intelligence, Cambridge, MA, United States, (4)Northeastern University, Boston, MA, United States

Smooth patient flow through outpatient clinics promotes timely, effective, and safe care while delays and bottlenecks might lower ratings of patient and provider satisfaction, increasing the risk for errors that may affect patient outcomes. However, no studies have been undertaken to analyze how human interactions affect clinic efficiency and quality of care. The goal of our project is to investigate the impact of human interaction on the quality and efficiency of the service provided comparing quality of care with interpersonal interaction measured through body-worn sensors called sociometric badges. The research was conducted within three outpatient clinics at the Division of Gastroenterology, Hepatology and Nutrition at Cincinnati Children’s Hospital. Our dependent variables included touch time/total visit time, perceived quality and stress measured after each visit, and waiting time. Independent variables included turntaking, proximity, energy and consistency levels in the communication. The control variables were the type of provider (role) and the complexity of the case (clinic type). Physicians, nurses, social workers, dietitians, fellows, medical assistant and clinical researchers wore sociometric badges during clinic hours, while patients were excluded from the study. Preliminary results indicate that there was no relationship between clinic type and perceived difference in the experience (stress or quality), while the appointment length differed significantly between complex and non-complex cases. We did not observe a significant difference in the percentage of speaking time vs listening time between roles. When we analyzed the proportion of turns each person took during an appointment, MDs and RNs were most engaged in conversation.

Social Networks Analysis in Young Mothers in the Process of Rebuilding the Social Fabric of the Victims by the Winter in the Colombian Caribbean (South America)
Castro Conrado, Carolina S., Madaniaga Orozco, Camilo A.
Changes and natural disasters in the last century involve various social actors, which were affected not only physical and material but psychosocially. Colombia has recently been suffering these phenomena; the flood emergency affected the country between 2010 and 2011, leaving 110,202 people homeless in the Colombian Caribbean, all in shelters, which live in a situation of social marginalization that affects the personal relationships, their well-being and ability to cope in the affected communities. Given that youth is a period of significant change, the perspective of social network analysis allows us to highlight the crucial role that charge certain relationships, functioning like effective ties that affect significantly the actions of the subjects in the reconstruction of the social fabric. For the social networks analysis a descriptive correlation research was done with mixed approach. The aim of the study is to determine the association between the structural characteristics of personal networks, the perceived social support mechanisms, personal coping strategies and well-being in a sample of 75 young mothers affected by the winter in the Colombian Caribbean (South America). Pearson’s correlation analysis was done to determine the association between variables. The results of this study will be the basis for the construction of a public policy to mitigate the damage resulting from the natural disaster.

Assessing Cultural Differences in Conversations: A Semantic Network Analysis of the Global 500 Corporate Facebook Sites

Chang, Hui-lung
FJU, Taipei, Taiwan, Republic of China

The goal of this article is to explore the manifestation of culture in the semantic content posted by Facebook participants on English-language and Chinese-language Facebook sites, utilizing high- and low-context framework proposed by Hall and collectivism-individualism dimension suggested by Hofstede’s. Data will be gathered from the 2012 Global 500 list published by Fortune magazine. Only multinational corporations that maintain both English language and Chinese-language Facebook sites will be selected. According to Hofstede’s typology of culture, the culture of most of the people who live in such English-speaking countries as Australia and the United States, is markedly different from that of those who live in such Chinese-speaking countries as China and Taiwan, with the former belongs to individualistic culture and the latter the collectivistic culture. In an individualistic/low-context society, people think of themselves primarily in terms of “I”, and only take care of those who are close to them. Thus, explicit messages need to be exchanged because people are less involved with each other. In a collectivistic/high-context culture, people think of themselves in terms of “we-group” identity, thus understated and implicit information is exchanged during an interaction because people are more involved with other people. The content of the conversations on corporate Facebook walls will be analyzed using semantic network analysis. A semantic network analysis of the text of conversations will identify the central concern of the Facebook participants. Will these cultural differences be reflected in the content of conversation posted on corporate Facebook walls between English-language and Chinese-language Facebook sites?

Fundamental Limits of Network Community Detection: Theory, Algorithms and Applications

Chiang, Mung1, Poor, H. Vincent1, Shah, Devavrat2, Shapiro, Jacob1, Wolfe, Patrick J.3
(1)Princeton University, Princeton, NJ, United States, (2)Massachusetts Institute of Technology, Cambridge, MA, United States, (3)University College London, London, United Kingdom

Detecting and validating the presence of group and community structure is of primary importance in social network analysis, yet relatively few results are known regarding fundamental limits of detectability. Here we address such limits from a statistical point of view, giving bounds on the detectability of small communities both with and without side information concerning network actors and linkages, and describing new and highly scalable algorithms for community detection with provable performance guarantees. We treat a variety of classical models that include the gravity and p* models, stochastic blockmodels, and eigenmodels. Finally, we show application of our results both to static friendship networks as well as to dynamic communication networks.

Social Network Characteristics Are Associated with HIV Risk among African American, Asian/Pacific Islander, and Latino Men Who Have Sex with Men (MSM) in the United States

Choi, Kyung-Hee1, Boylan, Ross1, Paul, Jay1, Ayala, George2, Gregorich, Steven E1
(1)University of California, San Francisco, San Francisco, CA, United States, (2)Global Forum on MSM & HIV, Oakland, CA, United States

Background: Social network characteristics are related to HIV risk. However, little is known about their relationship to risk among U.S. MSM of color. Methods: A chain-referral sample of 403 African American, 393 Asian and Pacific Islander, and 400 Latino MSM recruited in Los Angeles County, CA completed a standardized questionnaire, which asked about their
egocentric social networks (up to 15 adults with whom respondents had recently spent free time, had discussed important matters, or who had influenced important decisions), safer sex norms, and anal intercourse partners (up to 10) during the prior six months. Partnerships were HIV-nonconcordant if serodiscordant or serostatus unknown. Results: Overall, 26% of the sample reported HIV-nonconcordant unprotected anal intercourse (UAI) with a non-primary male partner in the prior six months. In a GEE logistic model that controlled for age, race/ethnicity, nativity, education, sexual orientation, and incarceration history, a 10% change in network density was negatively associated with HIV-nonconcordant UAI (OR=0.90, 95% CI=0.85-0.96, p=0.0021). In addition, the effect of respondents’ closeness to network members on HIV-nonconcordant UAI was significantly moderated by safer sex norms (p=0.0154). A one-point change on a 1-4 scale measuring average closeness to network members increased risk for HIV-nonconcordant UAI among those who had low safer sex norms (OR=2.45, 95% CI=1.58-3.81, p=0.0001), but not among those who had high safer sex norms (OR=1.09, 95% CI=0.70-1.71, p=0.6902). Conclusions: The significant association of social network characteristics with UAI underscores the need to develop network-based interventions to reduce sexual risk for HIV among U.S. MSM of color.

Decoupling Brokerage in Policy Networks: A Longitudinal Analysis of Strategic Behavior

Christopoulos, Dimitrios1, Ingold, Karin2
(1) MODUL University Vienna, Public Governance & Management, Vienna, Austria, (2) University Bern, Institute of Political Science & Oeschger Centre for Climate Change Research, Bern, Switzerland

Within policy processes, policy brokers and political entrepreneurs can have a crucial impact on decision-making. The policy process literature claims that actors' resources and power are associated to their positions in political structure and reflect in their capacity to take strategic action. Brokers are identified here as those that gain by intermediating between others while political entrepreneurs are those evidently 'punching above' their political weight. For both type of actor relational assets such as trust and reciprocity are instrumental to their success. In this paper while controlling for the political capital of exceptional agents we look at actor's capability to build trust and adeptness at protecting their power over time. Translated into network terms, we are therefore not only interested in global network structures and individual actor centralities, but in their capacity to exploit structural holes and maintain their strategic positions in a network over time. We test our hypotheses based on two empirical case studies and longitudinal data sets that capture such agents across distinct stages of the policy cycle. The first is Swiss Climate policy examined between 1998-2008 and the second a EU regulation decision in 2004 related to competition and transport policy.

Product Performance and Development Environment: A Collaboration Perspective

Corallo, Angelo, Fortunato, Laura, Gentile, Antonio Andrea
University of Salento, Lecce, Italy

The main vehicle for growth, as perceived by the companies' management of the is innovation: through the ability to innovate, enterprises can create considerable competitive advantage, by developing completely new products and services, or improving existing products and value-added services related to them. Innovation has always been conceived as a relation between ideas, technologies and skills inside and outside the company, but today this seminal concept is evolving towards a systemic process based on sharing and cooperation. The New Product Development is the process most affected by the ability to generate innovation. It is a highly knowledge-intensive process and one of the major problems in this context is represented by how to design and maintain an effective collaboration and knowledge exchange between functional groups. The New Product Development process is defined by a sequence of activities that are carried out by separate working groups, each characterized by its own knowledge basis. In this work, we intend to show how the interactions between these teams are closely related to the performance of the product in terms of design, functionality and customer appreciation. Through the analysis of the interactions between these teams, making use of various enterprise collaboration tools, we identify the times and the ways that make the interactions between various teams effective. In preliminary experimental results, we show how we can use the results to suggest improvements in real collaborative scenarios, thus, in the product performance.

The Role of Community Detection in Multi-leveled Network Analysis

Corallo, Angelo, Gentile, Antonio Andrea, Fortunato, Laura
University of Salento, Lecce, Italy

In the last few years, community detection has made substantial innovative steps, both in the amount of manageable data, as well as in the reliability and velocity of the analysis performed. This presentation systematically investigates for the first time the relationship between the concepts of i) "boundaries of the network" (identifying the limits of the network, as subject of the study) and ii) "clustering inside a network" (tracing out dense sets of nodes from the network.
Seminar Section

Semantic-social Networks in Tourism. The Case of Costa Brava (Girona, Spain) Destination
Coromina, Lluis¹, Gassiot-Melián, Ariadna²
(1)University of Girona, Dept. of Economics, Girona, Spain, (2)University of Girona, Faculty of Tourism, Girona, Spain

Tourism destination image is a relevant concept in the decision-making process of tourists. Several agents play a role when promoting a destination and giving, then, an image of it. This study pretends to discover more about Costa Brava's (Girona, Spain) image as a tourism destination form different agents' perspective (official websites, travel guides, travel agents, blogs and Tripadvisor) and to study its differences on promotion and opinions based on the attributed-based, the holistic and the affective component. Data used are frequencies for words and co-words on textual online data (text-mining methodology) from the selected agents. Latent semantic analysis is carried out in order to discover latent dimensions of matrices represented by the network of different agents. Content analysis is used in this study to analyze text relationships and then, the results as the number of occurrences in term-document matrices (where punctuation, plurals, stopwords were treated and a dictionary of synonymous created) as input for semantic text analysis and network text analysis for the different agents. Semantic maps are drawn on the basis of the similarities among word distributions using the cosine for normalization. Statistical analysis will be carried out as an exploration of the main dimensions in the network. Results will permit to compare semantic maps of different agents in order to check whether different network structures would lead to an emergence of different clusters, identifying patterns across agents. Results might be used to influence and improve marketing strategies, operations or tourism facilities in the tourism destination.

Informal Networks and Poor Innovation Rates: A Study of the Composition and Structure of Personal Networks in Poor Innovator Countries in the EU and Russia
Crosby-Nagy, Michelle O.
Corvinus University of Budapest, Sociology, Budapest, Hungary

What is the relationship between informal networks and poor invention and innovation rates? This paper seeks to describe the composition and structure of the personal networks of CEOs of SMEs in poor innovator countries in the pharmaceuticals industry in the EU as well as Russia using LinkedIn first degree connections. Germany is used as the country for comparison. Building on the work the It is suspected that Alters are primarily personal contacts from former places of work and study; more so than countries where there is a better mix of arms length and personal contacts as the basis for economic exchanges. The results of this study contribute to the important, but empirically devoid, link between informal networks and invention and innovation rates.

User Recruitment in Online Social Networks
Crowley, Caren, Daniels, Wilfried, Bachiler, Rafael, Joosen, Wouter, Hughes, Daniel
KULeuven, Leuven, Belgium

In recent years, online social networks have emerged as a key communication platform for millions of Internet users. The large and growing user-base of online social networks presents an opportunity to create a new class of ‘participatory applications’ wherein users contribute computational resources, human knowledge and sensor readings such as GPS location data that is used to create new kinds of applications. The success or failure of this new generation of participatory applications will be determined to a large extent by the behavior of users. However, user behavior and responsiveness has thus far received little attention from online social network researchers. In this paper we contribute to the literature on online social networks through an empirical analysis of the degree to which users participate in viral recruitments of participants and the responsiveness of users to automated requests for real time data. We discuss our findings in light of existing social network theories.
A Cross-national Comparative Study Based on Contact Diaries Recorded in Hungary and Taiwan

David, Beata¹, Huszti, Eva², Fu, Yong-Chih³

(1) Semmelweis University, Institute of Mental Health, Budapest, Hungary, (2) University of Debrecen, Faculty of Health, Debrecen, Hungary, (3) Academia Sinica, Institute of Sociology, Taipei, Taiwan, Republic of China

Contact diary as an alternative method to collect data on egocentric networks nowadays is mainly used by Fu (2007) in Taiwan. His approach with minor modifications was adapted by Huszti (2012) in Hungary. The diaries are filled by the respondents for at least a 7 days period. On each day all contacts are recorded: either a one-on-one contact that lasts at least 5-10 minutes, or contacts shorter but considered important for the respondent. Then for each name elicted through the contacts several name-generators are recorded. There are 52 diaries collected in Taiwan (Fu 2008) and 142 diaries in Hungary (Huszti, David, Vajda 2012). Our paper aims to compare the two contact diary datasets in two ways. First there is the comparison of the two national datasets on the individual aspects of the contacted person, the contact situation and characteristics of the ties with the contacted person. Then we'll calculate the SoT index (Strength-of-Ties index) and analyse the results on the level of socio-demographic characteristics and type of relation.

School and Community Safety: A Case Study in the Field - Effective Social Network Analysis Strategies and Protocol for Use in Educational Settings*

Dickmann, Ellyn
University of Wisconsin-Whitewater, Whitewater, WI, United States

This presentation, based on actual field studies, is focused on the use of social network analysis to support the development and maintenance of safer school and community settings. Two primary areas will be discussed: 1) The Use of Social Network Analysis, and 2) The Unique Culture/Environment of Educational Settings. Specifically in area 1, the use of social network analysis, use of available secondary data sources, and use of qualitative data from the educational environmental will be discussed (mixed methods). In area 2 the following will be discussed: 1) social network analysis approaches and protocol; 2) obstacles and barriers related to the culture of educational environments; 3) strategies to gain entry to educational environments; 4) presentation tactics; and 5) the importance of building capacity in educational environments to promote the use of social network analysis. *Although this presentation will focus on K-12 education settings—all educational settings will be mentioned as relevant, i.e., early childhood through post-secondary education.

The Cultural Network in Lower Saxony - Modes of Operation and Influence of Institutional and Economical Cooperation

Dollereder, Lutz
Leuphana Universität Lüneburg, Kultur, Lüneburg, Germany

In the planned poster my doctoral study on how legal, economical, political and programmatic conditions influence the social structure of the cultural sector in the Land of Lower Saxony (Niedersachsen) is presented. In cultural life in Germany, cultural organizations, public funding institutions, artists, the audience and private companies interact and cooperate. The relationships are complex and entangled. In this case study, these relations are unraveled to show the respective impact and the effects due to the surrounding society. By investigating the social ties of actors in the music sector of Lower Saxony, a closer look is taken at the dynamics and effects of cooperations. Hereby, the focus is set on institutional and economical cooperations. We deal with the development of network structures in Lower Saxony, Germany. The theoretical framework of this work is based on concepts of „Identity and Control“, „Strong Ties/Weak Ties“, „Structural Holes“ and on „Balance in Network relations“. Through a qualitative fieldwork study, it is revealed what kind of role social relations play in professional music life on the one hand, and in institutional conditions on the other hand. Thus, the interactions between music, social actors and institutional cultural work in Germany, wich are based on „communication“ in Luhmann’s sense, are sketched. Likewise, by applying network theories, the study reveals how a cultural network emerges and develops under the influence of institutional structures.

Examining the Co-authorship and Acquaintanceship Networks of a Multi-disciplinary College in a Research University: Measuring the Degree of Interdisciplinary Collaboration and Homophily Effects

Dumas, Catherine L.
University at Albany, State University of New York, Informatics, Albany, NY, United States
A recent study by Alberto Pepe (2011) explored co-authorship and acquaintanceship networks in a diverse scientific research environment to analyze patterns between the networks. My study will apply Pepe’s methodology to construct and compare the networks of co-authorship and acquaintanceship within the College of Computing and Information (CCI), State University of New York at Albany. Bibliographic data will be used to construct the co-authorship network and an online survey will be used to collect data to form the acquaintanceship network. The focus will be on the faculty who have published in the departments: Computer Science, Informatics, and Information Studies. The purpose of this study is to identify the extent of interdisciplinary research collaboration by faculty of CCI. The data analysis will also include centrality metrics to identify central figures, and examine patterns of homophily (gender, educational background, age, ethnicity, department, and academic status). This research aims to provide insight for CCI decision makers on the status quo of the research environment. It will serve as a baseline of current research production in order to identify ways to increase the interdisciplinary collaboration efforts of CCI faculty.

The Development of Collaborations in a Scientific Community - Evidence from an Experiment Using Sociometric RFID Devices
Eberle, Julia1, Stegmann, Karsten1, Lund, Kristine2, Barrat, Alain3,4, Sailer, Michael3, Fischer, Frank1
(1)Ludwig-Maximilians-University Munich, Education and Educational Psychology, Munich, Germany, (2)Université de Lyon, Lyon, France, (3)Aix Marseille Université, Marseille, France, (4)ISI Foundation, Tourino, Italy

Conferences and workshops serve as an important means for scientific communities; they offer opportunities for researchers to identify potential collaboration partners, to initiate new collaborations, and to integrate newcomers into the scientific community. However, time during such events is always limited and expertise as well as interest of the participating researchers is only to a small extent visible and known to the other participants. Against this background, we examined to what extent community experience (newcomer vs. experienced member) and provided information about other participants (with a brochure containing information about other participants’ interest and expertise vs. without) affect interaction during workshops and the development of collaboration intentions. We observed participants’ behaviour during eight international and interdisciplinary scientific workshops. Participants’ interactions were tracked using sociometric RFID devices. After the event, participants reported in a social network questionnaire with whom they developed collaboration intentions. A multilevel analysis using HLM/HCM on participants who had not collaborated with each other before showed that newcomers did not interact less with other participants than experienced members. The provided information about other participants, however, reduced dyad’s chances to interact with each other, leaving more time for a few longer interactions. The longer the interaction of a dyad during a workshop, the higher was the probability of developing collaboration intentions.

An Examination of Resource Networks, Related Pedagogical Choices, and Teachers of Students Identified as Gifted and Talented
Edinger, Matthew1, Edinger, Suzanne2
(1)University of Derby, Faculty of Education, Health, and Sciences, Derby, United Kingdom, (2)Nottingham University Business School, Management, Nottingham, United Kingdom

In this paper, we explore the relationship between teachers and resources in two-mode networks. Pedagogical resources chosen by teachers of identified gifted students are crucial to high student achievement and academic success (Wenglinsky, 2000; Eggen & Kauchak, 2006). However, many gifted teachers rely on the ‘fads’ of the gifted educational field presented through workshops and conferences instead of research-based best practices that are supported by rigorous empirical evidence (Ambrose et al., 2010; Renzulli, 2012). Using a mixed methods study of 270 gifted teachers from differing regions of the United States, we hope to contribute to the literature on teacher pedagogy, social networks, and gifted education in three important ways. First, by examining the two-mode teacher and resource networks, we found that many teachers do, when developing their pedagogy, rely upon information propagated through conferences and workshops rather than the journal articles, books and university classrooms that disseminate research-based best practices. Secondly, we found that demographic attributes such as years teaching and levels of education are directly associated with the sources teachers select to find teaching practices. Finally, similar to the hypotheses of critics in the field, our data analysis suggests that the strategies chosen and used by gifted teachers who attend conferences and workshops are more likely to be ill-supported teaching ‘fads’ rather than well-researched teaching practice. The results of this study also offer significant implications for school administrators and practitioners within the field of gifted education.

Individual Social Capital and the Creation of Group Social Capital in the Context of Team Innovative Performance
In this paper, I explore the relationships between individual social capital, group social capital, and team innovative performance. The association between individual and group social capital is underexplored (Burt, 2000; Kilduff & Krackhardt, 2008), and is important to investigate so that we may improve our knowledge of how and when social capital transfers from individuals to their teams and why this transfer might facilitate team innovation. I hope to add to the literature on social capital in teams through three important contributions. First, I argue that the external ties of team members are an important predictor of the team’s set of external ties. However, this association is not automatic and is influenced by an individual’s willingness to share his ties. Thus, secondly, I propose that individuals with greater levels of team-related relational and cognitive social capital, those who are oriented toward connecting others and those who work interdependently with their team members are more likely to share their ties with their team. Finally, I examine the interactive role of external and internal team ties in promoting team innovative performance. I conclude by discussing the potential methodological and managerial implications of this model.

Decomposing the Social Heartbeat of Norway

Engø-Monsen, Kenth
Telenor Group, Oslo, Norway

We will report on a study performed on data obtained from a mobile network operator in Norway. The bases for the analysis are the natural activity profile - the heartbeat—of the aggregated customer behavior during the day and during the week of the collective behavior from a random sample of mobile telephony customers. We consider decomposing the “heartbeat” by the friend-rank measure, where communication partners are ranked according to volume (seconds) or number of voice calls, SMS, or MMS. Another way to decompose the “heartbeat” is by considering the gender of the originating and the terminating party of the communication link. We report some novel findings of the friend-rank and gender decompositions of the communication “heartbeat”, and also consider some interesting findings regarding approximating the true social network by the friend-rank network; the social network structure generated by the restriction of the original social network to friends of a given friend rank.

Modelling a Whole Friendship Network from Anonymous Egocentric Data

Fearon, Elizabeth1, Wiggins, Richard2, Hargreaves, James1
London School of Hygiene and Tropical Medicine, London, United Kingdom

Aim: To examine two methods for modelling whole networks from anonymous egocentric data. Network structure is central to understanding the diffusion of behaviour over a network. Yet whole network data can be logistically or ethically difficult to collect. Methods: I extracted egocentric information from the first year of the ‘Teenage Friends and Lifestyle Study’ whole network (Mitchell and West, MRC Glasgow). I used a ‘possible matches’ (PM) algorithm that for each edge randomly chose a node whose attributes matched those of the reported friend. Secondly, I built a dyad-independent exponential random graph model (ERGM) from properties of the network observable from ego-nets. For each approach, 150 networks were simulated and compared to the observed network on in-degree distribution, transitivity, geodesic distances, eigenvector and betweenness centralities. As a control, I compared the PM and ERGM simulations to those from a density-controlled random graph network (DCRGM). Results: Transitivity and geodesic path length were underestimated. PM and ERGM simulations performed no better than those from the DCRGM in reproducing the in-degree distribution. The simulated networks had similar mean eigenvector and betweenness centralities to the original but did not capture individual node variation. Discussion: Model accuracy depends on the ratio of attribute categories to total number of nodes and on having strong attribute homophily. Results suggest that using alter-to-alter ties would substantially improve model fit. Where bias in alter-to-alter ties is likely to be minimal and where strong homophily exists, egocentric friendship data could cautiously be used to estimate some whole network properties.

The Study of Social Support from the Personal Networks Perspective in the Context of Chronic Illnesses

Fernández Peña, Rosario1,2, Loureiro Varela, Eva1, Marqués Sánchez, Pilar1, Llopis Cañameras, Jaime2
(1)University of Girona, Girona, Spain, (2)Autonomous University of Barcelona, Barcelona, Spain, (3)Public Health Agency of Catalonia, Barcelona, Spain, (4)University of León, León, Spain, (5)Sant Joan de Déu Hospital, Barcelona, Spain

The last few decades have seen an increasing interest in the influence of different aspects of social environment on the health of people and populations. A solid theoretical framework has been built up on the basis of empirical evidence which demonstrates the positive effect of social networks on the wellbeing and health status of people. Social support is
considered by the WHO to be one of the social determinants of health and should be considered an important factor in the development of public health policy. Within the context of chronic illnesses, social support has been recognized as protective against stress, and associated with quality of life, adherence to treatment, rehabilitation and positive adaptation to illness. We present the results of an exploratory study in which we interviewed 15 persons with chronic pain, obtaining results about 350 alters, exploring different variables associated with social support discussed in the literature such as type of support, the social role and gender of social support providers, quality, reciprocity, frequency and amount of support provided, amongst others. The study may be a useful tool, for understanding the importance of environmental factors in determining the health and wellbeing of people with chronic illness as well as a key element in the development and improved models of health intervention.

Into University Transition: The Role of Freshmen’s Individual Characteristics in Social Network Ties

Fras, Ana1, Martin, Pilar1, de Federico, Ainhoa2, Espeixt, Elena2

(1)Universidad de Zaragoza, Facultad de Ciencias Sociales y Humanas, Psicología y Sociología, Teruel, Spain, (2)Université de Toulouse 2 - Le Mirail, Département de Sociologie et d’Anthropologie - Institut Raymond Ledrut, Toulouse, France

The aim of this work is to analyse the social network of first-year University in a sample of 400 Spanish undergraduates of Psychology, Management, Fine Arts, Teaching and Nursing of Zaragoza University in the Campus of Teruel. Often regarded as a stressful period, transition into university suppose deep and wide first year university student’s life. Freshmen’s social networks could play an important role in protecting them from deleterious effects of perceived stress though the size, quality and obtained social support of their relationship with other significant. But, in regarding social networks and psychological health, it must been taking into account some individual sociodemographical characteristics as gender. This study is mainly concerned with the description of first-year university students’ social network in terms of size, quality and obtained social support, showing the relationships between social networks ties and freshmen’s individual characteristics. Our results show a different pattern of social network ties for men and women. Practical implications on the basis of the findings obtained are discussed.

Estimating Active User Population Dynamics in Online Social Networks

Gibson, Ben1, Spiro, Emmo2, Fitzhugh, Sean1, Johnson, Britta1, Sutton, Jeannette1, Butts, Carter1

(1)UCI, Sociology, Irvine, CA, United States, (2)UCI, Irvine, CA, United States, (3)UCCS, Colorado Springs, CO, United States, (4)UCCS, Colorado Springs, CA, United States

The number of Internet users has increased greatly over the last decade, and social networking sites like Facebook and Twitter claim hundreds of millions of users globally. A given user, however, may not be active (i.e., attending to events involving his or her alters and engaged in information transmission), and the number of active users may vary greatly due to seasonal or other influences. Fluctuations in the size and composition of active-user populations has important implications for phenomena such as information diffusion, resource mobilization, and the formation of citation networks; currently, however, little is known regarding active user population dynamics, nor their measurement. Here, we introduce a method for estimating the size of active-user populations in an online environment over short time intervals (e.g., minutes to hours). Using a variant of the capture-recapture method (often used for animal populations), we take multiple samples from activity-queryable user populations (e.g., Twitter) and exploit the overlap of users between samples to estimate the population of those who are active. Results from a large study of Twitter users show reliable estimates of active users of Twitter over time for many levels of resolution, from monthly to hourly. The estimates show a clear diurnal pattern of active-user population, with daily and weekly patterns of active use. Further, with some extension, the method allows us to estimate mean degree of the active-user population. Our findings suggest that this method is an effective, useful approach for estimating active-user population dynamics in a variety of OSN settings.

Reducing the Complexity of Analysis Processes: A Web-based Workbench for Social Network Analysis

Göhert, Tilman, Hoppe, H. Ulrich

University of Duisburg-Essen, Faculty of Engineering, Institute for Computer Science and Applied Cognitive Science, Duisburg, Germany

A common pattern in the process of performing social network analysis using software tools is the need for switching between different tools and representations of data. Therefore network analysts often not only have to be experts in their field of analysis but also in the usage of the different tools involved, the appropriate data representation for each individual tool, and the possible ways of transforming the data for translation between the different tools. This often introduces a distraction from the actual analysis and adds a level of complexity that is not directly connected to the analysis question but to the analysis process. We present a network analysis workbench intended to overcome this problem by offering all necessary analysis features from data collection to visualization through an integrated, web-based
entrepreneurs are also discussed. Several important implications to the development of effective intervention and training for assisting during their business partner selection process, and advancing our knowledge about the nature and form of network paper contributes to the emerging cognitive network theory by highlighting the role of entre

feature for partner selection, relative to partner's past performance and similarity with the entrepreneur. The current forms of network cognition (i.e., cognitive accuracy and network literacy), on the attractiveness of a range of partner features including network position, past performance, similarity. The results confirmed our hypothesis that if they had higher cognitive accuracy and network literacy, they rated partner's network position more relevant as a business partner feature for partner selection, relative to partner's past performance and similarity with the entrepreneur. The current paper contributes to the emerging cognitive network theory by highlighting the role of entrepreneurs' network cognition during their business partner selection process, and advancing our knowledge about the nature and form of network cognition. Several important implications to the development of effective intervention and training for assisting entrepreneurs are also discussed.

Gender Differences in Online Professional Ego Networks

Gonzalez, Carlos, Ferrary, Michel
University of Geneva, Management, Geneva, Switzerland

We present preliminary results on ongoing research about the similarities and dissimilarities of the online professional ego networks of men and women users of a major American online professional social network. The ubiquity of online professional social networks is creating innovative ways in which individuals can maintain professional relationships with others. While substantial advances have been achieved on identifying gender differences in traditional social networks, a clear understanding of gender differences in online social networks, in particular professional networks, is still missing. We analyzed 15 compositional and 21 structural properties of the online professional ego networks of current students of executive programs at the University of Geneva. The sample represents a homogeneous, yet highly international cohort of students with relevant working experience. Egocentric measures such as degree, betweenness, clustering, E-I Index, structural holes, and brokerage roles were evaluated for each user according to certain attributes (e.g., sex, industry) and then aggregated according to sex for comparison.

Diaspora Communities on Social Network Sites in the Former Soviet Union

Gorgadze, Alexey, Alexandrov, Daniel
Higher School of Economics - St. Petersburg, Sociology, St. Petersburg, Russian Federation

Our research is focused on migration, ethnicity and identity politics in Web 2.0 in the former Soviet Union (fSU). Many young people of Armenian or Georgian origin are living in Russia because their parents moved there or because they went to study in Russian universities. Social network sites provide them with powerful tools to form e-diasporas and engage in identity work and boundary work, forging networked virtual communities with different identity labels. We study diaspora groups on VKontakte (VK), Russian social network service most popular among young Internet users in the fSU - about 195 million accounts by December 2012. Certain open features of VK profiles allow for analysis of geographic mobility and educational background of users, for example, how many graduates of high school in Erevan (Armenia) are now studying in the universities in fSU cities. Another important feature is the ability to make 'friendship' ties between groups and public pages, which allows for network analysis on the level of groups. In particular we interested in groups and public pages that create virtual communities with regional 'supra-ethnic' identities (“We are from the Caucasus” or “United Caucasus”) as many users participate both in ethnic groups narrowly defined (“True Armenians” or “Real Azeri Men”) and 'supra-ethnic' groups at the same time. We will present the data on ethnic and geographic composition of different groups, on their activity, and on inter-group ties.

Network Cognition and Business Partner Feature Preferences: An Experimental Study

Han, Jing, Meeus, Marius, Curseu, Petre
Tilburg University, Tilburg, Netherlands

The present study is positioned in a context of entrepreneurship, where entrepreneurs had the task of selecting business partners with distinct features. We argue that network cognition of entrepreneurs entails their mental processing capacity of information associated with networks and thus influences their tendency to select business partners based on network features. We adopted an experimental design to test the causality between network cognitions and one’s preference of business partner features. Participants played the role of entrepreneurs and had the task to rate the attractiveness of a set of business partner candidates with diverse pre-specified features. We examined the effect of two forms of network cognition (i.e., cognitive accuracy and network literacy), on the attractiveness of a range of partner features including network position, past performance, similarity. The results confirmed our hypothesis that if they had higher cognitive accuracy and network literacy, they rated partner’s network position more relevant as a business partner feature for partner selection, relative to partner’s past performance and similarity with the entrepreneur. The current paper contributes to the emerging cognitive network theory by highlighting the role of entrepreneurs’ network cognition during their business partner selection process, and advancing our knowledge about the nature and form of network cognition. Several important implications to the development of effective intervention and training for assisting entrepreneurs are also discussed.
The Application of Social Network Analysis in Evaluating Violence Prevention Programs: A Case Study of Salinas, California

Harris, Shawn D.¹, Salem, Omar¹,²
(1) Monterey Institute of International Studies, Monterey, CA, United States, (2) Naval Postgraduate School, Monterey, CA, United States

Due to rampant drug trafficking and gang activity, Salinas, California is considered one of the most dangerous cities in the state. Modeled after a program in Chicago, the Violence Interrupters was recently adopted by the Salinas Community Alliance for Safety and Peace (CASP). The program utilizes “interrupters,” who are generally former, high-ranking gang members, to prevent violent intergroup and interpersonal retaliation, independent of the Salinas Police Department. To date, such programs' effectiveness have not been evaluated quantitatively. This project examines the interpersonal networks of the Salinas “interrupters” to analyze the effect of the program. Our project uses network analysis theories and methodologies to monitor the changes in the connectedness of information brokers, the structure of hierarchies and relationships, and the interactions between at-risk actors, after the introduction of the Violence Interrupters program. Interviews and surveys define the linkages within the network by identifying hostile or friendly relationships, gang or cartel affiliations, informal clique affiliations and information flows between actors. The evolution of these relationships are then tested over time in relation to violent events in the community based on the specific persons, organizations and areas that are involved.

Impact of the Financial Crisis on Stock Networks in the US and Germany

Heiberger, Raphael H.
University of Bamberg, Bamberg, Germany

Despite many efforts, crisis on financial markets are in large parts still scientific black-boxes. Network analytical tools provide a fruitful way to rethink such market relations. Consequently, applying Minimum Spanning Tree algorithms (MST) has become popular among both Economists and Physicists to investigate networks of corporations. In this paper, the MST is constructed from the correlation matrix of daily stock prices of the 100 most highly capitalized equities in the US and Germany between 2005 and 2010. Our goal is to explore the network properties in different market periods. Using dynamic asset trees, we show the restructuring of these networks due to the financial crisis in 2008. Single step survival ratio and tree length, among other measures, reveal a strong reconfiguration of the network topology between a normal, “business as usual” phase, and crash market activities in the subprime crisis. In its aftermath, the stock network has been widely compartmentalized. As in complex ecosystems, the reaction to unusual disturbances seems to lead to more disassortative networks, with a higher degree of stability. The principle resembles the management of forest fires: single elements have to be separated in order to handle local blazes more easily. In network terms, we observe a rising modularity, that is, a decoupling of the correlation tree into relatively discrete components, which provide higher robustness against external shocks. Concluding, we illustrate differences and similarities in the US and German stock market reactions, and discuss possibilities and limitations of the analogy with complex ecological systems.

“Solidarity in Enmity” in Inter-ethnic Relations: An Implementation of Multiplex Network Analysis with SIENA

Hellpap, Robert L.¹, Bicer, Enis²
(1) Utrecht University, Sociology, Utrecht, Netherlands, (2) University of Bremen, Institute of empirical and applied sociology (EMPAS), Bremen, Germany

Several research findings indicate strong tendencies for ethnic segregation and ethnic boundaries, which can be examined by methods of social network analysis. In accordance with the theory of ethnic homophily, people prefer social bonds to other members of the same ethnic group. Additionally, segregated friendship networks often seem to cluster in higher order network structures as ethnically homogenous triads. Our examination extends the notion of ethnic boundaries in social networks beyond considering only positive ties (e.g. friendship) in dyadic inter-ethnic relations. For that reason we additionally regard negative forms of interpersonal relations (e.g. hostility) and investigate triadic closure. Consequently the central research question is: Are ethnic boundaries determined by an absence of positive links and/or the existence of negative relationships between members of different ethnic groups? Balance theory suggests that positive relations between two actors are more likely to emerge when both have positive relations to a common third actor. Furthermore, if a befriended actor has a negative relation to a third person, it is more likely that ego likewise develops a negative relation towards that actor. We refer to the first type of triadic closure as positive balancing, to the latter as “solidarity in enmity”. Based on group-identity theory, our expectations are: Positive balancing is more likely for
Voluntary Distributed Computing Is Transforming the Field of Computational Heavy Science

Holohan, Anne
Trinity College Dublin, Department of Sociology, Dublin, Ireland

Voluntary distributed computing is transforming the field of computational heavy science, allowing members of the public to participate in scientific research as they download data from scientific project servers, crunch it, and upload it to the project server. Examples would be Folding@home, based at Stanford University and SETI@home, based at UC Berkeley. The most productive and loyal volunteers are primarily those individuals in teams and active in VDC community forums that are run by supervolunteers and moderators, and are backed by a scientific team who value the necessity of having volunteers. Building on research conducted for a forthcoming book on the subject, for this conference I map the network of participants of four projects: two long-standing successful projects with active supervolunteers and scientists, and two projects that began large but have dwindled, partly due to the lack of support and leadership for volunteers from supervolunteers and the scientists. I am seeking patterns that can shed light on the functioning of both types of

School Bonding Homophily in Adolescent Social Networks

Henry, Kimberly L.¹, Hansen, William B.²
(1)Colorado State University, Psychology and Public Health, Fort Collins, CO, United States, (2)Tanglewood, Greensboro, NC, United States

The peer group is one of the most important socialization sources for adolescents. Plenty of research indicates that negative peer influence can lead to involvement in health risky behaviors, but far less work has examined positive peer influences. School bonding is a key protective factor during adolescence that has been associated with positive youth development across a wide range of studies. In this study, we examine the social networks of middle school students to determine if there is assortative mixing (i.e., a tendency to associate with similar others) on school bonding. Cross-sectional social network data from seventh-grade pupils in 8 public schools in the West is currently being collected (with data collection complete by the end of January 2013). Each student nested in each grade and school indicates their friendship ties, the strength of those ties, and also completes a brief school bonding inventory. Exponential Random Graph Modeling (ERGM) will be used to estimate assortative mixing for boys and girls, adjusting for network structures. A separate ERGM will be specified for each school, and the results will be combined using meta-analytic techniques. This study will provide useful information about the nature of assortative mixing on school bonding among middle school students. This information may have important implications for prevention initiatives aimed at helping students with low school bonding become bonded to adolescents with high school bonding.

The Use of Social Network Analysis (SNA) in Digital Public Affairs (DPA) - SNA as Preparation of Strategic Communication Decision Making in Politics and Economy

Hennes, Wolfgang¹, Gloor, Peter A.², Schoder, Detlef²
(1)Universität of Cologne, seminar for business informatics and information management, Cologne, Germany, (2)MIT Center for Collective Intelligence / University of Cologne, Massachusetts / Cologne, MA, United States

In this project we examine the public perception of DAX30, Forbes 500 companies and political parties in their communication key aspects on the Web: issues, brand, people, products, services, competition. Our process consists of seven steps: (1) location analysis: which locations are important for the debates about the institution? How visible are essential stakeholders from science, companies, politics and media? (2) wikipedia analysis: how are these issues discussed on Wikipedia? (3) content / sentiment analysis: How are these issues spoken about? (4) people analysis: how visible is the management of the institution? (5) stakeholder survey: what are essential stakeholders thinking? (6) competition analysis: how are the institutions’ competitors spoken about? (7) conclusions: which recommended follow-ups result from the study. The goal is to map the public perception of essential issues of the institution and to carve out a competitive comparison with the most important competitors. Through this the institutions will be supported to apply their communication resources in the analyzed issues. The studies took place on behalf of the management boards of the companies - the data were compiled in 2011 and 2012. Main results are that on the one hand there is a lot of content about the companies’ issues but the companies have low visibility on the Internet. This means that institutions might try to “own” the subject and the “knowledge leadership” for their issues to fulfill their Digital Public Affairs goals (analyze, inform, involve).

ethnically homogeneous triads. Solidarity in enmity is more likely for ethnically heterogeneous triads To test the hypotheses we use a longitudinal network dataset comprising around 400 5-th and 6-th grade pupils and apply stochastic actor-based models performed by SIENA.
project networks and hence, give some insight into the constant need to recruit and retain volunteers for voluntary distributed computing.

Using Smartphone-based Ecological Momentary Assessment to Assess the Relationships between Emotional States and Social and Physical Contexts of Eating within Personal Social Networks

Hua, Jenna¹, Eom, Sue², Li, Yan³, Wang, May⁴, Seto, Edmund⁴

¹UC Berkeley School of Public Health, Berkeley, CA, United States, ²Seoul National University, Seoul, Korea, Republic of, ³Kunming Medical University, Kunming, China, ⁴UCLA School of Public Health, Los Angeles, CA, United States

Recent research suggested that obesity is likely to spread among family and friends' networks via some form of social influence on individual health behaviors; however, it was unclear in which form or under what context the influence occurs. Ecological Momentary Assessment (EMA) is a methodology that captures the momentary experience of individuals. It collects real-time data in natural environments repeatedly across contexts, and detects within-person and between-person level variations in the same contexts. The purpose of this study was to pilot-test the use of smartphone-based EMA to determine the relationships between emotional states and social and physical contexts of eating within personal social networks in a cohort of 21 participants. We developed a 10-question EMA to capture participants' emotional states, eating places and whom they were eating with. Participants were instructed to answer the EMA before and after each meal for three days. Each participant responded 13 to 18 EMAs over the three days, and 42% of the EMAs were completed after a meal. More than 60% of the participants felt medium to very happy emotions before the meal. 54% had no mood change after the meal; 19% felt happier after the meal, and 27% felt less happy. Participants reported higher level of happiness when they were eating with family and friends, while eating at restaurants or school was also associated with higher levels of happiness. The pilot study demonstrated feasibility to use smartphone EMAs in larger future studies to explore the relationship between social context, emotion and eating.

International Postcommunist Trade Network Analysis

Husom, Philip E.
Purdue University, Political Science, Lafayette, IN, United States

This paper analyzes the trade network of 25 postcommunist countries with OECD members as part of a project exploring the international diffusion of policies and regimes. Diffusion literature in political science misses many aspects of what network analysis considers in contagion and generally considers a one-sided relationship between two countries, overlooking the reciprocal nature of international relationships. Applying network analysis to international diffusion can be useful in many ways; it allows us to look at what is diffusing through which channels, and which countries are the drivers of international diffusion. There are many important aspects of international diffusion, including policies, communication, migration, and regimes, and countries interact in various ways. A crucial aspect of analyzing a network is identifying which nodes are the most important, and in this vein this paper presents an analysis of the trade network of the postcommunist region. The aim is to identify the most important nodes in the network and to produce visualizations of the network. This is of course a very preliminary analysis of the network, and there are many other aspects of diffusion to be examined, but a trade network is a solid foundation for further work on international diffusion.

How the Use of Weak Bridging Ties in Microfinance Can Help Poor Entrepreneurs

Jackson, Cornell A.
University of Greenwich, International Business and Economics, London, United Kingdom

Microfinance, financial services for the poor, has the problem of the poor not getting the amount of poverty reduction envisioned by the founders of the modern movement. One reason for this is that poor entrepreneurs' businesses in general do not generate enough returns to move them out of poverty. Very little work in microfinance has looked at the structural aspects of entrepreneurial networks of poor people. This research was conducted to test the theories of Granovetter (1973) and Burt (1992) to see if they are able to improve the entrepreneurial networks of poor people in ways that would make them more successful and help alleviate their poverty. Mapping the networks of 111 sari sellers who were microfinance clients in Tamil Nadu in India confirmed Granovetter's finding that poor people rely on strong ties. Not surprisingly, the networks of the sari sellers reflected the hierarchical nature of Indian society and as a result, the tree structure of the network resulted in structural holes surrounding these entrepreneurs. A network intervention was carried out to determine whether weak bridging ties could be introduced into these entrepreneurial networks. This showed that in some cases, adding weak bridging ties directly improved the businesses of poor people. However, the research also showed that poor people require help in adding weak bridging ties to their entrepreneurial networks. The
research identified five ways organisations such as microfinance institutions can use their capabilities to help poor people add weak bridging ties to their networks.

**Network Structure of Phonographic Market with Characteristic Similarities between Artists**

Jarynowski, Andrzej¹, Buda, Andrzej²

(1)Jagiellonian University, Smoluchowski Institute, Krakow, Poland, (2)Wydawnictwo Niezalezone, Wroclaw, Poland

We investigate relations between bestselling artists in last decade on phonographic market and from perspective of listeners by using the Social Network Analyzes. Starting network is obtained from the matrix of correlations between the world’s bestselling artists by considering the synchronous time evolution of weekly record sales. This method reveals the structure of phonographic market, but we claim that it has no impact on people who see relationship between artists and music genres. We compare ‘sale’ (based on correlation of record sales) or ‘popularity’ (based on data mining of the record charts) networks with ‘similarity’ (obtained mainly from survey within music experts’ opinion) and find no significant relations. We postulate that non-laminar phenomena on this specific market introduce turbulence to how people view relations of artists.

**Information Exchange between Mentors and Mentees: Examining Communication Linkages between Participants in the Rocky Mountain Sustainability Science Network Academy**

Jiang, Jingxian¹, Gretzel, Ulrike²

(1)Texas A&M University, College Station, TX, United States, (2)University of Wollongong, Wollongong, NSW, Australia

Past research on mentoring has been largely devoted to examining mentoring associated work- and career-related outcomes of mentees mainly in for-profit organizations. While a range of positive outcomes (e.g. career satisfaction) are recognized, few studies have been directed towards understanding how mentors and mentees interact with each other. Mullens (1994) proposed that mentors and mentees mutually seek a variety of information (i.e., technical, referent, normative, performance information and social feedback) from each other; factors such as mentoring functions, contextual variables and mentor/mentee characteristics influence the extent of information seeking. Limited empirical support has been obtained for this theory. Therefore, the current study intends to contribute to this stream of research by empirically analyzing the information exchange relationships among mentors and mentees. Specifically, this study investigates the reported information exchange networks of partners and students participating in the Rocky Mountain Sustainability Science Network Academy in 2011 and looks into the reasons why certain communication links were not formed. Differences in information exchange relationships as reported by male and female mentees are also investigated. The Academy is a week-long workshop for minority undergraduate students undertaking sustainability related internships on public lands. The philosophy of the Academy is to recruit and retain future leaders in public land management in the U.S.; successful mentoring is therefore a critical component of the Academy. This study makes a contribution by empirically testing Mullen’s information exchange theory in the area of public land management and education. Furthermore, it emphasizes the role of gender in the mentoring relationship.

**Cooperation and Strength of Social Ties in Adolescent Social Networks**

Jih, Yeou-Rong¹, Burnett Heyes, Stephanie², Block, Per², Lau, Jennifer²

(1)University of Oxford, Experimental Psychology, Oxford, United Kingdom, (2)University of Oxford, Sociology, Oxford, United Kingdom

A multitude of changes in social attitudes and behavior occur during adolescence. One notable change is the development of nuanced prosociality, with age-associated increases in prosocial moral reasoning and strategic cooperation. The current study investigated cooperation in two established UK school-based adolescent networks. Social ties were mapped exhaustively in a Year 9 (13-14yrs) and a Year 12 (16-17yrs) class using a social network questionnaire that assessed relationship duration, perceived nature (e.g. best friend, close friend), trust/confiding and companionship; a modified Dictator Game played with all other network members yielded a behavioral measure of cooperation. We utilized multiple regression quadratic assignment procedure to assess the relationship between bidirectional social ties and cooperative investment. In both networks, out-link strength (social ties reported by a participant toward peers) predicted investment - that is, adolescents invested more in individuals to whom they reported stronger ties. However, in only the older adolescent group did the difference between out- and in-link strength predict investment - that is, only older adolescents invested more in individuals who reciprocated strong ties. This is consistent with the notion that nuanced prosociality develops throughout adolescence. In the Year 12 network, but not in the Year 9 network, adolescents incorporate the extent to which authentic social ties are reciprocated in their cooperative strategy. This ecologically valid experimental paradigm accounts for the strength of social ties within authentic social networks and has potential to further the understanding of adolescent cooperative dynamics and the development of nuanced prosociality.
Network Homophily and Assortative Mating: An Agent Based Model of Marital Matches in Networks

Kamada, Takuma¹, Chihaya, Guilherme K.²
(1)Tohoku University, Sendai, Japan, (2)Umea University, Umea, Sweden

Sociological studies of assortative mating find a tendency for homogamy regarding characteristics such as race, class and educational background. Such tendency is partly explained as a result of opportunities to meet potential partners, which are conditioned by the social networks one is embedded in. High network homophily regarding the attribute of interest would reduce the opportunities to meet people who differ in that attribute. We build an agent based model of matching in social networks with varying degrees of homophily. Results from the simulation experiments show that the number of marriages between agents differing in the attribute of interest decreases with network homophily. Such decrease happens regardless of the preference function that agents use to choose a partner. To empirically demonstrate the effects of homophily on assortative mating, we utilize panel data (1990, 2000, 2010) for 102 of the largest metropolitan areas of the U.S. population census. Residential segregation is used as a proxy for network homophily. We estimate the effects of residential segregation on the proportion of interracial marriage using fixed effects models. The results show that interracial marriage is less common in metropolitan areas where people of different races live separately. We conclude that segregation in networks resulting from homophily is a plausible generative mechanism of homogamy in marriage markets, because it reduces the number of marriages between people of different races. This research contributes by bringing the debate of network homophily into the field of assortative mating and by studying how matching depends on network structures.

How Might Collaboration Foster Your Academic Career? Young Researchers' Networks in Educational Research in Germany

Kenk, Martina
Goethe University / DIPF, Educational Sciences, Frankfurt, Germany

Young researchers’ academic networks evolve to different types with regards to homophily of gender and discipline as well as social learning environment. This quantitative study analyses ego-centered networks of former Ph.D. students, who were members of a research program in Germany, mainly from the disciplines of psychology, education and didactics. Their academic career and activities, e.g. publications and research projects, during the years 2000 to 2010 were collected, evaluated and analysed as multiplex valued relationships between co-authors and research collaborators. The social learning environment was examined with a focus on the connections to the Ph.D. supervisors and their positions in the network. The preliminary data analysis identified two distinct models of social learning environments: a traditional ‘teacher-student-relationship’ with few strong ties to experts versus an innovative ‘community of practice’ with many weak ties to peers as well as to experts. Visualisation of the results allows insights into the structure and characteristics of academic networks. The appropriate use of graphic elements for attributes and relational data and their limitations will also be discussed. The network type, the model of situated learning and the academic position achieved are main indicators to draw conclusions about the significance of academic networks for a professional career.

The Added Value of Personal Dimensions of Professional Networks in Academic Science

Kiopa, Agrito, Melkers, Julia
Georgia Institute of Technology, Atlanta, GA, United States

In this study we link personal networks to individual productivity in science. In the context of academic science, individual level productivity is an outcome of a complex web of processes that start with opportunity; and proceed through the creation of new knowledge and its dissemination. In these processes, scientists and engineers self-organize in personal collaborative networks. In these networks, professional aspects are intertwined with social and personal. Both social and personal aspects of collaborative networks manifest in the role structure of the relationships, which comprise these networks. Social aspects manifest in such roles as advice, whereas personal aspects manifest in close friendship ties. Friendship plays a distinct and important role of integration of these networks, which can be seen as primary professional communities of academic scientists and engineers. The role of friendship is to mobilize social capital embedded in these personal professional networks, and thus to facilitate pooling all available resources in the pursuit and of the scientific knowledge. We hypothesize that friendship between close collaborators will have significant positive effects on the total of resources mobilized form collaborative networks, as well as on the scientist's publication productivity. To test these hypotheses we use ego-centric social network data of 1598 US scientists and 12,452 network alters. Overall, our results show that personal dimension of professional networks such as the friendship, albeit not the most important is a productivity relevant factor.
The Delineation of Functional Labour Market Regions by Using a Graph Theoretical Approach and Newman-Girvan's Modularity Q

Kropp, Per¹, Schwengler, Barbara²
(1) Institute for Employment Research, Regional Research Network, Halle, Germany, (2) Institute for Employment Research of the Federal Employment Agency, Nueremberg, Germany

Functional labour market regions are quite important for regional labour economic analyses and for regional policies because they show the concentration of economic activities within regions. These regional units allow comparing statistical data that are on the one hand obtained at the place of work like the income and on the other hand are obtained at the place of residence like the unemployment. The main purpose of the paper is to propose a methodological approach for delineating functional labour market regions based on commuter flows between municipalities. Data are available for all employees in Germany who are subject to the compulsory social security scheme at the place of work and at the place of residence for the years 1993 to 2008. Our method uses in a first step the graph theoretical approach of Nystuen/Dacey (1961) and Rabino/Occelli (1997) in order to generate a wide array of delimitations. In a second step Newman and Girvan's (2004) modularity measure Q is used to identify the best delimitation. We show that for Germany the best delineations have around 50 very heterogeneous regional labour markets. Furthermore, we use Newman's modularity measure Q to compare our result with results of other common delineation methods (cluster analysis and factor analysis), with established functional delineations as well as with administrative regions. The advantage of our approach is supported by other quality measures, like for example the self-containment ratio as an indicator for the closeness of a region or by commuting quotas.

Social Networks and Counseling

Kupfer, Annett, Weinhold, Kathy
TU Dresden, Fakultät Erziehungswissenschaften, Dresden, Germany

Social networks and personal relationships affect individual coping of the early requirements and problem definition (primary appraisal), the appraisal and assessment of the individual coping skills, personal and social coping resources (secondary appraisal) up to direct or indirect influence on concrete coping behavior of those involved. Up to 40% of the therapeutic/ counseling effects are attributed to extra-therapeutic factors (e.g. social resources). Despite their apparently large effects, social influences on emergence, development and impact of counseling and therapy are only rarely the research subjects of social and health sciences. In a three-year study (DFG) informal social influence - supportive helpful, regulating controlling and stressful conflictual - was exercised and analyzed prior to men and women and their coping efforts during and after the use of professional counseling (student counseling, educational counseling, psychological counseling). The focus of qualitative interviews and quantitative rating scales were the subjective experiences and reflections of 72 people on the existence, meaning and effect of different influences by different sources of their personal social network. It turns out that in addition to the companion friends throughout the problem solving process, taking a special meaning as a coping resource assistants. They rank well ahead of parents, siblings, colleagues and neighbors.

Social Networks and Evidence Based Practice in German Schools

Laier, Bastian, Preisendoerfer, Peter
Johannes Gutenberg-Universität Mainz, Mainz, Germany

Teachers have access to a wide variety of information sources (own experience, student feedback, external evaluation, scientific journals, etc.) on which they can rely to teach their students. Furthermore, teachers can share and discuss these information sources with other actors so that the information acquires the character of social capital. The different sources of information can be described as more or less evidence based. Our research focus lies on such sources that can lead to so called evidence based practice. Following Argyris/Schön (1999) and Borgatti/Cross (2003), we expect that the formal and informal social relationships of teachers influence the acceptance and implementation of evidence based practice. Two different surveys have been conducted to analyze this influence. The first one contains egocentric network data from 925 teachers (4025 alteri) of 110 schools of the federal state Rhineland-Palatinate, Germany. This survey served as a first step to determine the relevant network actors with whom teachers talk about their work. Results have shown that almost 80 % of the named alteri are teachers within the same school as ego. Therefore, a second survey makes use of a complete network approach to analyze the influence of network structure on information flow within selected schools. The combination of individual relationships and information sharing within organizations such as schools allows conclusions about the influence of individual social capital and network structure on information flow and finally on the diffusion of evidence based information.
Relational Components in the Formation of Regional Mobility (Poster Presentation on Self Organized Human Use of Technology)

Liepelt, Klaus1, Schulz, Christian2
(1)University of Applied Sciences Mittweida, Media, Leverkusen, Germany, (2)University of Applied Sciences Mittweida, Electronics, Mittweida, Germany

Mobility research has a persistent tradition of analyzing the Traveller’s Choice by probing into personal behavior. We do not follow the mainstream assumption that, for understanding the formation of moving publics, the average traveller be the crucial unit of analysis. Neither should he be given credit as a major source of information in tracing the continuous reassembly lines of dancers moving between goals via shared technical equipment. The interview-based “modal split”, a global breakdown of market shares between the use of transportation facilities - bus, tram, car, motorcycle, bike, feet - does not adequately reflect the dynamics of spatial mobility. A Regional Transportation System is a complex arrangement of relationships between social and technical components, continuously changing. It implies interaction between interpersonal user networks with the effective functioning and penetration of technical services at grass roots. User decisions between available utilities are permanently being renewed, with changing intentions and targets; in view of resource sharing with nears or peers; frequently several times a day. We will disaggregate the interactions between human networks and available transportation facilities to their actual interface points. Our empirical case of an urban transportation area will deal with the behavior of 1200 Stopover points, thereby covering the limited realm within which people experience their private mobility. Process produced data will be collected and analyzed for these levels. Relevant functional equivalents should be discovered, so that small-scale coupling and decoupling between demand and supply may be monitored - and corrected - at its emergent locations.

Network Positions of Survey Non-respondents
Livak, Britt1, Schneider, John2
(1)University of Chicago, Health Studies, Chicago, IL, United States, (2)University of Chicago, Medicine and Health Studies, Chicago, IL, United States

Much attention has been given to the potential non-response bias that occurs in field surveys that attempt to enroll a representative sample. Most of the analyses surrounding non-respondents have focused upon individual-level attributes, and how these attributes vary across respondents and non-respondents. While these attributes are of interest in assessing the representativeness of the sample generated, analysis of the network position of non-respondents as defined by sociometric measures (e.g. centrality) has not been conducted. In order to assess the network position of non-respondents, we utilized data from the Secunderabadi Mens’ Study (SMS) a sociometric network of Indian men who have sex with men (MSM) generated using cell phone contact lists of men approached through Time Location Cluster Sampling. This generated three groups of linked MSM: interviewed “respondents”, n=239; MSM “alters” whom they were connected to (n=4885 MSM) and individuals approached, but who did not consent to interview - “non-respondents” (n=96). Major reasons for non-response were: “Not reachable” (41%), “Too busy” (39%), and “Out of region” (7%). We compared attributes and network positions of non-respondents, and alters who were not sampled to the 239 interview respondents. Non-respondent attributes were similar to those of respondents (demographics, sex-role). Network position differed, however. Non-respondents had significantly higher constraint than respondents (mean 0.68 vs. 0.14), and non-sampled alters had significantly lower in-degree (mean 1.2 vs. 3.5) and higher constraint (mean 0.93 vs. 0.14) compared to respondents. This analysis suggests that the network position of non-respondents may be important when considering the potential impact of non-response bias.

Ethnic Preferences at Romantic Partner Selection in Case of Secondary School Students: The Effect of Heterogeneity
Lorincz, Laszlo
MTA TK 'Lendulet' Research Center for Educational and Network Studies, Budapest, Hungary

Group composition (opportunities) and preferences are usually treated as two separate factors affecting partner selection. Previous research has shown that opportunities affect partner selection: for example more heterogeneous areas result in more heterogeneous marriages (Blau and Schwartz 1984). This study raises the question whether (ethnic) group composition have a direct effect even on (ethnic) preferences themselves. Based on the research course of contact theory (Pettigrew, 1998) the hypothesis can be put that such interaction exists. The first wave data of the Hungarian network panel “Wired into Each Other” was used for analysis, containing data of 1224 9-th grade students in 44 classes of seven Hungarian secondary schools. Ethnicity (roma and non-roma) was based on self-assessment. Three levels of
preferences were measured: (1) Perceived norm of dating with someone with roma origin, (2) Individual attribution of
physical attractiveness of each classmates, (3) Individual preference for dating each classmates. Multi-level regression
models were used for analysis: two-level linear model in case of the norms, three-level logistic models (level 1: tie, level2:
individual, level 3: class) in case of the attractiveness and preference for dating. Increasing share of roma students in the
class was found associated with increasing acceptance of dating with roma students. Additionally, increasing share of
roma students was associated with increased attributed physical attractiveness of roma classmates. Both norms and
perceived physical attractiveness affected preference for dating, and share of roma students did not have an
independent effect after controlling these.

Impact of Social Capital on Professional Careers of Investor Relations Managers

Maas, Martina\(^1\), Hollstein, Betina\(^2\), Bassen, Alexander\(^3\), Pfeffer, Juergen\(^2\)

(1)Universitaet Hamburg, Hamburg, Germany, (2)Carnegie Mellon University, Pittsburgh, PA, United States

Job opportunities are unequally distributed. Many studies show that promotion prospects depend on social background.
In particular, for top-ranking positions social status plays an important role. We are interested in network effects on
professional vitas, i.e. what is the impact of social capital on professional career advancement? The focus of this study is
on Investor Relations Managers - a rather new occupational group in Germany. Goal of our research is to study their
professional careers and to identify the impact of social capital on their vitas, i.e. social support provided by family,
friends, and colleagues. For this purpose, career paths need to be collected. Consequently, we surveyed all
(approximately 1,000) Investor Relations Managers in Germany as well as some former managers with a standardized
online questionnaire. Additionally, we conducted 30 qualitative in-depth biographic interviews with a selected sub-
sample. By making use of network visualization and information visualization techniques we illustrate aggregated career
paths of an entire occupational group and analyze the impact of social capital on these paths. In this poster presentation
we present the research design of this study as well as first results of the visual analysis of the career paths.

Social Environment and Decision Making: An Examination of Social Influence Mechanisms Determining
Migrants' Health Care Service Utilization

Maier-Bode, Michel

University of Mannheim - Doctoral Center in Social and Behavioral Science, Mannheim, Germany

How do social embeddedness and its accompanying social influence mechanisms shape individuals' decision making and
what can be inferred regarding causal relations? Based on empirical observations, dealing with migrants' underutilization of
medical services in the German health care system, I investigate how and to what extend the social environment
migrants are embedded in determines individual action. Doing so, this attempt broadens the understanding of migrants' behavior by not merely focusing on conventional explanations such as language barriers or discrimination. Rather, the
consideration of social influences shifts attention towards a network perspective in the context of explaining migrants'
medical shortages. Using novel data from a mosque, representing a relevant focal point for adherents of the Islam faith,
allows examining the reasons for underutilization of the largest migrant group in Germany. Mosques do not only
represent places designated for religious reflections but also places where social interaction takes place, people get in
touch with each other, and social influence mechanisms have to potential to operate. Differences between the
community members within the mosque based on their position in the social network allows drawing conclusions about
the conditions necessary for a behavioral change. Consequently, this project adds to the understanding of general social
network effects as well as to the specific situation of migrants in Germany. Implications for migration policy programs as
well as new perspectives thinking about minorities' disadvantages will be the contributions of this work. Furthermore,
theoretical advances concern the understanding of network influences on behavior.

Retrieving the Social Facet of Walking through Proximity Data: A Network Analysis

McAneney, Helen\(^{1,2}\), Hunter, Ruth F.\(^3\), Davis, Michael\(^2\), Tully, Mark A.\(^{2,3}\), McCann, Jim F.\(^{2,5}\), Valente, Thomas W.\(^6\), Kee, Frank\(^2\)

(1)Queen's University Belfast, Institute of Child Care Research, Belfast, United Kingdom, (2)Queen's University Belfast, UKCRC Centre of Excellence for Public Health, Belfast, United Kingdom, (3)Queen’s University Belfast, Centre for Public Health, Belfast, United Kingdom, (4)Queen's University Belfast, The Institute of Electronics, Communications and Information Technology (ECIT), Belfast, United Kingdom, (5)Queen’s University Belfast, School of Mathematics and Physics, Belfast, United Kingdom, (6)Univesity of Southern California, Department of Preventive Medicine, Redondo Beach, CA, United States

Objective: To explore the longitudinal nature of the social facet of participants within the engagement of a physical
activity work place intervention. Methods: The PAL (Physical Activity and Loyalty) scheme is a novel approach for the
Which Net is Working? Comparing Networking Patterns of the Russian Speaking Communities in Germany and Norway, and their Role in the Process of Integration

Mendzheritskiy, German, Bagreeva, Ekaterina

The migration from the countries of the former Soviet Union brought thousands of migrants to Germany and Norway between 1990 and 2010. The report is based on a field research conducted by the authors on Russian speaking migrants in the two countries during 2008-2010 using qualitative and quantitative methods, with following qualitative study started in 2012. In case of Germany, the migration in the 1990s and early 2000s was mainly ethnical. The main groups making up the migrants from the former USSR are: ethnic Germans and their family members (majority), ethnic Jews with their family members, as well as other small groups of migrants. These groups amount to more than one hundred thousand per year in 1990s, reaching about 2.5 million people in Germany today. The situation in Norway differs noticeably from that of Germany. In this country, more than 60% of the migrants arriving in the 1990s and early 2000s were women marrying the local population, while the rest is work and student migration. All groups combined total about 14,000 migrants from the former USSR. The results of the study identified distinct patterns related to migrant networking in both countries - areas the migrants prefer to interact with compatriots, and what areas they prefer networking with the local population, as well as different impacts of such relationships on the complexity of the integration processes.

Social Networks of HIV-positive Women of Color, Social Support and Medication Adherence

Messer, Lynne C., Quinlivan, Evelyn B., Parnell, Heather, Roytburd, Katya

Women of color (WoC) are disproportionately affected by HIV epidemic, in their infection rate, mortality, and loss to care. We explore the social networks of HIV+ WoC, their role in social support provision, and how network characteristics are associated with medical adherence among WoC in HIV care. Network data were collected from ~150 HIV-positive WoC patients at the University of North Carolina’s Infectious Disease clinic (July 2011-January 2012). General Social Survey questions were modified to elicit egocentric network membership and member characteristics. Interviewers also asked validated social support, medication adherence, demographic, and other questions. Measures of network exposure, size, tie strength, density and support provision were constructed. Fixed-slope random-intercept multilevel linear regression models will result in beta coefficients and 95% confidence intervals for the relationship between network characteristics (level-two), social support (level-one) and self-reported treatment adherence (level-one). Women were equally distributed across education categories (less than high school (HS), HS, more than HS) and 65 percent (%) were under 50 years old. About 10% were in non-permanent housing and the majority (72%) were unemployed. Correlations among social support scales were moderate ($r=0.5$). In models containing sociodemographic variables only, unemployment and low education were significantly associated with lower levels of social support. Network data are being cleaned so network model results will be presented at the meeting. Social support may be important to HIV care adherence and social network structure and characteristics are important elements of support provision.

A Coauthorship Network of the International Political Science Community

Metz, Thomas, Jäckle, Sebastian

University of Freiburg, Political Science, Freiburg, Germany
We present and analyze a large coauthorship network depicting the international political science community. Based on a bibliometric analysis, we derive the network which is currently the biggest one available for the discipline. It consists of about 25000 authors and has been assembled from a newly collected publication dataset covering research articles published in more than 50 political science journals between 1990 and 2010 extracted from the JSTOR online archive. We derive and visualize the network, statistically analyze its most important components and compare results to existing coauthor networks collected in the natural sciences where the quantitative analysis of collaboration patterns has a longer history. We also investigate how the network develops over time. By combining the network information with a bibliographic analysis comparing e.g. coauthorship patterns across gender or within subdisciplines we assess the scientific activity of the different components, their authors and give an impression of trends in productivity and coauthorships in the discipline and its subfields. Using an extension of the PageRank index adapted for coauthor analysis we determine the fields most central researchers and their position in the network.

Uncertainty and Collaboration in the Ecology of Games
Mewhirter, Jack1, Scholz, John1, Berardo, Ramiro2, Lubell, Mark2
(1)Florida State University, Political Science, Tallahassee, FL, United States, (2)University of Arizona, Tucson, AZ, United States

How institutions, actors, and networks combine to influence policy outcomes and cooperation is a central question in political science, one that is particularly important in fragmented policy systems involving multiple decision venues and public policy issues. This paper applies the ecology of games framework (Long 1958) to understand the structure and performance of complex policy systems. Through a comparative analysis of the political ecology of estuaries with relatively low (Argentina), and high (Florida, California) institutional development, this paper explores how stakeholders evaluate different policy institutions in estuaries that vary in development and complexity. Specifically, we analyze survey data from stakeholders in each area to assess the impact of several variables: uncertainty about the expected goals and actions of other stakeholders; uncertainty about scientific basis of policy; the centrality of the actor within the forum structure; the perceived cohesion of the actor’s organizational affiliation. We find that in general, more institutionally developed management networks are able to mitigate the effect of behavioral uncertainty but may be particularly vulnerable to scientific uncertainty; Conversely, institutionally underdeveloped networks are highly susceptible to behavioral uncertainty but not to scientific uncertainty. We also find that the effect of centrality and perceived organizational cohesion are much more pronounced in more institutionalized settings. Perceptions of conflict play a malignant role across evaluations for all cases.

And what if I Innovate my Business Model? Using the Network Lens to Explain the Successful Implementation of New Business Models
Micheli, Maria Rita1, Musmeci, Nicolò2
(1)Rotterdam School of Management - Erasmus University, Strategic Management & Entrepreneurship, Rotterdam, Netherlands, (2)King’s College, London, United Kingdom

Management scholars have assessed that the success of business model innovation (BMI) is determined by the interaction of companies within their value network (Zott and Amit, 2010) and actors with specific positional advantages are able to exploit the network to successfully implement new business models (Chesbrough, 2007). Despite the fact that the use of the network lens is therefore considered as functional to understand the process of BMI (Calia et al., 2007), only a few empirical studies embrace this perspective. In this paper we look at the correlation between the position of firms in reputation and cooperation networks and the successful implementation of BMI. The full network of the branch design organization in The Netherlands constitutes the context of our research. The research was survey - based and we obtained 74 completed surveys from 121 members. The remaining part of the network is re- constructed through the use of ERGM models. Varying the parameters of the models we are able to fit our reconstruction to different hypotheses about both network topology and properties of non-respondent firms: we therefore perform our analysis on different scenarios and discuss their validity. The paper leads to three main contributions. First the use of the network lens allows us to empirically study BMI, typically qualitatively analyzed (Zott et al., 2011); second, we show how ERGM models can support management studies usually facing low survey - response rate (Robins et al., 2004); third, for practitioners, we assess the consequences of BMI under different network conditions.

When Conflict Promotes Team Learning: Transformational Leadership and Psychological Safety as Moderators
Mojarro Duran, Barbara I.
For today's business organizations, developing work teams has become an important organizational strategy since it is believed that it will help them compete more efficiently. One of the critical aspects of teams is how they learn and adapt themselves to new challenging situations. Current organizational behavior research identifies variables such as conflict, leadership, and psychological safety as important factors that affect the team learning process. Having reviewed the theoretical discussion of what team learning is, from a social network perspective, it can be understood and the sum of reciprocal ties of certain key social dynamics. A team learns to the extent to which activities such as seeking feedback, reflecting, and finding new solutions to old problems are reciprocated among team members. In this study, I attempt to assess the feasibility of such an operationalization, and additionally propose that team learning (the sum total of reciprocal ties) will be increased when either relationship or task based conflict is present. The role of a transformational leader as a moderator on this relationships by creating a psychologically safe environment is also assessed. In other words, when the team leader shows transformational behaviors, he or she will moderate high conflict levels to promote a positive team learning process. The findings support all hypothesized relationships, which has important implications on the theoretical definition of the team learning process, as well as the definition of the team learning construct.

**Socio-structural Factors in Analytics-driven Organizational Decision Making: A Research Agenda**

**Mongeau, Scott**

Nyenrode Business University, Executive PhD Program, Breukelen, Netherlands

Responding to a rising interest in business analytics this paper proposes the use of social network analysis (SNA) as a tool to gain insight into IT systems-driven organizational decision making. It is proposed that a research lacuna exists concerning the role of hybrid organizational-IT systems network structures in analytics-intensive business decision making. The purpose is to suggest a broader research agenda to utilize SNA to assess and guide the planning and implementation of analytics solutions as hybrid organizational-IT networks. Analytics-driven decision making implies IT systems-driven organizational decision processes. Analytics is defined as “the use of data and related insights... to drive fact-based planning, decisions, execution, management, measurement and learning” and may be “descriptive, predictive or prescriptive” (Kiron et al, 2011). Recent research asserts that the foundation of this trend is not only a desire to strengthen decision making quality, but to realize core competitive business value creation. It is proposed that correlations between SNA organizational decision network structures and decision quality outcomes exist. Drawing from Latour’s Actor-Network Theory (ANT), it is proposed that IT analytics systems be included as actors in analysis. SNA provides a method to map socio-structural architectures in IT systems-intensive environments, such that more and less effective ‘cyborg’ (hybrid organizational-IT systems) patterns can be identified. Beneficial socio-structural categories can subsequently be advocated to firms seeking to adopt organizational changes to promote more effective decision making practices. Kiron, D. et al. (2011). Analytics: The Widening Divide. MIT Sloan Management Review(Special Report).

**Social Network Analysis of Peer Popularity and Binge Drinking among U.S. Adolescents**

**Mundt, Marlon P.**

University of Wisconsin-Madison, Family Medicine, Madison, WI, United States

Adolescent binge drinking is a major public health challenge. Without clear guidance on the causal pathways between peers and binge drinking, adolescent alcohol interventions may be incomplete. The objective of this study is to disentangle selection and influence effects associated with the dynamic interplay of adolescent friendships and binge drinking. The study analyzes data from Add Health, a longitudinal survey of seventh through eleventh grade students enrolled between 1995 and 1996. A stochastic actor-based model is used to model the co-evolution of binge drinking and friendship connections. Selection effects play a significant role in the creation of peer clusters with similar binge drinking. Friendship nominations between two students who shared the same binge drinking frequency were 3.46 (95% CI: 2.38-5.01) times more likely than between otherwise identical students with differing alcohol use frequency. Binge drinkers were more popular among U.S. adolescents. Adolescent binge drinkers were 7% more likely to receive a social pay-off with more friendship nominations than non-binge drinkers. An adolescent who nominated bingers as friends was 14% more likely to begin binge drinking than adolescents with non-binge drinking friends. The data demonstrate that strong family ties reduced the odds of adolescent binge drinking by 7%. This investigation demonstrates that binge drinkers receive a social payoff in terms of increased popularity. Adolescents attempt to conform to the binge drinking of the popular adolescents they want to befriend. Future studies may want to explore interventions which curtail popular binge drinkers’ alcohol use and/or foster family support.

**An Exploration of Theoretical Mechanisms for Generating Degree Distributions of Evolving Networks**

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This paper introduces the theoretical foundations of the general framework for degree distributions of evolving networks. The general framework refers to one that establishes a set of theoretical relationships between the growth mechanisms of the elements that constitute a network and the topological properties of that network, and thereby, can facilitate the detection and estimation of the effects of the underlying evolutionary mechanisms on the observed networks. Following Ross Ashby’s (1964) logic of constraint analysis, the generative mechanism of power-law degree distributions was decomposed into two independent exponential growth functions (Reed & Hughes, 2002). Theoretical examinations of the exponential growth functions revealed a set of assumptions underlying power-law degree distributions, which are largely unrealistic or not applicable to real-world networks. Based on evolutionary theories (Hofbauer & Sigmund, 2003; Nowak, 2006), it was shown that those assumptions need to be modified, the exponential growth mechanisms can be replaced by new growth mechanisms corresponding to the modified assumptions, and the new mechanisms generate new theoretical degree distributions different from power-law distributions. As illustrative examples, three theoretical degree distributions were proposed, assuming upper bounds on the connectivity of networks. The proposed distributions were tested against several real-world networks in comparison with the best-fit power-law distributions. The results showed that new models better explained the observed degree distributions of the real-world networks than the power-law model, suggesting that different growth mechanisms underlies the emergence of the observed degree distributions. The implications of the findings and the possible directions of future research were discussed.

**Eloquent and “More Developed”: Network Centrality in Multinational Teams as Function of Language Ability, Nationality and Self-evaluations**

*Pauanova, Minna*

IESE Business School, Barcelona, Spain

Building on expectation states theory and research on intercultural relations and nationality-based stereotyping, I examine the ascribed and achieved status mechanisms behind individual network centrality in self-managed multinational teams. I argue that individuals are sought after for leadership and advice, but not for friendship, on the basis of the level of development of their home country (a diffuse status characteristic) and because of their fluency in the team's lingua franca (a specific status characteristic). An individual's core self-evaluation and self-rated spoken language fluency are examined as potential mediators of the effect of status characteristics on network centrality. Data on 286 individuals in 36 real teams confirm the prediction that (1) language fluency and nationality are strong status signals, (2) the mechanisms of formation of instrumental and friendship network structures are different, and (3) the effects of nationality on centrality are partially mediated by individual core self-evaluation. These results hold after numerous robustness checks. I contribute to research on the formation of intrateam social networks, especially in the multinational domain. Thus, I help further integrate diversity, status and inequality theories into the study of the micro foundations of the formation and perpetuation of social structure. Implications of the achievement/ascription mechanisms driving the formation of instrumental networks for the proliferation of multinational teams in organizations are discussed.

**Boundaries in the Relational Organization of Culture. A Network-theoretical Policy Analysis of the City Museum Foundation Hamburg**

*Peper, Robert*

Leuphana Universität Lüneburg, Institut für Soziologie und Kulturorganisation, Hamburg, Germany

In 2008 the government in Hamburg established a foundation composed of the largest city museums. The museums were given a common brand called the “Stiftung Historische Museen Hamburg” (Eng. “City Museum Foundation Hamburg”). The aim of the new established partnership is to create synergies on different levels. The installation of a central administration and the collaborative planning of exhibitions are just two of the goals that shall be reached. Additionally, cooperation between museums and to external actors is expected to be improved. Finally, the collaboration is supposed to lead to a reduction of costs in times of low government budgets. The decision made by the government can be understood as Cultural Governance. Therefore, politics installs a formal network to reinforce cooperation and to bundle cross-sectional tasks between museums. In order to evaluate the decision-making process of Hamburg’s cultural policy, a mixed method approach shall be used. In a first step, broker of the policy network will be identified in a documentary analysis of formal memberships, developing a network which will be drawn by using the program PAJEK. Additionally, the results will be validated and modified in expert interviews with key actors from three sectors: museums, politics and administration. An ego-centric network analysis will help to reveal the informal network structures. VennMaker will be
used to collect relevant data and to visualize the ego-centric network structures. The study aims at making a contribution to the better understanding of the broker and his potential role as a gatekeeper at organizational boundaries.

**Collaborative Network in Contentious Policies: The Effects of Activism in the Decision Making Process of Hydroelectric Dams in the Brazilian Amazon**

*Pereira, Ana Karine*², *Mertens, Frédéric*, *Vilaça, Luiz Henrique*³

(1)Universidade de Brasília, Political Science, Brasília, Brazil, (2)Instituto de Pesquisa Econômica Aplicada - IPEA, Diretoria de Estudos e Políticas do Estado, das Instituições e da Democracia, Brasília, Brazil, (3)Universidade de Brasília, Brasília, Brazil

Discussions of relational mechanisms have proved to be useful in research that analyzes collaboration and power asymmetry. In this paper we apply social network analysis to investigate how political minorities are able to influence state decisions on contentious policies. The empirical context is the Amazonas region of Brazil, where the Brazilian federal government has planned to implement the mass construction of hydroelectric dams. We focus on the story of Belo Monte, a giant hydroelectric dam located on the Xingu River. We analyze the collaborative relationship among a variety of environmental and indigenous activists (the blocking network) to understand why the federal government changed its original plan for the construction of Belo Monte. We decompose the decision making process over Belo Monte into three phases and analyze how the architecture of the blocking network helped to influence federal policy. Analysis requires a novel data set, which we produce through the interview of key actors, complemented by a study of environmental licensing processes. Two broad results are obtained: (1) the state actors responsible for major decisions concerning dam construction, including the Brazilian congress and the bureau of energy planning, are characterized by a closed and cohesive network which hinders collaboration with activists. (2) Despite this, the blocking network was efficient in connecting to power brokers through whom they could access political resources. We demonstrate that collaborative ties with unions and state agencies decisively improved the activists’ ability to influence state decisions, resulting for example in the reduction of dam flood area.

**The Role of Social Network Analysis in University-industry Cooperation: In Search of a New Methodological Approach**

*Pinheiro, Miguel N. L.*¹,², *Pinho, José Carlos*³, *Lucas, Cândida*¹

(1)University of Minho, School of Economics and Management, Braga, Portugal, (2)University of Minho, Biology Department, Braga, Portugal

Purpose: This paper explores the use of social network analysis (SNA) as a new methodological approach to study university-industry (U-I) links, particularly in the context of R&D cooperation. Building upon relevant literature, we have concluded that most studies in this field have mainly applied classic methodological approaches. Without questioning the relevance of these methodologies, to our best knowledge very few studies have applied the SNA perspective to understand interactional (or relational) effects and their implications in U-I links. Methods and Findings: In order to identify the major methodological approaches in previous research, the authors performed a comprehensive literature review of papers concerning U-I relationships published in the last two decades. Despite its sparse adoption in the field of management sciences, the authors postulate that SNA can be a useful and relevant tool to understand and examine interactions between university and industry partners, both at personal and organizational levels. The authors provide several examples of SNA applications based on data collected from U-I relationships in Portugal. Originality: Most studies regarding U-I interaction focus on describing technology transfer and commercialization. This study proposes the use of a new methodology that will focus on the establishment and maintenance of U-I relationships leading to R&D cooperation. The risk and uncertainty surrounding these relationships support the need for analysing the fundamentals of a successful cooperation, instead of focusing merely on cooperation outcomes. Specifically, this paper attempts to apply to this new methodology in order to understand the interactional dynamics embedded in U-I relationships.

**Communication Networks between Politics and the Media under Online Conditions**

*Raupp, Juliana, Schink, Christin*

Freie Universität Berlin, Berlin, Germany

Beyond metaphorical descriptions, social network analysis has not been applied systematically to media relations, yet. The intertwining of journalists and professionalized sources, however, implicates taking into account both sides simultaneously. By theoretically drawing on approaches to the interplay of journalism and the strategic dissemination of political information as well as on transaction cost (Lin, 2008) and social capital theory (Granovetter, 1973), we aim to capture the structure of the communication network between politics and the media. Our central question is: In what way are the network structures altered under online conditions? Structurally seen, we assume that its borders will fray
out. As a consequence not only speakers and gatekeepers but also brokers will emerge. Simultaneously, cliques may develop that try to restore the former exclusivity of the exchange network. By conducting a positional analysis with an encyclopedia of public life, the lobby-list of German parliament and Media Tenor citation ranking, we defined the borders of the communication network between German political organizations and the media on the federal level. With the help of 60 semi-structured interviews we gained network data for its relations information and influence. A network sampling opened our theoretically derived network to new actors. First results show that our theoretical sampling of elite organizations proofed valid, as only in some cases the network sampling revealed organizations outside this closed network. Furthermore online media are seldom used for the exchange of information in our context and therefore the assumed changes in structure cannot be pinpointed, yet.

**How Do Organizations Behave on the Field? A Dual Structuralist-constructivist Typology**

*Reischauer, Georg*

LMU Muenchen, München, Germany

Actions of organizations are not random but interwoven with the structure of their environment. Structuralist-constructivist strands in contemporary organizational and economic sociology - the new institutionalism, Bourdieu and White’s network theory - suggest that macro organizational behavior is best analyzed by considering the interrelations between networks, institutions and frames on the field. In this theoretic article, I put together these elements towards a typology of the behavior of the collective actor organization. Based on Sewell’s theory of dual structure of social life that focuses virtual schemas and actual resources, I combine core insights of the three structuralist-constructivist approaches and develop a framework of the dual structure of the organizational field. From the perspective of schemas, actions of organizations are coined by the position on the field (periphery vs. core) and its configuration (technical vs. institutional). From the perspective of resources, macro organizational behavior is linked to the access to resources (closed vs. open) and their configuration (non-symbolic vs. symbolic). The interplay of these four dimensions creates four ideal-type partial behavioral patterns: individualize, isolate, attack and defend. Detailing each of these patterns as well as highlighting basic methodological and methodical parameters, I argue that the dual structure of the organizational field should be taken into account when inquiring into the behavior of organizations.

**Social Network Analysis of Breakthrough Innovation**

*Richman, Jessica*

University of Oxford, Oxford, United Kingdom

This paper aims at understanding the elite networks involved in guiding global breakthrough innovation. Many organizations (e.g., Gates Foundation, Clinton Global Initiative, Breakout Labs) are motivated to promote breakthrough innovation in the service of humanity’s grand challenges. Using an original dataset involving members of these organizations, I will plot the elite networks involved in creating breakthrough innovation. I’m excited to share this preliminary research with the INSNA community.

**Abu Sayyaf Group: Well-structured Terrorists or Loose Network of Criminals?**

*Ringler, Kristine, Autin, Barbara, Gerdes, Luke*

United States Military Academy, Behavioral Sciences & Leadership, West Point, NY, United States

Analysts continue to debate the leadership structure maintained by the Abu Sayyaf Group (ASG), a violent non-state actor operating primarily in the Southern Philippines. Some argue that ASG is well-structured and maintains a relatively formal chain-of-command; others contend that ASG is, at most, a loosely-coupled network of criminals containing no central decision-makers. This paper seeks to partially resolve the debate, by using network measures to assess the structural role that ASG’s named leaders play in the organization’s kidnapping operations. The paper’s central task is to determine whether these men are crucial to the function of ASG, or if they are perhaps leaders in name only. Because existing datasets on extremism lack detailed agent-level data on ASG, the paper will utilize an original dataset that was collected and hand-coded from open-sources. The data spans the years 1991 to 2011 and includes 206 agents and 88 kidnappings. This multi-modal network will be transformed into an agent x agent network and will be analyzed using standard network metrics. Ultimately, this agent-level assessment has the potential to provide an empirical understanding of ASG’s organizational structure.

**A Longitudinal Study of Inter-organizational Research Team Development Using Social Network Analysis**

*Ryan, David D.*, *Emond, Marcell*, *Lamontaigne, Marie-Eve*
The Canadian Emergency Team Initiative on Mobility in Seniors After Injury (CETI) is a instance of an inter-organizational research team. Since its inception CETI the projects principal investigators have examined their inter-relationships annually using social network analysis. The analysis is used as a metric to inform the development of its collaboration and provides a focused opportunity for team reflection at its annual face-to-face-meetings. With a stable membership over its first two years, the analysis reveals increasing density and reciprocity along with more distributed centrality among its members. These results are consistent with existing research in this area. In year three, two additional research sites were added to the team and the impact of these additional nodes is described. The application of network analysis in this context contributes to the science of team science.

Effect of Network Structure on Startup Investment
Santana, Jessica J.
Stanford University, Sociology, Stanford, CA, United States

High tech entrepreneurship in Silicon Valley has generated landmark companies like Hewlett-Packard, Apple, and Google. A critical step in building these organizations is initial funding. Investors and entrepreneurs often portray Silicon Valley as a meritocracy where social ties have little effect on a startup’s ability to raise vital funds. In this project, we intend to test this assumption. We use a large online dataset that includes quantitative and qualitative individual, organizational, transactional, locational, and historical data on over 109,000 startups and 8,000 investors. Through data mining and social network analysis, we evaluate the relationship between fundraising and network segmentation, centrality, brokerage, and organizational proliferation. We expect to find significant clustering, clique formation, and interbreeding among startups, founders, and funders. By illustrating the patterns of fundraising given network structure, this analysis will clarify the importance of affiliation as a factor in Silicon Valley high tech investment.

Coauthorship Network and Academic Collaborations: A Case Study in Italian Solar Astrophysics Community
Scardigli, Stefano1,2, Berrilli, Francesco1, Bistoncini, Fabio2
(1)University of Rome Tor Vergata, Department of Physics, Rome, Italy, (2)FB&Associati, Rome, Italy

Coauthorship network is a rather novel research area functional to examine collaborative links or statistics among a specific scientific community. Using a sub-database, that spans over the last 5 years, of SAO/NASA Astrophysics Data System we derived the scientific production network of Italian solar astrophysics community through their article co-authorships. This community is chosen because is an archetype of Italian astrophysics communities largely fragmented between universities and scientific institutes and widely spread over national territory. We used the coauthorship network to capture collaborative pattern and to identify potential hub institutions. To validate the organization of the Italian scientific policy we computed a second network related to institutional affiliations. The observed departure between political consequence of the two networks reveals complex or anomalous connections and suggests a reorganization of scientific policy to improve their effectiveness and their political consequence.

Integrating Social Network Analysis with Contact Investigation of Tuberculosis
Stepp, John Richard, Fishwick, Paul, Lauzardo, Michael, Setzer, Donna, Ezzell, Zach
University of Florida, Gainesville, FL, United States

Tuberculosis is a major communicable disease with up to 1/3 of the world’s population infected. The analysis of social networks of new cases is almost always incomplete during contact investigations. This paper describes the development of a new software application that will develop social network data and guide contact investigators to new interviews and identify potential transmission pathways. The software is currently being beta tested for the Apple iPad in the Florida, USA in collaboration with public health officials. The challenges in developing new software is discussed, along with an ethnographic description of current practices utilized by contact investigators during tuberculosis outbreaks.

A Targeted Web-based Chlamydia Trachomatis Screening Strategy for Testing in Young People at Risk Using Social and Sexual Networks
Background: Despite the availability of public sexual health care centers and general practitioners many young people at high risk for Chlamydia trachomatis are hidden to care. Members of the social and sexual networks surrounding Chlamydia positives typically show high risk; these networks are important targets for interventions. Methods: Intervention Mapping (IM), a systematic approach to develop theory- and evidence-based interventions, was used to develop a secure and web-based outreach Chlamydia screening strategy to target Chlamydia testing towards young people who are currently hidden to care. Key methods include web-based Respondent Driven Sampling (Web-based RDS), starting from young Chlamydia positive sexual health care centre clients, to reach and motivate peers (i.e., sex partners and friends) to get tested. The idea behind RDS is that selected young people are recruited as seeds or ambassadors who themselves motivate others in their own networks to get tested, and so on. Results: Using IM, it is feasible to develop a new peer-driven web-based intervention to reach young people at high risk for Chlamydia. We here describe the intervention components and its theoretical framework, including the behavioural change model and network theory, and describe planned evaluation using qualitative, and quantitative (social network) analyses on systematic data from the networks of high risk young people. Conclusions: We believe this to be the first Chlamydia screening strategy that combines Web-based RDS with the delivery Chlamydia testing to high risk young people within their sexual and social networks. This approach contains useful elements for various health promotion area’s.

SocioWorks: Flexible Online Study Management for Collection of Social Network Data
Tien, Allen
mdlogix (Medical Decision Logic, Inc.), Baltimore, MD, United States

Researchers find many ways to adapt existing online survey software for their needs in collecting social network data. Some online survey software is effective at collecting social network data, but lacks the capability of managing facilities/sites, personnel, and various studies. Other online survey software is effective at study management and collecting non-network data. We have built SocioWorks to fill the need for comprehensive study management in social network analysis. SocioWorks enables and facilitates observing, understanding, working with, and changing relationship-based organizational knowledge and processes in hospitals and other health care systems. It supports social network-based clinical and public health intervention research and programs, and it serves as a tool for patients and families to better perceive themselves and the social structures within which they are embedded. SocioWorks has value to communities, for example to help families adjust to caregiving needs for a relative and to scale related research and intervention up to the policy level to support such caregiving. This presentation covers the study management, facility management, account management and user roles, survey authoring, data collection, and export features of the new online software SocioWorks. Next steps involve network visualization, data analysis, data management, and export to more network data formats for use in other software. This software is supported by an NIH SBIR grant and has been developed keeping in mind the specific case of using social network analysis in health research and application.

How Student Social Ties Make Peer Effects Work
Valeeva, Diliara R.1; Poldin, Oleg V.2; Yudkevich, Maria M.1
(1)National Research University Higher School of Economics, Center for Institutional Studies, Moscow, Russian Federation, (2)National Research University Higher School of Economics, Economics, Nizhny Novgorod, Russian Federation

Among the key issues in the empirical estimation of peer effects are correct identification of relevant peers and endogeneity of their outcomes ("reflection problem"). In this study, individual university student performance is related to the performance and the characteristics of the person’s social network members. The analysis uses data on two directed networks: friends’ network and study partners’ network of third-year students of one Russian top-tier research university. Data on network ties enables us to address “reflection problem” and disentangle influence of peers’ outcome from effect of peers’ background characteristics. The findings are that both peers’ GPA and peers’ ability measures are significant in the estimated regression model. An increase in peer mean GPA of one point is associated with an increase in own GPA of approximately one fourth. The regression with study partners’ network data has slightly greater explanatory power than the analysis based on friendship network data. No effects from student classmates are found in a model that
Managing Intra-organizational Networks in the Course of Innovation Implementation

**Wunderlich, Philipp, Größler, Andreas**

Radboud University Nijmegen, Nijmegen, Netherlands

Several studies have shown that an organization’s failure to benefit from an adopted innovation can often be attributed to a deficient implementation process rather than to the innovation itself. Existing implementation studies tend to focus either on actor-related or on structural drivers of implementation success. This research considers both aspects by analyzing senior management’s influence on several groups of employees which are organized within an intra-organizational communication network. In particular, it is examined on which groups senior management should exert pressure so that the innovation diffuses throughout the entire network at relatively low costs. In doing so, this study addresses the research gap that literature is lacking multidimensional models which match the complexity of implementation processes by accounting for several interdependent determinants of implementation success. A system dynamics model is built to simulate and analyze the implementation effectiveness of different management strategies within different network structures. Thereby the focus is on the identification of dynamic patterns which drive the implementation process. The findings of this study suggest that senior management can use its limited resources more effectively by focusing on collectives of interconnected employee groups and by neglecting individual employee groups which are not connected to each other. This general finding is specified for several network structures. In addition, managers should only apply pressure on groups until a specific tipping point is reached after which the innovation diffuses by itself within the respective group.

Network Characteristics of High School Students in the Sources of Strength Suicide Prevention Program

**Wyman, Peter A.¹, Valente, Thomas W.², Pickering, Trevor A.³, Pisani, Anthony R.⁴, Brown, Charles H.⁵**

(1)University of Rochester, Rochester, NY, United States, (2)University of Southern California, Preventive Medicine, Los Angeles, CA, United States, (3)University of Miami, Miami, FL, United States

Suicide is the third leading cause of death for 15-to-24-year-olds in the United States, with approximately 5% to 8% attempting suicide. Information on these students’ network epidemiology is useful for tailoring suicide prevention efforts. Baseline surveys from 7,898 students in the Sources of Strength program asked about having contemplated suicide, attempted suicide, and attempted with injury. Students also listed their closest friends and adults they trust and talk to. Network sizes in thirty schools ranged from 65 to 1,168 students per school. Random-effects logistic regression models adjusted for age and gender were used. Each centrality measure—being an isolate, not in the largest component, and lower in- and out-degree—was associated with each suicide outcome (all p’s< .05). Students with adult connections were less likely to have considered or attempted suicide (OR=0.90 for each tie, p< .001). Having friends with adult connections was associated with lower likelihood of having considered suicide (OR=0.85, p< .001) and attempted suicide (OR=0.81, p< .001), even after adjusting for the ego’s own adult ties. Suicide attempts were clustered within networks. Those with a friend who attempted suicide were 2.30 times as likely to attempt suicide themselves (p< .001). In an ANOVA on network ties, suicidal students had closer connections to other suicidal students than all other types of connections (p< .001). The results suggest that those who consider or attempt suicide are less connected in their network, have fewer ties to trusted adults, fewer friends with ties to adults, and are clustered among others with suicide outcomes.

Social Networks Analysis among Physicians Employed at a Medical School

**Yuce, Yilmaz K., Oguz Yolcular, Basak, Bozkurt, Selen, Isleyen, Filiz, Zayim, Nese, Gulkesen, Kemal Hakan**

Akdeniz University, Biostatistics and Medical Informatics, Konyaalti, Turkey

Objective of this study is to identify technological and medical practice influencers and characteristics of both technological and professional/medical practice networks among physicians at a state university hospital, in order to develop a technological change management strategy to overcome physician resistance towards Information and Communications Systems and promote their use. Sociometric method was adopted. The instrument was a self-completed, free recall type of questionnaire with two questions that focus on usual transactions and routine relationships. Along with gender, department, age and other information, each participant was asked to name those colleagues to/from whom s/he would ask/seek advice or guidance regarding (I) Technological or computer-related matters (II) Medical practice issues/matters. In-degree was considered as the measure to discover influencers. Density,
average degree, betweenness centralization and degree centralization are considered to compare both networks. Pajek, a free software package for social network analysis, was used to perform analysis. For statistical analysis SPSS was used. Out of 657 physicians, 394 accepted to participate (60%). Naturally, physicians are found have a greater average degree in their profession. However, with respect to degree centralization, physicians appear to be more centralized in the technology field than their own profession. Similarly, technology network has a greater betweenness-centrality than medical practice network. Such findings may be due to medicine having a diverse sub-disciplinary characteristic and organizational structure (three divisions, 39 departments). Both networks are found to be male dominant. Interestingly, in medical practice network, research assistants ask research assistants’ advice almost as much as they ask their faculties.

Opinions and Attitudes Embedded within a Network of Social Relations: Survey Case Study that Tackles Social Contagion Phenomenon

Zbieg, Anita1,2, Zak, Blazej3
(1)University of Wroclaw, Institute of Psychology, Wroclaw, Poland, (2)Wroclaw University of Economics, Institute of Marketing, Wroclaw, Poland, (3)Wroclaw University of Technology, Faculty of Computer Science and Management, Wroclaw, Poland

Embedding respondent opinions within a network of social relations enriches collected data with a contextual information about dependencies between them, and allows for use of network analysis tools in an interpretation of survey results. The case study examines dependencies of opinions towards ecology of individuals embedded in a social network. A Facebook application is used to examine ecological attitudes (NEP scale by Dunlap, Van Liere, 1978) of 168 respondents connected with friendship relationships. Results show an overall similarity of opinions within an examined part of the network, but it has also found significant differences between strength and direction of opinions self-reported by central individuals and the rest of the network. As the main problem in finding central individuals is a lack of information about the whole network, the study adopts friendship paradox (Feld, 1991) as a method which was already verified in a study of prediction of influenza outbreaks (Christakis, Fowler 2010). The study also adopts neighborhood overlap concept (Easley, Kleinberg, 2010) to weight a strength of relationship between individuals. Statements with the most significant differences concern to ecological crisis, and results are consistent with longitudinal meta-analysis of 20 years of studies conducted with NEP scale (Dunlap et al.: 2000). It suggests that the method conducted on a wider sample may serve for prediction of long-term changes in attitudes and opinions within examined network.

Network Facilitation and Consulting - An Experience-based Overview of Interventions and Impact

Zeutschel, Ulrich1,2, Bauer, Volker1, Bensmann, Dieter1, Dege-Rüger, Jürgen3, Zenk, Lukas4, Fischbach, Robert5, Preller, Georg5, Schwinn, Manuel6, Vaccaro, Eric7
(1)osb Hamburg GmbH, Hamburg, Germany, (2)AFS Germany, Volunteer Board Member, Hamburg, Germany, (3)Bensmann Netzwerk Beratung, Hamburg, Germany, (4)Internationale Bauausstellung IBA Hamburg GmbH, Bildungsoffensive Elbinseln, Hamburg, Germany, (5)Danube University Krems, Event Network Advancement, Krems, Austria, (6)Freie Universität Berlin, Institut Futur, Berlin, Germany, (7)Deutsches Rotes Kreuz, Bereitschaften, Berlin, Germany, (8)AFS Germany, Human Resources and Organizational Development, Hamburg, Germany, (9)Behörde für Schule und Berufsbildung, Hamburg, Germany

A working group of experts on network consulting and research from Germany and Austria has collaborated over the past two years to discuss their experience with network facilitation in NGOs and in public sector projects, and to conceptualize models and strategies with regard to network formation, cooperation, and output. The poster will present central insights from an interdisciplinary virtual conference ThinkNet’12 [http://www.wiziq.com/course/8141-thinknet-12] of group members with cooperation partners from NGOs and the public sector in December 2012, as well as results from the ensuing group work: Characteristics of network-based organizations (e.g. governance, roles of individuals) and approaches to shape their development by methods of network management (e.g. motives of network participation) and network facilitation (e.g. collaboration of internal and external consultants) Approaches to utilize the complexity of networks (e.g. conference tools such as Event Network Advancement, ENA), and to appropriately reduce that complexity (e.g. by methods of self-reflection) in order to enhance their output.

The Effects of Cognitive Styles on Network Position

Zhang, Ying, Aven, Brandy, Aggarwal, Ishani
Carnegie Mellon University, Pittsburgh, PA, United States

In this study, we examine how the individual’s cognitive style influences his/her network position in an emergency department (ED) of a mid-size hospital in the United States. Cognitive style is a psychological construct that represents consistencies in how individuals acquire and process information. Cognitive style measures capture the differences existing in the ways that individuals communicate and collaborate with one another, and thus provide a means to
understanding variations in interpersonal relationships. We focus on the verbalizer-visualizer cognitive styles since they are related to the functional areas people go into. And the visualizers have been further differentiated to object visualizers who process images holistically and spatial visualizers who process images analytically. In a seven-month period, we collected surveys on the cognitive styles, communication networks, and patient outcomes for a sample of 70 ED doctors, nurses, and support staff. Within the observation period the ED staff treated 9,691 patients. We found that the cognitive styles had effects on two network measures: degree and betweenness. Interestingly, higher verbalization scores had a significant and negative effect on individual’s degree centrality in communication network, indicating that the visualizers are more likely to communicate with other ED staff. Spatial visualization had a significantly positive effect on individuals’ probability to occupy a brokerage position in the communication network. Whereas a higher score in both objective visualization and verbalization had significantly negative effect on occupying a brokerage position in the communication network, controlling for roles and gender.

Employee Turnover in the IT Industry and its Impact on Social Capital and Success of Startup Companies

Zylka, Matthaeus, Spiegel, Olav, Fischbach, Kai

(1)University of Bamberg, Information Systems and Social Networks, Bamberg, Germany, (2)University of Cologne, Information Systems and Information Management, Cologne, Germany

Recently, The Wall Street Journal proclaimed there is a “War for Internet Talent.” It not only affects established players in the IT industry such as Google and Facebook that compete for talent, but many of these Internet “talents” become entrepreneurs themselves and establish their own startups. Our research aims to two questions. Which turnover patterns and trends can be observed in the IT sector, that is, where does social and human capital flow? To what extent can startup performance be explained by the social capital of founders, that is, their relationships to former employers? Our findings are based on the analysis of a network of 29,387 IT companies. Ties between any two companies reflect a turnover relationship, meaning that a company is linked to another company by virtue of the connection between a current employee who once worked at that other company. The data are drawn from the professional online social network LinkedIn. We apply social network analysis, as well as linear regression modeling, to validate our hypotheses. We provide evidence that startup performance is not based exclusively on individual human capital, but is also determined by the social capital resulting from the founders’ turnover history and their online network size. More specifically, we find that individual human capital (work experience, in years) and social capital (founders’ online network size at LinkedIn) are both positively related to the extent of funding granted to startups that is our key figure for performance.