

Oral Presentation Abstracts

Title: Coordinated Access and Sharing of Expertise Through Social Network During Disaster

Paper ID: 1

Authors: Ye Ryung, Kim-Chung (University of Sydney), Liaquat Hossain (University of Hong Kong), Andrew Edward (University of Macquarie), Kenneth K.S. Chung (University of Sydney)

Abstract:

Disasters are associated with first order impacts such as catastrophic destruction of properties, roads, public utilities and human lives. Second order impacts relate to the destruction of community, dwindling economic development, and other environmental factors. The management of disasters can either alleviate or aid in the minimisation of these order of impacts. While, human-made and natural disasters are typically followed by the chaos that results from an inadequate overall response, Preparedness is the best response to emergencies, so often a multi-agent-based approach to coordination decision support systems plays a significant role in disaster management and response in shaping decentralised decision-making on a large scale.

However, the diverse aspects of coordination make it difficult to find an integrated approach for continuous control. Also, there are different kinds of coordination such as physical coordination between emergent agencies or local agencies or administrative coordination. While traditional disaster management studies have focused on a coordination or managerial or government policy approaches, this study focuses on the direct local-based advice network used by emergency personnel (managers and volunteers) to understand how properties of such human networks impacts one to access and share expertise during a disaster incident to make the prompt and accurate decisions. The key motivating question that guides this research overall is: What properties of social networks at the network level, actor level and tie level are conducive to the expertise of coordination for expertise access and sharing. Furthermore, if an association was to be found, to what degree does this relationship associate with expertise coordination in a negative or positive manner. 'how centralisation and efficiency in an individual's social network associated with coordination?' and 'would network constraint and tie strength in an individual's social network negatively/positively associate with coordination?'

There are limitations using traditional coordination theory alone to investigate complex disaster management networks in dynamic environments. Therefore, this study uses novel theoretical and pragmatic approaches in suggesting an empirical-based framework and methodology for exploring the relationship between properties of social networks and coordination of expertise during disasters, which is critical in emergency response. In particular, this study investigates the effect of social network structures, the position or location of that individual within that network, and the strength of ties for the coordination of expertise.

Social networks theories such as structural holes theory and strength of weak tie theory and coordination theory are used to develop a social network and coordination of expertise (SNCE) theoretical framework. This framework is also validated and vetted by disaster management experts (disaster management agencies' managers and volunteers) through qualitative interviews, which are then used to design and refine a valid, and reliable survey instrument for the quantitative part of the study.

Network measures of degree and betweenness centrality, density, structural holes (constraint and efficiency), tie strength and expertise of coordination measures are applied for exploring the relationship between social network and coordination of expertise in knowledge intensive workgroup (disaster management domain).

Survey results from 56 managers and 66 volunteers from the State Emergency Services of New South Wales (NSW), Australia, showed that that network structure, position and ties of knowledge workers play a crucial role in the coordination of expertise. However, staff member hierarchical networks and volunteers (organic, dispersed and ad-hoc network) networks showed differing results. In particular, closeness centrality – or the extent to which one is independent in the network regarding accessing everyone else in the network - had a very significantly positive effect on staff members network but not in the volunteer's network. Concerning out-degree centrality – or the extent to which one seeks advice from others – it was found to be positively associated with the expertise of coordination in staff members but the reverse with the volunteer's network. Network density was found to be negatively correlated with coordination of expertise, but no statistically significant associations were found in the volunteer's network. The strength of ties was found to be positively associated with coordination of expertise in volunteers network. ICT use was found to be positively related to coordination of expertise in both the staff and volunteers networks.

Among the variables that showed significance, closeness, degree, betweenness centrality, network constraint, the strength of tie best explained overall variance for coordination of expertise (access and sharing of expertise) although professional accreditations remains a potent indicator also.

These results confirm the presence of social network properties, particularly in informal networks as useful indicators of coordination of expertise. The findings are useful not only in the disaster management domain for organisational restructure or policy setting, but also confirm that in occupational communities where participation is voluntary and ad hoc in nature, these networks are crucial in understanding where expertise is needed, the location of that expertise and bringing such expertise to bear.

Title: Triple-Helix Network Analysis in Korea-China using Publication and Patent Data

Paper ID: 2

Authors: Jungwon Yoon (Soongsil University), Han Woo PARK (Yeungnam University)

Abstract:

This study explores Sino-South Korean collaboration in science and technology by focusing on networks of university-industry-government (UIG) relations embedded in co-authored papers and co-assigned patents at institutional and global levels. Patents and scientific papers are examined over the period 2004-2014 to capture recent trends in and patterns of collaborative innovation activities of UIG actors in China and South Korea. The analysis was conducted from a triple helix perspective by investigating structures and dynamics of Sino-Korean scientific and technological collaboration. The results reveal some imbalance between science and technology in knowledge dynamics and differences in the extent and intensity of collaborative efforts of the two countries. Based on a comparative analysis of co-authorship and co-inventorship networks, the scale and density of scientific collaboration networks were much higher than those of technological ones. In fact, technological collaboration between China and Korea was not common in patents, indicating a need for further strengthening its network. The findings have important implications for both China and Korea in terms of their collaborative relationships in the future.

Title: Management Studies and Human Interests

Paper ID: 3

Authors: Han, Yi (Shanghai University of Finance and Economics)

Abstract:

The membership network theory of Ronald Breiger (1974) suggests that people do not have to connect to each other in order to get social resources. Multiple membership grants individuals accesses to various resources. In order to illustrate the above statement, I use the information on the membership of divisions of the Academy of Management to exam the types of resources that an individual scholar could explore. The ways how the academic divisions are grouped form a cognitive structure of an academic field, which is meaningful to individual scholars. Following Breiger's idea of duality of persons and groups, this study, unlike much empirical research in social networks that studied social capitals of individuals, focuses more on groups and what groups can offer. Take management studies as example, combing membership network theory and Habermas's theory of knowledge, this study suggests the importance of maintaining an organized pluralism in academic fields.

Title: Perception upon Virtual Reality on the Press and Twitter: A Semantic Network Analysis

Paper ID: 4

Authors: Jin Tao Huang (SungKyunKwan University), Kang Nyeon Lee (SungKyunKwan University), Jang Hyun Kim (SungKyunKwan University)

Abstract:

Virtual Reality(VR) is considered to have begun in the 1950s but early elements of it can be traced back to the 1860s and long before the development of digital technology. Since Facebook CEO Mark Zuckerberg took the world on a tour of how Facebook will work in VR, people's expectations about VR are getting higher and higher. Although the applications of VR are experiencing an exponential growth during the last two to three decades, researchers still did not catch up with a clear development direction of VR. This article examined people's perception of VR from 2007 to 2016, and discussed possible future directions in VR. The authors conducted semantic network analysis for the collected datasets from Twitter, and LexisNexis.com (search engine for various documents including news articles). In addition, the authors examined the structural pattern of those text data. The results show that VR in cyberspace have different components in the frequency of words, centrality and semantic networks. Through those results, the authors provide information to understand which sectors entrepreneurs should invest on.

Title: metaknowledge: Open Source Software for Networks Research on Science

Paper ID: 5

Authors: John McLevey (University of Waterloo), Reid McIlroy-Young (University of Chicago)

Abstract:

metaknowledge is new open source software we developed for conducting networks research on science. Its primary purpose is to produce well-formatted datasets from raw data provided by publication and citation databases and granting agencies. metaknowledge was designed with open and reproducible research workflows in mind, interfaces seamlessly with other widely-used data analysis software, and scales efficiently to networks with many millions of nodes. This talk (1) describes these and other design decisions and core functionality in metaknowledge, and (2) provides a practical overview of 10 tools for generating network datasets, including for multi-mode, multi-level, and longitudinal networks. We provide extensive examples using meta-data on publications and citations in social networks research.

Title: Unfolding of scientific communities in virtual networks

Paper ID: 7

Authors: Victor Tishchenko (ISA of Federal Research Center "Informatics and Control" RAS, Moscow, Russia), Prochko Alexey (ISA of Federal Research Center "Informatics and Control" RAS, Moscow, Russia)

Abstract:

In this study we present the results of analysing virtual social networks from the point of view of the theory of complex networks. For this purpose we justify a simple method (Louvain method) to extract the community structure of virtual network in a scientific Internet forum («www.aspirantura.spb.ru»). This site presents a network of virtual communication between more than 100 000 postgraduate and PH students and consists of 19 forums, 8 000 threads (topics) and 200 000 posts; it also contains materials and guidelines for writing dissertation.

The method used in our research is based on modularity optimization and consists of two stages. At first there is the search for "small" communities by optimizing the modularity on the local level. In the second nodes are aggregated one community and a new network is constructed larger scale, these steps are then repeated until, until it reaches the maximum level of modularity.

As a result it is shown by analysing a graph of 70 thousands nodes that unfolding of virtual communities in the degree of closeness centrality allows objectively highlight (identification) of the members of the board of the Internet users, who are united in different virtual communities, without resorting to textual analysis of the participants of the forum posts.

Finally, used algorithm allows us simulate a virtual community structure, highlighting the "influential" community members (the opinion leaders), and thereby construct a model of the behavior of the virtual social network members.

Title: Network Analysis of Literature on Network Clustering from WoS

Paper ID: 8

Authors: Vladimir Batagelj (IMFM Ljubljana and IAM Koper, Slovenia)

Abstract:

On January 7, 2017 we collected from the Web of Science (WoS) hits for the query "block model*" or "network cluster*" or "graph cluster*" or "community detect*" or "blockmodel*" or "block-model*" or "structural equival*" or "regular equival*". The basic data set was manually extended with descriptions of the most frequently cited-only works. From these data the citation network and some additional two-mode networks (works X authors, works X keywords, works X journals) were constructed using the program WoS2Pajek.

First, lists of the most productive authors, the most cited publications, main journals publishing papers on network clustering, and the groups of researchers that collaborated the most with their topics are given. The most influential publications in the field of network clustering were identified from the citation network by main path(s) procedures and by the islands method. All these approaches used SPC weights on citation arcs. The collaboration network and the citation network among authors were also computed and analyzed. At the end we present some results of temporal analyses of obtained networks.

All analyses were performed using Pajek – a program for analysis and visualization of large networks.

Title: The structure and social support of the friendship networks among urban and rural schoolchildren in Taiwan

Paper ID: 10

Authors: Sheu-jen Huang (National Taiwan Normal University, Taiwan), Ching-chieh Huang (National Taiwan Normal University, Taiwan), Wen-chi Hung (Cardinal Tien's Junior College of Health Care and Management, Taiwan), Chyi-in Wu (Academia Sinica, Taiwan)

Abstract:

The structure and social support of the friendship networks among urban and rural schoolchildren in Taiwan

The students of the elementary schools have been considered as at the stage of preadolescents. In the process of growing up, peer interaction is important for children's social development and long-term interpersonal relationship. The purpose of the study is to examine the structure and social support of the friendship networks of the schoolchildren. The present study will examine the following research questions: (1) What is the structure and social support of the friendship networks of the schoolchildren? (2) Are there any differences in the friendship network between urban and rural schoolchildren? (3) What is the difference of social support between urban and rural schoolchildren friendship network?

Participants were 262 5th graders, with 131 in urban and rural areas, respectively. Each one listed the names of best friends up to five in the class and answered a series of questions about their friends. SPSS for Window 22.0 statistical software was used for descriptive analysis, correlation, chi-square test. UCINET6 software was used for social network analysis and drawing the graphs of friendship networks of each class.

The results indicated that: (1). Schoolchildren preferred to make friends with the same sex classmates. Most of the classes were divided into two same-gender groups and connected by small number of classmates as bonding. (2). Taking the total degree as the size of the friendship network, the median of all networks was 5; meanwhile, there was no significant difference between the students of urban and rural areas. Defining the density of schoolchildren as close relationship, the median of all networks was 37.5. Those schoolchildren living in rural area had a closer relationship than their counterparts in urban areas. (3). Emotional support was the most received kind of social support. Also, there was no significant difference between schoolchildren of urban and rural areas.

Title: Exploring Male High School Students' Friendship Networks Change in Korea

Paper ID: 11

Authors: Chongmin Kim (Gyeongin National University of Education)

Abstract:

The previous study explored male high school students' advice and information networks for English learning in Korea and examined which attributes(achievement goals, English-learning motivation, and English achievement scores) and network structure(reciprocity and transitivity) affect English-learning help networks using p2 and p* models. The results of p2 and p* models indicated that the transitive triplets(transitivity), social performance-approach goals, the intrinsic motivation to learn English, and English achievement scores were statistically significant and positively related to providing and seeking help for English learning among students in the same classroom. Although this study has investigated the various effects of students' advice and information networks with focus on English subjects, change of students' social networks have not been examined in high schools in Korea. Thus, I explore change of male students' friendship networks within one high school in Korea: that is, the tie change of close friends' networks within classrooms and across classrooms in one male high school. My research question is this: What affects change of male students' friendship networks within high school in Korea?

The dependent variables were male students' friendship networks within high schools in Spring 2015 and Fall 2015(two time points), while independent variables are students' happiness, social achievement goal, and learning style of male students in one high school in 2015. This study will use RSIENA(Simulation Investigation for Empirical Network Analysis) software for data analysis.

The researcher expects that network change of students' social networks will exist across 14 classrooms in one high school in Korea. Findings will indicate that male students' friendship networks can affect positive students' culture by influencing students' collaboration. Based on these results, discussion and conclusion will be provided with focus on male friendship networks and high school students' culture.

Title: Status Struggles: Position, Peer and Practice in Classroom

Paper ID: 12

Authors: Chyi-in Wu (Institute of Sociology, Academia Sinica)

Abstract:

Adolescent outcomes of negative peer status, like, neglected, exclusion and bullied, are always major concerns of social issues by scholars and citizens. When encountering negative peer relationships, adolescents normally would be strained by depressive symptoms, failures of academic performance, anxiety, and problems of physical health, or even worse, by any comorbidity of these occurrences. These psychosocial syndromes caused by peer exclusion or bullies, could last for a longer time, sustained from adolescence through adulthood, if they were unable to dissolve these conflicts effectively through the process of "emerging adulthood." It could mostly settle down individuals underneath of happiness through his/her whole life.

There are two critical drawbacks on related literatures in studying negative peer status, at micro level, most studies intend to link adolescent's negative living experiences into individual's personal characteristics, while, at macro level, the majority of studies were focused on the mechanism of social context affect upon adolescents' negative social interactions or peer relationships. Both approaches are not able to investigate adolescents' dynamic daily activities and interactions within classrooms in a more appropriate manner. In other words, a research approach with a meso- level perspective, which could closely examine the subtle and complicated dimensions of adolescents' negative social interactions, is necessary for breakthrough these obstacles.

Accompany with traditional friendship network measures; this study intends to, first, look at dislike network of adolescent simultaneously to closely investigate the outcomes of the two different mechanisms of social networks. Then, based on investigating three network characteristics, i.e., degree, position and the process of structural balance, both of friendship network and dislike network, this study tries to construct a causal model to examine the effects of negative social interaction upon negative peer status within classrooms.

Title: Social Marginalization of Overweight/Obese Middle Adolescents in Taiwan

Paper ID: 14

Authors: Hsin-Hui Lu (Department of Psychology, Soochow University, Taipei, Taiwan), Duan-Rung Chen (Institute of Health Behaviors and Community Sciences, National Taiwan University, Taipei, Taiwan)

Abstract:

Research had found that social isolation among overweight and obese adolescents in non-Asian countries. However, the proportion for overweight or obese adolescents in Asian countries were increasing. Taking the obesity rates of adolescents and children into account, Taiwan ranks highest in Asia. Whether social marginalization of overweight and obese adolescents can also be found in Asia? Our purpose in this study is to explore the extent to which overweight and obesity affect social popularity of adolescents in Taiwan. The sample consisted of 8th grade adolescents ($n = 2642$) who were in wave 2 of Taiwan Young Project. The prevalence of overweight is 12.26% ($n = 324$), and obesity is 11.54% ($n = 305$). The social popularity of each adolescence was defined by the index for in-degree centrality in class. Multiple regression results showed that controlling sex, family-related life events (divorce, unemployment, and death of parents), school-related deviance (e.g. runaway, fight, or drug use), being a cadre in class, and active participating in the award competition, overweight ($b = -0.04$, $p = .034$) and obesity ($b = -0.05$, $p = .014$) still negatively associated with social popularity. This result indicated that overweight and obese adolescents were more likely to be marginalized in class. This call for policy intervention for proper weight discrimination.

Title: Deconstructing the World of Student Friendships: An Ego-network Analysis

Paper ID: 16

Authors: Thomas Odell (University of Bristol)

Abstract:

Researching friendship within a university environment provides an interesting insight into when and how social bonds are formed, maintained and dissolved over the course of three years of study. However, past studies have often failed to give real examples and visualisations of friendship structure, especially from a longitudinal perspective. An ego-network method using mathematical and quantitative analysis was therefore implemented to retrospectively study the friendship networks of 10 Bristol university students, with the aim of contextualising real friendships amongst theories of homophily and social capital. UCINET and Netdraw were the primary programs used for this analysis. Findings indicated that the individual disposition of students to hold certain friendship network structures was clearly affected in similar ways due to the transformative process of university. Whilst the size of each friendship network was different at year one, most networks increased in size over time at university, as more friends were included than excluded from individual's networks. Some structure remained throughout analysis, often in the form of distinct friendship cliques. Analysis of 'best friends' and 'removed friends' also appeared to be structured, by gender and proximity respectively, supporting ideas of homophily in friendship. Furthermore, statistical analysis demonstrated how students become better positioned to accumulate 'social capital' over time, which is useful for future conversion into other forms of capital, as well as social and employment opportunities. Individuals became exposed to new friends, who were less connected to those already in their network, and so benefitted from new sources of information.

Title: Mobility, Social Networks, and Self-Reported Health of Older People Living with HIV/AIDS in Washington, DC

Paper ID: 17

Authors: Debarchana Ghosh (University of Connecticut), Frederick L. Altice (Yale University School of Medicine)

Abstract:

Social networks and their association with the health of older people have been explored, but there are few studies that examined the relationship between the health of older people living with HIV/AIDS (OPLWHA) and their social networks. This exploratory study has the following objectives: 1) describes the characteristics of social networks among OPLWHA in Washington, DC; 2) analyzes the relationship between self-rated health status and characteristics of social networks of OPLWHA; and 3) analyzes the relationship between self-rated health status and types of social ties (weak, strong, fragile, and proximity/contact) of OPLWHA.

105 OPLWHA (or egos) were interviewed using an egocentric social network questionnaire with eight name generating questions, which were further categorized into four groups of ties: weak, strong, fragile, and proximity/contact. After listing a total of 223 network members (or alters) for all the types of ties combined, a second set of questions (name interpreter) collected information on geographic location, socioeconomic, demographic, and risk behaviors (alcohol use, craving for drugs, HIV-positive) of alters. The Short Form 12-item Survey (SF-12) instrument was used to measure OPLWHA's overall, physical, and mental health status.

With a combination of methods from social network analysis and Geographic Information System, we measured the following characteristics of a OPLWHA's social network: size; composition (family members, friends or acquaintances, alters with risky behaviors of alcohol and drug usage, HIV-positive alters); structure (density, effective size, structural role, constraint); and geographic location and proximity to alters. The relationship between these network characteristics and overall, physical, and mental health status of OPLWHA, calculated from the SF-12 instrument, were examined using Pearson's R and ANOVA.

Our results show that the OPLWHA have social networks that included three types of people: immediate kin, extended kin, and friends including alcoholics and drug users. Additionally, these networks varied by size. While the mean number of alters in a strong tie (people from whom the OPLWHA can borrow an important sum of money) was two (40% OPLWHA had none), the mean number of alters in another network was three (people with whom the OPLWHA enjoy socializing). Furthermore, only the alters with whom OPLWHA enjoy socializing had a significant positive correlation on the self-rated health of OPLWHA. The average size of weak ties (people with whom the OPLWHA drink alcohol or use drugs) was three, comprised primarily of friends and generally clustered around OPLWHA homes, thereby increasing the probability of more contact. Consistent with prior research, we found that the mere existence of a network does not imply that the network has a positive correlation with the subject's behavior or that the network provides the social support needed to positively influence health. A study of the correlation between social

network characteristics and health in the population of older people with HIV/AIDS is important as the number of OPLWHA continues to grow.

Title: Inference versus estimation in exponential random graph models

Paper ID: 18

Authors: Alex Stivala (University of Melbourne), Maksym Byshkin (Universita della Svizzera italiana), Garry Robins (University of Melbourne)

Abstract:

When using snowball sampling to estimate exponential random graph model (ERGM) parameters for very large networks, it was observed that there is a very high Type II error rate (that is, very low power) in inference on the edge (density) and alternating k-star parameters, as

commonly used in models based on the social circuit dependence assumption. However, this problem is not unique to snowball sampling, and also occurs when using Markov chain Monte Carlo (MCMC) maximum likelihood estimation (MLE) algorithms and stochastic approximation, as implemented for example in software packages such as PNet and statnet, to directly estimate a model for an entire network (not obtained via sampling from a larger network), even with no missing data. Here we investigate this issue further and try to explain why this problem occurs, what the implications are, and how we might try to mitigate it.

Title: Excavating Structural Holes: Dyadic Mechanisms Buried in Triadic Theory

Paper ID: 19

Authors: John Chandler Johnson (BI, Norwegian Business School), Amir Sasson (BI, Norwegian Business School)

Abstract:

Grounded in seminal discussions of triadic brokerage opportunities (Simmel 1950), bridging weak ties (Granovetter 1973), brokering structures (Gould and Fernandez 1989), and structural holes (Burt 1992), a substantial and growing literature examines brokers as facilitators of resource flows in social structure. The literature argues that brokers capture value by facilitating information (Burt 1992; Burt et al. 2000; Granovetter 1973) and knowledge flows (Hargadon and Sutton 1997), controlling exchange participation and terms (Burt 1988, 1992, 2008), enhancing exchange legitimacy (Khurana 2002), performing delegated monitoring functions (Diamond 1984), and clearing exchanges between multiple interdependent actors (Sasson 2008).

Among literatures studying brokers, Burt's (1992) structural holes is particularly influential (Stovel and Shaw 2012), perhaps because it offers intuitive and accessible theoretical and methodological innovations. Theoretically, structural holes extends resource dependence (Salancik and Pfeffer 1977) to consider redundancy and brokerage (Burt 1992: 54; 2005, 2007). Methodologically, Burt (1992) proposes aggregate network constraint, a broker operationalization widely successful both within structural holes and other literatures. Extensive constraint-based empirical research studies broker benefits such as: innovation and patenting (Burt 2004); promotion, evaluation, and remuneration (Burt et al. 2000); capital raised (Hillmann and Aven 2011); team, firm and industry performance (Burt 1988, 2008; Lee 2010; Soda et al. 2004; Zaheer and Bell 2005); and status and reputation (Pollock et al. 2015).

Despite constraint's ubiquity as an operationalization of triadic brokerage opportunities, we show that constraint actually operationalizes strictly dyadic properties. Formally decomposing constraint and using the resulting factors in a simulation study, we demonstrate that network constraint has a pervasive construct validity problem. Replicating two empirical constraint-based studies confirms the simulation's implication that findings commonly attributed to triadic mechanisms are actually attributable to constraint's embedded dyadic properties. Recognizing that constraint does not operationalize the triadic theories with which it is associated demands both reinterpretation of extensive existing work studying brokers and refocusing future broker research. The paper's formal and computational insights regarding constraint's underlying properties will facilitate that reinterpretation.

Title: Creating context for social influence processes in multiplex networks

Paper ID: 20

Authors: Antonio Rivero Ostoic (Aarhus University)

Abstract:

This paper elaborates on two theories of social influence processes to multiplex network structures. First, cohesion influence is based on mutual communication made by different types of relations, and second comparison influence that is built on contrasting types of tie. While a system of bundles with a mutual character constitutes the setting for a multiplex network exposure measure within cohesion, comparison influence is defined algebraically through classes of actors in terms of a weakly balanced semiring structure that considers positive, negative, and also ambivalent types of tie. A case study with these approaches is made on an entrepreneurial community network with formal business relations, informal friendship ties, and perceived competition among the firms, and the methods are validated with the Sampson Monastery data set.

Title: Computing Structural Balance in Signed Networks with Network Motifs

Paper ID: 22

Authors: KAIQI ZHANG (The School of Management, Xi'an Jiaotong University)

Abstract:

Networks are a fundamental modeling tool for defining complex systems and are widely used in physics, sociology, biology and other areas. Network motifs are small subgraph patterns in the networks and organize the basic structure of the network. In signed network, there are four basic motifs to define the balance structure between the three nodes. And the relationship between the motifs organization and global structural balance is a question worthy to study. In this paper we introduce a framework that identifies clusters of network motifs to expose the organizational pattern in signed social networks, compare the global structural balance of network with different motif organizational patterns, and propose a new method to describe the global structural balance via detection motifs in signed networks. Through the detection for different signed networks, we find that the network is not structural balanced although the network is organized by the local structural balance motifs, and the global structural balance of the network is determined by the position of the local structural balance motifs. The method we proposed can effectively compute and detect the global structural balance partition of signed networks, and through adjusting the scale parameter our method can detect the structural balance of signed networks at different scale resolution levels.

Title: Generating random networks with a given blockmodel structure

Paper ID: 23

Authors: Marjan Cugmas (Faculty of Social Sciences, University of Ljubljana), Anuška Ferligoj (Faculty of Social Sciences, University of Ljubljana), Aleš Žiberna (Faculty of Social Sciences, University of Ljubljana)

Abstract:

The presentation addresses the question of generating networks with a given global structure, where different global structures are defined by selected blockmodels (Wasserman and Faust 1994, Doreian et al. 2005), e.g., cohesive, core-periphery (symmetric and asymmetric), hierarchical (with and without complete blocks on the diagonal) and transitivity (with and without complete blocks on the diagonal). The networks with the given blockmodels are generated using two methods: (i.) the method of relocating of links and (ii.) the less deterministic Monte Carlo Multi Chain algorithm implemented in “ergm” package in R. Different models to generate such networks by considering triads (e.g., all existing types of triads, all allowed or all forbidden types of triads for a given blockmodel) are proposed and evaluated.

It can be shown that considering only different types of triads is enough to generate networks with most of the analyzed types of blockmodels. However, in the case of a hierarchical blockmodel without complete blocks on the diagonal, the considering only different types of triads is not sufficient to generate networks with a mentioned blockmodel structure. In the case of other types of blockmodels, a more refined selection of included types of triads into the models improve the blockmodel structure of generated networks.

Title: Structural Signatures of Group Discussion Networks in Cooperative Online Games using Weighted ERGM

Paper ID: 24

Authors: Qi Hao (Michigan State University), Joomi Lee (Michigan State University), Jingbo Meng (Michigan State University)

Abstract:

This research seeks to explore structural signatures of discussion networks within small groups. The data were collected from 32 small groups of size five to eight, playing an online escape-room game. In this game, players' avatars were put in an online environment to individually look for clues that helped them get through a gate to enter the next level. The players could communicate with an individual player or the whole group via text messages. The chatting logs of the groups were used to build discussion networks. Discussion networks are special in that their ties (talk turn exchange) are states-ties, which are transient and locally defined, only existing when people are talking. Traditional network models that assume stable trait-ties (such as marriage or friendship) cannot be used. To deal with this problem, weighted exponential random graph model (weighted ERGM) was used. The number of talk turns directed from one member to another throughout the discussion was counted and used as the weight of the tie. The results showed that the information exchange pattern within most groups was hierarchical. Across the 32 discussion groups, dyadic reciprocity was not a significant structural signature. Triadic transitivity was positively significant while triadic cyclicity was either non-significant or negatively significant. Empirically, this research found that unorganized discussions within small groups could naturally show hierarchy. Methodologically, this research gives an example of analyzing weighted networks with transient state-ties that are usually found in networks based on talk turns, phone calls, emails etc.

Title: Why do Family Business Groups Form Marriage Ties? Evidence from an Emerging Economy

Paper ID: 25

Authors: Chi-Nien Chung (National University of Singapore), Zong-Rong Lee (Academia Sinica, Taiwan), Hongjin Zhu (McMaster University, Canada)

Abstract:

Within the field of organization studies, a classic debate between resource dependence theory and the social status model is the role of kinship networks in market economies. Specifically, intermarriage ties between business families are pervasive and often play a central role in these networks. Although family business groups are widely connected to each other through marriage ties, less attention has been paid to the formation of marriage ties. It is possible that the marriage ties among large family business groups are driven by their needs of resource access and maintaining market position and hence the groups knot the ties in order to secure the resources. This is especially likely in emerging economies where market infrastructures for access to various resources are underdeveloped and transaction costs are high. It is also possible, however, that marriage ties are formed not because of resource needs but due to the identity of the elite's social status. Elite families form marriage ties with each other to sustain the exclusive boundaries of their status and maintain their apex identities. Due to the lack of appropriate data, the debate has yet been properly examined and current studies yield inconclusive results. Moreover, whether the relative importance of resource access and status identity shifts when market institutions progress remains unanswered. We are left uncertain about the mechanisms underlying the formation of marriage ties among family business groups in emerging economies. This is a significant gap as such marriage ties not only shape the resource access and growth of the group but also have implications to the class structure and social inequality of the society.

We develop a framework that specifies how resource considerations of business group families promote marriage ties and how such strategic effects vary among families with distinct social status standing during market transition. We construct our sample with matched case-control method and apply the longitudinal autocorrelation model to the dyadic marriage events among the business groups. Using data of dyadic marriage ties among the 100 largest family business groups in Taiwan over 1973 and 2006, we demonstrate that the formation of marriage ties is a joint process of strategic concerns of resources by family businesses as well as their social status dynamics. Our analysis shows that two business groups are more likely to marry each other when the marriage enhances their internal product and capital markets. However, such effects weaken in business groups of elite families and when external market institutions develop. Moreover, we find that the mitigating effect of external market development is weaker for elite-family groups relative to non-elite family groups. Overall, our study highlights the tradeoffs that family firms confront when they generate marriage ties in emerging economies where traditional social structures and market-oriented transitions coexist.

Title: Social Network Analysis of Banks and their Investment by Segment

Paper ID: 27

Authors: Shabana Kamal (Branch Manager, Bank Alfalah, Zamzama Branch, Quetta Cantonment, Balochistan, Pakistan), Kamal Badar (Institute of Management Sciences, University of Balochistan, Quetta, Balochistan, Pakistan)

Abstract:

It is an exploratory research using social network analysis (SNA) to explore a two mode network structure of banks and investment segments in Pakistan from year 2007 to year 2014.

We apply the SNA techniques on our two mode network, that is, visual representation, network centrality measures, sub-group analysis and blockmodeling for each respective year from 2007 – 2014. The aforementioned techniques give us an overview about the embeddedness of banks and investment segments in the financial sector network. SNA identifies the core banks in Pakistan over a period of time, which contribute the maximum in a network by investing in maximum number of investment segments. Moreover, SNA also identifies the core investment segments which had the maximum contribution from banking sector.

Network visualizations along with network centrality and sub-group analysis show that public sector and private sector banks in Pakistan have more diversified investment portfolios, with, the National Bank of Pakistan having the highest contribution in investment segments. In addition, our results show government securities among investment segments having received maximum contribution from banks. Treasury bills and Pakistan Investment Bonds are the top government securities in a group. Other core investment segments include Ordinary Shares, Term Finance Certificates, Sukuk Bonds and Mutual Funds. Block modeling using the core-periphery model results identify the core group of banks, that is, The National Bank of Pakistan, United Bank Ltd., MCB Bank Ltd., The Bank of Khyber, The Bank of Punjab, Askari Bank Ltd., Saudi Pak Industrial & Agricultural Investment Co. Ltd., Habib Bank Ltd., Habib Metropolitan Bank Ltd., Allied Bank Ltd., and Faysal Bank Ltd.

This study is useful to help regulatory authorities to monitor the investment strategies of banks. Moreover, it can also help to monitor strong and weaker investment segments. It can help to review the risk profile of banks and investment segments and how much it can be contagious. This research can be further extended to study the relationships between centrality measures and profitability of banks and investment segments with an impact of moderator i.e., size and type of banks and investment segments. The careful review of relationship network of banks and investment segments can produce valuable results for investors, investees and regulators.

Title: A semantic network analysis of customer perception of Samsung Galaxy Note7 explosion issue

Paper ID: 28

Authors: Jae Won Lim, Minjoo Yoo, Jang Hyun Kim (Sungkyunkwan University)

Abstract:

When firms face the crisis, their social media platforms increasingly tend to act as a place for both firms and customers. A focal firm's risk communication message can be delivered instantly and broadly and customers can voice their opinion at the same time. This study explores how customers' perception has changed for Samsung about Galaxy Note7 recall crisis in Korea. During a series of explosion events, Samsung posted ten official announcements on their social media and then customers commented their opinions. This study examined the semantic networks of comments from the Samsung official social media 'Samsung Newsroom (blog and Facebook)'. From release to compensation program announcement, explosion event period was divided into five. The results show that there are distinguished customer's emotional words changing in each period. In the first period of release, there were many positive words to praise Galaxy Note7. Although there were negative words when recalling, there were more positive words since many customers thought that Samsung made a good decision. After recall announcement, however, people who booked in advance still do not get a Galaxy Note7 replacement and Samsung urged customers to stop using it. Customers gradually got angry and positive words drastically decreased from this point. At the discontinuance announcement, the number of negative words reached its peak and they are still angry due to the inappropriate compensation. The implications of our results for Samsung risk management are discussed based on semantic network analysis.

Keywords: Galaxy Note7, Recall, Social media, Comments, Semantic Network Analysis

Title: THE ROLE OF INSTITUTIONAL LOGICS IN BOARD INTERLOCK FORMATION: COMPARING U.S. AND CHINESE DIRECTORATE NETWORKS

Paper ID: 29

Authors: Kai Xu (Univ of Texas at San Antonio), Ji Youn (Rose) Kim (University of Kentucky), Michael Withers (Texas A&M University), Mike Howard (Texas A&M University)

Abstract:

Board interlocks represent important interorganizational relationships that provide critical resources and oversight to the interlocking firms. Understanding the drivers of board interlock formation has been an important area of study across a number of academic fields. Despite the key insights from the diverse areas of research, however, our understanding of board interlock networks is built almost entirely from research based on single country analysis, which fails to consider the variety of contextual factors across different global settings. As a result, we have a limited understanding of the role that different corporate governance systems in each country may play in the formation and evolution of board interlocks. Specifically, due to the unique cultural and political configurations of different national contexts and differing level of economic and regulatory development, each country tends to have distinct corporate governance systems. Thus, firms in different countries are likely to have different views regarding corporate governance and particularly the role of boards, which influence the resulting dynamics of board interlock networks. Yet, limited attention has been given to the question of how institutional environments, such as corporate governance systems, at the national level influence the formation and evolution of board interlock networks. In this study, we address this issue by conducting a comparative analysis of the dynamics of board interlock networks within the U.S. and China. Building on recent work examining institutional logics, we posit that the dynamics of the board interlock network in each country is largely shaped by unique corporate governance systems based on the different institutional logics in each national context. We focus on two dominant institutional logics: agency-based logics and resource dependence-based logics. These two logics, as the most prevailing perspectives in corporate governance research, provide distinct views on the foundation for the established board functions and influence interlock relationships. We suggest that, although the two logics are likely to co-exist in the U.S. and China, the salience of each logic may differ depending on national context. Specifically, we theorize that the dynamics of board interlock networks in the U.S. are more likely to be driven by the agency-based logic that often dominates the country's corporate governance practices, whereas the interlock network in China is more likely to be shaped by the resource dependence-based institutional logic. Empirically, we explore the evolutionary dynamics of both the U.S. and Chinese board interlock networks, examining ties among the largest firms in each nation between 2002 and 2011, using stochastic actor-oriented models (SAOMs). Specifically, we focus on three governance practices that have been considered from both the agency and resource dependence perspectives: industry membership, board independence, and CEO duality, and how they differentially affect the evolution of board interlock networks in each country. Our results show that shared industry membership is positively associated with board interlock network change in China, whereas it is negatively associated with board interlock change in the U.S. In addition, both board

independence and CEO duality have a stronger effect on board interlock network change in China than in the U.S.

Title: The Duality of Connections: A Political Control Model of Corporate Strategy

Paper ID: 30

Authors: Jianhua Ge (Renmin University of China), Wei Zhao (UNC Charlotte and Shanghai University)

Abstract:

One important issue largely ignored by extant research in managerial political involvement is that the political connections, as conduits or pipes of influences, can be leveraged and manipulated by both parties that are connected together. That is, political connections provide the firm and the government with opportunities for mutual influence. Therefore, not only the firm, but the state, government, or political officials can simultaneously achieve their own political goals and interests through these political connections. Relatively little attention, however, has been paid to how government affects corporate strategies through political connections.

To fill these gaps in the extant literature, we propose a political control model of corporate strategy. By considering the duality of political connections, this paper argues that political officials can channel their intentions into firms, affecting the orientation of business strategies. Consequently, corporate strategy is not the pure product resulting from strategic initiatives; rather, it can be potentially an outcome of political control and co-optation, reflecting political agenda and serving political interests. Empirical evidence supporting these arguments is obtained from China—a transitional economy with an entrenched political authority.

With the growth of the private sector in China, to enhance its power and control in economy, the party-state has created a variety of institutional linkages to co-optate private enterprises, including business associations, party branches, party membership, and political council positions. By establishing these political connections to embrace private enterprises into politics, the government endows material and social benefits to these connected firms. At the same time, the government builds channels instilling its political intentions into the firms. Political incentives or career concerns for local officials largely motivate them to get involved in the economy and business because the economic reform in China has shifted the evaluation criteria for officials from political loyalty to local economic development. Particularly, the regional and local governments have exerted tremendous impacts as reforms have allowed provinces to play a much more important role in economic management than the ministries at the center which were traditionally in charge of planning and coordination, indicating that firms are heavily locally embedded.

For career interests, local officials are motivated to promote local economy and pursue the GDP growth, which is often cited as the indicator of economic performance and has been found to positively affect political mobility. To best boost the growth of GDP within a term, the local officials are usually urging local firms to recklessly expand their size and increase their investment for an extensive growth within a short period. Based on a national survey of Chinese private enterprises, we find that politically connected firms are more likely to adopt the extensive growth strategy (i.e., quick market expansion with relatively low profitability). Such strategy in reality is propelled by local political officials for their promotion incentives within China context. Within

this process, under the guises that business co-optates the source of external uncertainty, business is, in reality, co-optated into politics.

Title: Trust or opportunity? Managing corporate lending networks if institutions are weak

Paper ID: 31

Authors: Katarzyna Burzynska (Radboud University Nijmegen), Sonja Opper (Lund University)

Abstract:

That social capital matters in corporate lending relations is uncontested. While the literature has largely focused on the quality of dyadic firm-bank ties in explaining corporate credit access, we suggest a supply side perspective of lending networks surrounding individual corporations. Building on the common notion that dense networks offer reputation advantages thanks to effective forms of within-group monitoring and sanctioning, our theory predicts that closure in lending networks should help to build trust between lender and borrower and thereby facilitate a company's credit access. Nevertheless, information advantages associated with more open network structures matter too. Access to mutually unconnected financial intermediaries also brings in new ideas guiding and informing the realization of novel investment projects. The realization of such opportunities, however, depends on the question whether other sources of trust—such as third party enforcement guaranteed by predictable local institutions—substitute for the type of trust otherwise produced by within-group monitoring and collective sanctions within closed lending networks. We further hypothesize, therefore, that corporations benefit less from network closure if institutional conditions surrounding the firm guarantee the predictable enforcement of credit contracts. To test our predictions, we use a panel of 515 corporations listed on China's Stock Exchanges holding a total of 7009 major bank loans granted by 183 distinct banks during the period from 2007 to 2012. To assess a corporation's structural position within a network of financial intermediaries, we construct a corporation's network constraint where inter-bank ties are measured by mutual ownership shares. Our findings support the hypothesized positive effect of closure. Our findings also robustly confirm that closure offers fewer advantages if the institutional environment provides credible mechanisms helping to produce institutionalized trust between contract partners. These findings are robust to various specifications. More generally, our findings contribute to the relational lending literature as well as an emerging literature highlighting how the interplay between network structures and formal institutions shapes individual and corporate strategies.

Title: Institutional development and the contingent value of signals in the alliance formation process

Paper ID: 34

Authors: Oliver Rossmannek (University of Freiburg, Germany), Olaf N. Rank (University of Freiburg, Germany)

Abstract:

This study investigates how the institutional development of countries influences the formation process in networks of strategic alliances. We assume that firm characteristics, which indicate the quality and trustworthiness as a partner, are especially helpful in the alliance formation process if the firm is located in a low developed institutional environment. This is because countries with a low institutional development suffer from a higher level of uncertainty. To test our hypotheses, we apply stochastic actor-oriented models (more precisely their implementation SIENA) using a network of 95 airlines over a five-year period. This method for analyzing longitudinal network data allows us to account for resource-based and social determinants in the alliance formation process. We find that membership in an industry association and a high share of government ownership are more beneficial for the degree in the alliance network if the firm originates from a country with low institutional development. We find no support that the relationship between geographic partner distance and the likelihood of a tie formation is contingent on the institutional environment. Our study highlights the contingent value of signals in the alliance formation process. The consideration of the institutional environment complements our view in order to improve our understanding of the processes in interorganizational networks.

Title: Does Interlock Network Still Matter for Corporate Actions: A Retest of Social Influence Theory on Corporate Social Responsibility in the U.S.

Paper ID: 35

Authors: Yi Zhao (Department of Sociology at the University of Arizona)

Abstract:

The “old boys’ club” is dead. Although the “inner circle” (Useem 1984) and dense board connections continued to exist among American corporations throughout the 20th century, the most recent study by Chu and Davis (2016) has shown that the “inner circle” is now disappearing since the turn of 21st century due to the breakdown of the recruitment preference for well-connected directors. As a consequence, the effects of interlock network on U.S. corporations found previously may no longer hold. For example, the two authors found that the 2010 interlock network can no longer account for the public firms’ adoption of the poison pill tactic as it did in 1982 because it is too sparse to provide enough exposures to previous adopters. Given this important macrostructural change, it is imperative to verify whether previous understandings of the effect of interlocking directorates on other aspects of corporate actions remain valid. In this paper, I revisit the theory of social influence and test whether social cohesion and structural equivalence in the interlock networks of large U.S. corporations can still account for the adoption of Corporate Social Responsibility (CSR) practice. My sample includes 442 major U.S. companies indexed by S&P 500 during 2009. I select this particular year in order to test how network influence can remain resilient especially when the network becomes loose and when firms may be less committed to social benefits after the 2008 financial crisis. Although the majority of CSR studies tend to focus on the good CSR practice, I investigate the diffusion of both good and bad social practices because both could actually be adopted by a typical organization given enough peer influence. Methodologically, I use the network autocorrelation model (NEM) to separately estimate the effect of social cohesion and structural equivalence on firms’ social performance while controlling for confounding factors. Because NEM’s parameter estimation could be negatively biased under certain situations (Neuman and Mizruchi 2010), I correct for this problem by using the tested solution (Fujimoto, Chou and Valente 2011). Contrary to Chu and Davis’s (2016) finding on the diffusion of the poison pill, my result shows that the 2009 interlock network can still account for the CSR performance of large American corporations, especially their engagement with responsible social actions even though the “inner circle” is demising. Firms still tend to have similar CSR performance as those sharing board directors and those occupying equivalent network positions. Therefore, the finding suggests that current fracturing of interlock network may differentially impact the diffusion of various ideas or behaviors. Further studies are then needed to explain why certain practices can still be diffused by the network (albeit loose) while others cannot.

Title: The Impact of Distribution Channel on Trial-Version Provision with Positive Network Effect

Paper ID: 36

Authors: Zelong Yi (Shenzhen University), Lijun Ma (Shenzhen University), Fan Li (Shenzhen University)

Abstract:

Many software developers provide free trials to facilitate distribution of their commercial products. Meanwhile, in the international market, some of them authorize local agents to resell products

to consumers. In this paper, we explore the optimal trial strategy in the presence of agent participation. Due to agent participation, the double marginalization effect may result in a higher price and a lower demand of the commercial software. We find that, if the network intensity is strong, the developer will release a trial and attract trial users to secure greater positive externality, which is consistent with the case without agent participation. By contrast, if the network intensity is weak, the developer will still release a trial, which is in sharp contrast to the case without agent participation. The trial is released in order to countervail the negative double marginalization effect.

Title: Longitudinal Analysis of Collaboration Graphs of Forked Open Source Software Development Projects

Paper ID: 37

Authors: Emerson Amirhosein Azarbakht

Abstract:

In this study, we used a developer-oriented statistical approach to understand what causes people in complex software development networks to decide to fork (break away), and what changes a community goes through in the run-up to a decision to break-up. Developing complex software systems is complex. Software developers interact. They may have the same or different goals, communication styles, or values. Interactions can be healthy or troubled. Troubled interactions cause troubled communities, that face failure. Some of these failures manifest themselves as a community split (known as forking). These failures affects many people; developers and users. Can we save troubled projects? We statistically model the longitudinal sociograms of software developers and present early indicators and warning signs that can be used to predict an imminent break-up decision.

Social interactions are a ubiquitous part of our lives, and the creation of online social communities has been a natural extension of this phenomena. Free and Open Source Software (FOSS) development efforts are prime examples of how communities can be leveraged in software development, where groups are formed around communities of interest, and depend on continued interest and involvement.

Forking in FOSS, either as a non-friendly split or a friendly divide, affects the community. Such effects have been studied, shedding light on how forking happens. However, most existing research on forking is post-hoc. In this study, we focus on the seldom-studied run-up to forking events. We propose using statistical modeling of longitudinal social collaboration graphs of software developers to study the evolution and social dynamics of FOSS communities. We aim to identify measures for influence and the shift of influence, measures associated with unhealthy group dynamics, for example a simmering conflict, in addition to early indicators of major events in the lifespan of a community.

We use an actor-oriented approach to statistically model the changes a FOSS community goes through in the run-up to a fork. The model represents the tie formation, breakage, and maintenance. It uses several (more than two, up to 10) snapshots of the network as observed data to estimate the influence of several statistical effects on formation of the observed networks. Exact calculation of the model is not trivial, so, instead we simulate the changes and estimate the model using a Markov Chain Monte Carlo approach.

When we find a well-fitting model, we can test our hypothesis about model parameters, the contributing effects using T-tests and Multivariate Analysis of Variance Between Multiple Groups (Multivariate ANOVA). Our method enables us to make meaningful statements about whether the network dynamics depends on particular parameters/effects with a p-value, indicating the statistical significance level.

This approach may help predict formation of unhealthy dynamics, which is the first step toward a model that gives the community a heads-up when they can still take action to ensure the sustainability of the project.

Title: Patterns, factors, and effects of partnership: Exploring community-based organizations involved in social services at a historical Taipei area

Paper ID: 39

Authors: Yi-Yi Chen (Department of Social Work, National Taiwan University)

Abstract:

Community-based organizations (CBOs) are increasingly important in social welfare as governments withdraw their roles in funding and providing services. Social capital literature indicates that partnership with other organizations is one of the strategies for CBOs to improve service performance because networking would facilitate information exchange, resources sharing, and learning of participants. However, more empirical research and theory development at organization level are needed to clarify what kind of partnership is beneficial to what kind of CBO, with regard to carrying out social services for community residents. The question is valuable for societies like Taiwan where various CBOs are emerging and taking up roles in support of community wellbeing.

This study aims to explore the pattern, influential factors, and effects of CBOs' partnership and the relation among the three variables. The geographic scope targeted is Southern Wan-Hua area of Taipei, Taiwan. It is an historical urban area where rates of poverty and many social problems are highest in Taipei. The CBOs are active in mobilizing local resources to support people's need beyond the social services covered by the government. Formal and informal alliances have been in place and more collaborative actions are evolving, which allows this study to examine patterns and factors of CBOs' partnership.

This study implements a face-to-face structured survey of partnership and organizational properties of CBOs in this area. The identified types of CBOs include community development association (CDAs, an organization representing a municipal community by law), social services agencies, and others such as religious and medical organizations that are involved in social services for community residents. Both relation-oriented social network data and attribute-based organization data are collected and analyzed, using UCINET and SPSS. Social network properties are measured by centrality indicators referring to breadth, brokerage, and embeddedness of networking. The characteristics of partnership include frequency, functions, integration level, and formality. Controlled are influential factors organization level including leadership, community capacity, and collaboration history. A focus group is held for collecting local experts' interpretation on the preliminary results of data analysis.

The findings are insightful for developing guidance for best practice of CBOs and community governance of social policy. Future study can build a plausible model for further study by employing the organizational factors identified and/or applying to survey of distinct areas.

Title: Social Network, Relative Deprivation, and Protest Propensity in Urban China: A Structural-Cognitive Approach

Paper ID: 40

Authors: Yongjun Zhang (School of Sociology, University of Arizona)

Abstract:

Social protest has dramatically surged in China since the early 1990s. Using Data from the Chinese General Social Survey in 2006, this article mainly attempts to examine the mobilization potential in China by analyzing urban residents' willingness to support collective action including gathering, demonstration, strike, and petition. This article distinguishes institutionalized and non-institutionalized protest activities and focuses on the role of relative deprivation and social network on these two types of protest propensity in Urban China. Our study shows that urban residents prefer using less-risk institutionalized protest as one way of redressing grievances rather than high-risk collective action. Respondents who enjoy better biographical availability, political engagement, and structural availability are more likely to be in the pool of mobilization potential. Our research also confirms that individuals' social network attributes in terms of size, strength, variety, density, and connections to power have great influence on both types of protest propensity to some degree. Taken together, relative deprivation and social networks can partly explain the outbreak of social protest in Urban China.

Title: Elite Social Capital Reproduction in Urban China under Mao

Paper ID: 41

Authors: Danching Ruan (Hong Kong Baptist University)

Abstract:

In the first three decades under the Communist rule (1949-1978), the Chinese government made great efforts in bringing social equality to China, and it was quite successful in many aspects, such as housing, income, and medical care in urban China. However, there is an unequal side of the picture. This paper addresses the issue of elite social capital reproduction in urban China under Mao. It will show how social inequalities in social capital are created and maintained by social agents at different levels. It argues that, in addition to the efforts made by elite families, institutional arrangements, i.e., the work unit system and the school system, have played an important role in the process of elite social capital reproduction. The work units and schools create social segregation within the urban population and facilitate social network formation among elites. These elite networks partially account for the fact that many children of the urban elites under Mao grew up to become political, economic or cultural elites under Deng Xiaoping. The historical period for the study is from 1949 to 1978, when China started its economic reforms. The study site is Beijing, the capital of China, which has always had the highest concentration of administrative and professional elites in the country since 1949. The study is based on the data from in-depth interviews and published memoirs and other published historical documents.

Title: Public appearances of political elites in opaque regimes - the cases of China and the Soviet Union

Paper ID: 44

Authors: Franziska Barbara Keller (Hong Kong University of Science and Technology), Sergey Sanovich (New York University)

Abstract:

Even though observers of authoritarian regimes and elites have long relied on interpreting public appearances to understand the politics of such opaque governments, such as the P.R of China or the Soviet Union, there is very little theoretical or systematic empirical research on that topic.

The existing literature on public relations in authoritarian regimes views the regime largely as a unitary entity engaged in a battle with the opposition via censorship and propaganda. In the tradition of the new research of authoritarian regimes, this paper instead focuses on the actions of individual political elites within the regime by examining their co-appearance in public. Using social network analysis on a dataset of 19'000 appearances of 300 top Chinese officials from 2003 until 2014, and a smaller dataset of the Soviet leaders' co-appearance in 1972 -1988, we show that while public co-appearances are indeed determined by structural factors such as an elite's official position and their policy portfolio, but also reflects factional affiliation. The latter's effect is especially noticeable during less stable times, such as leadership transitions and during China's recent anti-corruption campaign.

Title: Difference or Similarity? Understanding corporate elites' networking behavior in constructing friendship and advice ties

Paper ID: 45

Authors: Pyung Nahm (Seoul National University), Sun Hyun Park (Seoul National University)

Abstract:

Research on corporate elites' social networks has primarily focused on the consequences of the elites' interpersonal ties with other corporate elites. Studies have especially concentrated on how a firm's policies or outcomes were influenced by the focal manager's friendship and advice ties to other firm's managers. While these studies successfully emphasized the significance of the social networks of corporate elites, relatively little attention has been paid to the antecedents of these corporate elite ties and the resulting inter-organizational networks. Homophily in terms of personal attributes is assumed to be the main antecedents of friendship formation among corporate elites but no studies have directly examined such assumption. The present study addresses this gap by directly examining the individual and organizational motivations underlying interpersonal ties between corporate elites. We utilize a semester long executive program for corporate elites, held in a large university in South Korea, as the empirical context to analyze the networking behavior of the participants. We conducted two surveys: a survey on network structure and another on individual characteristics. Following the roster model of Marsden (1990), our network survey questionnaire included an alphabetical list of the entire cohort and asked questions about the respondent's friendship and advice relationship with each manager on the roster. Our survey on individual characteristics asked questions on participants' personalities, religious belief and political preference, along with the data on corporate characteristics such as each manager's work post, firm size, and educational level.

By invoking on social exchange theory, we theorize that instrumental motivation influences corporate elites' networking behavior, making the corporate elites to assess the potential value of the relationship with the other individual based on each elite's corporate characteristics. Moreover, we also examine how the degree of similarity and difference in corporate characteristics affect the likelihood of friendship reciprocation. We examine whether the assumption of social homophily of personal attributes as an antecedent of friendship ties is a robust assumption even in the case for corporate elites. The results suggest that similarities of both corporate characteristics and personal attributes increase the likelihood of friendship tie reciprocation, whereas differences in corporate characteristics lead to the failure of tie reciprocation. These friendship ties, our results suggest, are also shown to mediate the relationship between dyadic corporate characteristics and the formation of advice ties. Our study contributes to the literature on corporate elite's social networks by clarifying the antecedents to friendship and advice tie formations between corporate elites. This study also contributes to understanding the instrumental motivation of corporate elites in the context of networking with other elites. Overall, we enhance understanding of how corporate elites' corporate characteristics and personal attributes affect their networking behavior and their choice of potential networking targets.

Title: The Role of Emerging Farmers' Personal Networks In Market Access And Start-Up Farm Success

Paper ID: 47

Authors: Christian Kelly Scott (Pennsylvania State University)

Abstract:

The Mid-Michigan local food system harbors a wide variety of local farms ranging from new to long established operations. Market access plays a key role in the sustained success of these farms, particularly emerging farmers. The study examines the personal networks of Mid-Michigan's emerging farmers and identify characteristics of farmers with differing backgrounds as they relate to their market access decisions. The study examines the social ties among farmers through the use of network analysis and measures of social connectedness. Study findings yield insights into the relationship between social networks and market access among emerging farmers in Mid-Michigan, and the factors contributing to the sustainability of the farmers' operations. Through analysis and comparison of long-term indicators of likely success, entrepreneurial farming aspects of the incubator farm program's participants emerge. Farmers identify what it means to know the ideal market facilitators to enter the local food economy. The study then examines what that means for their individualized definition of success and what these networks represent to each individual farmer, farmer groups, and the incubator program as a whole.

Title: UNPACKING THE BLACK BOX: FIRM-BANK RELATIONS, THE COMPETITIVE CONTEXT, AND INTERNAL RATINGS OF ENTREPRENEURIAL FIRMS IN AN EMERGING ECONOMY

Paper ID: 48

Authors: Yanlong Zhang (Peking University), Ling Yang (Tsinghua University), Jia Chen (Peking University)

Abstract:

This paper investigates how social relations between entrepreneurial firms and banks influence the internal ratings that firms receive from banks, and how the local competitive context moderates the effect of firm-bank relations and jointly shapes the rating results. An analysis of survey data on Chinese entrepreneurial firms reveals that the duration of firm-bank relations significantly enhances the internal ratings that firms receive. More importantly, although the impact of the firm-bank relationship is amplified in a more competitive financial market, the impact tends to be attenuated in a market in which essential market supporting intermediary organizations have been developed. These findings contribute to relationship banking and social networks literature by enriching our understanding of how social relations and the competitive context interactively shape the internal risk management systems of emerging market financial institutions.

Title: Local Conflicts, but transnational foci? Ethnic organizations in Sweden and the conflict “back home”

Paper ID: 50

Authors: Sofiya Voytiv (Stockholm University)

Abstract:

Using Scott Feld’s model of the focused organization of social ties (1981) this paper argues that the conflicts invoking the ideas of ethnicity, territorial belonging, and religion may be reflected in and frame the interethnic relationships not only in the places where they actually happen, but also the social networks of the migrants that come from these countries. This paper aims to further develop the theoretical approaches to the social network theory of focused organization of social ties as related to the conflict development in the home countries of different migrant groups.

In this analysis I focus on the Ukrainian and Russian ethnic organizations active in Sweden. I use the logistic regression models to account for the probabilities of Ukrainian and Russian organizations to send different types of links to other ethnic organizations depending on the developments of the conflict in Eastern Ukraine as well as in-depth interviews with the organizations' members. The data for the analysis combine the conflict event data from Uppsala Conflict Data Programme (2014 to 2015), and the ego-centered directed network data of the officially registered Ukrainian and Russian ethnic organizations available for the period of 2013 until 2016.

I suggest that the conflict “back home” can become a focused activity of ethnic organizations’ in the host country if the home country of the members is in conflict, and thus build patterns of interaction and sentiments not only to the representatives of the home, host and the country from the other side of the conflict, but also other ethnic groups with the perceived similar past.

Title: Network density and medical mistrust among breast cancer patients: Do relationships vary by ethnicity?

Paper ID: 52

Authors: Yamile Molina (University of Illinois at Chicago), Ganga Vijayasiri (University of Illinois at Chicago), Jake Fisher (Duke University), Tyson Brown (Duke University), James Moody (Duke University), Richard Warnecke (University of Illinois at Chicago), Gar

Abstract:

Background: Ethnic differences in medical mistrust likely contribute to breast cancer disparities and should be addressed. Mistrust may manifest differently for non-Latino Whites (NLWs) and ethnic minorities due to cultural emphases and historical context.

Objectives: To examine if associations between social network variables and mistrust among breast cancer patients varied by ethnicity.

Methods: This secondary analysis uses 134 Latina and 268 NLW patients from a Chicago-based study. Egocentric network variables included: size; density; %same ethnicity; %female. Mistrust was measured by the 10-item Health Care System Distrust scale. Multivariable linear regressions were conducted to examine if mistrust was associated with network x ethnicity interaction terms. If significant, subsequent models examined the main effects of network variables on distrust separately for Latinas and NLWs.

Results: Relative to NLWs, Latinas exhibited more mistrust and had larger, denser, and more diverse networks (all $p < .0001$). Significant interactions emerged for density and size. Denser ($p = 0.05$) and larger networks ($p = 0.06$) were associated/marginally associated with lower mistrust among Latinas, but were not associated with mistrust among NLWs ($p = 0.62$ and 0.97).

Discussion: Our results suggest network interventions may be particularly useful for promoting trust among Latina breast cancer patients.

Title: What Binds Us Online: Friendship vs. Communication Ties?

Paper ID: 53

Authors: Anatoliy Gruzd (Ryerson University), Ksenia Tsyganova (St.Petersburg State University), Dmitri Tsyganova (St.Petersburg State University)

Abstract:

When analyzing online groups and their interactions, network researchers often rely on one of the two types of social network data: (1) a Friendship network ('who is a friend with whom') or (2) a Communication network ('who interacts or communicates with whom'), but rarely both. And depending on the type of social network data researchers have access to, researchers can reach very different conclusions about the group being studied. To ensure that we can get a more accurate understanding of group dynamics on social networking sites, this study examines and compares both friendship and communications network ties formed on VKontakte (VK), a popular social networking site in Eastern Europe. Specifically, the study explores whether there are differences between friendship ties and communications ties formed among members of public groups on VKontakte and how those differences may affect our understanding of these online groups. In particular, we want to know if there is a positive or negative correlation between the friendship and communication networks.

This paper examines four online groups with distinct points of views on the ongoing conflict between Ukraine and Russia; two of the groups supported the 2014 Euromaidan revolution in Ukraine and two opposed the revolution. We chose these groups because (1) they are public; anyone can join, post and reply to other's messages, and (2) the subject matter of their discussion, the crisis in Ukraine and the conflict between Ukraine and Russia, tends to elicit strong feelings for or against. As the conflict in Ukraine is still ongoing and tensions are high between opponents both offline and online, these groups became common spaces for online users to discuss news, politics, share information about local and global events, and find likeminded individuals to connect. This makes these groups ideal candidates to find out whether members would primarily communicate with their VK "friends" as a mechanism to avoid confrontation and attacks; or whether they would be more likely to engage contrary minded participants directly.

Based on the QAP correlation analysis, no correlation was found between the friendship and communication networks. This suggests that VK friends who are members of the same group are not likely to communicate with each other online. In other words, there are other factors such as the topic of a thread that may explain why group members engage in online discussions. The fact that VK group members do not engage their VK friends online may be a sign of hostile discussions, as we would generally expect a lower level of hostility between interactions among self-declared friends. If this supposition holds, we may be able to use correlation between friendship and communication networks as an indicator of the level of hostility in an online group. Information like this would be extremely valuable to group moderators who might be able to use such insights to intervene in group discussions as needed.

Title: Facing the Giants: A Network Analysis of Transnational Advocacy Campaign at Intergovernmental Organizations

Paper ID: 54

Authors: Bi Zhao (Purdue University)

Abstract:

The participation of transnational actors (TNAs, non-state actors including advocacy groups, service providers, and experts) in global governance has been on the rise. What shapes TNAs' influence in world politics, and especially when they face more power actors such as intergovernmental organizations (IGOs) and their member states? This paper shows that certain network features are associated with successful efforts by TNAs to push for normative and policy changes in IGOs. In particular, I show that the successful effort by a coalition of NGOs led by Medicins Sans Frontieres (MSF) and Act Up to change the WTO policy with respect to intellectual property rights on pharmaceutical products was defined by two distinct network phases: an initial phase in which a highly centralized network involving a small number of closely connected NGOs facilitated a clear definition of the reform agenda, and a second stage in which a more diffused network of actors lobbied the WTO to change the policy. The network influence suggests that the traditional focus on exogenous structure and/or internal agentic attributes are insufficient for explaining campaign outcomes. An inter-organizational network reveals important factors pertaining to their success.

Title: Look Who's Talking: Bipartite Networks as Representations of a Topic Model of New Zealand Parliamentary Speeches

Paper ID: 57

Authors: Ben Curran (University of Auckland), Kyle Higham (Victoria University of Wellington), Elisenda Ortiz (Victoria University of Wellington), Demival Vasques Filho (University of Auckland)

Abstract:

We utilize the New Zealand government's digital Hansard database in order to construct a topic model of parliamentary speeches in the period 2002-2014. A Latent Dirichlet Allocation topic model is implemented in order to reveal the thematic structure of our set of documents. This generative statistical model enables the detection of the major topics that are more discussed in the New Zealand parliament, as well as permits their classification by Member of Parliament (MP) and/or party. The information on topics proportions is subsequently analyzed with a combination of statistical methods. We construct a bipartite network representation consisting on topics linked to MPs and proceed to the study of community structure and the examination of several features using a complex networks approach.

Title: Inter-Agency Collaboration in Local Government: Evidence from Water Governance in Dongguan, China

Paper ID: 59

Authors: Hongtao Yi (The Ohio State University), Chen Huang (Huazhong University of Science and Technology), Tao Chen (Huazhong University of Science and Technology)

Abstract:

Rapid economic development in China has imposed immense stress on the ecological systems, especially local water system. As the biggest manufacturing hub in the world, Dongguan municipal government in Guangdong China is faced with tremendous challenges in managing and governing its water resources. Stimulated by the ineffectiveness of vertically managed and fragmented administration of water resources, with multiple city departments in charge of different aspects of water affairs, Dongguan has started experimenting inter-agency cooperation in water management. A multi-layer and horizontal cooperation network emerged as a result of the reform.

In order to empirically assess the status, motivations and obstacles of the inter-agency cooperation of local water governance in China, this article conducts in-depth interviews and online surveys to collect government network data in Dongguan, China. The interviewees involve department managers from Dongguan Water Affairs Bureau, Dongguan Environmental Protection Bureau and twelve other water management departments. Online and paper surveys were conducted among 30 municipal departments, 32 town departments, 15 water related enterprises and 8 local research institutions. Applying social network analysis with UCINET, we constructed a water governance cooperation network.

As shown in the preliminary results, we find that water governance in Dongguan is demonstrated as a well-connected governance network, with widespread participation from Water Affairs Bureau, Environmental Protection Bureau, Development and Reform Commission, Water construction and operation centers at the town level, water related enterprises, non-governmental organizations and research institutions. Although the policy-making in Chinese local governments remains bureaucratic, network governance was introduced into the system to some extent. We found in this study that water-related governments in Dongguan were not perfectly familiar with each other, thus they did not achieve full cooperation and reach the potential of cooperative water governance. By analyzing the cooperative network, we found this network has weak to moderate density allowing for collective action problems. The network has also presented central actors with high power with control over information and resources. It also captures strong bonding capital among some policy actors, as shown in high reciprocity, clustering coefficient and transitivity.

By analyzing this cooperation network, we report some preliminary findings. First, there is insufficient vertical cooperation, which means a majority cooperation is limited to local sectors. Second, low public involvement is detected, as the key network players are still governmental departments, and NGOs play very little role in the network. This paper calls for more public participation from NGOs and grassroots organizations in the water governance, as well as involvement of governments across different levels.

Title: Cross-level coordination for electronic public services: A social network analysis of Guangzhou's online business hall

Paper ID: 60

Authors: Huiping Zhang (School of Political Science and Public Administration, University of Electronic Science and Technology of China), Guofu Yang (School of Political Science and Public Administration, University of Electronic Science and Technology of China)

Abstract:

The purpose of this empirical study is to examine the role of various departments at different levels in electronic public services provision and to identify the cross-level coordination mechanism for improving electronic public services. The context is the online business hall established by the municipal government of Guangzhou, which had enabled information sharing and exchange among municipal, district (county), town (street) and village (neighborhood) level and issued "Guangzhou Municipal Measures on Online Business". All descriptions of business processes and titles of documents should be provided for registration or application are collected from the websites. The documents are seen as the nodes of the networks, and the relationships between the nodes are identified from descriptions of business processes. If two documents should be provided in a same business, the number of the relationships between two nodes represented by the corresponding documents will add one. Four networks will be established according to four different levels and the differences of information relationships among different levels will be sought out. Based on the study results, recommendations will be brought forth on enhancing cross-level coordination including increasing information sharing among various departments at different levels, reducing citizens' information provision, optimizing e-government systems, and developing big data.

Title: Lobbying beyond interests in the EU Climate Change and Energy Policy-Making Process: An Explanation of Coalitions' Formation through Multilevel Network Dynamics.

Paper ID: 62

Authors: Valentina Baiamonte (Graduate Institute of International and Development Studies, Geneva, Switzerland)

Abstract:

The European Commission and other EU institutions take into high consideration inputs from interest groups and lobbies. These organisations provide institutions with technical expertise that policy-makers and bureaucrats from the European Commission, Parliament and Council usually lack. Before drafting a legal proposal, the European Commission regularly announces consultations open to different groups of interests. During these consultations, interest groups, private companies and members of the civil society develop formal and informal networks of coalitions and submit position papers to the European Commission. Coalitions can be different in nature: cross-sectoral, isolated at the periphery of the network, or well-connected. However, within the same consultation, some actors may formally join more than one coalition and present different position papers.

Why do coalitions within a policy network take these particular configurations? Why do certain actors decide to join more than one coalition?

To answer these questions, this research argues that it is necessary to identify the dynamics that brought actors under the same coalition. The causal mechanisms tested in this research will be the following. First, some actors may join more than one coalition to campaign together with partners they have been traditionally working and lobbying together. Second, structure of coalitions can be shaped by interests shared among the members. Thus, in analysing coalitions that overlap, it is necessary to deconstruct the definition of "interest" and reveal other potential overlapping mechanisms. "Interest" will be divided into three sub-definitions highlighted by the Advocacy Coalition Framework (ACF): core-interests, core-policy preferences and policy instruments. The Advocacy Coalition Framework argues that core-interests and core-policy preferences are the glue that keeps coalitions together. However, this theory neglects to apply these definitions to explain overlapping coalitions. Lastly, the consequences of overlapping coalitions will be disclosed through contributions from the Social Capital and network analysis theories. This research argues that stakeholders placed between two or more coalitions are responsible for the diffusion of policy preferences and instruments. Placed between two or more coalitions, policy brokers develop a communication channel between competing coalitions; which, in turn, can determine the diffusion of ideas.

To unveil dynamics behind coalitions' formation, this research will combine two methodologies: multi-level network analysis and content analysis. The final objective and contribution of this research would be to explore dynamics as a relational system. The hypotheses presented are relational in nature and refer to specific patterns that can be identified through specific network measurements.

Title: Structural Balance and Polarization in the U.S. Congress, 1973-2016

Paper ID: 63

Authors: Zachary Neal (Michigan State University)

Abstract:

Networks of political alliances and antagonisms are difficult to collect directly both because politicians are busy and have little time to participate in research, and because they have motivations to conceal their actual alliances and antagonisms. To overcome this challenge, many have turned to one-mode projections as a solution. In particular, in the past decade, several analyses of bill co-sponsorship networks have emerged that examine the structure of political ties. In these networks, legislators are viewed as having a tie or alliance if they co-sponsor many of the same pieces of legislation.

This approach, while promising, has two important drawbacks. First, ordinary one-mode projections may have the potential to identify political alliances (i.e. positive ties), but they cannot identify political antagonisms (i.e. negative ties). Second, valued one-mode projections and their non-valued counterparts generated by applying a universal binarizing threshold are subject to a number of structural distortions including inflated clustering, transitivity, and density.

The Stochastic Degree Sequence Model (SDSM) offers a solution to both of these challenges. In this presentation, I use the SDSM to construct a longitudinal time-series of signed networks based on bill co-sponsorship in both the U.S. House of Representatives and the U.S. Senate in each Session of Congress from 1973 to present (22 waves). This approach controls for variation in legislators' sponsoring activity, and for variation in the popularity of specific pieces of legislation. Using unique empirical sampling distributions for the weight of each edge in the projected network, political alliances (and antagonisms) are identified by edges whose weights are statistically significantly greater (or smaller) than expected in a null model. These data represent one of the largest (in nodes) and longest (in time series) signed networks, which will be made publicly available through this paper/presentation.

In each of these networks, I conduct a signed triad census and compute a measure of structural balance. As would be expected from theory, the amount of structural balance in these networks increases over time. However, a closer look at why balance increases reveals a more troubling pattern. In both chambers of congress, the increase in structural balance is due to growth in "mutual enemy" triads (+--) and not to growth in "mutual friend" triads (+++). Thus, greater structural balance in the U.S. Congress since 1973 has been achieved through polarization and the growth of political antagonisms. I conclude with a discussion of the implications of these findings for efforts to reduce political polarization, and of the prospect of using signed one-mode projections to facilitate the study of signed networks, balance, and polarization in other contexts.

[NOTE TO ORGANIZERS: If a session on negative ties & signed networks is formed, this paper could also be a good fit there.]

Title: Why and How Venture Capital Syndication Influences Their Successful Exits: Empirical Evidence from GVC and FVC

Paper ID: 64

Authors: Li Zhu (University of Chinese Academy of Sciences), Lynda Jiwen Song (Renmin University of China), Hu Yang (Central University of Finance and Economics)

Abstract:

Compared with the traditional investment, venture capital (VC) is a kind of high uncertainty and asymmetric information of investment, in order to limit the risk and improve the return on investment, VC has to make a joint investment way (syndication) to solve the problem of insufficient resources and high risk. While increasing evidence shows that not all syndicates behaviors end well. Rational choice theory or resource dependent theory have long been interested in the drivers of collaboration partner selection of venture capital (VCs) syndicates. From social embeddedness theory, VCs always emphasize the connections to focal collaborator to overcome environmental uncertainty and get access to resource. A good syndication network position makes VCs benefit more from the spread of the network diffusion, better reputation, suitable depth of embeddedness and successful exits eventually. Then why syndicates behaviors emergency on government venture capital (GVC) and foreign venture capital (FVC)? How depth of embeddedness is more suitable? We plan to make a contribution on the point of combining the two mainstream theories. Our research firstly focuses on methodology of Propensity Score Matching (PSM) to explain the reason of GVC and FVC choose each other, and then using social network analysis to clear how depth of embeddedness is more rational and effective in China from 1985 to 2010, eventually using in-depth interviews to validate the correctness and reliability.

Title: Identifying the leaders of Chinese venture capital industry — network analysis vs ground truth

Paper ID: 65

Authors: Jianlin Zhou (School of Systems Science, Beijing Normal University), Qing Guo (Department of Sociology, Tsinghua University), Ying Fan (School of Systems Science, Beijing Normal University), Jar-der Iuo (Department of Sociology, Tsinghua University), Weiwei Gu (Beijing Normal University)

Abstract:

The venture capital (VC) in China is a young but fast-growing industry, dating back to the end of 20th century. Explosion of recent researches has helped us gain deep understanding of this field, the aspect that how to identify the leaders of this industry has gained considerable attraction, which has important practical and theoretical significance. Based on the professional questionnaire survey, here we get the ground truth of leaders in VC field. Then we make use of network analysis methods to accord with reality and investigation result. With using the data in the SiMuTon database(year 2000-2013), we establish the undirected network of venture capital firms in China. It is a network that two firms connect to each other if they have at least one co-investment. Then we extract the basic topological statistical index of the joint investment network, including degree, clustering coefficient, k-shell and variation trend of k-shell. Based on these indices of the network, we perform the cluster analysis on the VC firms to detect the leaders. The results could fit the ground truth very well.

Title: Digitalized renqing flowing in a Chinese journalists' network: how the space for guanxi capital is diminishing in the digital era

Paper ID: 66

Authors: Wang Xiao (School of Journalism and Communication, The Chinese University of Hong Kong)

Abstract:

Little has been known in relation to the dynamics of guanxi capital in probably one of the most guanxi-characterized network--explicit or implicit--journalists' network. In a traditional viewpoint, there is nearly a canon for evaluating what a good journalist should be and do to become a qualified developer and even controller of guanxi capital. However, embedded and embodied in this digital era, Chinese journalists may find this canon slightly outdated. A flourishing of digital media forms have both enabled and motivated users to become content producers and even reproducers (e.g., by retweeting). This crowd-sourcing trend implies that contemporary media are actually steered by a two-sided logic: media professionalism and audience, more precisely, user involvement. In this case, a digital turning of guanxi capital accumulation within a journalist network can be witnessed. This study took Blue Whale (BW, 蓝鲸), an online working platform networking real-name verified financial journalists in China, as the case. 24 independent interviews (13 from NFD in Guangzhou and 11 from BJN in Beijing) and two focus groups were conducted. The space for guanxi capital was contended to be diminishing with the intervention of digital technologies, especially various original features afforded by online platforms. Findings reached are primarily revolving around challenges to three major theoretical models in guanxi network studies.

First, with the intervention of BW, journalists' other-directed character achieves autonomy through their ability to connect to a larger and instant horizontal network. They are afforded by the platform to monitor the surroundings via online peer groups and industrial topics, in order to achieve recognition and normative orientation, which restructure their other-directed character. That is to say, journalists are increasingly empowered to produce their own biographies on a digital platform that celebrate everyone's right to be as individual as possible. The rise of a soft individualism was captured that the online network is no longer a social extension of family values and ethics, and that journalists become reluctant to inject their collectivism-characterized national personality into career development. Second, the blurry boundary between instrumental and non-instrumental relations was found to become clearer and more solid on BW. Financial journalists do retain a distant-close sequence of their guanxi relations offline. However, this awareness of relational particularism was found to be diluted and weakened by the possibility for every user to share and exchange news sources and clues, to "act" on several stages simultaneously, and to optimize social interactions to their personal advantage. Third, it was illustrated how the reciprocal obligations and favor exchange/Chinese renqing have been digitalized by "affordances" of online digital money. In specific, some intriguing affordances on BW, in particular the BW coin, have restructured journalists' online interactions and obligations, which were generally reflected in interviews that conventional instrumental demands of renqing receiver retained to be satisfied, yet the reputational recognition for renqing provider had been

digitally changed. In other words, the strong, frequent, and highly instrumental obligations among journalists in the past have retained, but turned out to be more symmetric, in both time and form, through digitalized renqing.

Title: Slaves, Freedmen, Indians and Pardos. The Early Modern Social Networks of the Population of Color in the Atlantic Portuguese Empire

Paper ID: 67

Authors: Agata Bloch (Polish Academy of Sciences), Michal Bojanowski (Interdisciplinary Centre for Mathematical and Computational Modelling, Warsaw University)

Abstract:

The objective of this presentation is to show how the early modern Portuguese social networks were established during the 18th century and how the Lusophone overseas in conjunction with the transatlantic solidarity were constructed in the context of the enlightened Atlantic. Thousands of letters were written by the inhabitants of the Atlantic colonies during this period and now they can be found at the Portuguese Overseas Archives. As a part of our project, a special mathematical modelling system has been developed to enable the investigation on the early modern social networks. The research brings innovative results in many fields, always highlighting how this small Iberian country connected the world, consequently creating the transatlantic Lusophone culture and the Portuguese overseas mentality. The in-depth analysis of the unpublished petitions written by slaves, freedmen, Indians and pardos of the Atlantic Portuguese colonies to the king allowed to redefine their position and the social status under the reign of the D. João V. The 18th century is an interesting period to be studied, because on the one hand there were the African and the indigenous communities deeply rooted in the Portuguese colonies, on the other - the slave model and the strong social classification remained in force. The research, however, reveals the interesting relation between the population of color and the king, seen as arbiter, mediator and "good father" in the typically domestic relationship and as the sovereign and the last instance in the relations of authority between the colonial and metropolitan administration. The research provides tangible answers to questions like 'how the king succeeded in establishing the lasting relations with the marginalized individuals from the Empire,' and 'how the Portuguese overseas identity and the sense of belonging of the colonized to Portugal emerged'. Finally, it is worth reflecting whether the racial discrimination was a result of the lack of appropriate policies over the last few centuries or a specific policy in the early modern Portuguese Empire.

Title: The Role of Women and Men in the Structures of Dissident Christianity in Medieval Languedoc from the Perspective of Social Network Analysis

Paper ID: 68

Authors: David Zbírál (Masaryk University)

Abstract:

For decades scholars have discussed whether any special role was played by women in medieval dissident Christianities in general, and in Languedocian Catharism in particular. However, the tools used to address this question have remained quite limited and unable to provide more than rather anecdotal answers. This paper aims at filling this gap and inquiring systematically into the social networks of Cathar Christianity in Languedoc as portrayed in a set of inquisitional records, using network analytical tools to bring new insights regarding the roles played by women on one side, and men on the other, in the functioning and transmission of this illegal religious culture. A more general aim is to examine the prospects of social network analysis in research into medieval dissident Christianities based on inquisitional records.

Title: Communities of Dissent: A Social Network Approach to the Study of Late Medieval Heresies

Paper ID: 69

Authors: Delfi I. Nieto-Isabel (Institute for Research on Medieval Cultures - University of Barcelona, Spain)

Abstract:

Between the twelfth and the fourteenth centuries, the region of Languedoc, in fact, the whole area spanning between the north-east of the Iberian Peninsula and northern Italy, witnessed the emergence of a series of new forms of piety that later came to be the centre of new religious expressions. Some of these fell quite effortlessly within the framework of orthodoxy, giving rise to new institutional contexts—new religious orders—while others ended up being regarded as ‘heretical,’ and thus more or less unwillingly became religious dissenters. The main objective of this paper is to analyse the community performance of these dissident groups through the methods of social network analysis in order to identify the existence of common patterns of articulation, and reassess the participation of women in these movements. Furthermore, the comparative study of some of the different forms of dissident spirituality in late medieval Europe will shed some light on the ongoing debate surrounding the ‘construction of heresy.’

In order to illustrate this methodology, the subjects of this paper are three specific dissident communities: the groups commonly referred to as ‘Cathars’ in modern historiography, Waldensians, and the Beguins of Languedoc. The sources for this study comprise the inquisitorial registers copied in Manuscripts 21 to 37 of the Doat Collection (preserved in the Bibliothèque nationale de France), the Book of Sentences of the Dominican inquisitor Bernard Gui (Add. MS 4697 British Museum), which includes the sentences pronounced during his inquisitorial activity between 1308 and 1323, and the records of the inquisitions held by Jacques Fournier between 1318 and 1325 during his time as bishop of Pamiers (MS Lat. 4030 Biblioteca Apostolica Vaticana). This selection of sources has allowed a diachronic and synchronic comparison of the development of these three communities of dissent and, ultimately, of the persecution they suffered.

The fact that the registers are not complete, which sometimes poses an unsurmountable obstacle for statistical analysis, does not necessarily hinder network studies, because analysing a ‘complete network’ is not the only productive option. The networks extracted from these sources inherently lack information, not only because of the aforementioned gaps of inquisitorial registers, but also because deponents are first and foremost confessing subjects who were forced to testify, and thus were likely to try and minimise their involvement or conceal information out of fear. However, at the very least, the relational information provided by these sources reveals the outline of the spiritual network the inquisitors intended to uncover. The aim is not to map all the connections between all the members of a given spiritual network, but to be aware of the limitations of inquisitorial registers and choose our questions accordingly. This approach may help us detect structures that might not be recognised by those involved in them, but that nonetheless

provide information about the mechanisms of dissemination of religious beliefs and practices, while allowing us to redefine the very concept of dissident community.

Title: Networks of Judges, Accused and Accusers in the 'Mongol' Trials (yarghu) of the Mongolian Empire

Paper ID: 70

Authors: Florence Hodous (Renmin University, Beijing, China)

Abstract:

As an empire of unprecedented size with an incredibly diverse population, the Mongol Empire had unique needs in terms of resolving legal cases among its peoples. While most often the Mongols allowed local populations to keep their own laws, there was still a need to resolve cases which arose between members of different groups (or ethnicities) or between the officials and generals who were servants of the Mongol power. Such cases were dealt with through 'Mongol' trials known as yarghu.

A mapping of participants, such as judges, accused, accusers, and witnesses in these trials has never been attempted. As the sources from this time period record mostly politically-important trials, they are ideal for analyzing power relations between members of the ethnically-diverse elite of the empire. Key questions which the networks of participants will cast light on include: Do clusters which emerge from the trials overlap with known factions among the elite of the Mongol empire? In other words, does the history of these factions, as described in the text of the sources, overlap with incidental information which can be gleaned from the descriptions of trials, or do these tell a different story? What light do the trials, and a quantitative analysis, shed on the ethnic makeup of the different factions?

While we often think of the Mongol Empire in terms of one united empire or, after the breakup of the united empire, four khanates, with clearly defined succession to the khanship, recent research is showing just how fragile were the alliances which permitted some of the khans to maintain power, and just how much they depended on ever-shifting factions which, when they turned against each other, led to wars, retaliation and vengeance, as well as legal trials and executions. This research will therefore contribute towards a better understanding of the real power structures behind the throne in the empire and in the khanates.

This talk will be based on results from a database of trials in the Mongol Empire, newly developed by Prof. Michael Fuller of UC Irvine for my current research project at Renmin University, Beijing. This database is currently being developed and expanded to bring together the hundreds of trials that are known and recorded in the sources in languages such as Chinese, Farsi and Latin, as well as other languages.

Title: Topologies of medieval local power: the prosopographical networks of the Norman nobility in the kingdom of Sicily

Paper ID: 71

Authors: Hervin Fernández-Aceves

Abstract:

The paper discusses the research possibilities created both by document digitalisation and relational sociology for the study of medieval aristocracy. I evaluate here how data collection can be conducted having in mind a socio-relational method. I argue here that the possibility to access a large number of documents and the opportunity to process them digitally significantly change the way social and political historians make use of diplomatic material. The paper accordingly provides examples of results obtained so far by examining documents related to the upper aristocracy of the kingdom of Sicily in the twelfth century. The database constructed from the Italo-Norman charters studied has made it possible to organise the prosopographical and diplomatic information, found in a large but scattered corpora of documents, into a series of sociomatrices. Keywords: databases, digital humanities, diplomatics, methodology, nobility, Norman Italy, relational sociology

Title: Hypergraph Representations: A Study of Caribe Attacks on Colonial Forces, 1509-1700

Paper ID: 73

Authors: Termeh Shafie (University of Konstanz), David Schoch (University of Konstanz), Jimmy Mans (Leiden University), Corinne Hofman (Leiden University), Ulrik Brandes (University of Konstanz)

Abstract:

Network data consisting of recorded historical events are conveniently represented as hypergraphs where the ties or events can connect any number of nodes or event attributes. In this paper, we perform a centrality analysis of a directed hypergraph representing attacks by indigenous people from the Lesser Antilles on European colonial settlements, 1509-1700. The results of central attacks with respect to attacked colonial force, member of attack alliances, and year and location of attack are discussed and compared to a non-relational exploratory analysis of the data. This comparison points to the importance of a mixed methods approach to enhance the analysis and to obtain a complementary understanding of a network study.

Title: Humanitarian Advocacy in the International Refugee Crisis: NGOs' Network Agenda Building and Setting

Paper ID: 74

Authors: Aimei Yang (University of Southern California), Adam J. Saffer (University of North Carolina)

Abstract:

In 2015, an estimated one million refugees crossed into the European Union (EU) to seek asylum (Frontex, 2015). This large influx of refugees overwhelmed many European governments and triggered the most severe international refugee crisis since World War II. In 2016, the crisis has continued to claim the lives of thousands of refugees and has casted serious doubts on EU's governance capacity and respect for basic human rights. Nonetheless, the public's response to this crisis is far from united. Populist groups in many European countries have used the crisis to weaken the EU's legitimacy and inflame tensions against immigrants. For humanitarian NGOs, success hinges upon their ability to mobilize resources, rally international allies to help refugees, and build and set the agenda on the refugee crisis discourse.

The current study aims to understand how humanitarian NGOs can build and set agenda in a time of international turmoil and crisis and offers practical suggestions to advance NGOs' communication effectiveness. The current study draws upon the classic theory of agenda setting, recent development in network agenda setting, and public relations research on agenda building to understand the effect of NGOs' communication strategies that may influence the discourse of the refugee crisis (Berger, 2001; Guo & Vargo, 2015; Kioussis, Popescu, & Mitrook, 2007; McCombs, 2013; Waters, 2013). Unlike traditional agenda setting research that adopts a mass communication perspective, this study takes an organizational perspective that focuses on NGOs' communication strategies and tactics that build and set the media's and the public's agendas.

We believe NGOs' ability to build and set agendas is influenced by a combination of factors ranging from their communication strategies to their network positions. Organizations' online and offline network positions may empower or constrain their ability to share information and influence conversations. Specifically, we identified three sets of potentially influential variables that include organizational communication tactics (number of news releases, social media posts, etc.), organizational engagement with the public (number of social media followers, etc.), and organizations' network positions (NGOs' online and offline network centralities). Further, we examine the extent to which these variables influence NGOs' coverage in mainstream media and online (i.e. Twitter). Using topic modeling, we compare the main theme of NGOs' advocacy and media coverage to identify the themes that receive coverage in the media. The topic modeling analysis complements the regression analysis by demonstrating the overall effect of NGOs' agenda setting and building.

Our data were collected from Union of International Associations, LexisNexis database and through data mining subscription services. Further, multiple research methods including social network analysis, regression, and topic modeling are utilized in the data analysis process. Findings of the studies provide unique insights to advance agenda setting and building theory and practice

in the networked context. Additionally, findings of this study provide timely practical suggestions to guide NGOs' future communication practice on the refugee crisis.

Title: From Online Strangers to Offline Friends: In-depth Interviews of Video Game Players in Hong Kong

Paper ID: 75

Authors: Gina Lai (Hong Kong Baptist University), Kayi Fung (University of Saskatchewan, Hong Kong Baptist University)

Abstract:

Advancements in information and communication technology (ICT) have attracted much research interest in studying how social relations are influenced by the Internet. An emerging research theme focuses on Massive Multiple Online Role Play Games, video games that connect multiple players as allies or contestants in the game. Yet, existing studies have generated inconclusive results. Some scholars observe that gamers have smaller social networks than non-gamers whereas some other scholars find that video gaming can enlarge gamers' social network and strengthen pre-existing social relationships. These studies have largely employed cross-sectional data to measure changes in social networks and overlooked the dynamic processes involved. The present study adopts qualitative data to examine the formation, maintenance, and transformation of new social ties via online video games. Data come from in-depth interviews with 18 console game players (Nintendo DS) in Hong Kong who were aged between 20 and 35 years old. NDS games link multiple players through wifi connection or the local area network (LAN). It was launched in 2005 and was discontinued in 2012. It was the best-selling handheld console in the gaming history with the total sale of 154.01 million consoles. Respondents were asked about their video gaming experiences and their social relationships with people with whom they were involved in video gaming over the years. Results show that online video games provide the platform for players to meet other players. In addition to the game itself, players also met new friends via game-related online forums where they sought information about the game and playing partners. The fact that they play the same game and share the same hobby (playing video games) fostered a sense of familiarity and homophily among players and turned online strangers into online acquaintances with whom the interactions mainly centered around the game and/or were restricted to the related forum. After routine interactions for some time, some players changed the interaction venue with these online acquaintances from public forums to more personal platforms, for example, Facebook and Skype, where they could get to know their online acquaintances beyond video games. The knowledge about their online acquaintances obtained via social media helped the respondents evaluate whether the transient relationships could be further developed into more stable friendship ties. When the social ties were transformed from acquaintances to friends, offline social activities were sometimes arranged, for example movie outings and dinner gatherings. These offline interactions further strengthened the social ties and transformed the relationships from particularistic to generalized ones. Some respondents could even obtain resources from their online-turned-offline friends to meet their personal needs. In sum, our data suggest that while homophily and mutual interests enable two unrelated individuals to form a social tie in the virtual space, compatibility and trustworthiness are the keys for the relationship to be strengthened and maintained in the real world. Social media allows a person to obtain have the knowledge and initial evaluation of another person's background and

other characteristics. Face-to-face interactions are crucial for one to verify the information and transform transient online social ties to more stable ones.

Title: Perceptions on Electric Vehicles and Their User Interface: A Case of Tesla S

Paper ID: 76

Authors: Kang-Nyeon Lee (SungKyunkwan University), JangHyun Kim (SungKyunkwan University)

Abstract:

The present study tracked text data, which included various opinions on electric vehicles (EVs) on the press, the web, and in academic writings. In the late 19th century EVs were commercialized with bright prospect; at that time EVs were new vision of transport system; but their adoption and popularization to global consumer market failed in the early 20th century; because fast growing oil industry provided automobiles, which had internal combustion engine (Conventional Cars: CCs) with competitive advantages: fuel cost, the speed of fueling, and mileage. As a result, CCs dominated transport system in the world until the 2000's; but the environment around automobile market changed since 2010's; Because of global warming caused by green house gas emission, the world began to need alternatives on CCs; Technological advance invented cheaper and more efficient battery than before; The Paris agreement in 2015 focused on curbing green house gas emission. Entrepreneurs seized the opportunities and provided advanced EVs with the market; Tesla and BYD are good examples. The authors employed semantic network analysis for examining perceptions on EVs; they concentrated on Tesla S (Tesla's flagship model) and the User Interface, and conducted Linguistic Inquiry and Word Count (LIWC) analysis on the community site of Tesla S. LIWC revealed the drivers' perspective and emotional responses on the user interface of Tesla S.

Keywords: Electric Vehicles, Semantic Network Analysis, Tesla S, Linguistic Inquiry and Word Count (LIWC), Paris agreement

Title: Leveraging Neural Network Algorithms to Explore Teachers' Social Networks and Knowledge Diffusion

Paper ID: 77

Authors: Sihua Hu (Michigan State University), Kaitlin T. Torphy (Michigan State University), Jiliang Tang (Michigan State University), Kenneth A. Frank (Michigan State University)

Abstract:

Social media platforms have greatly expanded and transformed the traditional social networks that teachers have in their physical space (Wellman, 2001). This novel social network in virtual spaces influences teachers' behaviors and exchange of information and knowledge within their informal professional community online. Pinterest, is a common social media platform teachers use frequently to exchange, share, and access ideas and resources related to teaching and learning. As an image-based personalized platform, teachers may save bookmarked resources found online. As a follower or followee, teachers may connect with one another, creating virtual social networks beyond their bounded physical spaces. These behaviors may provide a window into teachers' conceptualization of mathematics instruction.

In this paper, we use a sample of 80 early career teachers to illustrate the types of resources and ideas that teachers pinned, and how their virtual and physical network relate to their observable behaviors. Our hypotheses can be simply described as the extension of the Following Hypothesis (Tang & Liu, 2014) without assuming causation: teachers who follow another educator are more likely to pin the same type of mathematical teaching and learning related resources as that educator. We expect this probability to increase for those teachers who nominate these educators within their physical ego-centric school-based network. In fact, Torphy et al. (2016) find for those teachers who share physical social networks, they are more likely to access resources from the same online sites across various virtual spaces. This phenomenon provides the foundation of our hypothesis that instructional resources diffuse across virtual and physical spaces and may be related to the social network relational structure.

In order to categorize the types of mathematical pins that teachers tend to bookmark, we use different Neural Network algorithms, such as Deep Neural Network (DNN) and Convolutional Neural Network (CNN) (Krizhevsky, Sutskever, & Hinton, 2012) to a training set of 2,062 labeled pins from 28 teachers. We create nine mathematical categories based on the mathematics education literature. We find highly unbalanced pin counts across category: with significantly more pins in Standard Algorithm (433), Content Resources (476), Visual Representation (372), and Concrete Manipulatives (224). Preliminary results with varied neural network algorithms show fewer mathematical labels yield higher predictive accuracy for mathematical categorization. Future steps include condensing mathematical categorizations for predictive modeling across the full sample, using an iterative binary classification process.

This work will contribute to educational big data analysis, leveraging computer science tools to identify patterns in teachers' social networks and knowledge diffusion.

References

Krizhevsky, A., Sutskever, I., & Hinton, G. E. (2012). Imagenet classification with deep convolutional neural networks. In *Advances in neural information processing systems* (pp. 1097-1105).

Tang, J., & Liu, H. (2014). An unsupervised feature selection framework for social media data. *IEEE Transactions on Knowledge and Data Engineering*, 26(12), 2914-2927.

Torphy, K., Hu, S., Liu, Y., Chen, Z., & Martin, K. (2016). Teacherpreneurial behaviors in social media. Paper presented at the Second European Conference on Social Networks. Paris, France.

Wellman, B. (2001). Computer networks as social networks. *Science*, 293(5537), 2031-2034.

Title: Team Formation in Collaborative Crowdsourcing

Paper ID: 78

Authors: Ruqin Ren (University of Southern California), Bei Yan (University of Southern California), Lian Jian (University of Southern California)

Abstract:

Online crowds have proven to be capable in accomplishing more complex and interdependent work in self-organized teams, compared to independent crowd participants. However, team formation in collaborative large-scale crowdsourcing context can be challenging. What are the team formation strategies utilized by self-organized teams? What is the relationship between different team formation strategies and team performance? To answer these questions, our research examines two relevant aspects of self-organization of crowdsourcing teams: team formation network structure and expertise search strategies and its influence on crowdsourcing performance. In the first part of the study, we show the overall graph structure of collaboration relationships in a large crowdsourcing platforms, Kaggle. The results show that a small hub of top users collaborate among themselves, but not for the majority of the community. The majority of users stay in relatively stable partnerships with those they have already worked with before. In the second part of the study, we explore the connection between expertise self-disclosure and its influence on task performance in crowdsourcing. The results show positive relationship between self-disclosure of expertise at both individual and team level. We further report two mediators, team participation and leadership roles, on the connection between self-disclosure of expertise and improved task performance in crowdsourcing.

Title: Exploration and Exploitation of Team Assembly Strategies in a MOBA

Paper ID: 80

Authors: Xiaozhe Arcadia Zhang (University of Colorado Boulder), Brian Keegan (University of Colorado Boulder)

Abstract:

Multiplayer Online Battle Arenas (MOBAs), such as League of Legend (LoL) and Defense of the Ancient 2 (Dota 2), are team-based online games that have become the most popular PC games in the world. Producers regularly release “patches” to correct imbalances or bugs in the game that can significantly alter the power of in-game characters as well as the dominant tactics used by players. In response to these disruptions, players must rapidly develop new heuristics to remain competitive.

This study examines how professional e-sport players’ individual mental models adapt following patch updates to the rules of MOBA games. In this study, players’ mental models are evaluated based on “pick-order graphs” across games retrieved and constructed from in-game data. Pick-order graphs are weighted and directed networks containing the set of more than 100 characters in games like LoL and Dota 2. The relationships connecting these characters are derived from players’ selection sequences during the team assembly phase of a single match; if a team member selects character j following another team member’s selection of character i , then an (i,j) edge exists for that match. By aggregating behavioral sequences across millions of matches, we can model the emergence of and deviations from shared heuristics for optimizing team assembly strategies to jointly maximize their individual proficiency playing similar roles on the team, their role congruence with other teammate’s roles, and countering opponents’ character selections.

To understand the emergence of team mental models and the evolution of these pick-order graphs, we use the exogenous variation in the design of the game introduced by patch changes to compare the structure of players’ pick-order graphs before and after the patch update. Our findings show that characters changed by the patch see significant differences in position within players’ pick-order graphs. The days following the introduction of the patch show higher levels of entropy compared to pre-patch graphs, but these pick-order graphs rapidly converge back to a consensus model. These pick-order graphs also differ significantly between players of different skill levels as well as across geographic regions. We also observe spill-over effects as other characters unaffected by the patch become more and less valuable in relation to the new changes. Finally, we validate the changes we observe in the pick-order graphs by measuring character co-mentions on community discussion boards. Our findings have implications for understanding the development and stabilization of team mental models in ad-hoc virtual teams.

Title: Comparing Online Discussion Networks in Elite-initiated versus Grassroots-initiated Genetically Modified Food Controversies: The Case of China's Social-Media Space

Paper ID: 81

Authors: Yunya Song (Hong Kong Baptist University), Anatoliy Gruzd (Ryerson University), Xinyu Dai (Nanjing University)

Abstract:

This study integrates network and content analyses to examine public discussion of Genetically Modified (GM) food in China's social media space. The Internet has become a common venue for disseminating and accessing health information in China, with Weibo, the Chinese equivalent of Twitter emerging as a popular tool. This study provides a framework, built around comparing Weibo users' responses to GM food debates of two contrasting types—elite-initiated versus grassroots-initiated—for addressing the intersections of public perception, emotional expression and information-oriented behaviors in online social networks. Network analysis was used to identify the main clusters in the Weibo networks created by the mention and reply connections among people who posted and commented respectively in elite-initiated and grassroots-initiated GM food debates. Using R package “igraph”, the fast greedy algorithm was applied to identify the clusters, and hubs in each major cluster were identified according to their in-degree centrality. Key users occupy strategic locations in these networks, in positions like hubs who in these interaction networks receive links from far more Weibo users than most others. Our aim was to identify who plays key roles in GM food discussions and provide methods for defining these roles. The mention and reply relationships allow us to identify the key influencers, and to recognize how Weibo users interact with each other to form conversational connections. Researchers have questioned to what extent users are exposed to a diversity of viewpoints, or simply reinforcing already-held beliefs in online social networks. This study tests to what extent Weibo users are exposed to cross-attitudinal content within the clusters respectively in elite-initiated and grassroots-initiated debates. A T-test was used to test for a difference between percentage of messages labeled with supportive and opposing attitudes towards GM food in clusters. By utilizing new approaches that consider the distinct ways in which social media communities centered on GM food develop, this study gain deeper insight into the patterns and mechanisms of public perception formation in online social networks along with previously inaccessible aspects of social interaction, particularly the social network structures in a unique cultural context.

Title: Questioning closeness: helpful tie as a new dimension in social capital research

Paper ID: 82

Authors: Amritorupa Sen

Abstract:

Tie strength - a concept used extensively within social capital research has gained much popularity in the recent decades. Popularized by Granovetter, the use of this concept is growing in varied empirical studies. However, all these empirical works have shown that personal networks are either strong or weak. This conceptualization of tie strength in stark binary terms obscures other important dimensions it can reflect. This paper deals with one such important aspect of tie strength – that of naming a tie without expressing the relationship in terms of closeness, but instead using “helpful” to address tie strength. It attempts to expand the current binary understanding of "strong" and "weak" and introduce "helpful" as an attribute that the ego uses to explain the alter's role in his/her network. Who are these “helpful” ties? Under what circumstances do people name their ties as “helpful” as opposed to “close” and what is its relevance within social capital theorizing? Using personal networks survey and semi-structured interviews I collected data from 185 villagers as well as the village-migrants in the city, in the rural and urban contexts of West Bengal, India. This paper will discuss in detail characteristic features of helpful ties, how is it different from strong and weak ties and its theoretical relevance.

Title: The interplay between expertise, follower-follower relations, and commenting behaviors in crowdsourcing: A multidimensional network perspective

Paper ID: 85

Authors: Yu Xu (University of Southern California)

Abstract:

Crowdsourcing means outsourcing to the crowd. It describes a new business model that obtains needed ideas or services by harnessing contributions or solutions from a large number of individuals. Crowdsourcing companies launch a call for proposals for solving a problem. Individuals then offer their own solutions as well as assess others' proposed solutions through a voting system. In the final stage, crowdsourcing companies sell the winning ideas back to the crowd for profit (Brabham, 2008; Brabham, 2010). As an emerging social phenomenon, crowdsourcing has received considerable scholarly attention, especially in the field of communication (Brabham, 2008; Stephens, Chen, & Butler, 2016), organizational studies (van den Hooff & Kotlarsky, 2016), information science (Merritt, Ackerman, & Hung, 2016), etc. Nonetheless, few of them have paid attention to the interplay between expertise and public goods on crowdsourcing platforms. An individual's expertise generally refers to mastery of knowledge in a specific domain (Ackerman, Pipek, & Wulf, 2003). Public goods are defined by two characteristics: jointness of supply and impossibility of exclusion (Hardin, 1982; Olson, 1965). This study seeks to address this important but largely overlooked knowledge gap.

Based on a multidimensional network analysis on the Threadless artist community, this research specifically examines how connective and communal public goods are interrelated and how expertise constrains the production of public goods in the context of crowdsourcing. This issue is worthy of investigation because it can shed light on how crowdsourcing participants interact with each other and the environment. Evaluating the interplay between expertise and the creation of public goods is also a first step to conceptualize how individual expertise becomes composed or compiled to the collective level in the process of crowdsourcing (Fulk, 2016).

The results of exponential random graph models (ERGMs) show that Threadless users are more likely to have a reciprocal hyperlink with those who comment on the same submitted designs. Second, There is a positive relationship between Threadless users' in-degree centrality in the hyperlink network and their tendency to comment on submitted designs. In addition, Threadless users with high expertise are more likely to receive hyperlinks from others (3a) and comment on other submitted designs (3b). Finally, the higher the expertise of two Threadless users, the greater likelihood of a reciprocal tie (4a) and co-commenting between them (4b).

This paper makes several theoretical and methodological contributions. First, it contributes to the literature on crowdsourcing by empirically testing a theoretical linkage that has not received sufficient attention from scholars. Specifically, this research examines the relationship between individual-level expertise and the creation of connective and communal public goods. Previous studies are limited in providing motivational and cognitive explanations only for why individual participants are engaged in crowdsourcing tasks. Second, it also contributes to furthering our theoretical reflection on how connective and communal public goods in crowdsourcing platforms

are mutually constrained. Third, the application of a multidimensional network approach to the study of crowdsourcing is completely novel, as prior research examined this issue at the two-mode network level only (Stephens, et al., 2016).

Title: Polarization and Clustering in Scientific Debate and Problem Framing: Network Analysis of the Science-Policy Interface on Grassland Management in China

Paper ID: 86

Authors: Aitong Li (The Chinese University of Hong Kong), Masaru Yarime (City University of Hong Kong)

Abstract:

Environmental problems are usually framed out of a repertoire of environmental arguments that are filtered by a policy network, which is formed around intricate connections among individuals (scientists and policymakers) and among their affiliated institutions. This study raises the importance of coupling network analyses at both individual and organizational levels to achieve a better understanding of the underlying political structure that influences the science-policy communication. Through an empirical study of a policy network related to grassland management in China, this study reveals the underlying political structure of the network and its political impacts on problem-framing processes. It is found that political polarization and power unbalance in the network, resulted from existing institutional arrangement, have confined the framing of environmental problems to specific areas and impeded the development of comprehensive policies.

Title: Linking Social and Ecological Networks for Environmental Problem Solving

Paper ID: 88

Authors: Michele L. Barnes (University of Hawaii & James Cook University)

Abstract:

Complex interdependencies between social and ecological dynamics underpin many important environmental problems. To account for these complex dynamics, a novel interdisciplinary network modeling framework that captures the relationships within and between people and nature has recently been developed. This approach leverages cutting edge advances in multi-level random graph modeling and brings together perspectives from across the natural and social sciences to (1) identify key social and ecological interdependencies, (2) understand how social actors mediate social interactions and relationships with resources, and (3) develop novel theory and cultivate practical guidance for more effective environmental governance. Here, I review a selection of past and current efforts applying this social-ecological network approach empirically across a range of human-nature contexts to highlight its benefits and challenges. I then present new, comparative data on how social-ecological networks relate to fisheries co-management outcomes in Kenya. This work provides important empirical insight on how social and ecological systems are interlinked, the factors that drive the formation of social-ecological structures, and how social-ecological feedbacks relate to environmental governance outcomes. I conclude with a discussion on key gaps and the future potential of social-ecological network approaches for environmental problem-solving.

Title: Incorporating Text Mining into Social Network Analysis for Urban Resilience Governance

Paper ID: 90

Authors: Roger S. Chen

Abstract:

In recent years, social network analysis has been widely applied in studies of environmental governance and resource management, to illuminate the roles of cooperation and social capital in building stakeholder relationships and multilevel governance. However, this application of social network analysis still suffers from a degree of vagueness, due partly to inherent problems with its existing methods of subgroup analysis, and partly to the difficulties of data collection in urban settings. Accordingly, this paper proposes the use of text mining to construct networks featuring specific stakeholder interactions, which can be used to improve the analytical interpretation of subgroup effects – and specifically, indications of bridging/bonding ties. When text mining is applied to solid and traceable information extracted from event-based digital data, it is not only able to identify stakeholders and their interactions, thus remedying problems of data reliability, but also to construct networks that reveal specific dimensions of stakeholder interactions under investigation. Having identified stakeholder networks with specific meanings, this study then applies social network analysis to an assessment of the water-related resilience governance in the southern Taiwanese city of Tainan. The results suggest that when confronting urban complexity, the incorporation of text mining into social network analysis provides a useful alternative to existing methods of data collection and data processing, and helps to advance the theoretical interpretation of bridging/bonding measurements, which are key concepts in social network analysis for environmental governance and management.

Title: The Global Structure of Communication Studies: A Social and Semantic Network Analysis of International Communication Association

Paper ID: 95

Authors: Ke Jiang (University of California, Davis), George A. Barnett (University of California, Davis)

Abstract:

This paper describes a social and semantic network analysis to study the structure of communication research on the global level by examining the relations among the concepts used in the titles of International Communication Association (ICA)'s conference papers, ICA's divisions and interest groups, and the scholars' countries of origin between 2013 and 2016. Specifically, it examines the concepts that the different divisions/interest groups and countries most frequently use to study communication; the co-authorship of papers presented at ICA meetings; and the global distributions of divisions and interest groups of communication studies in terms of scholars' countries of origin. The results indicate that over the period of 2013 to 2016, three regional centers of communication studies have emerged in different social and cultural context with different academic and semantic emphasis.

The first center is the United States, which has the most co-authorships with China. Communication studies in the United States are the most comprehensive and diverse. With the rapid economic and technological development, China has become the East Asian center for the study of communication technology, environmental communication, and mobile communication. Chinese scholars emphasize the concepts social, public, relationship, culture, and network. Also, the concept China becomes a new focus for many ICA divisions and interest groups, such as Global, and Intercultural Communication, Ethnicity and Race in Communication, and Communication Philosophy. The third center is located among the European countries. They primarily shared co-authorships with each other. Germany and the United Kingdom are the two most important axes. Scholars from Germany focus more on political and mass communication and emphasize concepts related to media effects and online communication. Scholars from the United Kingdom paid more attention to the study of journalism and communication theory emphasizing concepts related to political, digital media, journalism, TV, and framing.

Title: A network visualisation method of cognitive dissonance in discourses: discovery, validity, application and extensions

Paper ID: 96

Authors: Marc Idelson (Nottingham University), Jinwei Zuo (Peking University)

Abstract:

Discovery. Initially discovered in support of a business ethics-themed master thesis, revealing the tension between traditional adherence to filial piety (in the Confucian sense) and occupational adherence to fiduciary duty (in this case of finance professionals), a network visualisation method of cognitive dissonance in discourses is introduced and prototyped. In a context of semi-directed interviews, subjects express beliefs. Some beliefs contradict each other, either universally or in specific contexts. The situation in which the belief was expressed by the subject may also be context-specific or context-independent.

Validity. Coding of subjects, beliefs, their respective properties, their relationship to each other and the reflexive, symmetric but not transitive relationship between the latter, as well as the respective properties of these two relationships produces a 2-mode network where any closed triangle with one subject and two beliefs visually marks a manifestation of cognitive dissonance. Cognitive dissonance detection within the 2-mode network, including of its probability and/or intensity in the case of more refined frameworks, is automatic, though coding, including of contexts, contradictory beliefs, subject properties, belief properties and relationship properties may be assisted by either traditional qualitative discourse analysis or natural language processing, or combinations of both. (The set theoretic algorithms are developed in the full paper.)

Application. The framework can be applied very rudimentarily with mere binary valuation: relationships are either true or false, i.e. subjects hold beliefs or not and beliefs —universally— contradict each other. We call this framework U2 for (binary, universal). Injecting context-laden beliefs can refine discourse understanding and avoid false positives, especially in high context national and occupational cultures with polysemous vocabulary. We call this framework R2 (binary, relative or context-sensitive).

Extensions. A number of increasingly refined operational variants of these frameworks are possible, e.g.:

- U3 (ternary, universal) and R3 (ternary, relative): Extending the range of possible values of relationships from True and False (Aristotelian logic) to True, False and Unknown (Kleene logic) allows for visual coding of ambivalent terms, sentences and contexts.
- R4: (quaternary, relative): Extending the range of possible values of relationships to True, False, Unknown and Truefalse (Yin-Yang logic) provides a further means to operationalise comfort for and cognitive representations of ambiguity.
- R_{∞} : (fuzzy, relative): Abandoning discrete logics for a linear, continuous spectrum of truth enables the framework to acquire probabilistic features.

- R^\ominus : (fuzzy and fuzzily ambivalent, relative): Adding an ambivalence dimension provides the framework with the ability to model dissonance and cognitive comfort with dissonance on a continuous scale.

The power of expression of the above subset of possible frameworks is not totally ordered: $U2 \subset R2 \subset R3 \subset R4 \subset R^\infty \subset R^\ominus$; $U2 \subset U3 \subset R3$; $R2 \Delta U3 \neq \emptyset$.

Further potential extensions may include the injection of Hegelian sublation to more faithfully model the plasticity of natural languages.

Title: Evolution of Chinese Function Words in Co-occurrence Networks

Paper ID: 101

Authors: Xinying CHEN (Xi'an Jiaotong Univeristy)

Abstract:

The approach of network analysis, already applied in Chinese linguistics (Li & Zhou 2007; Peng et al. 2008; Liu 2008), remains less-widely used in diachronic studies, except for one work (Liang et al. 2014). Here, we adopted this approach to study Chinese functional characters/words and evaluate their evolution and the efficiency of this approach. We built four Chinese character co-occurrence networks based on the articles from four historical periods including ancient Chinese, middle ancient times Chinese, modern times Chinese, and modern Chinese, and then, analyzed the features of the whole networks and two characters 在 zai (a verb, meaning 'to exist', 'be living', 'to stay or remain'; or a preposition, meaning '(to be located) in or at') and 人 ren (a noun, meaning 'human being or people'). For the sake of comparison, the chosen articles from each period had similar sizes and numbers of characters, and the two characters were frequent both in these articles and in general. In history, zai underwent a grammaticalization process, whereas ren remains as a content word. This allows us to compare the different evolutionary tendencies between the two characters.

Based on the network features (degrees, path length, density, diameter), we found that ancient Chinese underwent important changes as moving into middle ancient times, and evolved in different directions and gradually changed back, thus making modern Chinese more similar to ancient Chinese than those in the other periods. In the middle ancient times, the writing system emerged, and became more and more distinct from the oral Chinese for a long time before starting to adapt to the oral Chinese again in the modern times, and changed into modern Chinese after the reform starting in 1919 (Wang 1980). Analyses on these networks reflect such evolution of the writing system.

We also traced the evolution speeds or degrees of Chinese characters/words via these quantitative data that were rare in traditional research. We found that the changes of the degrees of zai and ren both fit the changing tendency as described above. Two additional findings caught our attention. First, although the features of the two characters changed back after middle ancient times, the shapes of the curves were distinct. Previous research found that modern Chinese shared similar ordinate with ancient Chinese. In our study, however, the ordinates of both characters in modern Chinese were significantly higher than those in ancient Chinese, indicating that the evolution speeds or degrees of the two were higher than the average. Second, the degree of zai had a significant increase from modern times Chinese to modern Chinese, while ren had a relatively smaller increase. This could be due to the increase in the speed of the grammaticalization of zai during the time. In Solé et al.'s (2002) and Chen's (2013) work, functional words were the hubs of either the whole network or a local community. Solé et al. (2002) also suggested that hubs could indicate the grammaticalization process and its starting points. Hubs could be functional or potential functional words to undergo future grammaticalization. Then, by analyzing the centrality of a functional word in a language network and the change of the

centrality over time, we could infer the speed or degree of the grammaticalization process. Although our work showed the feasibility of using network parameters to describe the grammaticalization process, more work is needed to transform the notion of “centrality” into a numerical value for comparing words and using it to describe the evolution of functional words.

Title: A Network Approach to Understanding Aphasics: Insights from Word Co-Occurrence Networks and Functional Brain Graph Modeling

Paper ID: 102

Authors: Feng LIN (Department of Rehabilitation Medicine, the First Affiliated Hospital of Nanjing Medical University), Weihua XIANG (Department of Rehabilitation Medicine, the First Affiliated Hospital of Nanjing Medical University), Jing GAO (Department of Rehab

Abstract:

This study was to explore the application of networking paradigm on speech-language pathology, especially on aphasia. Firstly, we established a framework for collecting conversation data from Mandarin Aphasics. The framework, which derived from Cantonese AphasiaBank, has four parts. Each one contains several topics. Part I: picture description, including "broken window", "refused umbrella", "cat rescue" and "flood". Part II, story narrative, including "tortoise and hare", and "cry wolf". Part III procedural discourse, including "egg, ham and fried rice". Part IV, free talking, including "important event", "disease story" and "disease coping". By following this scheme, a Mandarin corpus dataset was established from fourteen aphasics and their healthy controls. We constructed their word co-occurrence networks. Secondly, five aphasics and five healthy controls got magnetoencephalography scan with picture naming tasks. We modeled their brain functional graphs. In the graphs, MEG sensors were nodes, edges were synchronizations between nodes, and values of debiased estimator of the squared weighted phase lag index were edge weights. We employed bootstrap method to test the synchronization values on 99% confidence interval level. This study explored the resulted networks by using the Pajek4.06 and the "igraph" package of R. The word co-occurrence networks showed different resemblance patterns from the conventional classification system of Boston diagnostic aphasia examination. This report discussed similarities between different aphasia phenotypes and went deep into the brain functional graphs. The healthy participants showed expected brain functional networks on their bilateral occipital and left frontal-temporal lobes, while they also exhibited significant right brain synchronizations in 400-600ms, the phonetic processing stage. Aphasic persons showed enhanced synchronizations around cerebral medial sides. Their graph models also had delayed patterns and decreased parameters, including hierarchical gradients and modularities. By comparing the network sizes, assortative mixing and k-cores of word co-occurrence networks with the right-skewed synchronizations and left-skewed activations of brain function graphs, this study suggested that there are functional brain networking mechanisms that shape the word network phenotype of aphasic discourses. Finally, this report discussed prospects of word network analysis in speech-language pathology.

Title: Theorizing Dormancy

Paper ID: 104

Authors: Chang Z. Lin

Abstract:

Relationships change, and ties that were once significant sometimes fade or disappear. Having once existed, however, these ties retain the potential to re-emerge, mobilized like sleeper cells as circumstances or needs change. When reactivated, previously dormant ties can offer benefits such as novel information and support (Levin et al. 2011). These types of ties deserve more scholarly attention as their significance has been overlooked by previous network studies that often conceptualize dormant ties as those that were once present within an individual's personal network but are not included at a later time period. This conceptualization overlooks important nuances – ties can differ in the extent to which they are dormant in that some ties could experience strand-specific dormancy that is different from other ties. For example, a dormant tie can manifest in the lack of interaction of social support while another tie can manifest in the lack of emotional attachment. Recognizing that ties can be active or inactive in different ways, this paper treats tie dormancy as a multi-dimensional concept. More specifically, I problematize the nature of dormancy and ask:

1. What are the indicators of dormancy and how are they related? Does the definition of dormancy vary across different types of relationships?
2. What are the different trajectories of dormant relationships?

Using an innovative interview technique that uses respondents' wedding albums from at least 15 years ago as a memory aid, this paper develops a nuanced theory and measurement of dormancy that moves beyond understanding ties – as well as the social support and resources that flow between them – as either present or absent, and present different “profiles” of tie dormancy depending on different precipitating causes (e.g., moving away or interpersonal conflict). These profiles are characterized by unique combinations of deficits/retention in the exchange, interaction, and attachment aspects of ties.

Title: Power, social networks and economic action in the Ecuadorian Securities Market

Paper ID: 105

Authors: Andrés Chiriboga-Tejada (SciencesPo, MAXPO, Paris, France)

Abstract:

This study brings power and social network analysis together as explanatory devices to market economic exchanges. The case analysed is the Ecuadorian Securities Market (ESM), which is organized into two Securities Exchanges that have been formally operating since 1969. While cooperative networks have been broadly addressed in structural network analysis of financial markets, my study shows that the ESM, despite the existence of cooperative relations, is mostly an arrangement where power is exercised through networks in a way it has transformed a naturally uncertain environment into a routinely setup that works in favour of specific actors. I performed an empiric exploration based on the groundings provided by Social Exchange Theory (power networks) and literatures within Sociology of Finance based on Structural Network Analysis. I reconstructed the system of relations amongst actors participating in the market using transactions in a ten-year period (2004 – 2013). Transactions account for the existence and strength of ties between actors (issuers, buyers and brokers) and their evolution throughout the period of analysis. It should also be stated that, in order to strengthen my interpretation and conclusions, I relied on a cross-fertilization of methods and included evidence provided by several interviews with former and current brokers from institutions that showed to be relevant in the network analysis performed. With the use of several network metrics and complemented by the use of qualitative methods, the study shows that there is a recurrent centrality of state institutions and brokerage houses belonging to the largest financial groups in the country. Also, most-central actors control the majority and the strongest ties. Those ties account, mostly, for resource recirculation that private banks generate among their own financial group. Most revealing is the fact that the types of securities that mostly contribute to the strength of these ties (convertible notes and certificates of deposit) are instruments that are traded to benefit the bank operation rather than implying a real participation in the market. Furthermore, this analysis shows that the market is not a cohesive structure built around the most-central actors. It is rather organized into cliques. Most-central actors, other than concentrating the most and the strongest ties, participate in most cliques. Based on this evidence, I have called this particular setup: exercising power in a decentralized way. Beyond these initial findings on networks and power in this market, the study opens the possibility of exploring economic effects of this network setup. For example, analysing why this particular market has not been able to expand at pace similar to others in the region. Also, the study can extend its scope to a broader multiple topology that takes other relevant networks into account (i.e. political networks influential in this market).

Title: Knowledge acquisition and learning for innovation: An explorative study of top managers' ego networks in the watch and jewelry industry

Paper ID: 107

Authors: Alexander Fliaster (University of Bamberg), Sonja Sperber (ISM International School of Management)

Abstract:

Top managers (TMs) are a key driving force of organizational change and innovation (e.g. Elenkov & Manev 2005). Past studies have indicated that intensive personal learning by TMs plays a crucial role in successful change initiatives (Bruch & Sattelberger, 2001). Much less is known, however, about the social dimension of top managers' learning. In particular, while previous studies have shown that in general social networks essentially contribute to the creation, sharing, and adoption of new and useful knowledge (Moran 2005; Zheng 2010), the informal knowledge networks the top managers create to learn for innovation are still under-investigated. This research gap is critical since social networks can serve TMs as a valuable source of timely and relevant information on both the organization and its external environment (Collins & Clark 2003).

We address this research question by integrating insights from the creativity theory (Mumford et al., 1997), the theory of social foci (Feld, 1981) and the structural holes theory (Burt 1992). Most theories of creative problem solving suggest that the combination of existing knowledge concepts, or the reorganization of knowledge elements within an existing concept, give rise to the new ideas (Mumford et al., 1997). Since Schumpeter's (1934) seminal work this "carrying out of new combinations" is also viewed in the literature as the key mechanism underlying innovation, and there are many aspects to the learning embedded in those knowledge exchange and combination activities (Nahapiet & Ghoshal, 1998). Following Burt (1992, 2004) we argue, in particular, that TMs learn by bridging structural holes – that is, by establishing ties to otherwise disconnected contacts and by selecting, accessing and combining bits of knowledge across those groups of contacts. In line with Feld (1981) we further theorize that the reason for the disconnection is that social actors organize their activities (and thus knowledge acquisition and learning) around different social foci. Furthermore, we argue that in the industrial innovation context social foci are essentially shaped by the need for division of labor and coordination both within the company ("organizational segmentation" according to Lazonick, 2000) and within the inter-organizational innovation value chain (Afuah & Bahram, 1995).

We explore the innovation-related learning networks of TMs, particularly different foci (i.e. entities) that the TMs connect by bridging ties to acquire combinable knowledge empirically. We conducted semi-structured interviews with TMs of ten companies in the watches and jewelry industry, among them industry leaders such as Fossil, IWC Schaffhausen, Officine Panerai, and Parmigiani Fleurier. In addition, we have analyzed other sources of information, such as industry and corporate reports, industrial rankings etc. We present the main results of the explorative study and identify its important implications from both research and managerial perspective. We hope that this study has contributed to a better understanding of the network dimension of TMs learning as well as the ongoing debate on the interplay between formal organization and informal social structure (McEvily et al., 2014).

Title: Crafting Contagion in an Organization: A Field Experiment

Paper ID: 110

Authors: Brian Rubineau (McGill University), Eric Gladstone (University of Kentucky), David Thompson (Community Solutions), Alexa Beavers (Boehringer Ingelheim), Erin Arcario (Boehringer Ingelheim)

Abstract:

Prior attempts at leveraging contagion processes towards organizational goals have met with limited success. We argue that this is because prior work has often treated individuals as equally influential, or has relied on demographic variables at the node level to predict likely influence. We conduct a randomized, controlled, and double-blind field experiment to test whether a network-based approach for identifying influential individuals can better leverage a planned contagion process in a large U.S. firm. In organizational units assigned to the treatment condition, change agents target influential individuals in those units based on their k-score as calculated from a communication network constructed from the firm's email server logs. In units assigned to the control condition, change agents target individuals with demographic and administrative characteristics (gender, race, tenure, pay level) matched to the influential individuals. Results show striking differences between the control and treatment groups in leveraging contagion processes. In a voluntary webinar promoted by the change agents across the units, treatment units achieved a 42% conversion rate from signups into attendees, while control units saw only a 13% conversion rate. The presence of influence does not mean that all persons are equally influential. Network metrics provide useful indicators for likely differences in individuals' efficiencies as transmitters. We show that by using network data to identify influential individuals, firms can leverage intrafirm social influence processes towards their policy goals.

Title: Making the world smaller: A network intervention to improve public school educators' access to and use of research evidence

Paper ID: 111

Authors: Jennifer Watling Neal, Zachary P. Neal, Kathryn McAlindon, Jennifer A. Lawlor, & Kristen J. Mills

Abstract:

Despite the emergence of U.S. policies encouraging the use of evidence-based programs in schools, U.S. educators struggle to access evidence and integrate it into their decision-making. Additionally, researchers struggle to disseminate evidence to these educators. This research-practice gap in education is the focus of the Michigan School Program Information (MiSPI; www.msu.edu/~mispi) project, which seeks to improve the social networks through which educators acquire research evidence. In the proposed presentation, we present findings from a replication of Milgram's Small World Experiment to understand the network barriers and facilitators of research evidence acquisition. We then illustrate how we are using these findings to develop a network intervention to strengthen educators' networks, and help them search those networks more efficiently.

The MiSPI project conducted a statewide replication of Milgram's Small World Experiment. A random sample of 382 superintendents and principals in the U.S. state of Michigan were asked: "If you were looking for information about school programs, who would you talk to first?" Subsequent survey waves traced these network chains, with the goal of identifying three key outcomes: (a) whether the chain reaches an educational researcher or other high-quality information source, (b) the length of such successful chains, and (c) the types of intermediaries that appear in these chains. Although network chains have the potential to transfer research evidence to educators, our preliminary findings suggest that communication often breaks down. We will present evidence of three problematic types of network chains in our data that led to these communication breakdowns. First, some educators had no one to go to for information about school programs. Second, some educators' network chains ended in self-ties where an intermediary reported going to him/herself for information. Third, other educators' network chains ended in echo chambers where individuals sought information from each other in closed loops. Echo chambers circulate information within a school or district, but do not provide access to novel outside information. In addition, we will present our data on the characteristics of successful network chains that resulted in educators' access to research evidence.

Next, we will demonstrate how we are using findings from our small world experiment to develop a network intervention designed to improve educators' access to research evidence. First, we plan to strengthen existing networks by encouraging educators to strategically build a small number of new ties to key intermediaries that were common in successful network chains in our small world experiment. This may involve calling educators' attention to, and creating opportunities to interact with, staff at their county-level intermediate school district and key personnel in relevant professional associations to reach new sources of information. Conceptually, this component of the intervention corresponds to the random re-wirings that yields a small world network structure as illustrated by the Watts-Strogatz model. Second, we plan to help educators think about ways

to more strategically search their existing networks for evidence. This will focus on raising educators' awareness of their existing networks, and avoiding echo chambers by encouraging information searching via intermediaries that occupy different roles from themselves.

Title: How trust relationship decay in an open innovation context: based on network signaling mechanism

Paper ID: 112

Authors: Jinhan Jiao (University of Science and Technology of China) Zuzana Sasovova (VU University Amsterdam), Allard van Riel (Radboud University Nijmegen)

Abstract:

Inter-organizational relationships in the context of open innovation are complex because of co-existing competition and cooperation. Although the partners may try to maintain trust relationships, trust violation behaviors may be inevitable, e.g., due to the pursuit of conflicting interests. However, mechanisms of trust relationship decay remain unexplored in extant work. This study aims to shed light on how characteristics of inter-organizational network structure influence the path from trust violation to trust decay, that is, this paper tries to explain the trust decay process, using network signaling mechanism as a theoretical lens. We distinguish three types of trust violation behaviors according to the following trustworthiness dimensions: competence, integrity and benevolence. Based on the mechanism of trust, cognitive balance theory, and social network theory, we propose that trust violations will lead to trust decay through a relationship disequilibrium, and we try to explain the process from the perspective of network signaling mechanisms. Keywords: network signaling, tie strength, trust decay, relationship disequilibrium

Title: Connected and Networked Seniors

Paper ID: 113

Authors: Anabel Quan-Haase (Univ of Western Ontario), Hua Wang (Univ of Buffalo), Barry Wellman (Netlab Network), Mo Guang Ying (Univ of Toronto), Renwen Alice Zhang (Northwestern Univ)

Abstract:

Interviews from the fourth East York study show varieties of connectivity among older adults, aged 65+, in Toronto Canada. More than half use digital media, and almost all use mobile phones. Digital media use integrates with in-person and telephone contact, with both friends and kin. They are 'traditional' users of digital media, relying principally on email and, to a lesser extent, on telephone-like Skype. Some use Facebook passively to catch up with news about distant friends and relatives. Digital media, in-person and phone contact all provide a variety of support. However, those who use digital media find more supportive companionship than those who do not use it.

Title: Testing Effects of Group Intellectual Diversity on Group Members

Paper ID: 114

Authors: Alexander Victor Graham

Abstract:

The current literature and general understanding of group work tends to suggest that diversity is a beneficial quality for which groups should strive. However, such arguments are typically couched in terms of contained groups of people working on a single physical or intellectual product (Campbell, Mehtani, Dozier, & Rinehart, 2013; Grobolkšek, Ferligoj, Mali, Kronegger, & Iglic, 2014). I examine whether these hypotheses might generalize to loose collectives working in a shared intellectual space. To do this, I conduct a social network analysis of a co-citation network of biomechanical modelling papers with the goal of testing whether group diversity predicts two different measures: individual impact and group popularity. I use a collection of 8651 records from the Web of Science database based on the topic of biomechanical modeling. From these records, I produce a valued co-citation network. When isolates are removed, there are 3143 nodes with 20377 edges. I operationalize diversity as the dissimilarity of two bibliographies. I define groups of papers using the Louvain clustering method. From these two definitions, I argue that group intellectual diversity (GID) can be characterized by summary statistics of the distribution of dissimilarity measures of each paper within a group. I then answer the question of what effects group intellectual diversity has on the impact of individual papers and the popularity of the discussion within which the papers take place. I control for effects highlighted in previous bibliometric studies such as the novelty of information, number of authors, and time since publication (Uzzi, Mukherjee, Stringer, & Jones, 2013).

Title: Communicate or Perish. Predicting innovative behaviors via Email Communication Analysis.

Paper ID: 115

Authors: Andrea Fronzetti Colladon (University of Rome Tor Vergata), Peter Gloor (MIT Center for Collective Intelligence), Francesca Grippa (Northeastern University)

Abstract:

Our research analyzes the online communication behavior of nearly 2000 employees in the R&D department of a global energy firm. By studying their internal communication via emails over three months, we identify the main characteristics that differentiate subject matter experts and innovative researchers from other colleagues.

We use traditional and novel metrics of Social Network Analysis to calculate individual network centrality (degree and betweenness) and to measure employees' response time, balance in messages sent and received, and the level of engagement and responsiveness in email conversations, measured as the number of pings to others until they respond.

We classified researchers into four categories based on input from senior management: the most senior subject matter experts; product identified innovators (PII) - i.e. employees who submitted at least one patent or had written one publication; award identified innovators (AII) - i.e. employees who won a major internal institutional award; and other employees within the R&D department. These four categories did not overlap. Out of the 1944 employees we had 26 subject matter experts, 54 PII, and 131 AII.

The results indicate that subject matter experts are directly connected to a higher number of co-workers (higher degree centrality), receive more messages than they send and tend to ping others more often to solicit a response, thus fostering active and engaged conversations. We also found a significant variation in communication behaviors between PII, AII and their colleagues. Award identified innovators seem to be more popular internally to the company (receiving more email messages). Product identified innovators, on the other hand, respond faster to emails and show a lower betweenness centrality. Innovators - either PII or AII - are connected to more peers, thus accessing and integrating a diverse set of knowledge sources.

Title: Knowledge Sharing Behaviour in Three Open Innovation Cases

Paper ID: 116

Authors: Andrew Terhorst (Commonwealth Scientific and Industrial Research Organisation), Dean Lusher (Swinburne University of Technology), Dianne Bolton (Swinburne University of Technology), Ian Eslum (Australian National University), Pen Wang (Swinburne University)

Abstract:

A growing number of firms are embracing open innovation to remain competitive in an increasingly globalised and knowledge-driven economy. Open innovation may be defined as a distributed innovation process based on managed knowledge flows across firm boundaries in line with the firm's business model. Managing open innovation is quite challenging and demands a deeper understanding of contextual and psychosocial factors that shape knowledge sharing behaviour.

Positive attitudes towards learning and knowledge sharing enhance the likelihood of open innovation success. Furthermore, more complex innovation challenges require higher levels of social interaction to facilitate knowledge assimilation. The configuration of knowledge sharing and idea generation networks reveals information about personal and workplace attitudes towards new external knowledge, and also provides insight into key social processes that underpin the assimilation, transformation and exploitation of new knowledge.

We applied mixed method social network analysis to assess knowledge sharing behaviour in three open innovation cases from the food and agriculture industry. Our cross-sectional study used exponential random graph models to analyse the configuration of knowledge sharing and idea generation networks. The contextual setting of each initiative was assessed through semi-structured interviews.

Our results show the pattern of knowledge sharing is influenced by the amount of tacit knowledge being exchanged. We also find autonomous motivation predicts tacit knowledge sharing in all three open innovation initiatives. Moreover, tacit knowledge appears to play a key role in knowledge assimilation processes. Our modelling suggests the configuration of the knowledge sharing and idea generation networks in two of the open innovation cases can be explained in terms of brokerage roles. The level of collaboration in the third case was relatively low, which explains why brokerage was not a defining character in this instance. Our results suggest we can characterise the nature of collaboration in open innovation initiatives by reviewing brokerage patterns. In instances where brokerage patterns can explain observed network configurations, we can assess which brokerage roles are most significant. If patterns of brokerage are unable to explain observed network configurations, we then know other factors are affecting the nature of collaboration.

We show mixed method social network analysis is a useful technique for assessing knowledge flows in open innovation collaborations. Such analysis provides a contextualised and nuanced view of knowledge brokers and their agency. A better understanding of knowledge sharing behaviour in open innovation collaborations should contribute to more successful outcomes.

Title: Towards successful innovation of public research: Transitioning from business models to industry engagement models

Paper ID: 117

Authors: Bopha Roden (Swinburne University of Technology), Dean Lusher (Swinburne University of Technology), Tom Spurling (Swinburne University of Technology), Julia Brennecke (Swinburne University of Technology), Michael Gilding (Swinburne University of Technolog

Abstract:

Towards successful innovation of public research: Transitioning from business models to industry engagement models

ABSTRACT

Over the last 10-20 years, every country with public research capacity has seen a political agenda geared at university-industry transfers. However, most countries, including those in the OECD, experience difficulties in developing links between the academic world and industry, as the two “worlds” have very different functions, cultures and operating rules (OECD, 2014). Globally, interactions between publicly funded research institutions, including universities, and industry are becoming subject to measurement and management, leading to more formal, contractual exchanges based on codified rules and regulations.

This study investigates the impact that engagement approaches (or business models) adopted by public research organisations and universities have on their level of engagement with industry. At the most basic level, the premise of a business model relates to a business with a product or service to be sold to an end user. The business model “spells out how a company makes money by specifying where it is positioned in the value chain” (Chesbrough and Rosenbloom, 2002) and “depicts the design of transaction content, structure and governance so as to create value through the exploitation of business opportunities” (Amit and Zott, 2001). This leads to the question – is a university research team or a public research organisation (PRO) to be treated as a business with all the implications that come with being a business? Further, is the business model concept appropriate for these public institutions, as the business model typically asks questions such as: “who is the customer?”, “what does the customer value?”, or “how do we make money in this business?” (Magretta, 2002, p. 4)? Should public institutions, who deal with basic research and the production of scientific knowledge, look towards business engagement models, models geared towards building links that will benefit both parties towards successful innovation?

In this paper, we take a mixed-methods approach that uses semi-structured interviews about social networks and the commercialisation strategies for PROs. Using ERGM in combination with qualitative interview data, we show the variability of strategies of differing PROs in their business engagement strategies with private firms, and how these strategies are also reflected in differing network structures for the PROs. The implications of these results, both for PROs and for private firms, will be discussed.

Title: Influential relations: How experiential learning diffuses in organizations

Paper ID: 118

Authors: H Colin Gallagher (Swinburne), Alberto Monti (Bocconi), Garry Robins (Melbourne), Alessandro Lomi (Melbourne)

Abstract:

Vicarious learning – learning from and through others – requires that others be willing to share their experiences, positive and negative. This is difficult particularly when knowledge is the product of trial-and-error learning. Under what organizational conditions are individuals more likely to share their experience?

Addressing this question is of central importance to organizations in knowledge-intensive environments where complex technical and procedural information is difficult to convey reliably across organizational boundaries. This is a demanding communication task, that requires organizational participants constantly to refine their own learning through feedback-seeking and assessments of past mistakes. Under such conditions, boundary-spanners occupy a position of potential vulnerability, asked to revisit past errors for the sake of better future performance. These knowledge sharing and transferring processes may operate best under certain network conditions, as well as certain types of self-identification with the (subordinate) team and (superordinate) organization.

In this paper, we investigate how network positions and self-identification increase or, as the case may be, reduce the propensity of organizational participants to share best practices learnt by experience within and across organizational units. We apply a social-influence type model, namely autologistic actor-attribute models (ALAAMs) for social influence in multilevel networks — to data we have collected on advice and help relations among the members of a multi-unit mechanical company ($n = 170$) involved in the production of high precision components for Formula 1 racing cars.

Title: Innovation networks: Structural differences between data collected from primary and secondary sources

Paper ID: 119

Authors: Dean Lusher (Swinburne University of Technology), Till Klein (Swinburne University of Technology), Julia Brennecke (University of Liverpool), Peng Wang (Swinburne University of Technology), Michael Gilding (Swinburne University of Technology), Greg Simpo

Abstract:

Network approaches to the study of innovation often use secondary data, either in the form of patents or publications in order to examine co-inventorship and co-authorship. Less frequently, network approaches involve the collection of primary data. Rarely if ever do studies of innovation combine the two. Intuitively we would expect differences between primary and secondary data. Both approaches have been criticised, either as lacking objectivity in the case of primary data, or nuance and detail as in the case of secondary data. Further, both approaches allow different insights into innovation as they necessarily utilise quite different types of network ties. However, are there some types of primary data network ties that are more similar to secondary data networks? And where there are differences, do these differences demonstrate some form of regularity? In this presentation we conduct a social network analysis of scientific innovation networks in the field of polymer science more particularly, in the area of controlled radical polymerisation (CRP). Using exponential random graph models (ERGMs), we show the structural differences between the secondary data networks of co-inventorship and co-authorship of polymer chemists with primary data networks such as trust, advice and collaboration. The results show us that we may overestimate the amount of collaboration when using secondary data, and that the asymmetric nature of advice-seeking and knowledge flows are unable to be adequately captured from secondary data. The systematic ways in which these networks differ are discussed, concluding with the implications for studies of innovation networks and the limits of the differing data sources.

Title: Bipartite innovation networks and collaboration between patent owners

Paper ID: 120

Authors: Demival Vasques Filho (University of Auckland), Dion O'Neale (University of Auckland)

Abstract:

A great number of real world networks are, in fact, one-mode projections of bipartite graphs comprised of two different types of nodes. This is the case of interactions among institutions regarding collaboration for technological innovation. The original network is bipartite with institutions (agents) linked to patents they have developed (artifacts), while the projection is the co-patenting (collaboration) network, connecting institutions who have joint patent applications. Such one-mode networks are often analyzed without taking into account the underlying bipartite graph. However, projected network features and topology are highly affected by the original structure. Here, we create an empirical bipartite network using the European Patent Office data and project it onto the agents. We look at properties of both networks that may play a role in knowledge sharing and collaboration. We compare these to the properties of synthetic bipartite networks and their projections as supporting tools to understand the processes that might operate the network formation. A good understanding of the topology is critical for further studies of the dynamics on the network; in this case the potential flow of technological knowledge. We show how the statistical properties of the bipartite structure shape the topology of the one-mode projected network. Furthermore, we propose new metrics based on network properties as a way to quantify how collaborative agents are in a collaboration network.

Title: Endogenous Legal Innovation in the Global Trade Governance Complex

Paper ID: 121

Authors: James Hollway (Graduate Institute Geneva), Jean-Frederic Morin (Université Laval), Joost Pauwelyn (Graduate Institute Geneva)

Abstract:

Where do innovations in legal agreements come from? When do parties introduce novel norms to a system of contracts on a given subject matter? Research that explores how new norms, policies or institutional designs diffuse has not addressed how these are introduced in the first place. Drawing on a complex adaptive systems perspective and network theory, this paper argues that legal innovation is at least partly driven endogenously when parties with exposure to diverse norms negotiate unconstrained by previous agreements. This paper demonstrates the theoretical argument using the example of norms on environmental issues being incorporated into trade agreements concluded between states for the first time. Using a new dataset with 310 different environmental norms in 660 trade agreements concluded between 1945 and 2015, we find that trade agreements are more likely to innovate and innovate more when they involve parties with diverse repertoires of experience with prior norms contracting for the first time and thus less constrained by earlier commitments. Contrary to prevailing wisdom, the exogenous factor of power asymmetry is not statistically significant.

Title: Networks of Innovation: Models from Japanese Advertising

Paper ID: 122

Authors: John McCreery (The Word Works, Ltd.)

Abstract:

In industry, project teams are responsible for driving innovation, and the composition of teams shapes the networks in which team members participate. Key features of teams include members with distinct personalities and professional skills. The mix of skills required for projects and team chemistry that reflects leadership styles and interpersonal relationships both affect network properties, both of which are influenced by the technological and economic environment of the industry in question. This paper develops these ideas using data from the Japanese advertising industry, combining historical and ethnographic research with network analysis of creative teams included in the annual that publishes the results of one of Japan's largest advertising contests.

Title: Wise innovation? Using a personal network perspective for identifying innovation and nurse champions of innovation

Paper ID: 123

Authors: Shirly Luz, Drach - Zahavy Anat, Shadmi Efrat (Haifa University, Israel)

Abstract:

Scientific Background. Champions of innovation are known as a means to effectively spread innovation, but only scant research has focused on identifying factors that facilitate the champions' success. This study proposes to narrow these gaps by using a Social Network Analysis (SNA) to better understand innovation success. The use of SNA, will contribute to the innovation literature in several aspects: 1. It will allow a better understanding of ego-network measures that might be crucial for innovation indicators; 2. It will allow mapping interpersonal networks of professionals in organizations focusing on analyzing their patterns of interaction with others. This will help in understanding the inner functioning of health care organizations and their related innovation outcomes.

Objective. The main aim of this proposed study is to examine the relation of the ego-network measures to innovation indicators in terms of its usefulness, level of radicalism and spread within the unit.

Method. Cross-sectional design. The current study employed a multi-method (innovation assessment and network analysis), multi-source (domain experts, head nurses, deputy nurses, champions and staff nurses) approach to data collection. The sample comprised 94 champions of innovation in nursing, in three Israeli hospitals. A head nurse, deputy nurse, and one staff nurse were interviewed from each unit, to identify the champions of innovation, using identification and verification based on Markham's criteria. The dependent variable Innovation was assessed via four indicators, by different raters: (1) Innovation spread - head nurses, champions and 3 randomly sampled staff nurses were asked to rate the extent of the innovation spread initiated by nurse-champions on a scale of 1-to-5; (2) Innovation radicalism level -To assess radicalism, eight domain-relevant expert were asked to rate each innovation on a scale of 1 to 5 on one of several dimensions; (3) Evaluation of perceived usefulness - the degree to which an individual believes that innovation will improve healthcare delivery; was also assessed. The independent variable ego-network measures: density, homophily and tie strength were obtained from interviews collected with VennMaker software.

Results. The mean age of champions was 39.50, with 81% females, 78.7% Jewish, 53% B.A. The mean professional seniority was 4.7 years, and mean unit seniority was 4.03 years. Preliminary results using R software indicate that 1. Higher density champion ego network was associated with enhanced innovation spread and usefulness; 2. Network homophily was associated with enhanced spread and usefulness and with decreased radicalism. Further analyses will be conducted to test the links among ties strength and innovation indicators.

Conclusion. Attention to the social network in which an innovation is carried out contributes to the study of innovation in healthcare and champions of innovation. The investigation of how the

champions' social network is linked to innovation success is potentially of significance; understanding of how the networks are structured and what is the optimal structure (e.g, density) and the optimal attribute measures (e.g, diversity) of networks of innovation champions will contribute to innovation success.

Title: THE VALUE OF INSTRUMENTAL BROKERAGE IN PRESERVING IDEATION ACTIVITY

Paper ID: 124

Authors: Rick Aalbers (Radboud University)

Abstract:

Downsizing, usually experienced as an exogenous shock, has the potential to have a significant detrimental effect on organizational performance and, in particular, its potential to innovate (Dougherty and Bowman, 1995). The mechanism behind the disruption (and restoration) of organizational networks remains little understood, with both organization- and network scholars recently outlining as important task for future research to identify the effect of exogenous shocks on organizational networks (Guthrie et al., 2014; Rogan and Mors, 2016). Both formal workflow related as highly discretionary network relations, such as the ones that carry voluntary ideation within a firm, have considerable impact on organizational productivity (Cross and Cummings, 2004). Downsizing disturbs both of these relations, hampering organization recovery and innovation (Shah, 2000; Aalbers et al. 2015). Both relations, however, are fundamental to steering operations within a firm (Hill et al., 2012). Disruption following downsizing blocks information exchange, frustrating management in steering towards sustainable recovery of the organization and frustrating employee's engagement with discretionary innovative activity (Susskind, 2007). While the former category of relations – of the formal kind – is typically on the radar of those directing a downsizing event, the latter category – of the discretionary kind - is commonly discarded. Adopting a unique before-and-after event research design, we analysed detailed data of a substantial downsizing event, observing how discretionary early stage ideation-related collaboration changes over time. Combining network theory and social exchange theory, we predict and confirm which kind of intra-organizational discretionary ties are more likely to survive a downsizing event, and under what circumstances. The network of discretionary relations maintained to exchange new ideas within a firm, we demonstrate, is much more resilient than current literature suggests. Drawing on network theory and social exchange theory, we show that the positioning of employees in an organization's instrumental workflow network prior to downsizing, determines the degree to which individuals remain engaged with discretionary ideation activity after downsizing. In addition, the value of inputs provided to peers prior to downsizing, positively moderates the likelihood that such discretionary activity at the core of firm innovativeness, persists. As such, we contribute to research on the effects of downsizing and the evolution of social relations (in a firm) in general.

Title: Teaming up for challenges: a two-mode network analysis of collaborative crowdsourcing

Paper ID: 125

Authors: Rong Wang (Department of Communication Studies, Northwestern University)

Abstract:

Crowdsourcing brings changes not only to how project workforce is sourced but more importantly to the ways that workforce is organized and coordinated in collaboration. Drawing from literature on organizational innovation and network science, this study investigates how teams are formed to participate in collaborative crowdsourcing. Most of the literature on crowdsourcing has focused on uncovering the process of innovation through the lens of isolated or independent participation. Little knowledge is known regarding the dynamics of crowdsourcing underlying generative co-creation toward effective solutions. The motivation behind people forming teams to participate in crowdsourcing is grounded on the argument that crowdsourced tasks are often complex problems which require diverse skill sets, and networked innovation helps harness the collective intelligence of a crowd by aggregating individual expertise and skills to a collective level. Large scale behavior data at both individual users and teams levels from a global crowdsourcing community Openideo were collected, which captured all the historical data on the site from August 2010 to December 2015. The data mining was conducted with the following procedures. First, all the 34 public crowdsourcing challenges were identified to locate all the active users on Openideo.com. This generated a total of 7233 members. Second, public profiles of all the users were collected, including the date a user joined the community, team affiliations, number of contributions a user won, number of challenges a user won, location, and skill scores generated by Openideo through tracking daily user activity. Third, team collaboration networks were collected by constructing a two-mode network, with individual users and teams being two modes and team affiliation as relationship between them. This study applies bipartite exponential random graph modeling (ERGM) to test the proposed hypotheses on what drives the team collaboration ties in a crowdsourcing community. All the identified team members ($n = 2097$) and project teams ($n = 943$) were included in the network analysis. It makes two contributions to the study of collaborative crowdsourcing and network science. First, it extends the bipartite network perspective to the context of crowdsourcing, which enables the estimation of individual level attributes, team project level attributes, and local structural logics in the modeling. Second, it demonstrates the value of examining the dynamics of crowdsourcing and provides evidence through an empirical examination. Implications are drawn from the results to discuss how to motivate individual participants to engage in team-based crowdsourcing.

Title: Reputation and Success in Art

Paper ID: 128

Authors: Samuel Fraiberger (Northeastern, Harvard), Roberta Sinatra (Northeastern, CEU), Christoph Riedl (Northeastern, Harvard), Albert-Laszlo Barabasi (Northeastern, Harvard)

Abstract:

How does reputation affect the success of artistic endeavors? To shed light on this question, we have collected a unique dataset on 463,632 artists between 1980 and 2015 and across 142 countries. Auction market performances are predicted by the number of exhibitions, the geographical span and the prestige of the institutions in which an artist's artworks are exhibited. These findings have implications on our understanding of the role reputation plays in cultural markets.

Title: Assets Diversification, Portfolios Homogenization and Systemic Risk

Paper ID: 129

Authors: Yajing Huang, Taoxiong Liu

Abstract:

The network structure of the economic system has been considered an important source of systemic risk. The existing research mainly focuses on the mechanism of contagion based on connectivity, which generally comes from the share cross-holding or overlapping portfolios. We argue that the differences between systemic risk and individual risk should be understood from two perspectives, the homogenization of portfolios across individuals and the contagion mechanism. Risk-averse behavior increases the homogenization of portfolios held by different financial institutions, increases the positive correlations among them, and therefore increases the probability of the simultaneous collapse of a considerable part of the network, which are prerequisites and amplifiers of contagion. Based on a mean-variance utility function, the outcome of the market equilibrium wherein the participants minimize their individual risks through asset diversification is exactly when the probability of simultaneous collapse is maximized. Even though the possibility that all the institutions in a large network fail at the same time, stemming directly from portfolio homogenization, is quite small, the combination of the increased risk of the simultaneous collapse of a considerable part of the network and the mechanism of contagion will produce a large increase in systemic risk, as measured by the probability of the ultimate global failing of the network.

Based on our theoretical analysis, we further perform simulations to illustrate the influences of portfolio homogenization on systemic risk. However, the homogenization of all the companies and the contagion mechanism are all determined by the structure of the network. How to change the homogeneity of the network without changing the contagion mechanism? To solve this problem, we realize that the correlation among original investible assets can be adopted to characterize the degree of homogenization, which ensure the separation of the contagion mechanism and portfolio homogenization mechanism. Under this treatment, we study the influences on systemic risk from the portfolios homogenization and contagions by simulations with some special network structures, rings, completely connected network and Poisson random network, which show that their different roles typically rely on the degree distributions of nodes in these network. Specially, the influencing extent of portfolio homogeneity on systemic risk is not monotonously dependent on the degree of the network: if the average degree of network is small, the increase of the portfolios homogeneity will obviously increase the systemic risk; if the network has a middle level of degree, the systemic risk is less affected by homogenization; if the network has a high level of degree, systemic risk will be significantly affected by homogenization again.

In order to explain all the simulation results, we eventually establish a step by step contagion model to analyze the influence of portfolio homogenization on network risk at each step. By theoretically analysis of the model, we show the rationality of the simulation results and conclude that for what type of network the influence of portfolio homogenization on systemic risk will be

enlarged by the contagion and for what type of network the influence will be eliminated by the contagion.

Title: The Role Played by Social Network on the Risk of Informal Finance: A Study based on Theoretical and Empirical Analyses of Social Network Structure

Paper ID: 131

Authors: Ting W Lowan (University of Kentucky), Jinchuan Shi (Zhejiang University), Yaorong L Lowan (University of Kentucky)

Abstract:

It is widely recognized that social network has a profound influence on the risk of informal finance, however, it is still left unanswered that what kind of social network structure can control/amplify risk. Based on Social Network Analysis Methods and rotating savings and credit associations (RoSCAs for short) as one example of informal financial activities, this study answers this question. The authors propose a set of probabilistic models of default, based on which they then use data from the Financial Crisis in Wenzhou, 1999 to empirically test assumptions. The empirical methods used for data analyses are Newey-West robust regression and survival analysis (robust Cox proportional hazard model). Main conclusions include: 1) The tighter a social network is, the more effective the network can control the financial risk, including no strange member and lower looseness of the network; 2) The social network among several RoSCAs can either control or amplify risk: it shapes the basis for synergistic monitoring and synergistic punishment so it can control risk; but this function is significant only if the intermediate member plays as the head of a RoSCA. Meanwhile, the social network among RoSCAs constitutes channels for risk contagion, which rises systematic risk of informal finance.

Title: Varieties of Intergovernmental Organization Memberships and Structural Effects in the World Trade Network

Paper ID: 132

Authors: Zhengqi Pan (Singapore University of Social Sciences)

Abstract:

To what extent does joint membership in intergovernmental organizations (IGOs) matter for bilateral trade? How and under what conditions do the various types of IGOs -- economic, socio-cultural and general purpose -- influence bilateral trade between their members? How do complex interdependencies in world trade matter? Existing research tends to examine aggregate joint IGO memberships, and has done little to analyze how specific types of IGO membership matter in trade. Using a detailed IGO dataset and a novel network analysis approach called the temporal exponential random graph model, I assess the importance of three main IGO types -- economic, socio-cultural and general purpose -- in helping members to establish major trading ties. The results provide support for general purpose and socio-cultural IGOs and point to the importance of network phenomena such as popularity, activity and transitivity effects. Moreover, joint economic IGO memberships exhibit slightly more complex relations with bilateral trade. A robustness test reveals that preferential trade agreements are significant in fostering trade, while the World Trade Organization and other economic IGOs such as development banks are not. This paper presents a nuanced way of analyzing IGOs and provides the impetus for the study of complex interdependencies in international trade.

Title: Networked Learning and Analytics in Online Education

Paper ID: 133

Authors: A. Gruzd (Ryerson University), M. Durier-Copp (Dalhousie University), S. Comber (Dalhousie University), M. Fitzgerald (Dalhousie University), D. Tay (Dalhousie University)

Abstract:

This study assesses the potential of using Social Network Analysis (SNA) and network visualizations as a Learning Analytics (LA) tool for instructors to generate useful insights about student online interactions in their class. We are especially interested in faculty's ability to perceive social networks and student interactions in their classes as these relate to learning and performance.

The study was conducted around the following research questions:

Q1: How accurately did instructors perceive student interactions online?

Q2: How accurately did instructors perceive the class-wide interactivity level?

Q3: What factors affect instructors' perception of online interactions?

Q4: Is there a connection between learning and participation in online discussions?

We answer these research questions by

- discovering how the three instructors in the study perceived class interactions through a network drawing exercise (interviews), then
- comparing instructor networks drawn during the interviews to the network visualizations which represent the actual online interactions, and finally
- soliciting instructors' feedback on the network visualizations of the actual online interactions.

The main objective is to discover differences and similarities between the instructor's mental model and actual online interactions among students. Our pre-study assumption was that showing a network visualization to instructors is needed to reduce the gap between how instructors perceive students' online interactions versus what actually happened. Having an accurate representation of who is engaged in class (and how) may be especially important when an instructor relies on his or her own recollection of online discussions (or on rudimentary metrics such as the number of posts) to assign participation marks in the class. To answer our research questions, we collected data from three graduate courses taught in a Canadian university.

The results confirmed that SNA and network visualizations do have the potential of making the "invisible" visible to instructors, and thus enhancing their capability of engaging students more effectively. The difference in perception of actual as against perceived interaction in the discussion fora underlines the potential that LA can provide to instructors and instructional designers. The faculty's perceived connection between the effect of stronger engagement in the discussion with students' learning experience, and the connection between frequency of interactions and satisfaction with the course also emphasizes the importance of LA.

In sum, if fully realized, SNA and network visualizations can be a valuable LA tool which would allow educational decision-makers and teachers to detect and understand patterns in learning behaviour and interactions, as well as to project learning outcomes, and help make intelligent, responsive and strategic teaching decisions based on those learning projections.

Title: Social networks and favourite subjects: can friends explain gender differences in STEM preferences?

Paper ID: 135

Authors: Isabel J. Raabe (University of Oxford), Christoph Stadtfeld (ETH Zürich), Zsófia Boda (ETH Zürich)

Abstract:

Considering the higher pay and prestige of jobs in Science, Technology, Engineering, and Maths (STEM), the under- or overrepresentation of sub-groups of the population contribute to social and economic inequality. Relevant demographic characteristics in this regard are both gender and ethnicity, with gender having received more academic attention. Despite that fact that the traditional gender gap in educational attainment has been reversed and boys and girls perform almost equally in Maths, women are still underrepresented in STEM occupations. A popular argument is the so-called “leaky pipeline” which proposes that girls, over their educational career, drop out of a STEM career trajectory. Indeed, many studies document different tendencies in aspirations (instead of actual performance) based on gender. Therefore, it is crucial to understand how these different patterns of aspirations come about.

Gender differences in aspirations can be explained by a variety of factors, of which peer effects in school are particularly important. While social network models are appropriate for such analyses, their results often lack statistical power due to their classroom-level focus. In our study, we address and aim to rectify this by analysing a large number of classroom-level social networks that consist of two node levels, one level represents students and the other their favourite subjects. We analyse the co-evolution of friendship and two-mode favourite-subject networks applying the random-coefficient multilevel SAOM framework. Our study thus presents a dynamic multilevel analysis of multilevel networks. We use a two-wave dataset of 251 Swedish classrooms collected as part of the Children of Immigrants Longitudinal Survey in Four European Countries (CILS4EU).

Title: The World of Twitter: Understanding the Global Diffusion of Knowledge and Ideas among Entrepreneurs and Innovators using Big Data Analysis

Paper ID: 137

Authors: Borkert, Maren (TU Berlin), Kratzer, Jan (TU Berlin), Mercouris, John (TU Berlin)

Abstract:

Cross-border communication as well as the diffusion of ideas and knowledge around the world is considered vital for such different things like business innovation and economic growth, international relation(ship)s and development, as well as the reduction of poverty, inequality and injustice. In consequence, transnational knowledge and innovation diffusion, sometimes referred to as 'social remittances' (Levitt 2001), is discussed in a broad range of disciplines, giving birth to a whole wealth of literature on the topic (Acemoglu et al. 2011, Rogers 1962, Stone 2004, Valente 1995). Until today, however, empirical evidence is scarce, anecdotal and difficult to access. Analysing the Twitter network of the Berlin IT start-up 'Factory Berlin', the self-proclaimed community of entrepreneurs and innovators, in this paper we show the, surprisingly strong, local composition of its 10,000 members (Gephi). Zooming in, we identify the transnational actors among them, that is, those users who receive more than 50% of incoming information ('friends') from two time zones (while difference between top two time zones <80%), illustrate their social network position as well as communication patterns. Data-mining some 4 Mio. tweets with self-developed software, we detect instances of transnational knowledge diffusion, cluster their content (DBSCAN), and show the evolution of messages across borders by measuring similarity using Jaro distance metric. Providing empirical evidence for the diffusion of ideas and knowledge across the globe with big data analysis, our research illustrates how the diversity of a network affects its innovativeness and competitiveness. At the same time, it clears up the modern myth that new media facilitate innovation at a global scale single-handedly. As our research shows the vast majority of tweets, in fact, is centred on topics such as sports, sex and events and thus of ordinary aspects of daily social life. Reflecting on methodological challenges and limitations, we argue that the analysis of big data needs to be contextualised in the everyday life of social actors if we do not want to lose the human experience and miss out on the role we humans play in creating innovation by focusing exclusively on the very large.

Title: Private entrepreneurs' initial socioeconomic status, political tie and new venture performance: evidence from transitional economy of China

Paper ID: 138

Authors: Li Xu (Wuhan University, China), Mingxia Liu (Wuhan University, China)

Abstract:

This paper investigates the relationship between private entrepreneurs' initial socioeconomic status, political tie and performance of new ventures in transitional economy of China by drawing upon the social network theory. Since the Chinese government called for a new wave of "mass entrepreneurship and grassroots entrepreneurship" to boost the economy, entrepreneurship has gained tremendous attention and passion in China that gives birth to lots of private entrepreneurs. Some successfully founded a new venture while others ended up with failure. Thus, this may give rise to the question that what characteristics of private entrepreneurs affect the performance of new ventures in China. Previous study has already examined the performance effects of entrepreneurs' prior experiences (Zhang et al.,2013), functional experiences (Li&Zhang, 2007), social class (Zhang et.al.,2013) and initial social status (Wang, 2016) in China, however, these research has ignored the key feature of entrepreneurial activity in transitional China—political networking (Li&Zhang,2008). Based on this, we propose that (1) both political tie and initial socioeconomic status of private entrepreneurs affect performance of new ventures; (2) central network position moderates the relationship between initial socioeconomic status of private entrepreneurs and new venture performance; (3) central network position moderates the relationship between political tie of private entrepreneurs and new venture performance. Data from CPES (Chinese Private Enterprises Survey) will be used to test the hypotheses and preliminary results will be discussed.

Title: Got Funding: Glocalized Networks and Mobile Media Entrepreneurship

Paper ID: 139

Authors: Wenhong Chen (UT Austin), Bryan Stephens (UT Austin)

Abstract:

Geography and entrepreneurship has been a perennial topic. This paper centers on how glocalized networks with both local embeddedness and global outreach affected funding among mobile startups, drawing on digital trace data, ethnographic fieldwork, and in-depth interviews. Using CrunchBase, a large database of tech ventures, we randomly selected 700 founders of mobile startups and successfully scraped LinkedIn data of 615 of them. The merged CrunchBase and LinkedIn data allowed network analysis of 345 founders, 688 investors, and 7630 LinkedIn endorsers. There was a glocalized pattern of investors and founders. Bay area, New York City, Boston, LA, and Washington DC were the top four hubs of both investors and founders, while Washington DC was the fifth investor hub and Seattle the fifth founder hub. At the same time, London, Tokyo, Tel Aviv were notable nodes in the investor network. Results demonstrated the significance of glocalized investor network and the white male advantage in funding success. First, funding success was structured by geographic configuration of investor and endorser networks. The overall size of the investor network increased but the size of co-located investor network decreased funding, indicating an advantage of global outreach. Funding success was also affected by having at least one investor in a top 5 investor hub but not by the founder's location in a top 5 founder hub, indicating an advantage of structural embeddedness with prime investment location. In comparison, LinkedIn network attributes showed limited impacts on funding success. Moreover, the industrial diversity of the LinkedIn endorser network decreased funding, indicting a penalty of network overexposure. Second, our analysis revealed significant funding disadvantages experienced by women and minority founders.

Title: Connecting newcomers to a social network with the right alters: Designing a randomized field experiment to test network interventions

Paper ID: 140

Authors: Florian Schloderer (INSEAD), Miguel Lobo (INSEAD)

Abstract:

Newcomers to an existing social network face the challenge to get connected to the right alters in a timely manner. Such connections are important for them to gain access to social resources and to facilitate their informal competence development that could enhance their individual performance and social outcomes. This research studies how network interventions could promote the formation of effective network structures of newcomers when they enter an existing social network. This poster will present a set of network interventions and a detailed research plan how to test the impact of these interventions on individual performance and social outcomes using a randomized field experiment. We plan to use a sample of young recruits, such as university graduates, during their on-boarding process to a private sector organization. Findings from this research are expected to be relevant to various stakeholders: For example, to recruits to promote their career advancement, to organizations to enhance the effectiveness of their recruitment processes, and to policy makers interested in the promotion of youth employment.

Title: Strategic Players for Identifying Optimal Social Network Intervention Subjects, with Application to an Undergraduate Social Network

Paper ID: 141

Authors: Miles Ott (Augsburg College), John Light (Oregon Research Institute), Melissa A. Clark (University of Massachusetts Medical School), Nancy Barnett (Brown University)

Abstract:

Introduction: Social network interventions (SNIs) target individuals who, by virtue of their status in the network, are influential in the behavior of others. Such interventions are specifically designed to take social connections into consideration when attempting to change behaviors, in large part because social networks provide a way to spread information and positive behaviors. SNIs typically involve engaging peer educators or opinion leaders who communicate with their communities and serve as role models, thus conveying behavior change goals to others.

Methods: We present a method whereby social network ties are used to identify opinion leaders who are situated in the network such that these individuals are: a) able to influence other individuals who are in need of, and most receptive, to intervention, thereby maximizing diffusion; and b) not embedded with ties that are likely to be behaviorally antagonistic to the intervention or that would compromise the optimal evaluation of intervention efficacy. In this study we developed Strategic Players (SP), a method for identifying network members who are close to the target subset (i.e., targeted group), and far away from the non-targeted subset (i.e., avoidance group). Our method maximizes the average inverse distance from each member of the SP set to the remaining members of the targeted group, while minimizing the average inverse distance from each member of the SP set to the members of the avoidance group. These two quantities of distance are weighted by a user-defined parameter θ , and $1-\theta$ respectively.

Results: We apply the SP method to a college alcohol study, in which a behavioral health intervention is deployed to a subset of the members of a directed social network of first-year undergraduate students ($N=1341$) at a mid-sized American university. To order to evaluate the efficacy of the intervention, the network was partitioned into two groups: the intervention group ($n_i=584$), and the control group ($n_c=757$). The targeted group was composed of the 260 members of the intervention group who were categorized as heavy drinkers (defined as 2+ heavy drinking days in the past month), while the avoidance group were the 270 heavy drinking members of the control group. After comparing the results of several different θ values, we used the SP method with $\theta=0.6$, to identify the SP set such that 88% of the targeted group either was a member of the SP set or nominated a member of the SP set, while only 12% of the avoidance group nominated an SP set member.

Conclusion: The SP method provides an improvement in the identification of opinion leaders for social network interventions over current methodology. Researchers using the SP method should consider what levels of contagion and diffusion are required for their intervention, and be aware that the choice of the θ parameter and the size of the SP set will depend upon both of these considerations, as well as to the specific structure of the social network to which they are applying their intervention.

Title: Gender differences in trust game: the influences of Social capital

Paper ID: 142

Authors: Yang, Tien-Tun (Department of Sociology, National Cheng-Chi University, Taiwan), Hsung, Ray-May (Department of Sociology, National Cheng-Chi University, Taiwan), Lu, Ke-Wei (Department of Sociology, National Cheng-Chi University, Taiwan)

Abstract:

Trust is regarded as a central concept for understanding important economic, social and political behaviors. Widely supported evidence of trust in human life exists. Many empirical studies argue that the existence of gender differences in trust behavior (Eagly, 1987). Research findings about gender differences on trust behavior are confusing and inconclusive (Balliet, Li, Macfarlan, & Van Vugt, 2011). The studies on how social capital affects trust behavior for males and females has been lacking. Therefore, we attempt to explore gender differences in terms of the effects of social capital on trust behavior. We know women and men have different characteristics of social networks (Agrawal, 2000, More, 1990 and Neuhouser, 1995). Different behaviors and attitudes exhibited by men and women from different traditional social expectations can make the difference in the composition of individual social networks between men and women (Hsung 2001). Women desire more intimate relationship and homogenous group of friends, and men sustain and make friends in joint activities to enlarge heterogeneous relations. When you are in heterogeneous relations, you can know all kinds of people and get more new resources. At the same time, you will have higher general trust and trust strangers more. Consequently, we intend to explore how people format their trust behavior through trust game experiments with three sessions of dyadic repeated trust exchanges. This study recruited 126 subjects (72 female students, 54 male students) from National Cheng-Chi University during the period from January to July in 2016. The preliminarily findings on trust behavior are that women continue to trust their partner from round1 to round5, but men perceive ending effect and are less likely to trust their partner in the last round. Besides, we also find the influences of social capital are significant only for men not women. Male subjects with greater diversity of accessed social capital are more likely to trust their partner; however, the effect of social capital on the trust behavior is not significant for female subjects. key words: gender differences, trust game, social capital, heterogeneous relations

Title: Business-government ties targeting to improve firm innovation during the institutional transition of China: A multilevel analysis

Paper ID: 144

Authors: Yang Chun (School of Social Sciences, Tsinghua University), Bart Bossink (Faculty of Sciences, VU University Amsterdam), Peter Peverelli (Faculty of Economics & Business Administration, VU University Amsterdam)

Abstract:

Ties that connect to governmental officials can facilitate firm's innovation performance, since they provide a key channel to get access to information and resources that are controlled by government. However, limited literature has been systematically devoted to the effects of the institutional environments, in which business-government (B-G) ties are embedded, on the relationship between B-G ties and firm innovation. In practice, on the one hand, external resources, such as R&D subsidy, business permits, and public procurement, are government-dominated. Therefore, building either regular or irregular social ties with officials substantially matter for firms to obtain these resources outside the boundary of the organization (Powell 1996; Peng & Luo 2000). On the other hand, B-G ties are embedded in and shaped by particular institutional environment (Luo, 2004; Powell, 1996). In a transitional economy, which dominated by inefficient, uncertain, and incomplete institutions, firms are likely to cultivate and use their social capital such as connections with officials to cope with the imperfect market and decrease the transaction cost (Peng & Heath, 1996). This paper draws on social capital theory to examine: To what extent the institutional environments shape the effects of B-G ties on firm innovation in China where is experiencing an institutional transition. It aims to answer following questions: 1) To what extent the B-G ties improve firms' innovation output? 2) Does the institution quality shape the effects of B-G ties on firms' innovation? It used the data from the China Enterprise Survey 2012 of the World Bank Enterprise Surveys to explore the above questions. To answer the first question, we firstly identified the regular (i.e formal interactions with officials) and irregular (i.e. informal payments to officials to get things done) B-G ties which are regularly witnessed in practices, and then examined their effects on firm innovation under control the micro-level (firm) and macro-level (city) factors. To address the second question, we firstly distinguished regional institutions in three dimensions, i.e. financial institution, business regulation, and judicial system, and then analyzed how these macro-level institutions shape the effects of B-G ties on firm innovation. By using the multilevel analysis models, we found that the regular B-G ties will increase firms' innovation output, while the irregular B-G ties show insignificant influence on firm innovation. In the context with higher quality of financial and judicial institutions, the positive effects of regular B-G ties on firm innovation are amplified, while the quality of business regulation exerts insignificant moderated influence on the relationship between regular B-G ties and firm innovation. This paper concluded by discussing the managerial implications for business managers and policy makers and by proposing directions for future research.

Title: Who do referrers work for? Marketization and network use in the Chinese labor market

Paper ID: 145

Authors: Elena Obukhova (McGill), Brian Rubineau (McGill)

Abstract:

While recent research has made significant progress in bringing to light the role conflict that referrers face due to potentially conflicting demands of their employer and their network members, our understanding of how institutional factors might shape this conflict is in its infancy. To address this literature gap, we formulate a series of hypotheses about the relationship between marketization and job-referring in China's transitional labor markets and test them using a large-scale nationally representative survey. Our analysis of who refers shows that marketization increases job-referring on behalf of the referrer's employer and our analysis of who is being referred shows that it decreases referring on behalf of the referrer's friends. Further supporting the decline of referring on behalf of friends, we find that marketization decreases job-referring to positions outside of the referrer's employer vs to positions with referrer's employer. We conclude with a discussion of implications of our study for our understanding of (a) forces shaping referrers' role conflict (b) network-based matching in transition economies and (c) cultural effects on brokerage behavior.

Title: Use of Social Ties for Job Search by College Students in China

Paper ID: 147

Authors: Gina Lai (Hong Kong Baptist University), Odalia Wong (Hong Kong Baptist University)

Abstract:

Studies in Western societies have documented that expansion of higher education does not reduce social inequality but instead, tends to reproduce it. The family transmits social advantages to the next generation through placing their children in selective universities, which later enhance the labor market outcomes. Yet, social network researchers argue that the use of social ties for job search can help a person to maneuver structural constraints to achieve favorable outcomes, although social position influences the access to social capital. Would graduates of elite institutions be less likely to use informal means for job search than their non-elite counterparts because institutional prestige has a large enough premium in the labor market such that the former has a less pressing need to help from their social networks? Would social ties have similar effects on labor market outcomes for graduates of elite institutions and graduates of non-elite institutions? Would the use of social ties for job search further exacerbate or mitigate social reproduction? These issues will be subject to investigation with data from a recent survey of young people whom we have followed in a panel study in urban Nanjing since 2010. A vast majority of these young people (98.41%) entered higher education in 2011, of whom about 43% went to junior colleges and 54% to 4-year universities in China, and the remaining 3% to overseas universities. Data analysis focuses on respondents who graduated from colleges and universities in China. Preliminary results show that respondents tend to use a combination of formal and informal methods for job search. While graduates of elite institutions are more likely to use informal means to find jobs than the non-elite counterparts, using social ties does not enhance the likelihood of successfully securing a job for them. Compared to jobs obtained via formal means, jobs obtained via informal means tend to yield a lower monthly income and bring a lower level of satisfaction. Findings will be discussed.

Title: Space, Social Capital and Labor Market Performance

Paper ID: 148

Authors: Ke-Wei Lu (Department of Sociology, National Chengchi University, Taiwan)

Abstract:

This paper uses the first-wave data from the study on "The Construction and Outcome of Social Capital: Taiwan, Mainland China, and the United States" by Academic Sinica to explore how social capital affects individual job performance in different spaces. There were 3,281 respondents in the first wave of data, which were screened by four criteria: whether the respondents were employed, whether they had previous work experience, whether they had clearly indicated their place of residence, and where they lived earlier than their job search time. The final analysis includes 1,023 respondents. In terms of the classification of places, I use the proportion of higher education population in the census data from 1956 to 2000 to classify two places: areas of advantages and disadvantages. In order to avoid selective bias, I use Heckman sample selection model with the maximum likelihood method to estimate the effect of social capital on individual job performance. The first stage of the model mainly examine the effect of accessed social capital on the probability of job search through the contacts. The second stage model mainly examine how variables on mobilized social capital affect the occupational prestige of current jobs. The findings indicate that accessed social capital have a significant positive effect on the probability of using referrals to search for current jobs in the first stage model, regardless of the advantageous or disadvantageous areas. In the second stage, there were variations of the effects of mobilized social capital on the current job prestige between advantageous and disadvantageous regions. In the advantageous region, weak ties with contacts had no effect on the occupational prestige of current jobs, and both occupational status of contacts and occupational homogeneity with contacts had positive significant effects on the occupational status of current jobs. In the disadvantageous region, both weak ties and occupational status of contacts had positive effects on current job prestige; however, the occupational homogeneity had no effect on the current job prestige.

Title: Social Capital and Getting a Job for Young Adults in Taiwan

Paper ID: 149

Authors: Ray-May Hsung, Ke-Wei Lu, and Tien-dun Yang

Abstract:

Social networks are important resources for young adults to enter into labor market as well. This paper attempts to use panel data from Taiwan Educational Panel Survey (TEPS) and Taiwan Educational Panel Survey and Beyond (TEPS-B). This study is interested in the question about how accessed and mobilized social capitals affect the job search and job attainment for young adults. We will use two wave data (students at 11th grade in 2001 and young adults around 25 years old in 2010) for the analyses. In terms of the factors on the accessed social capital, this study finds that the intergenerational social capital (the number of your friends' parents whom your parents know) at 11th grade of our respondents significantly facilitates the current accessed social capital, especially in the North region. The effect of the current accessed social capital on the probability of getting the current job through contacts only occurs in the non-northern region in Taiwan. However, the significant effects of mobilized social capital on the income of current jobs only occur in the northern region of Taiwan. In order to avoid the selection bias of the respondents who use contacts to find current jobs, we use Heckman two-stage regression model to estimate the effects of mobilized social capital variables on the income of current jobs. The mobilized social capital variables include strength of ties, occupational status of contacts, the relationship of contacts with the firm employer and employee, the occupational homogeneity between respondents and contacts. We found that most above mentioned variables of mobilized social capital significantly affect the income of current jobs through contacts in the northern region of Taiwan, and slight difference in other regions.

Title: Ties that bind, ties that structure : The case of French Socially Responsible Investment

Paper ID: 151

Authors: Elise Penalva-Icher (IRISSO - Paris Dauphine PSL University), Bernard Léca (Essec),
Frédérique Déjean (DRM - Paris Dauphine PSL University)

Abstract:

There is an increasing interest for the role of social positions to understand evolutions and changes within organizational fields. This paper advances a new approach to understand how actors manage their connections within an organizational field and how this influences their ability to shape the field. Indeed, social scientist distinguish at times analyses of social networks and institutions. Our aim is to fill this gap by examining the case of French Socially Responsible Investments market (SRI). Precisely, we want to explain how institutions (formal and informal) of the market come to more represent the interests of some players than others, and we explain this by the positions of the players in the field and their strategies of relational brokerage.

Early markets are filled with ambiguity. Structuration of organizational fields go through the creation of professional associations, standards, etc. French SRI matches this picture. SRI in France is recent and select assets not only on financial criteria but also by social perspectives, environmental and ethical. This phenomenon appeared in the mid-1990s and the arrival of an extra-financial rating agency (Arese-Vigeo). This market has also been offered a relatively open State regulation framework (the law on New Economic Regulations, known as the NRE law, or employee savings plans). The research question we address to the SRI market is: How this market is getting structured by interactions between field members?

To conduct this analysis we rely on a mixed methodology combining social network analysis and qualitative analysis to uncover the relational structures whereby some field members tried to maintain the existing institutional arrangement and the related field domination structure while others challenged it. Analyses presented in this communication are based on a fieldwork conducted between 2003 and 2006 on the French SRI market. This fieldwork relates on three tools: first on a participant observation of a year and a half in a SRI lobby group; Second, around 30 semi-structured interviews with SRI key players in France, whether they are analysts, fund managers, consultants, clients or associated with CSR initiatives and environmental protection; and third, a face-to-face questionnaire addressed to 78 individuals working in SRI in France (extra-financial rating agencies, boards, management companies, brokerage houses, NGOs, press, etc.) The questionnaire includes a social network analysis of SRI: complete co-work, professional association and friendship networks (name generators for co-wor and friendship, 2-Mode network for professional association).

This approach overlooks the work whereby actors actively shape the connections that constitute the network structure within which they are embedded. We argue that some actors are more likely than others to assert their interests in the constitution of a field by imposing standards that serve them. Why? Because they are embedded in association networks. There, they knit formal and informal heterophilious ties through what we choose to name a “field forum”.

Title: The micro-relational structure of the EU interbank money market. The effect of market uncertainty on transactions sequences

Paper ID: 154

Authors: Federica Bianchi (Università della Svizzera Italiana), Alessandro Lomi (Università della Svizzera Italiana)

Abstract:

Over the last two decades economic sociologists have given considerable attention to the mechanisms through which market uncertainty shapes the evolutionary dynamics of interorganizational networks.

In this study we examine how market uncertainty affects self-organizing sequences of relational events connecting financial institutions participating in the EU interbank market. More specifically, we analyze the complete set of 719,313 lending events observed on the e-MID trading platform between all the 223 banks participating in the market during the period January 2005 – December 2015.

We develop a relational event framework to address three related questions. First, how does uncertainty affect the network structure of financial markets? We address this question by looking at how the relational micro-structure of the market changed and reconfigured itself during and after the financial crisis. Second, how does uncertainty affect the fundamental micro-relational mechanisms like, for example, reciprocity, transitivity and assortativity – that are typically at work to stabilize interorganizational relations? We address this question by examining change in network micro-mechanisms before and after the financial crisis. Third, how does uncertainty affect the time-structure of basic network mechanisms? We address this question by examining the distribution of time elapsing between events that define reciprocated exchange sequences. Throughout the analysis the focus is kept on the role played by relational inertia and exclusivity – or the conditions under which organizations react to uncertainty by restricting exchange to prior partners.

Title: The persistence of face to face interactions in a digitalized economy: the effects of an electronic matching platform on 'real' relationships in two trade fairs.

Paper ID: 155

Authors: Guillaume Favre (University of Toulouse), Julien Brailly (Swinburn University), Emmanuel Lazega (Sciences Po Paris)

Abstract:

Since the development of electronic and internet devices, a lot of researches in sociology have emphasized the role of material devices for the construction of markets. In financial markets for example lots of research have studied this switch from 'face to face' to 'face to screen' interactions. In this presentation we study the effect of a market matching platform on effective relationships between actors and try to show that this phenomenon is not as linear as it is usually described. We aim to show that the effect of electronic devices could be different in emerging markets and in stabilized markets. We study social networks construction in two trade fairs for television programs, one for sub-Saharan Africa in Dakar and another one for eastern Europe in Budapest. These two trade fairs are strongly different because they have their own stories. While in Eastern Europe the trade fair has been organized for twenty years, it is only two years old in Africa. We use data extracted from a meeting organization platform on internet and discussion network data collected by questionnaires during the trade fairs. We then compare these different datasets to show that while in a market under construction, electronic devices participate in the tie formation and stabilization, they are used for reproduction of the market structure and inequalities when a market is mature.

Title: Social networks in the collaborative economy: the making of a sector and its norms

Paper ID: 156

Authors: Paola Tubaro (LRI-CNRS, Paris, France)

Abstract:

Data-intensive digital platforms are powerful coordination mechanisms that scale up economic interactions, such as sharing accommodations and carpooling, which were once confined to intimate social circles. However, their aggressive practices to capture value, sometimes at the expense of workers' security, have sparked lively controversies, and their "collaborative" discourse is now increasingly under scrutiny.

The proposed paper studies the formation of norms and values in today's collaborative economy of digital platforms, to reveal how the sector is redefining its own identity in response to recent criticisms. Norm formation is apprehended through the lens of the social structure, the fabric of relations among actors that embeds and regulates collaborative economy activities. The empirical context under study is the 2016 edition of the OuiShare Fest, a major yearly event that brings together hundreds of key players in the sector every year in Paris. Such an event can be thought of as a temporary organization where knowledge emerges and circulates among attendees, enabling a collective learning process; by fostering the emergence of a social environment and the production of specific norms and values, it plays a crucial role in the construction of this market.

The study uses a mix of digital, survey and interview data to reconstitute the (online and face-to-face) social networks of participants and link them to their knowledge, values and interests. It brings to light the different ways in which actors share knowledge and experience through social networking, and the informal development of cooperative processes for the gradual construction of standards and modes of regulation.

Title: Positive attribute and negative structural homophily among civic organizations in Kazakhstan

Paper ID: 157

Authors: Adil Rodionov (Eurasian University), Darkhan Medeuov (Leipzig University)

Abstract:

How does international financial aid affect cooperative behavior of local non-governmental organizations (NGOs)? Do financial inflows bring segregation or hierarchy into the structure of cooperation? Can NGOs, while turning global, preserve peer connections with local actors and be engaged in local issues? Civil society literature contains competing perspectives on how international financial aid may restructure local civic networks. Some scholars argue that international ties come at the expense of local integration as inclusion in global networks takes local NGOs out of the domestic context and separates professional NGOs from grassroots.

Drawing on this scholarship, we examine two hypotheses on how international funding influences cooperation patterns among NGOs. The hierarchy hypothesis states that civic organizations tend to cooperate with internationally funded NGOs as international funding lends an NGO a specific status of a valuable partner. The segregation hypothesis suggests financial homophily according to which internationally and locally funded organizations tend to choose similarly funded NGOs as cooperators.

To test these hypotheses we apply Exponential Random Graph Models to the data on cooperation among 221 Kazakhstani NGOs. Results support the segregation hypothesis implying that NGOs tend to cooperate with similarly funded entities. In addition, we also find negative popularity closure effect suggesting that NGOs which are nominated as cooperators by the same partners tend not to cooperate with each other.

Title: Cutting ties? Interprofessional networks and surgical team performance.

Paper ID: 160

Authors: John M. Hollingsworth (University of Michigan), Russell J. Funk (University of Minnesota), and Jason Owen-Smith (University of Michigan)

Abstract:

BACKGROUND: In complex organizations, individuals are interconnected by rich informal networks. These connections help channel knowledge and advice and create supportive social environments internally. Although influential theories have discussed how the overall structure of relationships inside an organization influences many outcomes, contemporary scholarship largely focuses on individual's ties.

QUESTION: In this study, we contribute to research on intraorganizational networks by examining how the overall pattern of connections among people from different professional training backgrounds (i.e., people from different professional groups) within an organization effects performance. We focus in particular on the performance of teams. On the one hand, several considerations suggest teams will do better in organizations where there are deeper connections across professional boundaries. Ties among professional groups should be helpful by making communication more efficient within the organization. Specifically, when ties are more robust, information is more likely to be routed more quickly and reliably to the relevant parties. In addition, deeper connections across professional groups should facilitate problem solving, by allowing teams to more easily search and access the diverse knowledge and experience held by the members of their organization. On the other hand, sociological work also suggests that deeper connections across professional group could foster conflict inside an organization, and therefore hamper team performance. Professional groups often compete for control over problems, and these jurisdictional disputes may be heightened when there are deeper connections across groups that promote more frequent interaction. Familiarity breeds contempt, and teams may become caught in the crossfire. Given these potentially divergent effects, how does the pattern of connections among professional groups within organizations influence team outcomes?

APPROACH: Our research setting is coronary artery bypass grafting (CABG). First developed in the 1950s, CABG is one of the most common and most expensive surgeries in the United States. Costs of surgical care episodes for CABG vary widely across hospitals. CABG is therefore an attractive setting because organizational factors are potentially important contributors to performance differences. Using national Medicare data, we mapped more than 21 million relationships among 238,004 providers caring for patients undergoing CABG at 1,186 hospitals. Within the network of each hospital, we distinguished between providers in three professional groups—primary care, medical specialty, and surgical specialty. We then quantify the degree of connection across these groups using the assortativity coefficient. Assortativity captures the degree to which ties occur between nodes with similar properties (i.e., physicians of the same specialty). The coefficient

ranges from -1 to 1. We use the reverse of assortativity, so higher values indicate deeper connections across groups. After computing assortativity for each hospital (2008-2011), we ran regressions that assessed the predictive value of the coefficient for CABG team performance, measured in terms of care costs.

FINDINGS: Our findings demonstrate significant variability across health systems in terms of the depth of connections across professional groups. This variability is associated with surgical care costs. In hospitals with deeper connections across groups, we observe lower spending. These findings hold even after accounting for patient, hospital, and community differences.

Title: Findings from the 2015 New Mexico Nonprofit Survey: Inter-organizational Collaboration and Challenges,

Paper ID: 161

Authors: Kun Huang (University of New Mexico), David Broudy (Social Vision, Albuquerque, NM, USA)

Abstract:

Since 2013, the Building Movements Project, a non-profit based in New York, funded by Kellogg Foundation and local funders, has conducted an annual survey of non-profit organizations in New Mexico, USA. The 2015 surveys collected demographic information about their service geographic areas, policy areas, and organizational types. The survey also included a network

component, asking the nonprofit respondent to identify five partners, partner organizational types (i.e., direct service providers, community organizing, intermediary/capacity builders, advocacy organizations, funders/foundations, arts, culture/media), and their tie strength (on a 4 point Likert scale). Respondent were also asked to select up to three types of collaborative ties from a list of seven, e.g., joint advocacy, care coordination, informal network, share budget, shared learning

about best practices, joint planning/strategizing.

The report, Working Toward the Common Good (available from

http://www.buildingmovement.org/pdf/Findings_from_the_2015_New_Mexico_Nonprofit_Survey.pdf)

, released in May 2016 at two nonprofit workshops at Santa Fe Community Foundation and United Way

of Central New Mexico in Albuquerque, respectively, summarizes nearly 300 responses to this internet survey. The survey showed the NP sector in NM to be very diverse, challenged financially, and strongly engaged in coalitions and partnerships.

We used social network analysis methods to analyze the open-nomination collaboration data. E-I (external-internal) index analysis, which examines the number of ties of group members to group outsiders relative to group insiders, tested the pattern of distribution of strong vs. weak ties across and within types of organizations, geographic areas in the open network. We also did focused analysis of the closed network of 209 organizations which answered the collaboration question. Not surprisingly, while there are some cross-location ties (i.e. groups based in Albuquerque reporting connections to groups in other parts of the state), nonprofit participants in the survey have a strong tendency to work with peers in the same location. Long distances between New Mexico's urban and rural areas could be a barrier to greater collaboration across the state.

Overall, the whole network created by the survey responses has an E-I index of -0.001, which indicates a slightly higher amount of internal ties than external ties. However, the counts of

internal and external ties by nonprofit type reveals that direct service nonprofits were the only type of nonprofits that reported more internal strong ties

than external ties.

Informal networking and care coordination are identified as the two most common type of collaboration. Joint community outreach and planning/goal-setting were recognized as the 3rd and 4th prevalent collaboration, followed by joint advocacy (5th) and shared learning (6th). The least common collaboration is sharing budget/fundraising, which is also true across all the six types of organization. It is notable that funders report joint advocacy as the least common collaborative tie. This reinforces the impression that many nonprofits either feel they cannot engage in advocacy or lack the resources. Thus, there appears to be room for improvement in the nonprofit sector through

education about, and collaboration in, advocacy coalitions.

Title: Deficient management control and role ambiguity as antecedents for employees' embeddedness in intra-organizational information exchange networks

Paper ID: 163

Authors: Natalie David (University of Freiburg, Germany), Olaf Rank (University of Freiburg, Germany)

Abstract:

Management control mechanisms, such as goal setting, monitoring and providing of feedback, are important information sources for employees about requirements on their role within the organization. However, organizations face an increasingly uncertain and changing work environment which often impedes precise goal setting and definition of employees' responsibilities. As a consequence, management control deficiency is likely to occur. Past research has widely neglected the crucial question though how employees cope with insufficient control and thereby lack of information on their role by their supervisor. Based on previous research on employee proactivity, we assume that employees compensate the lack of information by their supervisor by seeking information from their coworkers, positioning themselves advantageously in the intra-team information exchange network. Nevertheless, we assume that deficient management control does not affect employees' embeddedness in the information exchange network directly, but through the intervening effect of perceived role ambiguity. We test our hypotheses with data collected from 132 employees from five sales teams operating in different organizations in Central Europe. The results of our study support our assumptions, thereby furthering our understanding of the consequences of management control mechanisms in organizations and the determinants for employees' intra-organizational network embeddedness.

Title: Organizational uncertainty and the hierarchical orientation of advisory ties

Paper ID: 164

Authors: Rick Aalbers (Radboud University), Sander Smit (Tilburg University)

Abstract:

To better understand the role of uncertainty in organizational affective advice networks, we examine the retention of one's discretionary advisory ties and the formation of new advisory ties, under varying conditions of organization uncertainty. Exploring the effect of a managerially enforced corporate restructuring on the company's discretionary advice network as an exogenous driver of intra-organizational uncertainty, we argue that the degree of uncertainty faced by an individual employee will drive her future network partner selection behavior. We focus on the formation, continuation and dissolution of horizontal and hierarchically oriented advice ties. Based on social exchange theory, we pose that increased organizational uncertainty favors the continuation of existing horizontal oriented relations over hierarchically oriented relations in an organization's discretionary advice network. Individuals invest in those perceived as friends, and expect rewards from these investments. When the balance between investment and rewards is found unsatisfying or a better alternative might be available, the relation might be broken (Block 2015). Management announcing a downsizing may ignite such negative effect. Based on uncertainty reduction theory however, a reversed effect is expected for the formation of new advisory ties. Results, based on a unique field experiment at a financial service company confirm our hypothesis. Our quantitative analysis using exponential random graph (ERGM) models reveals patterns of tie persistence as well as of new tie formation and the variation in these patterns based on the hierarchical orientation of these advisory relations. Reasoning from the perspective of ego, our hierarchy variable displays the hierarchical levels of both individuals involved in an advice relation if alter is at least two levels higher in the hierarchy compared to ego. For all other combinations, a score of 0 is assigned to both ego and alter. Following recent advancement in network analytics we analyzed network interaction patterns in our data to quantify advice related exchanges within the discretionary advice network of a financial services company by means of ERGM to explicitly include higher order network characteristics such as homophily and reciprocity when continuing and/or establishing such advisory relations post downsizing event. We find that, overall, lower hierarchical echelons are net suppliers of newly formed advisory ties while higher hierarchical echelons are net recipients. A significant positive effect of our hierarchy-based homophily term indicates that employees tend to link to 'similar' others, where 'similar' in this context means both alters that are either equal or lower in hierarchy. A significantly negative effect for newly formed advisory ties, however, indicates that there is a tendency to link to dissimilar others, which -given the specification of our variable- by definition means upward linking. Lower hierarchical echelons are more likely to cling on to their existing peer-level advisory ties, yet abandon existing hierarchically oriented ties as organizational uncertainty increases. Our findings hold relevance for the field of network evolution and organization change. Because corporate restructuring is a widely-used lever of organizational change which operates, in part, through its effect on discretionary organizational networks, these findings have important implications for organizations.

Title: Networks and Professional Deviance in the Prescription Drug Abuse Epidemic

Paper ID: 166

Authors: Shu Zhang (Yale University), Marissa King (Yale University)

Abstract:

A long line of research in organizational behavior has found that where individuals sit in their social network is an important predictor of their likelihood of engaging in deviant behavior. However, studies have primarily focused on examining network structures of deviance by commission (i.e. deviance perpetrated with cognizance and intentionality). We extend our understanding of wrongdoing by considering deviance by omission and explore whether different network structures are associated with each type of deviance. In this study, we examine the relationship between physicians' inappropriate prescribing and their social network positions in the prescription drug abuse epidemic. Physicians engaged in deviance by omission, which has received limited attention from researchers and policy makers, have a substantial effect on the total volume of benzodiazepines prescribed. Using a longitudinal patient-sharing network comprised of 660,428 physicians linked by 12.5 million patients, we find remarkable differences in the networks of physicians engaged in deviance by omission and commission. Taking these differences into account will improve efforts to curb prescription drug misuse by allowing for more effective targeting of educational and policy efforts aimed at reducing inappropriate prescribing.

Title: Measuring Electronic Communication Networks in Virtual Healthcare Teams Using Electronic Health Records Access-Log Data

Paper ID: 170

Authors: Xi Zhu (University of Iowa College of Public Health), Dan Sewell (University of Iowa College of Public Health), Shin-Ping Tu (Virginia Commonwealth University Medical Center), Lindsey Hall (Virginia Commonwealth University Medical Center), Vimal Mishra (V

Abstract:

Research Objective:

Electronic Health Records (EHR) systems are broadly used to support the delivery of patient care. Communication through EHR is gradually substituting traditional interpersonal communication among healthcare professionals (HCPs). Understanding impacts of EHR on communication behaviors of HCPs, the emergence of virtual healthcare teams, and patient outcomes relies on the development of valid methods to measure and analyze communication networks in the EHR system. The purpose of this study was to explore methods of using EHR access-log data to measure communication networks in virtual healthcare teams.

Study Design:

This study was conducted at a large academic medical center. A random sample of 100 surgical colorectal cancer patients receiving treatment between 2013 and 2014 were selected. We extracted detailed access-log data from the EHR system to create a chronological dataset of HCP access to the sample patients' records. These access events were categorized as either sending information into or receiving information from the system.

Using the time-stamped event data, we constructed a weighted and directed network for each patient by assigning a link from a source HCP to a destination HCP using the inverse of the average time between each of the source's send events and, corresponding to each send event, the destination's earliest subsequent receive event. Network distances between HCPs thus correspond to the average idealized time that information can flow directly from one HCP to another. We examined structural characteristics of the 100 communication networks.

Principal Findings:

At the node level, the mean within-network averages of transitivity, out-degree centrality, in-degree centrality, closeness centrality, and betweenness centrality are 1.33, 0.12, 0.12, 0.13, and 0.03 across the 100 networks. Among the centrality measures, the degree-based and closeness centrality averages have similar coefficients of variation (approximately 0.8) and distributions, while the betweenness centrality averages vary somewhat less across networks (CV=0.7), and the transitivity averages vary little (CV=0.05).

At the network level, the 100 communication networks exhibited substantial variations in size (ranging from 8 to 440) and structural characteristics. The coefficient of variation for the assortativity (based on degree), out-degree centralization, in-degree centralization, closeness

centralization, and betweenness centralization are 1.34, 1.493, 1.49, 1.41, and 0.24 across the 100 networks.

We visualize three networks in the 20-60 size range that represent the maximum variations in closeness and betweenness centralization. Examining their overall structures, we find that: 1) the network with maximum closeness centralization shows a star-like structure with a clear core-peripheral distinction; 2) the network with maximum betweenness centralization has many structural holes where a central node (an attending physician) connects two otherwise separate components; and 3) in the network representing both minimum closeness and betweenness centralization, two thirds of its nodes belong to a tightly connected cluster and the other third are peripheral nodes directly connected to the cluster.

Conclusions:

The EHR access-log data provide rich information on HCPs' communication activities. Using time-weighted networks and other potential methods (e.g., exponential-threshold networks), it is feasible to use EHR access-log data to measure and study communication networks in virtual healthcare teams.

Title: Reducing the cost of knowledge exchange: Extending the relational view of information seeking to multiple knowledge-exchange relationships

Paper ID: 171

Authors: Yuval Kalish (Faculty of Management, Tel Aviv University), Amalya Oliver (Department of Sociology, Hebrew University)

Abstract:

Networks based on knowledge exchange (KX) have emerged as a means for collaborative learning among firms, and have become increasingly important for firms' sustainability. We integrate Information Search Theory (IST, Borgatti & Cross, 2003) with insights from social network theory to explain how organizational actors mitigate the costs associated with KX relationships by using network structure. We extend IST beyond the dyadic level of explanation to incorporate triads and other complex configurations, and we consider networks comprising multiple types of KX relationships. Using university-industry science consortia as an empirical setting, we utilize a multi-study approach consisting of an inductive study and two network studies—one cross-sectional and one longitudinal. Empirical analyses using Exponential Random Graph models and Stochastic Actor Based models support qualitative observations that organizational actors “design” their KX relationship networks to optimize the benefits and reduce the costs of knowledge exchange.

Title: Social network in terrorist organization: Detection of terrorist activities by a two-step strategy

Paper ID: 172

Authors: Ze Li (College of Information System and Management, National University of Defense Technology), Duo-yong Sun (College of Information System and Management, National University of Defense Technology)

Abstract:

Current researches indicate that social network analysis is a useful tool helps to understand the structure and dynamic of the terrorist organization. The networks of terrorist organization are changing under the effect by the internal interaction and external environment with a certain degree of correlation with the organizational behavior (i.e., terrorist activities). Detecting terrorist activities from terrorist networks could be particularly useful to enable the early warning, and faster response to both positive and negative organizational activities. However, it is challenging to identify the such “activity-related” network from regular ones in practice. To this end, we introduce a two-step detection strategy, which can identify terrorist activities (activity-related networks) based on anomaly detection and supervised classification. Specifically, this paper begins by defining the activity-related networks of the terrorist organization by considering the correlation between the terrorist activities and organizational networks. Next it extracts a number of features from the dynamic process of the organizational networks and recognizes the differences of the features when terrorist activities happen. Then it describes a two-step framework to detect the activities. The first step adopts unsupervised anomaly detection techniques to identify activity-related networks as well as some suspects from the over time network set. The second step further distinguishes the activity-related networks from the suspects, by mapping the defined features into a high dimensional space and computing the optimal decision surface with supervised classification models (e.g., artificial neural networks). Finally, it provides empirical results based on the framework to demonstrate the effectiveness of our strategy.

Title: Social network based exploration on global terrorism evolutionary: the Matthew Effect

Paper ID: 173

Authors: Zhanfeng Li (College of management and information system, NUDT), Duoyong Sun (College of management and information system, NUDT)

Abstract:

Although the investment on counterterrorism increases every year in a global sphere, terrorism never seems to be diminished. Inter-groups relationship could be one of the reasons: terrorist groups cooperate and interact with each other frequently and have formed a complex and dynamic system. For the purpose to explore the evolutionary dynamics of global terrorism, the paper mapped location-based networks to model the overall terrorism system, followed with time-spatial analysis. The research was mainly based on two models. The network division model divided the system into fractions to explore the evolution in group formation, while the preference attachment model to discover laws that how terrorism developed. Result shows that there is distinct Matthew effect in the process of terrorism evolutionary. The principal conclusion are as follows.

1. The more centralized a group is, the higher possibility it attracts new groups.
2. The more serious terrorism a country suffers, the more frequent its relevant terrorist groups evolves. And it results in vicious spiral.
3. Groups' disruption is more likely to result a worse result.

The findings are conform to the general knowledge about terrorism. The work moves forward a step to mining the evolutionary principle of global terrorism in a network view and could supply significant consult to transnational counterterrorism.

Title: Social network fragmentation

Paper ID: 176

Authors: Goylette F. Chami (University of Cambridge), Sebastian E. Ahnert (University of Cambridge), Narcis B. Kabatereine (Imperial College London), Edridah M. Tukahebwa (Ministry of Health-Uganda)

Abstract:

Public health interventions often seek to intentionally destroy paths between individuals to prevent the spread of communicable diseases. Immunizing individuals through direct vaccination or the provision of health education prevents pathogen transmission and the propagation of misinformation concerning medical treatments. Yet, it remains an open question whether network-based strategies should be used in place of conventional field approaches to target individuals for medical treatment in low-income countries. We collected complete friendship and health advice networks in 17 rural villages of Mayuge District, Uganda. Here we show that acquaintance algorithms, i.e. selecting neighbours of randomly selected nodes, were systematically more efficient in fragmenting all networks than targeting well-established community roles, i.e. health workers, village government members, and schoolteachers. Acquaintance algorithms also were effective in offsetting potential noncompliance with deworming treatments for 16,357 individuals during mass drug administration (MDA). We anticipate our findings will change how individuals are targeted in rural health interventions. For example, health policymakers can immediately implement acquaintance algorithms to select individuals to vaccinate or to increase drug uptake in large-scale treatment campaigns. Health advice networks were destroyed more easily than friendship networks; only an average of 32% of nodes were removed to reduce the percentage of nodes at risk of refusing treatment in MDA to below 25%. Treatment compliance of at least 75% is needed in MDA to control human morbidity attributable to parasitic worms and progress towards elimination. Network-based approaches should be used in place of targeting established community roles to damage social networks and, in turn, to quell the transmission of information, behaviours, or infection.

Title: Mapping the Tobacco Control Network in China Based on Social Network Analysis

Paper ID: 177

Authors: Jingjing Du (Renmin University of China), Hai-Ming Lee (Central University of Finance and Economics)

Abstract:

Tobacco control has been an essential topic in the area of public health, while social network theory and research have received wide acceptance over the years. In light of the fact that tobacco control is synergistic, we conduct social network analysis on the network of tobacco control in China, where we integrate various social actors into one system.

In this paper, we define the tobacco control network at first, which refers to the system formed by the relatively stable ties between smoking control actors through interactions. These social actors cover the health authorities, the medical institutions, volunteers, nonprofit organizations, etc. Next, we employ Beijing as a case to characterize the structure of tobacco control network. We find that, the centrality of single members affects their abilities of information capture and manipulation, which causes the difference of network positions and influences among actors; the whole network is featured with relatively weak ties and strength, slow variations and inequality thus hinders the development of tobacco control system; several subgroups in the network weaken the leading role of government, and the development of civil organizations is unequal.

The policy implications of this study are fourfold. First, we need to speed up the construction of legal system, both in legislation and enforcement areas. Second, the government should play a leading part by closer corporations among different sectors, more rational fiscal and tax policies, reforms of warning signs on tobacco packages and more official support for the civil organizations and individuals. Third, we need to improve the service quality of tobacco cessation and increase the public understanding towards it. Finally, it is essential to expand and strengthen all types of tobacco control subjects.

Title: Propagation of Financial Constraints in the Global Production Network: Evidence from Firm-level Data for Asian Economies

Paper ID: 181

Authors: Jiangtao Fu (Waseda University), Yasuyuki Todo (Waseda University), Petr Matours (University of Sydney)

Abstract:

This study examines for the first time the propagation of financial constraints through interfirm production networks using global firm-level data.

In supplier-customer transactions, suppliers have incentives to sell lower-quality products than agreed in the contract. To avoid this moral hazard problem, customers often request their suppliers to accept late payment by trade credit, rather than immediate cash payment. As global production networks become more extensive and the moral hazard accumulates upward through production networks, upstream suppliers are required to hold a larger amount of accounts receivable.

Our hypothesis is that financial constraints disseminate and are intensified through production networks because firms with larger accounts receivable need to hold larger working capital.

We test this hypothesis by analyzing an original compilation of transactions among major firms in the world. We combine two datasets: (1) FactSet Revere firm-level global production network data and (2) Osiris data of firm attributes. The FactSet Revere dataset includes information on transaction relations among 57,000 major firms in the world (10,000 US firms, 4,700 Chinese, 3,400 Japanese, and 2,200 UK) in 2015. Osiris covers all listed firms in the world, containing detailed financial information such as bank loans, trade credit, and working capital. After merging the two datasets using International Securities Identifier Numbers (ISIN), we obtain 3490 firms in our sample for estimation.

Using the graph of global production networks taken from the FactSet Revere data, we calculated the number of steps from final assemblers downstream that do not have any other corporate clients to their direct and indirect suppliers upstream. Our measures of upstreamness of each firm include the mean, median, and the maximum number of steps from the firm in focus to the firms at the bottom of the global production network.

We find that firms in more upstream positions in global production networks are likely to hold more trade credit (gross or net accounts receivable) relative to total assets. Further, we find that the utilization of trade credit is more prominent among firms in less economically developed countries. Finally, the amount of suppliers' accounts receivable is smaller when their customers are foreign firms. The results suggest that financial shocks affect upstream firms more strongly, which has important policy implications.

Title: A Network Analysis of International Trade in Plastic Waste

Paper ID: 183

Authors: Yikang Bai

Abstract:

While a substantial number of network studies have examined the overall international trade, few network studies have explored international trade in hazardous wastes. Drawing on the data from United Nations' Comtrade Database, this study takes the approach of network analysis to examine international trade in plastic waste, one major type of hazardous wastes.

Ecologically unequal exchange argues that in today's world system, countries in the core obtain the resources they need from the peripheral countries, oftentimes resulting in resource depletion and environmental degradation in the noncore. On the other hand, countries in the periphery are often the recipient countries of products and wastes of adverse environmental impacts from the core (Frey 2010a; Frey 2012b; Rice 2007). The findings of this study are generally consistent with the framework of ecologically unequal exchange. Developed countries, which occupy the core position in the world economic system, were extensively involved in plastic waste trade during the past two decades. Although the developed countries imported waste, they were the chief exporters of plastic waste. Among the developed countries, countries at the top exported extremely large amount of plastic waste to other countries. Developing countries, especially China, were major importers of plastic waste. In recent years, a few South and Southeastern Asian countries, such as India, Thailand and Malaysia, became more extensively involved in plastic import.

Title: Propagation of Shocks due to Natural Disasters through Global Supply Chains

Paper ID: 184

Authors: Yuzuka Kashiwagi (Waseda University), Yasuyuki Todo (Waseda University)

Abstract:

This paper examines how negative shocks due to natural disasters propagate through global supply chains. When suppliers are hit by a disaster, their customer firms which are not directly hit by the disaster may also be indirectly affected due to lack of supplies. Conversely, when customer firms are hit, their suppliers may also be affected due to lack of demand. Therefore, negative shocks from disasters would propagate to both upstream and downstream firms through supply chains, leading to substantial damages to the whole economy.

Using recently available data on global supply chains during the period from 2010 to 2015, we examine whether or not sales of firms decline when their customers or suppliers are located in areas affected by any major natural disaster. Our target disasters during the sample period include the Great East Japan earthquake, the Yunnan earthquake, and Typhoon Haiyan. Furthermore, the effect of indirect customers and suppliers which are two or more steps away from the firm is also estimated to find out how far negative effects propagate through supply chains. The dataset is unique in that it contains information on inter-firm transaction relations among 58 thousand major firms around the globe. Among the 58 thousand firms, 10,000 are US firms, 4,700 are Chinese, 3,400 are Japanese, and 2,200 are UK.

Some existing studies have already examined this issue. For example, Barrot and Sauvagnat (2016, *The Quarterly Journal of Economics*, 131) find a large negative effect of direct and indirect suppliers and customers hit by major disasters in the United States. However, they focus on supply chains within the US, ignoring global supply chains. Boehm et al. (2015, US Census Bureau Center for Economic Studies Paper, No. CES-WP-15-28) find that affiliates of Japanese firms in the US are negatively affected by the Great East Japan earthquake that affected their parent firms in Japan. However, their analysis ignores arm's-length transactions between firms. The present paper overcomes these shortcomings of the existing studies, incorporating most major inter-firm transaction relations in the world including international and arm's-length relations.

In addition, we look into shareholding and co-invention networks among firms to see whether other types of network strengthen or weaken negative effects through supply chains. For this purpose, we merge another comprehensive firm-level dataset that contains information on shareholding and co-holding of patents among firms with the supply-chain dataset. The investigation of possible interplays between multilevel networks is another innovation and contribution of this paper. We hypothesize that when supply chain links are associated with shareholding or co-invention links, firms are indirectly affected by partner firms that are directly affected by a disaster to a larger extent than otherwise.

Our results are expected to show how effects of natural disasters diffuse to the whole global economy through supply chains and other firm networks in a more comprehensive way

than existing studies. Accordingly, this study could provide more practical policy suggestions to prevent amplification of negative shocks through global firm networks.

Title: Economic Crises within Global Value Chains: Examining the Complex Dynamics of the World Trade Network

Paper ID: 185

Authors: Zhengqi Pan (Singapore University of Social Sciences)

Abstract:

How are economic shocks propagated in global value chains (GVCs) during an economic crisis? Would an economic crisis have the same impact on both trade in intermediate and final goods? To what extent is the topology of trade networks significant in crisis propagation? How important are state institutions in helping to mitigate crises? I argue that complex interdependencies, strong clustering in the world trade network, and the bullwhip effect exacerbate the effects of economic shocks throughout the supply chain, with intermediate trade hurt more than trade in final goods. On the other hand, countries with strong state capacity, especially developmental states, will be significant in mitigating the effects of economic crises. Using an advanced statistical network analysis method called the Temporal Exponential Random Graph Model (TERGM), as well as agent-based modeling of the world trade network, I find results that point to the importance of network connections and topology. Moreover, the bullwhip effect is also present under certain conditions, but the effects are dampened by government intervention and state institutions. In addition, countering the effects of economic crises, the developmental state acts as a shock dampener and export enhancer in the intermediate trade network. This paper focuses on the TV and communication GVC, which is highly fragmented and dispersed geographically, for the period 1996 to 2013. Correspondingly, data for my main dependent variables -- exports in intermediate and final goods -- are drawn from the OECD Structural Analysis (STAN) Bilateral Trade Database (ISIC Rev. 3) and converted into binary variables for TERGM computation with a threshold of 2%, consistent with existing literature. Overall, this paper contributes to the current literature on international trade in four significant aspects: (1) accounting for and modeling of network structures and complex interdependencies in world trade, (2) examining complex nonlinear dynamics such as the bullwhip effect during an economic crisis, (3) investigating the extent in which state capacity is important in mitigating economic crises, and (4) contextualizing international trade in the contemporary global value chains framework, looking at trade in both intermediate and final goods.

Title: The Echo Chamber Effects: Measuring Network Homophily in Social Media

Paper ID: 188

Authors: Shu-Fen Tseng (Yuan Ze University, Taiwan)

Abstract:

Recent research has focused on the potential of the Internet and social media to revitalize the public sphere. It has been suggested that the Internet has increased citizens' exposure to political discussion and contributed to the heterogeneity of political discussion networks (Brundidge, 2010). Others have argued that social media enables individuals to selectively interact with others who share like-minded views, which increases the political homophily and potentially damages deliberative participation (Sunstein, 2002; Himelboim et al., 2013; Collenoni, et al., 2014, Bakshy et al., 2015, Nikolov, 2015, Vicario et al, 2016). Scholars have identified six kinds of structures on Twitter topic networks (Smith et al., 2014). Two separate and polarized crowds would mostly common to see on the political conversational networks. This study aims to investigate discussion networks on a popular bulletin board system (PTT) in Taiwan and explore the roles of social media in leading online world toward whether polarized or diversified networks. PTT Bulletin Board System is the most popular discussion forum in Taiwan with more than 1.5 million active users. It is anonymous in the PTT discussion forum. In this environment, users are more likely to express their opinions in a rather aggressive and sarcastic style. Two political events (KMT Replace Candidate and The Ma-Xi Meeting) that were heatedly discussed on the PTT boards in 2015 was collected to examine network structures and to measure the echo chamber effect. Network structures of these discussion networks, for example degrees centrality, betweenness, vertices, cliques are calculated by the NodeXL software. We further clustered and compared these networks to understand whether these discussions reflect polarized networks.

Title: Longitudinal Change of Core Discussion Network in terms of Size and Discourse in Online Public Forums

Paper ID: 189

Authors: Sujin Choi (Kookmin University), Joshua SungWoo Yang (Department of BigData, MacroGen Inc.)

Abstract:

The declining size of core discussion network (i.e., a group of people with whom one discusses important matters) have raised not only scholarly attention but also public concern. People are more likely to discuss important matters with spouses and less likely with friends, neighbors, or coworkers. The average size of core discussion network was found to dwindle from 2.94 in 1985 to 1.93 in 2008, which represents the increasing social isolation. Given this circumstance, the present study carefully brings up a question of whether online public forums have any potential to develop into a core discussion network and how they change over time in terms of size and discourse.

We explore these questions in the context of online public forums that discuss political matters. Political matters can be regarded as an important matter in that one cannot share political talks and express opinions with anybody without any hesitation. People tend to avoid political talks with even close others, because it can raise conflicts and psychological discomfort. If, in online public forums, a group of people shares political discussions continuously and frequently and their discussions ripen over time, it might be a positive indication of becoming a core discussion network.

From a whole network perspective, we calculate density, modularity, reciprocity, and transitivity and conduct clique analysis to have a general sense of how far reciprocated and cliquish the political discussion network becomes over time. From an ego network perspective, we first identify people who joined the discussion for a long time period and form their discussion networks within one-path length. We then closely explore their longitudinal change in size: To which extent do their discussion networks' size increase or decrease over time? Does the change in the discussion network's size relate to the change in discussion frequency? We also examine their discourse by conducting a computer-assisted content analysis, building a semantic network, and tracking the change of the semantic network over time: What discourse do they make? Does the discourse become matured over time? Based on the data obtained from an online public forum that shares political discussions, a directed and valued discussion network is formed with nodes as discussion participants and links as reply relations.

Examining longitudinal changes in not only the structural qualities of the political discussion network but also the discourse made in that network, this study may have implications for the notion of core discussion network and for the soundness of online public forums. If the online public forum is found to have political discussion networks that are stable and deepen over time, the core discussion network might not be in decline but be changing its shape from a group of offline acquaintances only (e.g., spouses, friends, relatives, and coworkers) to a group including online discussants who could be perceived as close friends consulting important matters. Under

this presumption, online public forums, which have been regarded as emotional ventilation with anger and sarcasm, may be reconsidered having a positive function of nurturing a stable discussion network.

Title: Competition and collaboration in multilevel organized criminal networks

Paper ID: 192

Authors: James Coutinho (Swinburne University of Technology), David Bright (Flinders University), Johan Koskinen (University of Manchester), Andrew Wright (Criminal Intelligence Service Alberta)

Abstract:

Social network analysis has been used to understand processes of collaboration and competition among organizations in competitive legal markets. It has been found that organizations encountering each other in multiple geographical locales ('spatial multipoint competitors') may collaborate and develop complementary specializations rather than competing directly with one another for market share (Lomi & Pallotti 2012). Though there exists considerable research into criminal networks (e.g. Morselli 2009), there is little research into how organizations operating in illicit markets, such as different types of organized criminal groups, compete and collaborate with one another. This paper argues that criminal organizations compete for geographically localized markets in a way that is comparable to legitimate firms. It exploits a unique multilevel network dataset on organized crime collected by Alberta Criminal Intelligence Service. The data consists of 3137 organized criminals and their affiliations to 293 geographical locations and 188 criminal organizations, as well as attributes of both individuals and organizations. The paper theorizes that multilevel network structures arise as a result of micro-level competitive and collaborative behaviour among criminals. Using multilevel exponential random graph models (ERGM) to analyse a subset of the data, the paper looks at how spatial co-location of organized criminals shapes collaborative and competitive behaviour as evidenced by observed multilevel network structure. It also explores variations in competitive and collaborative behaviour across organization types, comparing hierarchical, mafia-style organizations with more informal collectives such as street gangs. It therefore contributes to the understanding of both covert social networks and the behaviour of criminal organizations operating in illicit markets.

Title: Social Influence Network Model of Performance Expectations

Paper ID: 193

Authors: Jingwen Zhong

Abstract:

This paper proposes a model based on Friedkin and Johnsen's social influence network theory (SINT) to explore the mechanism by which initial disagreements regarding performance expectation turn into group consensus. One presumption in status characteristics theory is that individuals in a task-oriented group will agree on who is more or less competent, which results in a consensual expectation hierarchy. However, it's argued in this paper that people can form different expectations given the same status information when they carry different status beliefs or vary in the relative weights placed on the salient status characteristics. Higher performance expectation leads to greater social influence over others. Thus, a person's opinions about him/herself and other group members will be influenced by those the person believes as more competent. In the proposed model, individuals' expectations for themselves and others are subject to the interpersonal influence, and meanwhile the interpersonal influence is affected by their expectations. A social influence network is constructed based on group members' performance expectations for each other and the interactions between group members. The model, which is specified with time-variant susceptibility and interpersonal influence matrices, formulates the process in which individuals adjust their opinions leaning toward the opinions held by those who they see as more influential during the interaction. The paper presents the model formulation and the operationalization of the key elements, and also examines the features of the proposed model with simulated data matrices.

Title: Anonymizing Social Network Data for the Research Community

Paper ID: 194

Authors: J. Skvoretz (U of S Florida), J. Arroyo Flores (U of S Florida), C. Gandy (U of S Florida), S. Viswanathan (U of S Florida), A. Iamnitchi (U of S Florida)

Abstract:

Network science of social networks requires both the investigation of properties of theoretically defined class of networks (random, small world, scale-free, community guided attachment) and the investigation of empirical networks over magnitudes of scale. With respect to the second problem, using empirical networks of ties among individuals raises important questions of privacy and anonymity: how can versions of actual networks be created that preserve privacy and anonymity but at the same time maintain research utility? We review recent work on this problem including our efforts using d2k distributions and ergms as devices to generate high utility networks that maintain privacy and anonymity. In general, the problem is complex and solutions depend on what is assumed about the capabilities of the agent seeking to unmask identities and on the network metrics considered essential to preserve.

Title: The Social Network Approach and Leadership Research: Common Pathways?

Paper ID: 196

Authors: Markku Jokisaari (University of Turku)

Abstract:

The social network approach provides both theory and methodology to examine central research questions in leadership. First, many leadership scholars argue that leadership is centrally related to social influence among people and the coordination of people's efforts toward a common goal. In this regard, the social network approach argues that to understand social influence and the coordination of common efforts, one has to examine how people are connected to each other and to focus on the wider social environment rather than formal dyadic relations between a leader and her followers. Second, a central part of leadership concerns access to resources in order to enhance the performance of work groups. In this respect, the social network approach suggests that leaders' ability to acquire resources depends on not only their formal position but also their informal relations within and outside the organization. Third, a central research question among leadership scholars is related to leadership development, i.e., how leadership evolves over time between a leader and his/her followers. Again, the social network approach suggests that in order to understand leadership development, a researcher should focus on not only the connections between leaders and followers but also their relations outside their focal work group. This paper examines how social network approach might advance leadership research. It also provides examples from leadership research that has capitalized on social network theory and methodology.

Title: The Cost of Ties: Explaining balance and status in signed tie formation.

Paper ID: 197

Authors: Nicholas Harrigan (Singapore Management University), Janice Yap (Singapore Management University), Tan Bing Yang (Vanderbilt University), Tan Yu Xun (Singapore Management University)

Abstract:

What drives signed tie formation? The two main competing explanations are balance theory and status theory. We test these theories with a stochastic actor oriented model (SAOM) of four longitudinal networks – friendship, esteem, dislike, and disdain – of 115 undergraduates. We find that balance theory is dominant in friendship ties, while status theory is dominant in esteem, dislike, and disdain ties. We argue this is explained by the difference in cost of ties: costly friendship ties generally require mutual investment and have a norm of loyalty, generating balance; while low cost ties lack these characteristics, allowing status to dominate.

Title: CAN THERE BE TOO MANY TREES? THE RELATIONSHIP BETWEEN GREEN SPACES AND SOCIAL CAPITAL

Paper ID: 199

Authors: Vincent Chua (National University of Singapore)

Abstract:

While studies show a positive association between green spaces and social capital – e.g., neighbours often use green spaces such as ‘community gardens’ to socialise or work on projects – the association needs contextualizing. E.g. Are there limits to the amount of social capital green spaces can facilitate? 2) Do green spaces facilitate social capital more readily (or less readily) in some neighbourhoods than others? Analyzing survey data from Singapore (n = 1,200) based on two neighbourhoods in 2015, this study finds that: 1) green spaces do strengthen social attachment between neighbours, but 2) at slower rates to residents who already have strong place attachments to the neighbourhood (as well as to residents who live in neighbourhoods with a spatial configuration that already fosters active neighbouring). Briefly stated, the value of green spaces for cultivating social capital is attenuated in neighbourhoods that already have a high stock of social capital among residents.

Title: Dynamic Latent Factor Network Modeling of the United Nations Voting Behaviors

Paper ID: 200

Authors: Bomin Kim (Penn State University), Xiaoyue Niu (Penn State University), David Hunter (Penn State University), Xun Cao (Penn State University)

Abstract:

The General Assembly of the United Nations serves as the key component of policymaking of the United Nations. 193 members vote on various of events each year. Nations' foreign policy preferences and positions can be revealed from those voting behaviors. In this paper, we analyze the UN voting data (Voeten 2013) using a dynamic latent factor network model. By controlling for geographic distances and bilateral trade between countries, the model estimated latent positions and movement of positions reveal interesting and meaningful foreign policy positions and alliance of various countries.

Title: Patterns of positive and negative relationships in family networks and mental health: Exploration of relational resources and strains in a general population sample

Paper ID: 203

Authors: Marlène Sapin (FORS & LIVES, University of Lausanne)

Abstract:

Literature has emphasized the association of various dimensions of social networks with health or mental health outcomes. In parallel, research has highlighted the influence of social structures and social inequality on health and mental health outcomes. There are however several challenges that we currently need to face. Although several explanations were postulated on the mechanisms which link social relationships with physical and mental health, such mechanisms still need to be explored. The embeddedness of this linkage within the life course and broader social structures also needs further examination. Several studies have investigated the role of social capital, as network resources, in relation with health and mental health, with mixed results. Fewer have assessed the straining effect of social relationships, such as demands or conflict. This paper hypothesizes that family-based social capital, defined as resources provided by family network members, has distinct mental health outcomes, depending on the presence or absence of negative relationships. Based on MOSAiCH 2013 data, a national representative survey organized in Switzerland, this study investigates patterns of positive and negative relationships, considered jointly. Using a typological approach, we explore the whole patterns of resources and strains in family networks and we analyze the extent to which they relate with mental health. We also assess how such patterns of social capital and straining relationships are embedded in particular life stages and in broader social structures.

Title: Potential role of personal social network analysis as a therapeutic tool in work with young people experiencing mental health challenges

Paper ID: 204

Authors: Jeffrey Grierson (Anglia Ruskin University), Katherine Ma (Anna Freud Centre, University College London), Saul Hillman (Anna Freud Centre, UCL), Peter Fuggle (Anna Freud Centre, UCL), Dickon Bevington (Anna Freud Centre), Tobias Nolte (Anna Freud Centre),

Abstract:

It has long been acknowledged that success in therapeutic interventions with young people experiencing mental health challenges relies not only on individual team members' relationship with the client, but on factors such as team cohesiveness, communication and involvement of family and friends. The current project involves the employment of a proof-of-concept case study to examine whether formal social network mapping and analysis can aid team members understanding of the structural dynamics of therapy and potentially provide a therapeutic tool in this field.

We employed a single client case study to examine and contextualise the structure and dynamics of the therapeutic social network. The client was a nineteen year old women from London who had experienced mood-related mental health problems. Data collection involved formal social network data collected from the client and with seven of the eight identified alters, contextual qualitative data collected from the client in interview and reflections on the mapping and analysis provided by practitioners. Alters generated with the client included both service providers (GP, Care-coordinator, mental health worker, academic tutor) and family and peers (mother, boyfriend, uncle and best friend). Ego-Alter ties measured were: frequency of contact; social support (emotional, informational and instrumental); quality of support and relationship frustration. Perceived alter-alter frequency of contact was asked of the client. Alter were asked similar tie questions in relation to the client and frequency of contact with other alters. All ties were measured with three point scales.

Analysis focused on the structure of the support network as characterised by the client and comparisons between ego and alter perceptions of networks. The perceived support network from the perspective of the client showed key differences in the structure and dynamics across the modalities of social support. In addition, there were more discrepancies in perception of emotional support from ego and alter perspectives than for other forms of support. Overall alters perceived a higher provision of emotional support than the ego did. There was also greater consistency of perception and experience of alter-alter ties between social members than among professional members, suggesting interesting issues in relation to unobserved professional ties.

A reflective process with professionals examined the utility of both the process of mapping these networks and the outcomes in terms of therapeutic practice. We have identified a number of potential benefits to incorporating a form of social network analysis within therapeutic practice to identify structural aspects of social support and the enabling of problematic practices at intake or for complex cases. We have also identified opportunities for care coordination mechanisms to be assessed and improved using a form of social network mapping. In addition, we have identified

some interesting challenges in relation to professional practice and ethics that need to be addressed as we progress this approach.

Title: Conflict structures in family networks of older adults and their relation with health related quality of life

Paper ID: 205

Authors: Eric D. Widmer (University of Geneva), Myriam Girardin (University of Geneva), Catherine Ludwig (University of Applied Sciences and Arts Western Switzerland),

Abstract:

This research explores the interrelations between health-related quality of life and conflict structures in family networks of the elderly. Data were derived from a sample of 2858 elders (aged 65 and older) from the Vivre/Leben/Vivere (VLV) study, a large survey addressing family life and health conditions of older people in Switzerland. Conflict density in family networks and betweenness centrality of respondents in family conflict are significantly associated with health-related quality of life measures. Further, results demonstrate that conflict-health associations are mediated by the level of perceived individual stress, when psychological health is concerned. Family conflict structures depend to a large extent on family composition and age. The results stress the importance for the older adults of actively shaping the composition of their family networks in ways that promote both conflict and stress avoidance.

Title: A comparison of personal networks between Chongqing, Toulouse and San Francisco

Paper ID: 206

Authors: JIN HUANG (LISST, CNRS AND UNIVERSITY OF TOULOUSE), MICHEL GROSSETTI (LISST, CNRS AND UNIVERSITY OF TOULOUSE)

Abstract:

Compared to the sum of work accumulated in Western countries, research on personal networks is still rare in China, despite the importance of interpersonal relations in this country. The research presented in this paper was aimed at answering the following questions: Is it possible to transpose a complex method of analysis of personal networks used in American and French city to a Chinese city? Given the higher importance of families in the social life of this country, do we observe strong specificities in the structure and composition of personal networks, or on the contrary, there is a convergence of relational structures (at least in the middle social strata and in urban areas) with those observed in Western countries? Beyond that, how are the characteristics of the networks linked to the social situations of the respondents (gender, age, level of education, etc.)? The article is based on an original survey of a population of 113 urban middle classes residents in Chongqing in 2014-15 by adapting the name generator method that was used in San Francisco and Toulouse (Michel Grossetti, 2007, "Are French networks different?", *Social Networks*, Vol. 29, no3, pp. 391-404.). Chongqing residents' personal networks has been analyzed in terms of the size of the network, its density, and composition, forms of homophily, multiplexity, social support, spatial dimension, and evolution over time relationships. In-depth interviews were conducted to understand how respondents respond to this type of questionnaire and choose their answers. The results show that the international comparison of personal networks can be carried out using this type of method because we find trends already identified in the studies carried out in San Francisco and Toulouse and the numerical indicators are in similar orders of magnitude. The results of the Chongqing survey are sufficiently consistent with the surveys taken as an example to convince about the feasibility of these comparisons. However, these results also show differences. In Chongqing, respondents did not cite more family members than in other surveys, but they cited them as a priority for most questions. While education is the factor that best accounts for the variation in the size of personal networks in the San Francisco and Toulouse surveys, occupation and income are more significant in Chongqing. Despite the small sample size, this study provides a preliminary understanding of personal networks in China. It provides a solid basis for a larger investigation in the years to come.

Title: Resource generator in comparative perspective

Paper ID: 207

Authors: Dominique Joye (University of Lausanne), Marlène Sapin (NCCR Lives and FORS), Christof Wolf (GESIS)

Abstract:

In the classical set of tools in the research about ego-centered networks in large surveys, resource generator is commonly used, in addition to position or name generator. However, different formats of questions have been used in this line of research, implying different consequences in terms of measurement and use. For example, the ISSP, in 1985 and 2001 focused on the availability and providers of support in the case of a short set of situations, using a long list of categories of persons or institutions, with a first and second choice format. An alternative instrument was proposed among other by Van der Gaag in a Dutch study was adapted among other countries in UK and Japan. In this format, a longer set of situations (typically between 10 and 20) is presented with a shorter list of people, from family to acquaintances through friends, possess this resource or would be provide this kind of support. Another variation, inspired from these two sources, could be to ask if the resources comes from persons or institutions in a more balanced format, opening the analysis to the interplay between social capital and other resources in a comparative perspective.

The ISSP 2017 is dedicated to a new module on social networks and social resources, including position and resource generators. The development of this module was an occasion to think about and evaluate the most efficient way to measure resource generator instruments in large general social surveys. We tested several instrument, in an experimental survey in Switzerland with more than one thousand of respondents as well during the pretest with several thousands of respondents in 9 countries covering 4 continents.

This presentation will show the properties of measurement of different instrument formats, exploring their dimensionality and their explanatory potentiality in different social contexts, which helped us to draft the final version of the questionnaire adopted for the ISSP 2017.

Title: The Role of Social Networks in Providing Social Support to Resettled Female Refugees During Pregnancy in the United States

Paper ID: 209

Authors: Diana M. Kingsbury (Kent State University)

Abstract:

According to the United Nations High Commissioner for Refugees (UNHCR), a refugee is an individual who “owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion, is outside the country of his nationality and is unable or owing to such fear, is unwilling to avail himself of the protection of that country”. Recent reports conclude that the world is experiencing the highest level of displacement on record. In 2014, the number of refugees worldwide totaled 19.5 million, nearly 25% of whom were women of reproductive age. Female refugees often face vulnerabilities that may significantly impact their quality of life across the spectrum of their experience – from fleeing their homelands to their resettlement. Addressing trauma, increased risk for sexual and physical violence, receiving adequate pre- and post-natal care, obtaining screenings for breast and cervical cancer, and accessing mental health care are among the most pressing needs identified within this population. In considering the health needs of refugee women resettled in the United States, of particular concern to this study are those related to pregnancy and the delivery of healthy infants. Previous research has identified social networks and the provision of social support before, during, and after pregnancy as important to the health and well-being of both the mother and the baby. This paper considers the role social networks play in providing social support to resettled Bhutanese refugee women during their pregnancies in the United States. A total of 45 women were interviewed to determine the size of their personal networks during pregnancy, the demographic characteristics of the alters they named, and a qualitative description of how connected the women perceived their new communities to be. Social support scores for each participant were also calculated using the Norbeck Social Support Questionnaire (NSSQ), a scale that measures perceived social support (both affective and tangible) using a network perspective. On average, participants reported a personal network of about 3.09 people. Husbands, sisters, and sisters-in-law were most commonly identified as important sources of support. Social support scores ranged from 23 to 107, with an average score of 58.71. Participants reported homogeneous networks that were almost entirely comprised of ethnic Nepali or Bhutanese alters. Participants perceived their networks to be supportive during pregnancy, particularly in the provision of advice, tangible assistance within the household, and practical matters related to pregnancy (such as providing transportation to appointments). Findings from this study may assist in the development of future interventions, programs, and policies aimed at improving the pregnancy experiences of resettled refugee women by utilizing a social network approach.

Title: A Study on the Strike Strategy of MLM Organization Based on Multiplex Nature

Paper ID: 210

Authors: Pi-hu Feng (College of Information System and Management, National University of Defense Technology, Changsha, China), Duo-yong Sun (College of Information System and Management, National University of Defense Technology, Changsha, China), Ze Li (College of I

Abstract:

The use of the social networks to study organized crime is a popular and effective methods. In this paper, we combine Andrew V. Papachristos et al. and David A. Bright et al. methods, and conduct a quantitative and qualitative study on a kind of MLM network. A new dismantling method based on multiplex nature of MLM networks is proposed, which is difference from the methods of single index or simple multi-index fusion in a single network. It combines the capital network, interpersonal relationship network and communication network together, and use a new multi-index fusion method to research. The experimental data show that this method has better results.

Title: Leveraging Social Network to Legitimize the Sharing Economy

Paper ID: 211

Authors: Yong Lin, Petros Ieromonachou, Ke Rong, Jing Luo

Abstract:

Along with the fast growth of the sharing economy, many emerging businesses (such as Uber for ride-share, Airbnb for room-share, and Upwork for skill-share) are in a contradictory situation that fast development with critical challenges. For example, those businesses themselves sometimes against the local laws and regulations in some countries. This paper aims to explore how sharing economy legitimize itself, by leveraging the social network identified in this research.

We found that the fast growth of the sharing economy is based on a huge scope of social network consisting of government, suppliers, customers, payment providers. The research results demonstrated that social network as a resource pool playing a very important role to facilitate the development the emerging business.

Taking Uber and Didi as case study and with a business ecosystem perspective, this research identified three levels of social network contributing to the success of the sharing economy, which includes authority-based social network, crowd-based social network, and competitor-based social network. Through mapping the development of both Uber and Didi, this paper identified a three-stage model before reaching legitimization, those three stages are differentiation, competition, and co-opetition. Moreover, the research results identified the capabilities and strategies of leveraging social networks to facilitate the legitimization process.

Title: Network autocorrelation modeling: Bayesian approaches for estimating and testing multiple network autocorrelations

Paper ID: 212

Authors: Dino Dittrich (Tilburg University), Roger Leenders (Tilburg University), Joris Mulder (Tilburg University)

Abstract:

The network autocorrelation model has been the workhorse for estimating and testing the strength of theories of social influence in a given network. In many social network studies, different types of social influence are likely to be present simultaneously, such as homophily and structural equivalence. In this setting, researchers often have expectations about the order regarding the strengths of such different influence regimes which can be modeled using various connectivity matrices and network autocorrelations. However, currently available methods cannot be adequately used for testing a specific order of relative importance of social influence in a network. In this talk, we present new Bayesian techniques for estimation and hypothesis testing in the network autocorrelation model with multiple network autocorrelations and connectivity matrices. First, we propose computationally efficient techniques for Bayesian estimation of such a model. Second, we introduce Bayes factors for testing precise and order hypotheses for the network autocorrelation parameters. In contrast to classical testing procedures, these Bayesian tests provide means for quantifying the relative evidence in the data in favor of a null hypothesis of no network effects and they allow researchers to simultaneously test multiple order hypotheses against one another. We illustrate our methods by using a burnout data set where we explore how health care workers influence each other's development of burnout across different types of professional affiliation.

Title: Community Detection under Exponential Random Graph Model: A Metaheuristic Approach

Paper ID: 213

Authors: Tai-Chi Wang, Frederick Kin Hing Phoa

Abstract:

Community is one of the most important features in social networks. Although many algorithms are developed for detecting communities, most of them hit the computational ceiling when a large-scale network is dealt. The nature-inspired metaheuristic algorithm is a potential solver for optimizing a target function. Its parallel computing architecture improves the computing efficiency for large-scale network analysis. This study proposes a novel swarm intelligence algorithm to detect communities. A new criterion, derived from the exponential random graph model with two communities, is proposed to construct hierarchical communities. It helps to detect the most significant community throughout the whole network, and to develop a test on constructing a hierarchy of communities. The feasibility and the detection accuracy of our algorithm are verified by the simulation studies, and this method is demonstrated via some famous networks.

Title: Applying Bayesian inference for ERGM to a large multilevel criminal network

Paper ID: 214

Authors: Johan Koskinen (University of Manchester), James Coutinho (Swinburne University of Technology), and Andrew Wright (Criminal Intelligence Service Alberta)

Abstract:

We consider inferring the structural properties of a network of 3137 suspected criminals, with affiliations in a set of 188 criminal organisations and where a multitude of personal relations have been elicited by experts in the field. This serves as the empirical context for exploring how to scale up Bayesian inference for Exponential random graph (ERG) models without compromising with the aim of capturing the key data-generating processes. We draw on the results of Snijders (2010) to decompose the larger network in to a collection of independent component ERG models. This allows for conditional parallelisable Bayesian computation that scales with the number of components rather than quadratically in the number of nodes. Inference is performed using the standard Bayesian MCMC approach with only some minor additional modifications to satisfy the constraints of the design.

Title: Efficient MCMC Estimation for Exponential Random Graph Models

Paper ID: 216

Authors: Maksym Byshkin(Università della Svizzera italiana), Alex Stivala(University of Melbourne), Antonietta Mira(Università della Svizzera italiana), Garry Robins (University of Melbourne), Alessandro Lomi(Università della Svizzera italiana, University of Melbo

Abstract:

Exponential Random Graph Models (ERGMs) are widely applicable to network analysis and they provide a particularly flexible framework to model explicitly structural features that are typical of social networks. The scope of ERGMs is limited by the fact that direct statistical inference (that is, inference that does not rely on sampling techniques) based on such models remains unfeasible for networks with more than a few thousand nodes. Consequently, ERGMs cannot yet be estimated for a broad variety of social networks that are becoming increasingly available and that may be of empirical interest. Direct computational statistical inference approaches rely on iterative methods that attempt to maximize the likelihood by carrying out repeated MCMC operations to draw networks from a large number of different probability distributions. We propose a much less computationally expensive approach, and we show that it outperforms the existing methods by several orders of magnitude. We construct an adaptive MCMC algorithm that estimates the parameters of ERGMs. The algorithm is first tested on small networks, and then applied successfully to the study of large-scale social and biological networks. The implications of the new approach for future studies based on ERGMs are discussed.

We acknowledge the financial support granted by the Swiss Platform from Advanced Scientific Computing (PASC - <http://www.pasc-ch.org/>) to the project: “Snowball sampling and conditional estimation for exponential random graph models for large networks in high performance computing.”

Title: Duality of Social Selection and Social Influence - ERGMs for network dynamics

Paper ID: 219

Authors: Peng Wang (Swinburne University of Technology), Johan Koskinen (The University of Manchester), Dean Lussher (Swinburne University of Technology), Garry Robins (The University of Melbourne)

Abstract:

Built on the interdependent nature of network activities and individual outcomes, we combine and extend the features Exponential Random Graph Models and Autologistic Actor Attribute Models into a modelling framework where both network structure and individual outcomes are modelled together. The co-modelling of attributes and structure are further extended to the analysis of longitudinal panelled data that captures the co-evolution process. The proposed models eliminate presumptions of whether social selection or influence processes dominates a given social context by combining social selection and social influence processes into a unified model. A generalizable data structure representing both networks and nodal attributes is presented. The proposed model specifications are demonstrated with simulation studies, including higher order configurations beyond dyadic effects that may alleviate model degeneracy. The empirical modelling examples illustrate the power and flexibility of the modelling framework and its empirical and theoretical implications.

Title: Sensitivity analysis for biases in network observations

Paper ID: 220

Authors: Ran Xu (Virginia Tech)

Abstract:

Though much progress has been made in modeling social network data, the validity of the network observations is still relatively a blind spot in available methods for social network analysis (Steglich et al., 2010; Moffitt, 2001). Most or all currently available statistical analysis methods assume that network observations are perfectly accurate and fully representative, while we know that social network data are sometimes unreliable and prone to error, especially network relations (Marsden, 1990; 2005). And this lack of validity in network observations is not just a result of simple random measurement errors, but often due to systematic bias that can lead to the misinterpretation of actors' preferences for network selections, which have a substantial impact on issues related to causal inferences. As a consequence, these misinterpretations that are manifest in observed networks could directly decrease the validity of the study and limit the inference we can draw from the data, such as those pertaining to inferences of contagion effects.

In this paper we explore a sensitivity analysis framework (Rosenbaum & Rubin, 1983; Frank et al., 2013; VanderWeele, 2011) for making inferences under the concerns of lack of validity in social network relations. First we will discuss the misinterpretation of actors' preferences that are manifest in observed network relations, and introduce the idea of simulation-based sensitivity analysis through the rewiring of observed network relations; and then we will talk about different mechanisms for rewiring; after that we will apply our proposed methods to test the robustness of inferences for contagion effects and give specific examples; finally we will derive a set of analytical solutions for random, homophily and anti-homophily based sensitivity analysis methods.

Together these proposed methods provide useful empirical tools that allow us to test the robustness of our inferences to biases and errors in network observations.

Title: Combining decision by sampling and Schelling model: The effect of within – group network on segregation generation

Paper ID: 221

Authors: YE Han-zhang (The Chinese University of Hong Kong), CHIANG Yen-sheng (The Chinese University of Hong Kong)

Abstract:

Built on the famous Schelling’s model of segregation, this paper examines the effect of same – group interpersonal network on segregation. Advancement from cognitive psychology shows us that people construct their perception of the society based on his/her observation of others, which is called decision by sampling. This paper introduces this decision rule into the model that agent observe the members in the same group to determine whether he/she is surrounded by “too many” members of the other group. The effect of different in – group network typologies will be presented with agent – based models.

Title: A New and Efficient Tool on the Measurement of Network Spread

Paper ID: 222

Authors: Yuan-Lung Lin (Academia Sinica, Taiwan), Frederick Kin Hing Phoa (Academia Sinica, Taiwan)

Abstract:

The growth of social networks, in combination with the increasing sophistication of big data tools, has led to a burgeoning interest in a rich understanding of relationships among people, institutions, and more. A relevant setting for such a study is graph theory, together with its random counterpart. Many graph models have been employed to investigate in the clusters of nodes. Based on structure and attributes of a network, the centralities, such as degree, betweenness, eigenvector, and closeness, are key measures on the importance of the nodes with respect to all nodes. However, there is no centrality describing the information spread within a network. In this work, we propose a new and efficient measurement, domination centrality, which combines the advantages of known methodologies without their drawbacks. Besides, an new algorithm based on domination centrality is proposed for the search of important nodes with effective spreading. We derive some theoretical methodologies that help in avoiding exhaustive computations.

Title: Weak Ties Lacking Strength: A Case Study of Self-Employed African Businessmen in Guangzhou, China

Paper ID: 225

Authors: Di Shao

Abstract:

Granovetter's influential hypothesis regarding the strength of weak ties (SWT) has inspired a large number of follow-up studies in different fields. However, the previous literature has provided scant reflection on the SWT's primary assumption itself. A brief review shows that only a few related works have considered the varying importance of information to its holder, or have been conducted in settings of relatively high competitiveness and specialization. Thus the question emerges: Are weak ties still effective for diffusing information of high importance in such settings? Drawing on a case study of self-employed African businessmen in Guangzhou, China, this study tries to fill this gap. It finds that in a highly competitive and specialized setting, disclosing information that is crucial to one's business interests requires a high level of trust. As a result, valuable business information is primarily diffused through strong ties within a field and in contrast, weak ties become channels typically used for redundant and less valuable information. Complicating the conventional understanding of the SWT, this study suggests that the setting and heterogeneity of information also matters in studying information sharing through social ties.

Title: Using Complex Numbers in Social Network Analysis: A Proposal of a Centrality Score for Digraphs

Paper ID: 228

Authors: Keita Sugihara

Abstract:

In this presentation, the presenter proposes to use complex numbers in order to define a centrality score for an (at least weakly connected) digraph. The centrality score is based on eigenvector centrality for an (undirected) graph.

First, the presenter looks at eigenvector centrality for a graph. Eigenvector centrality of a graph is defined as the eigenvector with the largest eigenvalue of the adjacency matrix of the graph. Then, the presenter focuses on the question of why eigenvector centrality is only used for a graph and not for a digraph. The presenter mentions the following as one of the reasons. In the case of a graph, its adjacency matrix is always symmetric, and because the eigenvalues of a symmetric matrix with real numbers are always real numbers, we can always find out the largest eigenvalue of the adjacency matrix of the graph. In case of a digraph, however, its adjacency matrix is not necessary symmetric, and because the eigenvalues of a non-symmetric matrix may have both of a real number eigenvalue and an imaginary number eigenvalue, we can't find out the largest eigenvalue of the adjacency matrix of the digraph. Considering the absolute values of the eigenvalues doesn't work. Therefore, applying eigenvector centrality on a digraph is difficult.

Second, the presenter shows that in mathematics a mathematician introduces the Hermitian adjacency matrix for a digraph to study the spectra of the digraph. The Hermitian adjacency matrix is a Hermitian matrix. The presenter suggests that we can utilize the Hermitian adjacency matrix with the aim of defining a centrality score for a digraph based on eigenvector centrality because the eigenvalues of a Hermitian matrix are always real numbers. To explain a Hermitian matrix, the transpose and the conjugate of a matrix will be discussed.

Third, the presenter introduces the Hermitian adjacency matrix. Guo defines the matrix using the imaginary unit i (the square root of -1) as follows. For a digraph $X=(V,E)$, the Hermitian adjacency matrix H is the matrix with entries $H_{uv} = 1$ if uv and vu are in E , i if uv is in E and vu is not in E , $-i$ if uv is not in E and vu is in E , and 0 otherwise.

Fourth, the presenter proposes hermite centrality score for a digraph. Using the Hermitian adjacency matrix, the difficulty experienced by applying eigenvector centrality on a digraph can be avoided. The presenter defines hermite centrality score of a node of a digraph as the absolute value of the corresponding element of the eigenvector of the largest eigenvalue in absolute from the Hermitian adjacency matrix of the digraph. If the largest eigenvalue in magnitude corresponds to both of a positive and a negative eigenvalues, hermite centrality score is defined using the eigenvector of the positive eigenvalue.

Fifth, the presenter discusses about hermite centrality score pointing out the difference of the score from out-degree centrality score, in-degree centrality score, closeness centrality score, and betweenness centrality score for a digraph.

Finally, the presenter summarizes the presentation.

Title: Building relationships in science

Paper ID: 229

Authors: Luka Kronegger (University of Ljubljana), Anuška Ferligoj (University of Ljubljana), Franc Mali (University of Ljubljana)

Abstract:

Keywords: Co-authorship networks, Scientific collaboration, Network dynamics, SIENA, STERGM

From everyday personal experiences we know, that establishing relationship to someone is different process from maintaining relationship for a longer period. If we narrow our general experience to scientific community, do we recognise a certain collaborative connection to a fellow researcher as a one night stand?

Research collaboration is one of the fundamental principles of modern science. The collective nature of the research work in modern science represents the driving mechanism of contemporary scientific advancement. The study of scientific collaboration, of co-authorship networks, enables us to get new insights into the dynamics and structure of mechanisms; on one hand, for establishing, and on the other, for maintaining scientific collaborations. In this presentation we will introduce the study of factors that lead to the establishment or maintenance of ties in co-authorship networks.

The proposed analysis is based on the results of Ferligoj et al. (2016) and distinguishes between the creation and the maintenance of the co-authorship ties between the researchers.

Analysed co-authorship networks were generated from the Slovenian national bibliographic database (COBISS) and analysed with the available stochastic methods for modelling of network dynamics (RSiena, STERGM).

References: Ferligoj, A., Kronegger, L., Mali, F. et al. *Scientometrics* (2015) 104: 985. doi:10.1007/s11192-015-1585-7

Title: Attribute-based Network Measurements: Working with Overlapping Group Memberships

Paper ID: 230

Authors: Martin Everett (University of Manchester UK), Steve Borgatti (University of Kentucky)

Abstract:

Suppose you have a network of ties among individuals, along with their participation in various activities. If participation were mutually exclusive, you would have the simple situation of a single categorical variable that identifies which activity each node was associated with. We could, then, for example, look at the degree to which a node's alters belong to each category. We could also assess the overall heterogeneity of each person's alters with respect to these activities – are their friends split across many categories, or are most of their friends just one kind?

Consider now the possibility that each alter might be associated with multiple categories. For example, the categories may represent activities, and the alters may both play the piano and play tennis. The question is can we still calculate attribute-based measures such as the diversity of activities participated in by ego's alters?

The question has bearing on a number of related analyses. A staple of ego network analysis is the assessment of ego-alter similarity ie homophily. When choices are mutually exclusive, we can record node choices as categorical variables, and it is easy to construct measures of ego-alter similarity. For example, the simplest measure is the proportion homophilous: what proportion of ego's alters made the same choice as ego? But again, what if the choices are not mutually exclusive, and an alter (not to mention ego) could have made multiple choices? In this paper, we consider a general approach to adapting measures conceived for categorical variables (i.e., partitions) to the case where we have instead node-by-category indicator matrices, as in the case of participation in multiple activities. We look at the Blau index, E-I, Yules Q and G-F brokerage. In addition we look at a form of Burt's structural holes which takes account of associations to different categories.

Title: Network-Related Risk Factors for the Detection of Anogenital Human Papillomavirus in a Community Cohort of Adult Men Who Have Sex with Men in Taiwan

Paper ID: 231

Authors: Carol Strong (National Cheng Kung University, Tainan Taiwan), Zong-Rong Lee (Academia Sinica, Taipei TAIWAN), Ya-Lun Liang (National Cheng Kung University, Tainan TAIWAN), Yi-Fang Yu (National Cheng Kung University, Tainan TAIWAN), Huachun Zou (SunYat-Sen

Abstract:

Introduction:

The lifetime risk of getting anogenital human papillomavirus (HPV) infection among men is about 50% globally. Men-who-have-sex-with-men (MSM) is a population that does not benefit from a girls-centered HPV vaccination policy. Although no studies have examined the association between HPV and sexual networks in MSM, other sexually transmitted infections (STIs), especially HIV, have received much attention in the public health literature. In this study, we examined the associated network-related risk factors for the detection of anogenital HPV in MSM.

Methods:

A total of 253 MSM, 20 years of age and older were recruited from community health centers and saunas in Southern Taiwan in 2015-2016. At baseline, men completed a questionnaire. Anal and penile swabs were collected for HPV testing. Men were seen again at 6th month when they filled out a sexual network questionnaire and were screened for anal and penile HPV. HPV DNA testing and genotyping were performed to detect 37 HPV genotypes, including 21 high-risk types and 16 low-risk types.

For network analysis, an egocentric network data collection method was utilized. Participants were asked to provide nicknames of the last five persons with whom they had sex. Under each set of five names, participants were asked to report characteristics of sexual relationship and behavior with each network member, such as concurrency, types and frequency of sexual behavior, condom use during sex, and sex partner being HIV positive or not. Mean scores were calculated to represent the proportion or the level of the above risk factors within each ego-network. To determine ego's bridging status, we asked participants to report whether they think any two of their sex partners may have had sex before. We categorized bridging status into high, medium and low by calculating structural constraints. Constraint scores were calculated using igraph package in R, while Stata was used for the rest. Bivariate and multivariate probit regression analysis were conducted to identify network factors associated with HPV detection.

Results:

A total of 178 participants returned for the follow-up. A third of men (34.4%) had at least one HPV type detected, while 29.4% were detected at the anal site and 11.6% at the penile site. Multivariate analysis showed that detection of any type of HPV at the anal site of the ego is associated with high level of bridging with marginal significance. Detection of high-risk types of HPV at the anal site is associated with being bottom during anal sex with marginal significance.

People with low-risk types of HPV detection at the anal site were less likely to perceive his sex partners having sex partners other than himself (aOR=0.43, 95%CI=0.25-0.75), but more likely to report not knowing this person before he first had sex with him (aOR=1.94, 95%CI=1.11-3.39).

Discussion:

Sexual network related risk factors associated with the detection of HPV were identified. Not all of the network factors were consistent with those associated with HIV or other STIs, which may be a result of the often neglected and asymptomatic nature of HPV infection in men.

Title: Statistical adjustment of network degree in respondent-driven sampling by individual-venue attendance information

Paper ID: 235

Authors: Ming Cao (University of Texas School of Public Health), Kayo Fujimoto (University of Texas School of Public Health), John Schneider (University of Chicago Medicine)

Abstract:

Respondent-driven sampling (RDS) is widely used to sample hard-to-reach populations, such as men who have sex with men (MSM), and to estimate the prevalence of disease and risk/protective behaviors. Existing RDS estimators, such as the Volz-Heckathorn estimator (RDS-II) and Gile's Sequential Sampling estimator (RDS-SS), approximate the probabilistic sampling frame based on the social network degree (i.e., how many contacts a respondent has). The validity of RDS heavily depends on the assumption that the measurement of network degree is accurate. However, in practice the degree is self-reported, which may yield recall bias. For instance, when asked "how many men who have sex with men (MSM) do you know in the city", it is not uncommon to find answers that may be outliers (e.g. 1000). Since those numbers are used as the inverse weights for computing estimators, samples may be lost if the normal range is only around dozens.

We propose a statistical approach to adjusting self-reported degree by using venue affiliation data to infer network degree, using information on frequencies of individuals' venue attendance. Resulting model-adjusted degree has a less skewed distribution, because venue attendance tends to be a strong predictor pulls back extreme self-reported numbers to a reasonable level among a young MSM population. Then, this new venue-based degree measure can be fed into RDS estimators that yield a higher efficiency (smaller variance) compared to self-report. Rationale supporting this approach is that recruitment is productive when young MSM meet sex partners at social and public cruising venues, i.e., MSM with more frequent venue attendance tend to have more social contacts, and thus have a higher probability of peer recruitment.

However, co-attendance cannot be used directly as a two-mode network, since it is limited to the sampled subjects and we want a population measure. Therefore, we designed a statistical model as following: self-reported degree follows a Negative Binomial distribution with the (log transformed) expectation be equal to a linear combination of power weighted health and social venue visiting frequencies.

Data came from the Young Men's Affiliation Project (YMAP), a prospective cohort study of HIV risk and prevention among young MSM (YMSM). This study was conducted between December 2014 and June 2016, in Chicago, IL (N=373) and Houston, TX (N=356).

All the computer code, including estimation under the Generalized Linear Model setting and grid search of tuning parameters in terms of Root Mean Square Error, will be made public in R programming language.

Title: Solving the problem of ineffective subsidiary: the impact of intraorganizational networks

Paper ID: 237

Authors: Kuskova Valentina, Volkova Irina, Antonina Milekhina, Bludova Oksana (National Research University - Higher School of Economics, Moscow)

Abstract:

The problem of effective management of company subsidiaries has been on the forefront of strategic management research since early mid-1980s (Roth & Nigh, 1992; Gates & Egelhoff, 1986). Recently, special attention is being paid to the effect of headquarters-subsidiary conflicts on the company performance, especially in relation to the subsidiaries' resistance, both active and passive, to following the directives of the headquarters (e.g., Schotter & Beamish, 2011).

A large number of theoretical approaches have been used to explain the existence of intraorganizational conflicts. For example, Strutzenberger & Ambos (2013) examined a variety of ways to conceptualize a subsidiary, from an individual up to a network level. The network conceptualization, at present, is the only approach that could allow explaining the dissimilarity of the subsidiaries' responses to headquarters' directives, given the same or very similar distribution of financial and other resources, administrative support from the head office to subsidiaries, and levels of subsidiary integration. This is because social relationships between different actors inside the organization, the strength of ties and the size of networks, as well as other characteristics, could be the explanatory variables that researchers have been looking for in their quest to resolve varying degrees of responsiveness of subsidiaries, and – in fact – headquarters' approaches – to working with subsidiaries.

The purpose of this study is to evaluate the variety of characteristics of networks formed between actors in headquarters and subsidiaries, and their effects on a variety of performance indicators of subsidiaries, as well as subsidiary-headquarters conflicts. Data is being collected in two waves at a major Russian company with over 200,000 employees and several subsidiaries throughout the country.

Title: MAPPING THE COMMUNITY OF NETWORK RESEARCHERS IN RUSSIA: STRUCTURE AND THEMATIC AGENDA

Paper ID: 238

Authors: Daria Maltseva (International Laboratory for Applied Network Research, Higher School of Economics, Moscow, Russia)

Abstract:

The direction of network studies in Russia is quite a new form of a research methodology. However, in recent years we can observe the growing number of scientists who implement the instruments of Social Network Analysis into their studies in different disciplines, such as sociology, economy, political studies, management, etc. The procedure of mapping this emerging community of Russian network researchers is not only important from epistemological point of view, but also has practical meaning as it can show the main active clusters and main groups of knowledge exchange and potentially could help to increase the possibility of scientists' cooperation.

We study structure of the research community of Russian scientists involved into network research by the citation (references) analysis of the articles devoted to network topics published in Russian scientific journals. We use data from the electronic library of Russian-language scientific periodicals eLibrary.ru, which contains more than 3800 journals. On the first step, using the key words corresponding to network studies, the data set of more than 11 000 articles was collected. On the second step, we collected all the references that were mentioned in the bibliography lists at the initial articles.

The analysis of the collected data allows us to build networks of references in Russian network researchers' community (both from Russian to Russian and from Russian to foreign scientists) – i.e., the field's structure, - as well as to map the thematic agenda of network studies in Russia.

Presenting the data on the scientific field's development, this study contributes to the studies in the field of sociology of science, as well as to the studies focused on the SNA development in different national scientific traditions.

Title: Modelling the Impact of Mass Protests of 2010s on Political Change (by using Data Envelopment and Social Network Analysis)

Paper ID: 239

Authors: Dmitry Zaytsev (National Research University Higher School of Economics), Margarita Erofeeva (National Research University Higher School of Economics)

Abstract:

An analysis of Mass protests of 2010s shows the non-linear nature of the political changes and the different roles that the protest publics could play in the mechanism of political changes: the triggers of the democratic development; democratic innovators in authoritarian environment; watchdogs raising concerns about quality of democracy, et cetera - depending on the prevailing conditions and the actions of other actors. Authors raise research questions of modelling the mechanisms of political changes in the conditions of the growing wave of democratization - in embedded democracies, as well as in consolidated democracies, in hybrid and authoritarian regimes, - on the one hand, and the crisis of traditional democratic institutions - representative democracy, political parties - on the other.

In this paper proposed models of protests publics' impact in the mechanism of political change will be tested by Data Envelopment Analysis (DEA). Results build on outcomes of will allow the authors to use Social Network Analysis to test models, received from qualitative analysis.

Title: Regional migration in Russia from a network perspective: identifying key migration flows between regions

Paper ID: 241

Authors: Elena Artyukhova (National Research University Higher School of Economics), Galina Gradoselskaya (National Research University Higher School of Economics)

Abstract:

In this study, we analyze patterns of intra-country regional migration through a network perspective. Using network analysis, we study structures and properties of interregional migration networks, and their evolution over time. Although migration flows could be perfectly represented as a network, there is still a deficiency of empirical studies analyzing patterns of migration using a network analysis. Thus, topologies of migration networks as well as their evolution over time remain poorly understood. To realize our study, we introduce regional migration networks where regions represent nodes and between-regional migration flows correspond to weighted directed arcs. Because of the structure of the data, we have complete weighted directed networks where all nodes are interconnected. These networks do not allow capturing the pattern of regional migration in full details. To overcome this problem, we use methods of reducing weighted complete networks. Mainly, we test and compare the minimum spanning tree algorithm and algorithm of sequential cutting of weak ties. After applying the algorithm, we transform resulting networks to their binary projections. This strategy corresponds to recent findings, which claim what the characteristics of a network, calculated on its binary projection can be even more informative rather than these characteristics calculated on an initial weighted network.

Title: Intra-organizational networks in project-based organizations: communication networks as a key to success

Paper ID: 243

Authors: Ivan Kuznetsov

Abstract:

Every organization is a network structure, designed for successful solving of its needs through cooperation of individuals (Kadushin, 2012), especially project-based ones. The only way to cooperate is to communicate. Since communicating is not optional, the opening of communication channels for the information to flow in the right directions is critical for the organization's performance as well as the morale of employees (Sinickas 2001).

With increase of project-based organizations in past years a lot of issues arise too. Project based structure could be a tough thing to manage. Employees should communicate both inside and outside of the project team, sometimes individual cannot differentiate their team co-members, there is huge massive of information flowing, etc. So they form informal communication networks to build more effective way to solve arising issues. Of course, it is the managers' responsibility to handle and administer the communication process and a privilege to inspire more constructive interactions. This could possibly lead to slight improvements, but often cause distraction, overload, poor quality and quantity of information with further negative results for successful task implementation.

This paper is an attempt to untie the knot of nets in organizations at the junction of human and project management literature with help of social network analysis. Its focus lies between communication networks and their effect on successful project implementation. In this paper examined such communicational networks as: workflow; employee voice; advice; problem solving; deficiency of contact; conflict; communication distortion. We past that networks are differ both in structure and in its effect on employees perceived efficiency.

The research is conducted in mid-sized Moscow project-oriented organizations 2016-2017.

Title: Scientific Community of Russian Sociologists: Network Analysis of Biographical Interviews

Paper ID: 244

Authors: Stanislav Moiseev (International Laboratory for Applied Network Research, Higher School of Economics), Daria Maltseva (International Laboratory for Applied Network Research, Higher School of Economics)

Abstract:

Contemporary studies of science and scientific knowledge consider scientific communities through the prism of different concepts such as “scientific field”, “collaboration network”, “invisible college”, which emphasize the social nature of scientific cooperation. It is quite difficult to uncover existing formal or informal ties between scientists directly (i.e. to confirm its presence in communication with involved subjects), that is why such studies are usually based on the use of indirect indicators -- joint publications or projects, participation in conferences.

In this study, we attempt to consider the process of tie formation on the basis of information received from the scientists themselves. The empirical base of the study is a dataset of biographical interviews collected in the project of Boris Doktorov, which is aimed to the analysis of the history of Russian sociology. On the current stage of the project this dataset includes more than 140 interviews with Soviet and Russian sociologists. In the future, it can be supplemented by data from other sources, containing biographical data.

The main purpose of the study is to reconstruct networks of interactions between the key figures of the Soviet and Russian sociology. The study will examine the different types of formal and informal networks (for example, based on ties between colleagues, friends, teachers and students). This will provide an additional basis for the allocation of generations of Russian sociologists, and will help us to trace the history of the development of sociology in the USSR and Russia.

Additional methodological purposes of the study are to develop procedures of transferring data from biographical interviews to a form suitable for network analysis and to test opportunities and constraints of the BORIS (Biography Oriented Research Information System) program for the analysis of biographical interviews.

Our project contributes to the studies devoted to the analysis of the collaboration networks between scientists and complements studies of the community of Russian sociologists and its history conducted by other authors.

Title: Spread of information in Political Discourse Networks

Paper ID: 245

Authors: Tamara Shcheglova (NRU Higher School of Economics), Galina Gradoselskaya (NRU Higher School of Economics), Ilya Karpov (NRU Higher School of Economics)

Abstract:

Nowadays mass media have a great influence in shaping people's ideas. Internet communication plays a special role in this process due to its availability, possibility of anonymity and speed of information dissemination. However, some ideas do not find a large response from internet users, while others are viral in nature and spread with a high speed. In our research, we characterise a distribution of certain ideas on the Web by the concept of "information wave". A difference between this concept and simple information spread is that information waves have a social nature of an origin. Information on socio-political topics is often a newsbreak for publication and dissemination. It is clearly seen during an election period when political parties and political figures are at the peak of information confrontation. In this period, false or defamatory information could enter in the cycle of information flows, that may harm political stability in the country and sow disorders in society. In this research, we analyse users of two social networks (Facebook, Vkontakte), who participate in spreading posts on the subject of Duma elections 2016 in Russia. We combine quantitative and qualitative approaches to data analysis to obtain the best results. The analysis shows that a core set of actors, spreading posts in social networks, is about the same from wave to wave. And it is possible to classify actors by their role: authors of the posts; those, who make reposts; those, who make reposts and write comments, those, who rewrites original posts. It helps to understand the direction in which the posts are distributed on social networks. Knowing the key actors and their roles, who spread socio-political information in social networks and the structure of information dissemination can help both: political parties and individual users, who read news in social networks. The former can build a strategy for work with social networks, which is particularly important on the eve of the presidential elections in Russia in 2018. And the latter can filter the information they receive from media.

Title: PERSONALITY TRAITS BEHIND THE MUTUAL FORMATION OF POLITICAL ATTITUDES AND SOCIAL RELATIONSHIPS

Paper ID: 246

Authors: Yana Maria Priestley, George Beknazar-Yuzbashev

Abstract:

The factors of political attitudes formation and its' eventual change is not a novel problem, but a vibrant one – the development of statistical methods allows to access the diversity of data types and attempt to untangle new complex research problems. Social network analysis provided political science with the possibility to consider social relationships and its structure in the investigation of various topics – political mobilization, protest movements, electoral behavior, political attitudes formation, etc.

Regarding the problem of political attitudes development there are two aspects of interest – influence of social milieu on political views and social selection based on political attitudes similarity. Both problems were examined by political scientists and social psychologists multiple times and the results were contradictory: some of them claimed that there is an evidence that social environment affects the political attitudes and it also appears as a foundation of future communication, when others weren't able to provide a support for such suggestions and took the opposite position. Such a controversy raises a question – are there some underlying factors that could mediate the relationship between these variables of interest?

In the present study the personality factors are hypothesized to affect the association between political attitudes and individuals' social networks – its existence and characteristics. Numerous studies were devoted to investigation of relationship between personality and political attitudes, and recent studies started to examine the association between social relationships and personality traits. Such body of knowledge allows us to put forward the aforementioned suggestion.

In our previous studies devoted to the mentioned problem of coevolution of political attitudes and social relationships we attempted to capture the complexity of attitudes and constructed the multifactor model that was confirmed empirically. We used the Mehrabian's (1996) scale of Libertarianism-Totalitarianism to avoid the discrepancy of interpreting of liberal and conservative labels by the Russian sample. Obtained with confirmatory factor analysis factors covered issues of government interference to social and economic policy, business, morality promotion and corruption.

In the present study we are going to follow this approach again, analyzing the possible association between personality factors, social networks parameters and political attitudes factors in their multiplex nature. We are using structural equation modeling with moderation and mediation for deep investigation of this triangle of associations. Personality traits are reflected by the Big-5 model and social relationships are measured as social networks of contacts between individuals. The sample will contain of 100-150 first-year students of several different faculties – partly from social sciences and partly from more technical specialties. The sample of freshmen

allows to analyze their networks from the point of its emergence and capture the social influence on attitudes more precisely. Previously we focused only on the political science students, so at the present study we also would like to look at the possible variation of relationship of interest between among types of specializations.

Title: Social Capital and Self-reported Health Status in Nursing Homes: An Empirical Study

Paper ID: 247

Authors: Anđelija Arandelović (Department of Public Health, Università Cattolica del Sacro Cuore, Rome, Italy), Daniele Mascia (Department of Management, Università di Bologna, Italy), Gianfranco Damiani (Department of Public Health, Università Cattolica del Sacro

Abstract:

Elderly people in long term care programs are forced to build new social relations after moving to geriatric centers, which in turn can have an impact on the state of their health conditions. Informal providers of social support play an important role in supporting this vulnerable group of individuals, encompassed by complex health conditions and social needs. The aim of the study is to analyze how patients' social network structure in a geriatric center affects their self-reported health status and conditions. We investigate two different types of network ties, namely friendship network and disease management exchange network, and derive some important social capital measures. This study relies on a cross-sectional survey administered in September 2016 in a nursing home in south Serbia. The questionnaire was aimed at collecting a number of information on patients, asking individuals to identify for each type of network other individuals to whom they were tied within the center. 135 individuals completely filled the questionnaire, with a response rate of 80% of the overall target sample. Semi-structured interviews were conducted with patients, administrators and other health care professionals from the nursing home in order to complement and enrich our quantitative analysis. A number of individual attributes and contextual data were collected from the surveys and administrative data. Ordered logistic regression analysis was performed. Our findings document that a better self-reported health status is associated to a greater friendship network constraint. However, the results were not the same for the disease management exchange network. These findings demonstrate that the impact of social networks on health conditions as self-reported may differ based on different kind of network ties, and that understanding different profiles of needs for social activities should be considered for planning long term care programs. A replication of the present study is planned in the near future in a nursing home in Austria.

Title: Personal networks, cognitive health and survival in late adulthood: Findings from the Longitudinal Aging Study Amsterdam

Paper ID: 249

Authors: Lea Ellwardt (University of Cologne)

Abstract:

Background: Research in epidemiology and gerontology has consistently shown that social integration is a determinant of health outcomes in general, and of age-related diseases in particular. I will outline how social integration, that is the embeddedness in personal networks of social relationships, has been argued to directly and indirectly facilitate wellbeing and buffer risk of functional decline in old age. Specifically, a distinction is made between functional (e.g., social support, loneliness) and structural (e.g., network size, role diversity) characteristics of personal networks that may contribute to healthy outcomes through different kinds of mechanisms. Furthermore, the role of kin versus non-kin networks is addressed.

Objective: The aim of the presented research is to investigate whether cognitive functioning and survival varies with diversity in older adults' personal networks.

Methods: Based on data from the Longitudinal Aging Study Amsterdam (LASA), I empirically studied the relationship between characteristics in the personal network and cognitive functioning and survival in a series of papers. Panel data comprised of seven waves between 1992 and 2013 of up to 2,911 Dutch respondents aged 54 to 85 at baseline. Analytical approaches included fixed effects models, Cox proportional hazard regression models and latent class analysis.

Results: Findings reveal stronger effects for structural than for functional characteristics in personal networks, independent of physical functioning and social confounders. Specifically, role diversity in networks exerted positive effects on maintaining cognitive functioning and odds of survival, although effects were generally small after adjustment for network size and health.

Conclusion: I suggest that a combination of functional and structural characteristics, together with an increased focus on non-kin networks, may be a more reliable protector of age-specific decline than a focus on single aspects of the network. The talk closes with suggestions for future avenues, also in light of upcoming societal challenges.

Title: Network Effects in Cardiac Rehab -- Empirics and Neural Networks

Paper ID: 250

Authors: Maksim Tsvetovat (Open Health Network)

Abstract:

Out of 750,000 heart attacks annually in the United States, almost a third are repeat heart attacks -- and these are most likely to be fatal as well. We know that adherence to a rehab regimen is critically important in the first few months following a heart attack, but, critically so, also is long-term lifestyle change starting from the day of hospital discharge. The lifestyle changes recommended by American Heart Association are simple and on the surface fairly obvious -- taking all medications as prescribed, eating healthy, stopping smoking, engaging in physical activity, watching blood pressure and cholesterol -- but in fact only 25% of heart attack patients adhere to this regimen after 6 months. Anecdotally, the critical determinant of long-term adherence is social support from family, peers and fellow patients.

Through a mobile app, we are now able to capture time-series data on how heart attack survivors interact and engage with their support community -- and link this engagement to daily health metrics including physical activity, blood pressure and changes in heart rate, as well as incidence of cardiac symptoms. In this presentation, we demonstrate effects of social support on daily lifestyle changes and cardiac rehab outcomes. We utilize an LSTM Neural Network to model interaction timeseries and predict whether adherence is likely to fall below a critical threshold.

Title: Networks in the Mind: Awakening Dormant Ties

Paper ID: 251

Authors: Bálint Diószegi (SKEMA Business School), Daniella Laureiro-Martínez (ETH Zurich), Stefano Brusoni (ETH Zurich)

Abstract:

Despite their value, making use of dormant ties is made difficult by our frequent inaptitude in recalling them. A key reason for this inaptitude lies in the pervasiveness of the recency heuristic. Whether the adverse effects of said heuristic may be overcome, and by whom, are the questions we ask in this study. To provide an answer, we implement a novel multistep methodology. We analyze the cognitive network activation patterns of 193 individuals to identify and understand differences in the ability to recall dormant ties. Our focus is on self-monitoring, which is characterized by attentiveness and adaptability to the current social context. We argue that high self-monitors are able to both collect resource-related information about their network, as well as to overcome cognitive heuristics by focusing more strongly on this information. As a result, dormant ties relevant to their agenda are less likely to elude them. Through these insights, we contribute to the recent stream of literature on the micro-foundations of social networks by showing how inter-individual differences affect people's ability to overcome their ingrained cognitive heuristics.

Title: Does peers affect individual performance beyond work? A social network perspective.

Paper ID: 253

Authors: Nobin Thomas (IIM Indore)

Abstract:

Social capital emphasises the fact that people become embedded in their interpersonal relationships (peers, co-workers, and friends) and relationships can bring them valuable information and useful skills. Though there are still unanswered questions about peer effects - who the most important peers are, the duration to which the peer effects remain active, and how peer effects outside work relate to the individual outcomes, scholars like Legewie and DiPrete (2011) have argued that peers matter because of the active learning involved in peer groups, how peers are seen as role models, and how they affect aspirations of the individual.

A deeper introspection is required to better understand how, whose and when peer effect leads to individual outcomes. We examine this from the context of an organization whose employees interact closely both at work and after work. The reason we take this approach is primarily because peers need not be directly related to the individual in the organizational chart and still can influence the individual both at work and after work. Specifically, we focus our attention on those employees who stay with peers. Since the subjects of our study are required to stay together during the period of data collection, we decided on management trainees undergoing induction training and whose performance is evaluated at short intervals. To our knowledge, this would be the first study to examine the peer effect at multiple levels from an emerging economy perspective and one among the few to study social capital outside work setting using social network analysis.

First, we explore whether peers outside work hours can affect a focal individual's performance. Second, our interest is in examining the increased effect of similar peers than different peers. Third, we focus on the duration of peer effects.

We start with the assumption that peers can have a strong influence on the focal individual even after work hours. The family backgrounds, values, orientations, etc that the peers come with can have a profound influence on the individual outcomes. We believe that peers can affect directly as well as indirectly. The individual's preferences, biases, aspirations, values, principles and beliefs can be affected by peers through an indirect route.

Our dependent variables, trainees' performance was measured at various points in time. At our training site, all the individuals take the same sessions in the same subjects in the three months duration. The independent variables in our case were the peer individuals' performance score.

Our study is expected to have implications for managers in understanding employee's relationship outside his or her work environment and how it significantly affects his or her performance.

Title: A Changing Landscape? An Intersectional Analysis of Race and Gender in Access to Social Capitals

Paper ID: 254

Authors: Song Yang, Brandon Jackson, Anna Zajicek

Abstract:

We use a nationally representative dataset to investigate race, gender, and differential access to social capitals. We define social capitals as resources controlled by the social contacts of individuals, who can mobilize those resources to facilitate their own actions. We characterize one's social capitals with three important indicators: the average occupational score of individual's social contacts (average), the highest occupational score among individual's contacts (reach), and the number of positions accessed (number). Our findings are surprising: although white men have highest average score in their social contacts, black women have highest reach, and highest number of positions accessed, net of effects from many mediating controls such as age, marital status, education, self-occupation score, and job characteristics. We discuss important implications of our research for future studies on social capitals.

Title: Social networks and its potential in creating social capital - a German case study

Paper ID: 255

Authors: Texier-Ast, Verena (University of Münster, Department of Geography)

Abstract:

Over the past two decades, the term 'social networks' has become a central way of describing the social contacts that a person has with other persons. Even though social networks increasingly occur in connection with digital networks of friends, they can also be deemed to play a significant role in the real world in the wake of planning and building activities associated with the creation of a social mix at a local level to counteract sociospatial division in contemporary cities. By providing buildings with a variety of structures as regards rents and owners at a local level, a physical proximity is created between different social groups in the population. The resulting local co-existence of different socio-economic groups would appear to be of benefit for socially disadvantaged population groups in particular, as these – due to a lack of financial means – can be classified as immobile in comparison with non-socially disadvantaged people from the middle, or even the upper, classes living in non-subsidized accommodation. In sum disadvantaged population groups could particularly benefit from the social capital of not disadvantaged population groups in the neighbourhood. Although therefore a social network sounds promising, the following question arises: Does a 'social mix' of different population groups foster the development of social networks for disadvantaged population groups and increase their social capital?

This question will be answered by presenting a social network analysis from a German case study – The Ackermannbogen in Munich/ Bavaria.

Title: Brain Connectivity and Social Network Embeddedness of Older Adults in South Korea

Paper ID: 256

Authors: Won-tak Joo (University of Wisconsin, Madison), Seyul Kwak (Seoul National University, South Korea), Jeanyung Chey (Seoul National University, South Korea), Yoosik Youm (Yonsei University, South Korea)

Abstract:

Social networks were known to provide cognitive reserve and alleviate the impact of brain diseases on cognitive function. Using cross-sectional data of resting-state fMRI and a global network of all older residents in Township K, South Korea, this study examined how social network size and social network embeddedness were associated with functional connectivity in the brain. While old age was associated with decreased functional connectivity in overall brain regions, social network embeddedness showed positive associations with functional connectivity between long-distance regions. Network Based Statistics showed strong evidence that social network embeddedness made a significant component-level change in functional connectivity, especially between frontal and occipital lobes.

Title: Solving the brokerage paradox: Trait homophily in triads, and the broker-in-between hypothesis

Paper ID: 257

Authors: Brian Rubineau (McGill University), Wyatt Taylor (University of Kentucky), Eric Gladstone (University of Kentucky), David Thompson (Community Solutions)

Abstract:

Brokerage requires an open triad: two unconnected actors indirectly connected via a broker. But open triads tend to close, and closed triads are broker-less. Solving this brokerage paradox requires identifying mechanisms that keep open triads open. This article posits homophily – that actor similarity facilitates connections, and its corollary – that dissimilarity inhibits connections, as a paradox-solving mechanism. This novel perspective yields the broker-in-between hypothesis. For traits exhibiting strong homophily, open triads with particular relative trait value patterns may be more likely to remain open. Specifically, open triads with indirectly-connected trait-dissimilar actors and a broker with a trait value between the two alters are more likely to remain open, and will be observed more frequently than chance. For traits not exhibiting strong homophily, this broker-in-between triad trait pattern is not expected to occur more frequently than chance. Our tests of the broker-in-between hypothesis using four distinct trait measures and workplace network data were fully supportive in both significant and null findings. Even actor traits that do not predict brokerage at the individual level can nonetheless predict brokerage at the triad level, given the presence of strong trait homophily. Implications for research on brokerage and trait-network relationships are discussed.

Title: Polarization in the Fracking Network: Applying Ideology Ecology Theory to Understand the Network Structure of Opposing Social Movements

Paper ID: 259

Authors: Aimei Yang (University of Southern California)

Abstract:

Organizations such as social movement organizations (SMOs) are infused with ideologies and are important agents that uphold and promote ideologies (Simons & Ingram, 2004). Recently, the digital space has become an increasingly important battle ground for SMOs with competing ideologies to advocate for their own causes and counter the arguments of adversaries. It is unclear, however, how SMOs' ideology niches may affect the structural patterns of their mutualistic networks (where relationships are defined by support) and denouncing networks (where relationships are defined by attack) in the virtual space.

According to ideology ecology theory (Minkoff 1999; Simons & Ingram 2004; Barnett & Woywode 2004;), SMOs may occupy different positions in ideology niches. Scholars have developed competing hypotheses about how ideological niches may affect organizations' interaction patterns. On the one hand, the ideological affinity position maintains that SMOs with overlapping ideologies are more likely to be sympathetic to one another and thus are more likely to develop mutualistic ties. On the other hand, the niche overlap thesis argues that ideological similarity increases the overlap among the resource profiles and thus increases denouncing ties among SMOs sharing similar ideologies.

To resolve the seemingly incompatible hypotheses, the current study proposes that SMOs' relationship building may also hinge upon other contingency factors such as shared resources or geographic similarities. Additionally, organizations' relationship networks may alter in the face of salient rivals with opposite ideologies such as movements and counter-movements (Pozner & Rao, 2006). It is likely that when SMOs recognize the challenges brought about by counter-movements, their competitions are directed away from within-group and toward between-group. Finally, specialist and generalist SMOs may behave differently and demonstrate unique tie formation patterns due to their positions in ideology niches.

In order to examine how ideology niche affects SMOs' relationship networks, the current study draws upon organizational ecology theory, its recent development in ideology niche (Minkoff 1999; Simons & Ingram 2004; Barnett & Woywode 2004; Dobrev & Kim 2006), and sociological research on opposing social movements (Dixon, 2008; Meyer & Staggenborg, 1996) to propose several hypotheses that predict tie formation patterns. In the past, propositions derived from ideology ecology theory have mainly been tested with organizational attribute data to explain the creation, development, and perish of organization populations (Simons & Ingram, 2004). The current study represents an exploratory effort to apply ideology ecology theory to explain network patterns among populations of SMOs and thus expanding the scope of the theory to explain social network structure.

The study collected hyperlink network data and organizational attribute data of two groups of SMOs that either promote or protest against hydraulic fracturing (commonly known as fracking). Hyperlink data were further manually coded into two networks based on the context of hyperlinks: mutualistic networks and denouncing networks. Exponential random graph models (ERGMs) were used to model tie formation patterns in these two networks and test theory-driven hypotheses. Implications for theory development and SMO communication practices are presented in the end.

Title: Brokerage Roles and Strategic Locations within Twitter Networks of the Egyptian Revolution

Paper ID: 260

Authors: Deena Abul Fottouh (McMaster University, Canada)

Abstract:

The Egyptian revolution of 2011 has become an important case study for research on digital activism. Most of the research done on online mobilization for this revolution discusses the effectiveness of this mobilization and the leverage online tools present to activists, without empirically testing whether online mobilization reflects the offline world.

This research investigates the online brokers of the Egyptian revolution to test whether online mobilization reflects offline activism. It focuses on the Twitter network structures of Egyptian activists, identifying those who occupy strategic positions that connect activists of different ideological backgrounds. It then tests whether those online brokers correspond to activists who were brokers on the ground.

The research uses social movement theory of coalition building and social network theory of brokerage to examine the empirical case study of the Egyptian revolution at two different time periods that represent solidarity and schism in the Egyptian revolutionary movement. Using the analytical tools of social network analysis, the research reveals that, in compliance with social movement theory of coalition building, online brokers who connect the different ideological groups were more prevalent during periods of movement solidarity than schism. Moreover, using various network analysis measures of brokerage, the research demonstrates that those online brokers are not the same as on-the-ground brokers. Both realms play different activism roles and complement rather than mirror each other in advancing the revolutionary movement.

Title: Exploring networks generated by #repealthe8th

Paper ID: 262

Authors: Rajalakshmi Kanagavel (University College Dublin), Sara O'Sullivan (University College Dublin)

Abstract:

Directed links in social media platforms especially Twitter facilitate the flow of information from one user to another. Many global events manifest the significance of political influence taking place among Twitter users. In Ireland, Repeal The Eighth is a visible and divisive campaign which uses the hashtag #repealthe8th. This paper is an exploratory examination of networks of tweets containing this hashtag. We focus our analysis on networks constructed from twitter users mentioning or retweeting other users in their networks. The exploration of information flows or diffusion over twitter networks will address the question of who tweets, what is being tweeted and to whom the content is tweeted. From the Twitter public API, we collected ~20,000 tweets with the hashtag #repealthe8th during the month of December 2016. The main objectives of this paper are (i) to examine and visualize the embeddedness of the actors be it organizations or people in the twitter networks (ii) to determine the nature and development of network structures of twitter conversations on the topic. Due to the time ordered data collection process, path based measures such as reachability, closeness, connectivity and betweenness and other positional measures for example various types of centrality or structural equivalence are defined and calculated in aggregated network flow. According to Pew Research Center reports, political campaigning tends to be characterized in the form of polarised networks. In contrary to the previous research, the resulting network resembles one connected component except for few dyads which means there is a cohesive set of ideas represented in the topics discussed among either people or organizations. However, when clustering (Smith et al, 2014) was performed on this two-mode network, several at the same time dense topic specific networks were formed demonstrating various viewpoints about the campaign relevant to different users.

Title: Online Social Support Network: a Preliminary Report on the Social Support of International Brides in Taiwan

Paper ID: 263

Authors: William D. Li (NDHU, Taiwan), C. C. Chuang (NDHU, Taiwan)

Abstract:

Although previous research has shed much light on the role of social network sites in relating to “friends” online (e.g. Ellison et al 2007), social support and social network on line making up by ego’s close friends has been much less addressed. Also, there are growing concern about how migrants can receive social support by using social media in keeping contact with their close friends and relatives in home country. This study presents preliminary results of using of Social Network Sites in access to social support among the international brides in Taiwan. Egocentric network approach has been applied thorough conducting questionnaire-based interviews by using name generators to collect their social network information. It provides strong evidence in showing how the online social network sites can make their social support network out of geographical boundary. It also helps the migrant brides in maintaining their social support network in using online social network sites.

Title: Locations of social network as part of daily activity space

Paper ID: 264

Authors: Anniki Puura (University of Tartu), Siiri Silm (University of Tartu), Rein Ahas (University of Tartu)

Abstract:

Daily activity space is an important concept from the point of view of individuals' use of space, transport and urban planning. Compact and overlapping activity spaces make it possible to plan jointly used infrastructure, diverse urban space and joint activities. Sparse and non-overlapping activity spaces suggest the need for individual transport solutions and make planning of functional urban and joint activities difficult. It is necessary to understand, why and how activity spaces are developing. Historically, functions and institutions have been most important designers of activity spaces, mainly related to home and work locations. Nowadays, it is understood that the importance of social network and its locations has grown and determines significantly our activity space. This paper assesses the locations of social network as part of daily activity spaces by using mobile phone based (CDR) data in Estonia. We assess home locations of calling partners in overall dimension and in daily activity spaces.

Title: #ClimateChange | exploring networks of social change and political will

Paper ID: 266

Authors: Rebecca Cunningham (Institute for Sustainable Futures, University of Technology, Sydney)

Abstract:

In the past 24 months, we have seen a global shift in climate change policy. At COP 21, 2015, nations came together to pledge action on climate resolutions- aiming “well below” 2 degrees. In 2016, these promises and policies were ratified in Morocco. In the same year, there has been significant political and social action such as Brexit, the election of the next president of the USA, conflict in Syria, China made renewable energy goals and banned new coal mines, and in India a group of volunteers planted 49.3 million trees in one day. On a more local level, in 2016 the New South Wales government announced a policy on climate change setting the target of net carbon zero by 2050. Each of these events and hundreds of others, each have potential impact on climate change.

This project uses network and discourse analysis of Twitter data (#climatechange) to benchmark impact of climate change policy; bringing into focus the intersection of top down government announcements and implementation plans with bottom up, grass roots environmental and community based actions. Analysis of individual users as well as the specific language of tweets using #climatechange we uncover the reach and tone of the most powerful tweets of the past 12 months (with plans to be longitudinal in due course).

In order to attempt to answer these questions, data was collected using a Twitter API and stored in a database (Neo4J) using Python (code available on github). The social network analysis and visualisations performed in ORA and UCInet. Content analysis of tweets undertaken using NVIVO.

Twitter has been used as a tool for communication between grass roots environmental groups for some time while simultaneously being used by government agencies for policy announcements. However, Twitter analyses have demonstrated that the cliques within online networks reflect those of social networks offline; for example political networks and religion networks users of particular parties / faiths tend to cluster. Further, other Twitter analyses have shown that many hashtags remain within an industrial clique and lack a global stickiness while others capture a broader audience; for example energy technology users of #carbon capture and storage (#CCS) remain in industry and government, few users outside the sector, whereas hydraulic fracturing (#fracking) has a much broader and active user base.

Using network analytics we will unpack the power and reach of #climatechange networks. Coupled with discourse analysis of the individual tweets this presentation will demonstrate the impact of climate change policy and social change activities at global, national and local scales.

Title: Network Members' Occupational Status, Tie Strength, and Depression in Two Societies

Paper ID: 270

Authors: Lijun Song (Vanderbilt University)

Abstract:

What are the roles of accessed SES (i.e., network members' socioeconomic status) and tie strength across culture in the social dynamics of depression? This project derives hypotheses from seven theoretical approaches. Social capital theory expects accessed SES to decrease depression, but upward comparative reference group theory predicts the opposite. The strength-of-strong-tie argument expects stronger ties to reduce depression. The strong-tie-as-social-support-source argument expects social capital theory to have stronger explanatory power than upward comparative reference group theory with the increase of tie strength, but the strong-tie-as-social-comparison-source argument predicts the opposite. According to the relational dependence explanation, social capital theory and upward comparative reference group theory should have respectively stronger and weaker explanatory power in collectivistic culture than in individualistic culture; the strength-of-strong-tie argument should have stronger explanatory power in collectivistic culture than in individualistic culture; and the other two strong tie-based arguments—strong-tie-as-social-support-source and strong-tie-as-social-comparison-source—should have respectively stronger and weaker explanatory power in collectivistic culture than individualistic culture. But the self-evaluation motive explanation predicts the opposite. Using nationally representative data simultaneously collected from the United States and urban China, this study measures four indicators of accessed occupational status, and finds mixed results.

Title: Contagion of Suicidal Thoughts among Korean Older Adults: Network-Structure Contingency of Contagion

Paper ID: 271

Authors: Seungwon Lee (Yonsei University), Yoosik Youm (Yonsei University)

Abstract:

Suicidal thoughts are contagious through social ties, causing inter-group disparities of suicidal thoughts in social networks of Korean older adults. The significance of contagion can vary according to the social network structure. This study focused on dyadic constraints of social ties that make such difference. Based on the network theory of Burt (1992), certain social ties are structurally more constraining than others, where constraint can be characterized as the degree to which one's social network is structurally concentrated on another. When an older adult A's suicidal thought diffuses to another older adult B, the dyadic constraint of A on B makes difference. If B's social network members all invest large proportion of their social ties to A, the contagion will be more significant. The stronger influences of such structurally constraining ties are attributed to the fact that there are no sufficient alternatives against the contagion. The older adults cannot avoid the contagious emotions and ideas.

To test this hypothesis, Korean Social Life, Health and Aging Project (KSHAP) data were used. Every older adult aged over 60 living in a rural area in Korea as well as their spouses were asked about their discussion partners to collect the global network data of the older adults living in the area. Also they were asked if they have thought about suicide in the last 12 months. KSHAP is an ongoing longitudinal study and two waves were used for the analysis. In the first wave, total 814 people participated (response rate 96%) and in the second wave, 591 people participated in the project (response rate 82%). In order to exclude other possible explanations such as homophily and confounding effects, fixed effect model and propensity score matching were used. In addition, to investigate the contingency of contagion, the dyadic ties were divided into two groups; one with high dyadic constraints above median and another with low dyadic constraints under median. With network topology fixed, individual attributes were randomly shuffled 1,000 times. Statistical significance was tested for both groups to discover whether there is a difference between the two groups.

The results from both fixed effect model and propensity score matching methods showed that suicidal thoughts are contagious. Also, the simulated networks revealed that the contagions are more significant when the social ties are structurally more constraining. In contrast, for those with low structural constraints, the contagion effects were not statistically significant. These results provide specific contagion mechanisms to explain separated clusters of people who think about suicides and those who do not.

Title: The form and function of global migration network

Paper ID: 272

Authors: Idan Porat (Israel Institute of Technology), Lucien Benguigui (Israel Institute of Technology)

Abstract:

In our work on the global bilateral and symmetric migration flow network (2006-2010), we identified a unique and exclusive topology. The global migration network has a frequency plot two similar qualitative bell shape of a Gaussian for large and small degree countries. These two groups have a unique relationship between the degree and network centrality indices (betweenness, closeness, eigenvector) and found to have continuous and homogeneous correlation with the degree which can be described by simple exponents (3; -1; 0.55). This structure was modeled and simulated with synthetic networks of similar characteristics of: 1. random symmetry matrix with density of 30%; 2. On top of the random symmetry network, we added more links to 20% of the nodes and turned them into hubs which are linked to most of the nodes. The results suggest that small degree nodes have the topology of random networks, but the dominant part of the large degree hubs controls this topology and shape the network into an ultra-small world. The relation $B_e(D)$ which can be described by a simple exponent with a value of 3, was suggested by Barthélemy as exceptional and depends on the characteristics of the network; This finding may be a result of the role of loops and alternative paths between small degree countries and the growth dynamics of global migration network. Here we would like to ask what the function of the global migration network is. And what is the relevance of shortest path indices in identifying this network. We think that the exclusive topology of the network might be a result of the fact that the network does not represent the paths of migrants rather the migration dynamics and migrants' decision making.

Title: Online and Offline Social Networks of Migrant Workers

Paper ID: 273

Authors: Jennifer Ihm

Abstract:

How do people maintain and improve their social and psychological well-being when confronted with a new environment that deprives them of social, cultural, and economic resources? One way to answer this question is to examine how people develop their social networks, which contribute to their survival and life satisfaction in their new surroundings. Specifically, in the contemporary environment, individuals strategically control their networks, both online and offline, so that a network in one sphere can compensate or substitute for a network in another and thereby sustain or increase their quality of life.

This study focuses on the online and offline networks of 200 migrant workers in the Masuk furniture manufacturing area in the Republic of Korea. The workers, who left their home countries, such as Bangladesh, Nepal, and Mongolia, to support their families at home, are deprived of their original social networks and suffer from governmental crackdowns and dehumanizing labor environments. To cope with their situation, the workers develop offline networks, with coworkers and neighbors, as well as online networks, through Facebook, for better lives.

The purpose of this study is to examine how migrant workers construct their online and offline networks. Extending previous research on the influential factors of social network formation (e.g., socioeconomic status, media usage patterns, individual characteristics, and geographic location), this study focuses on various factors that affect workers' online and offline networks. The characteristics of ego (e.g., legal status) and alter-ego ties (e.g., homophily of ethnicity, legal status, and organizational affiliation, and proximity) will explain how migrant workers configure their online and offline networks (e.g., size, frequency, and multiplexity).

Using a name-generator question, the survey asks the 200 migrant workers about their online and offline social networks: whom they discussed important personal matters with over the past 6 months, how often they communicated with them, and by how many means. The survey distinguishes online and offline networks by asking the workers to name their networks in two separate questions; their online networks are Facebook friends with whom they discuss important matters, whereas offline networks are people with whom they interact through any means. The survey also asks about various attributes that can explain the construction of participants' online and offline networks (e.g., ethnicity, organizational affiliation, legal status, and geographic location).

This research first contributes to the social network research by examining both the online and offline social networks of individuals. Online and offline networks represent different types of relationships and different aspects of individual well-being. By capturing different predictors of online and offline networks, this study provides a new understanding and explanation of online and offline social networks. Second, using social network analysis, this study offers a novel way to describe a minority's quality of life. This study reveals how migrant workers attempt to survive

despite government surveillance and oppression by factory owners. Online and offline networks reveal that people still autonomously attempt to survive and improve their lives amidst social, cultural, and economic deprivation.

Title: Social network with children and neighbors as predictors of life satisfaction among Korean older adults in traditional rural communities

Paper ID: 274

Authors: Baek Ji Won (Yonsei University)

Abstract:

Relationships in family and friendship are known to have important effects on older adults' life satisfaction. However, most of the studies concerning those effects cannot but have an important limitation when they merely focused on a simple characteristics of relationship such as living arrangement, social support, network size, rather than multi-characteristics of the relationships. The goals of the study are to analyze the effect of relationships with children and neighborhood on life satisfaction of Korean older adults in traditional rural communities. The characteristics of social networks with children and neighbors are measured by social network size, emotional closeness, and contact frequency. The data was obtained from the Korean Social Life, Health and Aging Project (KSHAP) that follows 774 older adults living in Township K for the period of 2011 through 2013. Using data, the study conducted panel regression analysis. As a result of the investigation, older men are more likely to have a high level of life satisfaction when those have the large number of children network. This children effect moreover remains significant in the within-panel and fixed-effect model. On the other hand, the children effect is not important to older women. Those are more likely to be satisfied in life whenever they have emotional closeness with social network members. There is no relation with neighbor effects and life satisfaction both men and women. This study suggests that gender differences exist among factors associated with life satisfaction among older adults in traditional rural communities. It is important for elderly men to have an active relationship with their children and for elderly women to have an intimate attachment relationship with people.

Title: Social interaction and pain: An arctic expedition

Paper ID: 275

Authors: Per Block (ETH Zurich), Lauren C Heathcote (Stanford University), Stephanie Burnett Heyes (University of Birmingham)

Abstract:

Complex human behaviour can only be understood within the social context. However, designing research to disentangle the bidirectional, causal associations between individual outcomes and the individual's role in his/her social network is an empirically difficult endeavour. We present here a longitudinal, tightly-controlled design to investigate and disentangle these processes within the context of a fundamental experience that drives much of human behaviour – physical pain. We collected daily ratings of pain and social interactions from a group of adolescents participating in a 3-week hiking expedition in an isolated part of the Arctic Circle, during which time participants interacted only with members of the expedition group and were subject to the same environmental influences. Using longitudinal network models (SAOMs) we disentangle processes of pain-related popularity (selection of interaction partners based on their levels of pain), homophily (selection of interaction partners based on similar pain experiences) and contagion (influence of another's pain on one's own pain experience), and the interaction of each with sex. We found no evidence of homophily or contagion. However, we did find evidence that individuals, specifically males, who reported more pain received successively fewer nominations as interaction partners. Additionally, we found that males reporting pain nominated successively fewer females. The popularity of females, in contrast, was unaffected by their pain experiences. Findings shed light on mechanisms mediating between sex, pain and social interactions and highlight the utility of combining longitudinal social network approaches with psychological tools to infer causality in the interplay between social and individual phenomena.

Title: Spatial Networks and Urban Inequality

Paper ID: 276

Authors: Joseph Galaskiewicz (University of Arizona), Kathryn Freeman Anderson (University of Houston), Kendra Thompson-Dyck (University of Arizona)

Abstract:

Recently, the third edition of *Place Matters: Metropolitcs for the Twenty-First Century* (Dreier, Mollenkopf, and Swanstrom, 2013) argued that where people live affects their life chances and opportunities. Logan (2012) described this phenomenon as spatial inequality. The idea has a long history in urban economics (Kain, 1968) and urban sociology (Wilson, 1987). The focus has been on how racial, ethnic, and class segregation restricts the access of minorities to jobs, services, and consumer goods. Indeed, research has found that levels of racial residential segregation are correlated with racial inequality (Massey and Fischer 2000; Firebaugh and Farrell 2016).

We argue that an equally important factor in restricting access are spatial networks. The imagery of the city is one of a network, where places (or locations or points or parcels) are nodes (defined by x and y coordinates), and streets, subway/rail systems, sidewalks, rivers/canals, etc. that connect places are the arcs. There is a vertical dimension to spatial networks, as places are stacked on top of each other within multi-storied buildings.

Depending on actors' location in spatial networks, they have spatial capital. This is people's ability to effectively and efficiently access diverse resources in the urbanized area that provide them benefit (Marcus, 2010). Along with their position in spatial networks, household resources, e.g., information and transportation technologies, household finances, social networks, and cultural knowledge, and social identities affect life opportunities. Household resources enable one to overcome the costs of travel and information embeddedness, while social identities can facilitate or deny access to certain venues.

We offer a formal model, but we can summarize it verbally. We first argue that actors' advantage is based on their having access to certain resources that are place based, e.g., elementary schools, shopping malls, parks, etc. Advantage depends on the distance to these places and the various resources at each place, e.g., not all elementary schools are the same. Of course, the distance to these places is relative and depends on how easily or quickly one can get from one's current location to some place. This will depend on the transportation technology available, communication technology, family resources, social identities, and the street grid. We further argue that actors' aggregate advantage is a function of its total access to all possible resourceful places, e.g., it is better to have access to multiple high quality schools than just one.

The presentation will examine the 'efficiency' of the transportation networks in several US metropolitan areas and see if this, as well as the supply of social services and jobs, can explain the level of racial inequality in urban areas while controlling for the level of residential segregation. We hypothesize that an efficient transportation network can reduce the impact of segregation on inequality, while an inefficient network can enhance the impact of segregation in racial inequality.

Title: Geographic and Social Proximity as Antecedents of Managerial Collaboration

Paper ID: 277

Authors: Olaf Rank (University of Freiburg, Germany)

Abstract:

In this study, I test the relative importance of two types of proximity predicting interpersonal collaboration among senior managers in MNCs: geographic proximity and social proximity. While it has been shown that each type of proximity separately has positive effects on managerial collaboration, it is largely unclear whether spatial distance or similarity in managers' attitudes is more important with respect to building and maintaining collaborative relationships. Geographic proximity is captured by the spatial distance between the MNC's subsidiaries the individual managers work for. Social proximity is defined by managers' similarity (i.e., homophily) with respect to four distinct attitudinal dimensions that have been found to be important with respect to the formation of interpersonal collaborative ties: (1) Attitude towards knowledge sharing, (2) role conflict, (3) behavioral role clarity, and (4) outcome role clarity. In addition, I control for several managerial characteristics such as gender, organizational tenure, and job tenure. Within a case study design, data have been gathered on the collaborative ties among 187 senior managers of a German high-tech MNC. Applying a class of exponential random graph models (ERMGs), the results clearly reveal the high importance of geographic proximity. In contrast, the results provide mixed evidence for the effects of social proximity: Only managers' similarity with respect to behavioral role clarity seems to enhance collaboration among them, whereas managers are more likely to be connected by a collaborative relationship if they are dissimilar with respect to their attitude towards knowledge sharing as well as role conflict. Further interesting insights can be drawn from differentiating collaborative relationships with respect to tie strength. While in the case of occasional collaboration, the results remain entirely stable, geographic proximity seems to be the only driver of frequent collaboration, whereas all effects for social proximity are insignificant.

Title: Different Treatments of Weights to Generate Null Models in Significance Tests in Community Detection Algorithms for Weighted Network Data

Paper ID: 278

Authors: Qinyun Lin (Michigan State University), Kenneth A. Frank (Michigan State University)

Abstract:

There are different approaches for weighted data in previous discussions about significance tests in community detection algorithms. One is to generate as many ties as are in the sum of the weights (e.g., if an actor has ties of weight 3, 4, and 5 then 12 ties of weight 1 are randomly distributed). Then the community detection algorithm is applied and the fit statistic recorded. But this procedure discards information about the distribution of weight assignments from the observed data. An alternative approach preserves these information by randomly reassigning those weighted links to other nodes but keeping the weight distribution for each actor (i.e. we keep the distribution of the weight assignments 3, 4, and 5 and reassign these three links). This paper studies how our conclusion of community significance may change under these different treatments of weights to generate the null model. Simulation results using the algorithm Kliquefinder show that some properties of the observed network data affect how these different approaches affect the performance of the algorithm: the total number of ties and the variance of weights (fixing the summed weight for each node). We also discuss different theoretical assumptions for each approach. As an extension, another two treatments of weights are presented based on theoretical frameworks of homogeneity and preferential attachment.

Title: Accounting for Heterogeneity in the Network Formation Behaviors: With an Application to Vietnamese SMEs

Paper ID: 279

Authors: Tadao Hoshino (Tokyo University of Science), Daichi Shimamoto (Waseda University), Yasuyuki Todo (Waseda University and Research Institute of Economy, Trade and Industry)

Abstract:

It is widely known that formation of social networks are often characterized by homophily. That is to say, agents are more likely to be connected when their attributes are similar. However, it is also shown that while homophilous ties tend to lead to redundant knowledge, heterophilous ties can be a source of diffusion of new knowledge across agents, contributing to their higher performance, as conceptualized by "the strength of weak ties" (Granovetter, 1973) and "structural holes" (Burt, 1992). Therefore, how heterophilous ties are created is an important question in social network analysis.

Pursuing this research agenda, this study empirically examines whether the extent of homophily are heterogeneous across agents, or whether some agents are indeed heterophilous. For this purpose, we estimate a model of network formation using firm-level panel dataset for small and medium enterprises (SMEs) in the textile industry in Vietnam that includes data on information sharing networks of firms. The panel dataset allows us to control dynamic interdependencies in the link formation. To take heterogeneity in homophily into the estimation of network formation, we employ two models of network formation in which coefficients representing homophily are assumed to be random across dyads: a normal random coefficients model where we assume the normal distribution of random coefficients; and a Gaussian mixture sieve (GMS) model where we drop the normality assumption and assume an unknown distribution of random coefficients.

We find that firms homogeneously show homophily in terms of ages of firms and their CEOs. In other words, firms are more likely to form information sharing links if their ages or CEOs' ages are close to each other. By contrast, some firms show heterophilous in terms of firm size, the type of clients, and the gender of CEOs, while most firms are still homophilous in these aspects. For example, when the number of workers of two firms is the same as its sample mean, the probability that the two form an information-sharing link is 5.1%. However, when the number of workers of one of the two increases by its standard deviation, the link-formation probability at the 95 percentile increases to 8.2% (i.e., these dyads are heterophilous) while that at the 5 percentile decreases to around 1.1% (homophilous). This finding implies that some firm dyads show heterophilous and that the variation in the extent of homophily is quite large. The heterophilous link formation can be explained by the argument in previous studies indicating agents can benefit more from heterogeneous links than homogeneous ones. The heterogeneity in homophily/heterophily in link formation across agents has not been found in the literature and is thus our major contribution.

Our results further suggest that although network formation is mostly characterized by homophily because of low costs of forming links with similar agents, a minority group of agents

prefer to link with dissimilar agents possibly because psychological costs of forming heterogeneous links are lower or they realize more benefits from heterogeneous links than others.

Title: The Structure of Sequences: Mining and Interpreting Networks from Event Log Data

Paper ID: 282

Authors: Brian Keegan (University of Colorado Boulder)

Abstract:

Drawing upon methods like narrative networks and sequence analysis, I evaluate a generalizable method called “collaboration sequence networks” (CSN) for mining relational data from socio-technical systems' event logs to construct complex networks of user actions on artifacts over time. The basic unit of analysis are dyadic interactions from temporally adjacent records in event logs. Using an event log archiving the records of two or more users' actions to a single artifact (e.g., a Wikipedia article), a temporal adjacency exists from user i to user j when user j takes an action on an artifact that had previously been acted upon by user i . The resulting network graph contains the set of users who have ever contributed to the artifact and the set of temporal adjacencies between users based on the artifact's event log.

These “temporal adjacency edges” are conceptually distinct from traditional SNA approaches that define network ties based on more explicit relationships like communication or exchange. This approach complicates fundamental assumptions about agency in network tie formation as users cannot always choose and often may not even be aware of whose work they modify or which artifacts will be affected when they make a contribution. However, the aggregation of choices to make contributions as well as the skewed distributions of activity may result in networks that show complex features such as high centralization, reciprocity, clustering, and shorter path lengths than those found in random networks of similar size and densities.

Contributions made in a sequence can capture the accumulation of work from single user, collaborative hand-offs or conflict between users, and re-engagement from prior users. The structure of collaboration sequence networks are also significantly correlated with substantive outcomes such as article quality in Wikipedia: collaboration sequence networks with shorter path lengths have significantly higher quality. Substantively this captures collaborations in which editors who remain engaged by modifying subsequent users' contributions generate collaboration sequence networks with lower average shortest path lengths.

Qualitatively, collaboration sequence networks can be used to diagnose the vitality of a collaboration: sparser networks reflect collaborations where new users' contributions are not integrated by prior users or a lack of on-going participation. The complexity of these structures, combined with other event log meta-data, can reveal new insights into behaviors that have previously been ignored by traditional analytic approaches because they encode important information about structural changes over time. By distilling large-scale and multidimensional log data, CSNs can reveal structural signatures that capture theoretically-relevant processes such as social roles, communities of practice, and organizational routines. Collaborative sequence networks illuminate theoretical questions about processes of self-organization and collective intelligence in distributed collaborations as the accumulation of resources can be traced back to the contributions of individual users and their modification of prior users' work.

Title: Peer Influence, Personality Traits, and Future Aspirations among Recent College Graduates: Evidence from Facebook and survey data

Paper ID: 283

Authors: Yen-hsin Alice Cheng (Institute of Sociology, Academia Sinica, Taiwan)

Abstract:

This paper aims to investigate how peer influence and personality traits affect recent college graduates' aspirations for the future. The data come from both authorized Facebook data and a survey of 1,886 university students collected during the first semester of their senior year in fall 2015. The former will define whether any two respondents are friends with each other and offer indicators of a given respondent's activities in Facebook; whereas the latter contains personality measures, post-graduation plans, number of daily contacts, socio-demographic covariates, and other relevant controls. Given that the student survey is a class-based stratified sampling design, preferences of a respondent's classmates can be readily identified in the data. According to social learning theory, the characteristics and preferences of one's immediate social circle can potentially shape an individual's future plans. In addition, one's personality traits are also crucial in affecting life trajectories, such that extraverted and open-minded individuals tend to be more proactive and less risk averse, which could lead to aspirations for more adventurous and less conventional goals. We also expect that respondents befriending with more extraverted peers may be more likely to make less conventional future plans. As college completion marks an important milestone in one's life course, career plans made surrounding this transition phase can have far-reaching impact on later well-being. We intend to explore whether the preferences of a respondent's peer circle shape his/her own future aspirations and how this link may potentially be mediated/moderated by one's personality traits and the personality composition of one's social circle among a recent cohort of college graduates in Taiwan.

Title: Acknowledgement patterns and networks: the case of accounting scholarship

Paper ID: 301

Authors: Andreas Andrikopoulos (University of the Aegean), Stella Zounta (University of the Aegean), Konstantinos Kostaris (Queen Mary University of London)

Abstract:

We study social networks in accounting research, focusing on the connections between authors and subauthors of published papers in academic accounting journals. Our sample spans a twenty-year period (1996-2015) and six accounting journals: Accounting Review, Accounting Organizations and Society Journal of Accounting Research, Journal of Accounting and Economics, Review of Accounting Studies and Contemporary Accounting Research. We employ social network analysis and map intellectual collaborations in a directed network of acknowledgement relationships. We discover that accounting research is increasingly collaborative and international (even though it is still largely dominated by scholars who are affiliated with USA-based institutions). Moreover, we find that acknowledgement partnerships exhibit small-world properties: they are highly clustered, populated by nodes which are closely connected and covered by a giant component which spans the largest part of the social network.

Title: Linguistic Signatures of Cross-Boundary Research

Paper ID: 302

Authors: Jesse Fagan (University of Kentucky), Jennifer Dolly (University of Kentucky), Katherine Eddens (University of Kentucky), Nathan Vanderford (University of Kentucky), Heidi Weiss (University of Kentucky), Justin Levens (University of Kentucky)

Abstract:

Research is frequently born out of silos. The researchers find interactions are easier with those who are close to them socially, physically, and cognitively. The current emphasis in medical research is to breach boundaries and encourage interdisciplinary research and transfer of research findings into fields of practice. But what differentiates boundary-crossing research compared to research which is entirely embedded in a single research program? This study examines seven years of research at a cancer center in the Midwest United States. We combine the network structure of co-authorship patterns at the research center with the text of the article abstracts. Using a combination random forests and Latent Dirichlet Allocation to determine the key linguistic features which predict boundary spanning cancer research. We report on the linguistic features of research which best predict boundary-crossing research and provide some insight into developing new projects which encourage interdisciplinary research behavior.

Title: Knowledge flow and innovation networks of genetically modified (GM) crops

Paper ID: 303

Authors: Jiaojiao Ji (University of Science and Technology of China), George A. Barnett (University of California, Davis), Ke Jiang (University of California, Davis), Jianxun Chu (University of Science and Technology of China)

Abstract:

Biotechnologies used to produce genetically modified food are collections of innovations in plant breeding. How knowledge about these agricultural biotechnologies flow between the public and private sectors, and how the innovation flow pattern evolves over time were examined in this research using network analysis. Patents of the four major commercial genetically modified crops (soybean, cotton, maize and rapeseed) were collected from Derwent Innovation Index. Then the individuals excluded assignee citation network and the assignee country citation network were extracted from the patents data.

For all four assignee citation networks, the analysis revealed that they are scale-free networks that follow the power law distribution, which have more efficient knowledge and innovation flow capability than random networks. Industrial giants from the private sector are more central than small business and public sector. The top 14 assignees with the highest coreness in the assignee network are Novartis AG, Bayer AG, Monsanto, BASF, Dow, Syngenta, BioTechnica International, Dekalb Plant Geneti, DuPont, Dekalb Genetics Corporation, Plant Genetic Systems NV, Aventis Cropscience, Ciba Geigy AG, and Hoechst AG. For the country citation network, the most central countries are generally developed countries. The three most central countries are USA, Germany and Switzerland. Further, these countries cite their own domestic patents a great deal.

The individuals excluded assignee citation and the assignee country citation networks show an increase in international interactions among the assignees and among the countries, but the early adopters of the innovations, the large firms and the developed countries, remain the most central over time.

Title: Evaluating NIH Translational Science Program in Scientific Collaboration Networks

Paper ID: 304

Authors: Meng-Hao Li (George Mason University) , Laurie A. Schintler (George Mason University)

Abstract:

In 2006, NIH established the Clinical and Translational Science Awards (CTSAs) programs “to provide catalysts and test beds for policies and practices that can benefit clinical and translational research organizations throughout the country across the United States.” The aim of the CTSAs program is to facilitate knowledge transfer from basic research to clinical research, and transfer findings from clinical studies or clinical trials to practice settings and communities. From 2006 to 2015, the CTSAs program has funded medical institutions from 12 to 62. The University of Illinois at Chicago (UIC) is one of the medical institutions to receive the CTSA award and established the Center for Clinical and Translational Science (CCTS) in July, 2008. Thus, this study used the CCTS as a case study to understand whether the CTSAs program makes significant impacts on scientific collaboration at UIC. This study retrieved data from UIC grant submission system, including, PI/CoPI, grant proposal collaboration networks (two-mode networks), and grant awards. The final sample of this study is 1,894 faculty members who have submitted grant proposals between 2006 and 2011 at UIC. This study compared two time periods, 2006-2008 (T1) and 2009-2011 (T2), to understand how the CTSA program intervention (2008) affects academic collaboration networks. The Stochastic Actor-based Models was used to explore how proposal collaboration networks change after the CTSA program intervention (Snijders et al., 2010). The results show that academic scientists’ networks consisting of greater transitive triads and transitive ties are more likely to forge a new collaboration relationship from T1 to T2. Academic scientists who come from similar disciplines are more likely to initiate a new collaboration relationship from T1 to T2.

Title: Identifying researcher complementarity in a scientific network

Paper ID: 306

Authors: Vinton Cheng (University of Oxford), Marcus Green (University of Oxford)

Abstract:

Social networking tools are increasingly used by academic institutions to map out the relationships between individual researchers (nodes). The connecting links (edges) are often drawn from surrogate markers indicating a viable relationship, such as co-authorship of academic papers, conference abstracts and joint grant applications amongst other parameters. Social networks provide a means to understand the landscape in which the researchers exist and, as translational and interdisciplinary research becomes more important, they can facilitate the generation of new collaborative links. However, the interpretation of social networks relies heavily on contextual information about each node. What information or characteristics are considered relevant and important, particularly for the basis of encouraging collaborations, remains a matter of debate.

With the aid of an ontology-based profiling system – a researcher digital fingerprint – our aim is to understand the complementarity of researchers in dyadic relationships. We hypothesise that based on the paired research interests it is possible to define a distinct value corresponding to active collaboration. In a pilot study of 154 scientific researchers from a single institution, there are 489 known collaborations within a total of 11704 possible links. Using the scalar product of paired fingerprints, we have identified that collaborative pairs demonstrate a higher degree of overlap in research expertise compared to the population average.

Identifying potential complementarity of researchers based on areas of interest may have implications for expertise discovery and research networking. Ongoing work will include expansion of the researcher cohort, building in a temporal component that permits assessment of changes in relationships as collaborations mature and the addition of multivariate analysis.

Title: Optimization of small-world property based on Memetic Algorithm

Paper ID: 307

Authors: HAIFENG DU (Center for Administration and Complexity Science of Xi'an Jiaotong University, China), JINGJING WANG (Center for Administration and Complexity Science of Xi'an Jiaotong University, China), WEIRAN WANG (Center for Administration and Complexity

Abstract:

Small-world network is based upon relationships in human society and is an intermediate network form between a regular network and a random network. Networks with small-world feature should have high clustering coefficient like regular lattices and have small average path lengths like random graphs. Memetic Algorithm combined with advantages of genetic algorithm and local search has shown good performance in solving combinational explosion problems. In order to make networks have strong small-world feature, we optimize a small-world property by adding short-cuts based on Memetic Algorithm. The experiment results show that our proposed algorithm can efficiently optimize small-world feature.

Title: Optimization of small-world property based on multiobjective evolutionary algorithm with decomposition

Paper ID: 309

Authors: Xiaochen He (Center for Administration and Complexity Science of Xi'an Jiaotong University, China), Haifeng Du (Center for Administration and Complexity Science of Xi'an Jiaotong University, China)

Abstract:

Small-world theory plays an important role in the field of complex network, and optimization of small-world property has been a major research focus. In this paper, we model this problem as a multiobjective optimization, and a method based on the multiobjective evolutionary algorithm with decomposition to optimize the small-world effect is proposed. Experimental results show that the proposed algorithm can solve this problem efficiently and generate a uniform distribution of solutions on the Pareto-optimal front.

Title: Friendship Formation: Testing Heterogeneity using an Agent-based Model

Paper ID: 311

Authors: Xiaomeng Li (Department of Geography, Environment, and Spatial Sciences, Michigan State University), Victoria Breeze (Department of Geography, Environment, and Spatial Sciences, Michigan State University)

Abstract:

A major strength of social network research is the consideration of heterogeneity in attributes and network positionality of the individuals. However, heterogeneity in individual behavior mechanisms is not as commonly considered. A typical approach of understanding individual behavior in social networks is to use statistical models such as OLS regression or ERGM to estimate effects of different factors on individual behaviors in the network. Often, the effect of each variable is implicitly assumed to be constant among individuals, unless there is some a priori justification to add an interaction term. However, this implicit assumption does not necessarily hold up in many cases.

In this study, we want to find out if incorporating heterogeneity can have a significant impact the result in social network models, compared with using the homogeneity assumption. If so, the assumption would need further deliberation. Thus, we built a simulation model and compare the results obtained with and without the assumption of homogenous effect of variables on individuals. We developed a simple agent-based model of friendship network formation. The model has three variables – homophily with income, preference for spatial proximity, and a transitivity effect. Agents, representing individuals, make friendship tie choices based on these three variables. We tested for scenarios where the parameters for each of the three variables are constant across all individuals (homogeneity), following a normal distribution, or constant within groups but varying between groups and compare the results.

The results show that the impact of heterogeneity on the result exists but the intensity of the impact varies. The results from the scenario where parameters are assigned by groups deviate slightly from results from the other two scenarios where parameter values among individuals are constant or following the normal distribution. This deviation increases when the mean of parameter values increase.

Our findings reiterate the importance of considering parameter heterogeneity for social network studies in general and the need to go beyond interaction effects. In particular, we need to consider the possible presence of parameter heterogeneity in terms of differences between latent groups in the population. We recognize that each social network and its dynamics is different. Thus the result from this simple model is not supposed to be generalized to other cases. Rather, it serves as an example proving the possible impact heterogeneity could have on the results of social network models, and calls for further rethinking of the assumption of homogeneous effect across individuals.

Title: Corporate Financial Distress and CEO Networks

Paper ID: 312

Authors: Ahmed H. Eissa (Concordia University-John Molson School of Business), Harjeet S. Bhabra(Concordia University-John Molson School of Business)

Abstract:

The question we try to answer is does CEO power reflected in his/her position in the network of corporate directors enhance decision making, firm policy and changes in the strategic direction of the firm or not? Could some factors mitigate the consequences of CEO power? We utilize a sample of corporate financial distress events that include credit rating downgrades, violations of debt covenants and reductions and omission of dividend payments. The sample includes all corporate financial distress events for U.S. Public firms from January 2003 to December 2015.

We conclude in this study that firms with CEOs occupying central locations in the vast network of corporate directors are more likely to experience an event of financial distress than a similar firm with a less central CEO. To measure this we utilize two measures of centrality, degree and eigenvector centrality. Results hold three, two and one year prior to the year of distress. Results also hold for the two networks we construct, the first is interpersonal employment links between executives and directors in public firms and the second network is interpersonal employment links between executives and directors in public and private firms.

Secondly, we find firms with central CEOs but longer Non-CEO tenure are less likely to experience a financial distress event. Longer organizational tenure could help the CEO in attaining intrafirm ties with members of the organization, helping CEOs in gathering and processing information and avoiding financial distress.

Finally we investigate director homophily for board members with regard to age and the number of educational qualifications. We argue that heterophily with respect to age and education could increase the likelihood of financial distress. Homophily with regard to general characteristics like having or coming from similar age groups or academic achievement could result in effective communication between board members and greater levels of familiarity in other characteristics. We find that firms with less homophilous board members with respect to age and education increases the likelihood of financial distress.

Title: Evaluating the Effectiveness of Crisis Response Strategies on Public Response based on Semantic Network Analysis and Topic Modeling: A Case of Samsung Galaxy Note 7 Explosion

Paper ID: 313

Authors: Sejung Park (Georgia State University), Han Woo Park (YeungNam University)

Abstract:

This study explores the effectiveness of corporate crisis response strategies on public response and perception over time. This has been done to study the case of Samsung Galaxy Note 7 smartphone explosion. First, through the lens of situational crisis communication theory (SSCT), a content analysis of response messages Samsung posted on its Facebook fan page SamsungMobile was conducted to analyze which crisis response strategies Samsung applied. Second, semantic network analysis, topic modeling using Latent Dirichlet Allocation, and sentiment analysis of public comments left to Samsung's messages were applied to detect trends in public response and perception on the crisis response strategies. Third, we tracked comment networks among the public to trace the pattern of network agenda building. The results of the content analysis indicated that Samsung predominantly used ignoring, informational, and reinforcing strategies. The findings of the semantic network analysis, topic modeling, and sentiment analysis revealed that whereas public response and perception toward the ignoring and informational strategies were primarily negative associated with its defective battery and complaints about poor service, positive responses, expressing brand loyalty and forgiveness were increased on the reinforcing strategy. Moreover, the results of comment network found that the public generated denser comment networks in response to the ignoring strategy than those for the reinforcing and informational strategies. This study offers evidence-based lessons from Samsung on how to systemically monitor stakeholders' reactions and manage consumer outcry to repair corporations' damaged reputation during a crisis.

Title: The theoretical model research on SMEs' open innovation commercialization performance of symmetric alliance: based on the perspective of social network

Paper ID: 314

Authors: Peng Xiaobao (University of Science and Technology of China), Jiao Jinhan (University of Science and Technology of China)

Abstract:

Because of the singleness and limitation of the internal resources of the enterprises, SMEs usually seek the commercial innovation in the form of open alliance. The alliance network structure will have a significant impact on commercialization performance since the strength differences on assets and size between SMEs are not much evident. It's deduced that enterprises occupying structural holes in a network can promote their commercialization performance in an inverted U type; while enterprises lying in a closure network and their performance exhibit U-curve relationship. Besides, alliance homogeneity degree moderates the effects: when alliance is

more homogeneous or more heterogeneous, the network structure work on performance differently. In addition, the moderating effect of alliance type will be moderated by innovation type again: when innovation tends to be radical or incremental, the moderating effect of alliance type will be influenced correspondingly.

Title: Why Take The Risk?: Firm Choices in Network Forms of Organization

Paper ID: 315

Authors: Meredith Woehler (University of Kentucky), Ajay Mehra (University of Kentucky), Federica Giordani (Sapienza University of Rome), Wyatt Taylor (University of Kentucky),

Abstract:

This research examines how and why network members are willing to voluntarily continue taking the risks inherent in network forms of organization. A network form of organization is defined as “any collection of actors that pursue repeated, enduring exchange relations with one another and, at the same time, lack a legitimate organizational authority to arbitrate and resolve disputes that may arise during the exchange” (Podolny & Page, 1998: 59). Since firms are under no obligation to remain in these voluntary organizations, we investigate why network members choose to remain a part of these inherently risky organizations. Scholars suggest that benefits to network members are contingent on trust enabling members to collaborate with minimized fear of opportunism. We examine one mechanism through which this requisite trust manifests: perceived network density. Using survey data from 84 technology firm CEOs within one such voluntary network form of organization, our results suggest that CEOs may remain in these organizations that leave their firms unprotected from and without recourse for opportunism because they perceive a network structure that imbues trust in their fellow network members.

Network members can reduce their risk by continuing to work with previous collaborators that have proven their trustworthiness. Since firms voluntarily choose to increase their risks by developing new collaborations, we also investigate how a network member chooses new collaborators. We posit that CEOs attend to differing signals of potential collaborators’ trustworthiness depending upon the availability of information from mutual collaborators. We explore the prior claim that firms do not form collaborations with firms with whom they do not share connections because they are unwilling and/or unable to do so. Our findings suggest that firms are willing, but likely unable, to form these connections.

Title: Institutional Legacy and Similarity of Political Behavior Among Business Groups in Taiwan

Paper ID: 316

Authors: Zong-Rong Lee (Academia Sinica), Shi-Rong Lee (Sciences Po)

Abstract:

Political and organizational sociologists have long been interested in the collective political actions of corporations. More recently, scholars have employed social network techniques to analyze campaign contribution among firms. Previous studies on political cohesion mobilized resource dependence theory and elite class theory to explain how corporations engage in collective action on political contributions in the United States and United Kingdom. However, the mechanisms offered by these two theories are rather universal. The current research proposes that historical, cultural, and institutional contexts should be considered when investigating the collective political actions of firms. We argue that collective political actions are not only determined by access to resources or class structure of corporate actors but also by past experiences on market logic and business–government relations. We collected data from 2007 legislative election in Taiwan and employed social network techniques to analyze the similarity of campaign contributions among business groups. The findings confirm our hypothesis that business groups with past experiences on monopoly, as well as members of social clubs, tend to contribute to the same political candidate.

Title: Association Analysis between Customers' Review and Purchasing Behavior on B2C Platforms

Paper ID: 317

Authors: Shixiong Wang (School of Economics and Management, Zhejiang Sci-Tech University), Yizhen Lan (School of Economics and Management, Zhejiang Sci-Tech University), Xiaoming Fu (Institute of Computer Science, University of Goettingen)

Abstract:

Online shopping platforms provide available channels for people to purchase all kinds of products and exchange their shopping experiences and reviews. A topic of great interest in online shopping platforms research is to explore customers' purchasing behavior and, in particular, to analyze the association between some customers' review like recommendation and other customers' purchasing behaviors. If one can identify the association which can shape customers' purchasing behavior, then it may be possible to alter these explorations to achieve a desired outcome, for example to encourage more people to buy a product or service.

Early work to characterize interpersonal influence in online shopping platforms focused on individual-based properties such as customer's preference, purchasing power. However, online shopping platforms can also be deemed as online social networks, in which all individual can interact with each other to exchange their opinion about the price and the quality of products or logistic service. That is, one online user's purchase decision-making not only depends on his or her own demand but also strongly rely on other user's review and advice. Recent investigations of data from real-world, online social shopping platforms indicate that individuals who have bought product have an important influence on new customers' purchasing behaviors. It is not sufficient to only consider the individual-based properties when we analyze customers' purchasing behavior. One must also consider opinions' exchange between individuals.

Our purpose in this paper is achieved according to the following three aspects: 1) to extract the most important factors which influence on individuals' purchasing behaviors by mining and analyzing customer's review; 2) to present an association model to describe the relationship between customers' reviews and purchasing behaviors; 3) to gain some association rules to encourage more people to buy a product or service.

In this paper, we firstly collect 682723 online reviews on women's clothing in Jingdong Mall (www.jd.com) by using a commercial crawler developed by Knowlesys Software Company. After cleaning up the collected data, all reviews are analyzed through dictionary-based content analysis method, and their sentiments are calculated. And then, the association model between customers' reviews and purchasing behaviors are represented based on FP-growth algorithm. Finally, we find some important conclusions: (1) the two most important factors which influence individuals' purchasing are the price of product and the quality of logistics service; (2) a bigger fluctuations in price will decrease individuals' interesting in the same product, while higher sending speed, transporting speed, delivering speed and the courier service attitude will promote more customers to buy the same product;(3) the products recommended by more customers are more popular and activate post-purchasing behavior.

Title: Higher Visibility, Better Participation: Peer Pressure Enabled by Enterprise Social Media

Paper ID: 318

Authors: Hui Li (Fudan University), Xiao He (Fudan University), Yun Huang (Northwestern University), Noshir Contractor (Northwestern University), Yunjie Xu (Fudan University), Lihua Huang (Fudan University)

Abstract:

Enterprise social media (ESM) provides organizational social platforms to facilitate the interactions among workers and between workers and knowledge content. With ESM, everyone in the organization has the potential to observe others' behaviors and status and be observed by others as well. This high visibility can induce peer pressure. Previous literature has shown inconsistent results about the effect of peer pressure at work: some found a positive spillover for productivity, while others found no effect on productivity. Also, not much research has focused on the effect of team characteristics on peer pressure effects. Therefore, it is unclear if the higher visibility enabled by ESM positively moderates the effect of peer pressure on organizations.

This study aims at investigating the effect of peer pressure on workers' participation in virtual teams using ESM. In general, peer pressure can have a positive effect on workers' virtual participation. However, previous literature suggested that larger teams or teams with bigger diversities are more likely to suffer from the free-rider or social loafing problems. We posit that the peer pressure effect on virtual participation becomes weaker with larger team sizes and diversity because of high monitoring costs or perceived dispensability. The effect of peer pressure on virtual participation is also influenced by the relational structures in teams. Specifically, we posit that peer pressure will have a greater impact on virtual participation in teams whose members have less dense friendship networks.

We test the two hypotheses in the context of MUST, an ESM utilized in a Chinese organization called Giant Network. In December 2015, MUST deployed the "daily team report," which shows each member's daily and cumulative activities using scores and ranking. This feature makes individuals' levels of participation visible to all team members and enhances the possibility for peer pressure. This study extends literature on peer pressure by exploring the extent to which an affordance (i.e., visibility) provided by ESM and network characteristics of the team moderates its impact on participation.

Title: Networks and Leaders: Link between one's Network and Leader Preference

Paper ID: 319

Authors: Zeynep Aksehirli (Ozyegin University; Northeastern University)

Abstract:

Abstract:

When we interpret it widely, leadership can be defined as influence of others' behavior towards a desired end. Behavioral leadership theories provide a rich literature that states leadership styles are defined based on dominant forms of behaviors leaders use. Two main categories are the leadership behaviors

focus on building relationships with followers and the ones that focus on organizing task details to help followers' performance. 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 categories. However, the intersection between network structure and leadership behavior preferences is relatively unexplored. This study aims to answer the primary research question whether followers' network structure affects their preference for consideration versus initiation of tasks.

Several characteristics of an individual's network can be expected to affect their leadership preferences. These characteristics are degree centrality (i.e. number of close ties they have within their network), density (i.e. ratio of actual connections in a network to all possible connections) and structural holes (i.e. an individual's level of access to connections with unique information). In brief, I hypothesize that:

Hypothesis 1: Higher degree centrality correlates with a preference for consideration;

Hypothesis 2: Higher density correlates with a preference for consideration, whereas

Hypothesis 3: Higher structural holes correlates with a preference for initiating task structure.

Data collected from 437 white collar professionals, using Leader Behavior Description Questionnaire (LBDQ-XII) and ego-network surveys, are used to test these hypotheses and discuss the consequences. LBDQ defines leaders' behavior in 12 sub categories as Representation, Demand Reconciliation, Tolerance of Uncertainty, Persuasiveness, Initiation of Structure, Tolerance and Freedom, Role Assumption, Consideration, Production Emphasis, Predictive Accuracy, Integration, Superior Orientation. Results of the study identifies how one's network preferences are related to their behavioral expectations from an ideal leader. These preferences will have profound effects of leader-follower exchange relationships and organizational fit decisions.

**Title: Why is Trust in the Federal Government Higher than Local Governments in Rural China? -
-An Social Capital Approach to Study Distributive Injustice**

Paper ID: 322

Authors: Shuai Man, Kun-Hao Yang

Abstract:

In China, the high-level government is the most trustworthy level of government for the public, while the various local governments and villages are the least trustworthy. This paper would like to propose a viewpoint concerning distributive justice of local governments to explain this puzzle. We first hypothesize that an individual's cognition of fairness in government service reduces the difference between his or her trust in the high-level and local governments. Chinese rural residents enjoy the same high-level government policies without difference, but may find these policies implemented in various ways. In other words, they may receive different treatment from the local governments. A person who receives poor treatment will consider the local government unfair, and this reduces trust in local governments. We then theorize that rural residents attribute unfair treatment from governments to local rather than high-level government. Cognition of good governmental performance certainly increases people's trust in all levels of government, but only local governments are blamed due to distributive injustice, since they take responsibility to distribute government resources in executing policies. At last, we suggest that a person deeply embedded in a rural community will get more public goods, which generally distribute through community and then make him or her satisfactory with local government. By the same token, a person with rich micro-level social capital will influence distribution directly by utilizing his or her social connections, so this individual enjoys more government resources and thus increased trust in local government. This paper thus proposes that individuals either with rich micro-level social capital or deeply embedded in a community may have opportunities to influence the distribution of public resources which benefit their own interests. Local governments are thus transparent and helpful for them; that raises their trust in local governments.

Following the arguments stated above, we thus formulize the hypotheses as follows: 1. An individual's cognition of government performance increases his or her trust in government. 2. An individual's cognition of fairness in government service reduces the difference between his or her trust in the high-level and local governments. 3. An individual's embeddedness in a community helps increase his or her trust in governments. 4. An individual's embeddedness in a community reduces the difference between his or her trust in high-level and local governments. 556 cases sampled from Wenchuan earthquake area are included in our explanatory model. These hypotheses are confirmed, and this paper thus answers the question why people trust in high-level government more than local government in the Chinese rural areas.

Title: Bottom-up Consent: Social Capital, Government Arrangement, and Post-Disaster Recovery

Paper ID: 323

Authors: Zhonghao Wang (Tsinghua University)

Abstract:

How does social capital affect post-disaster recovery? While numerous studies have focused on this question, few look closely at the ways by which local social networks interact with government involvement, especially in authoritarian states where government plays an essential role in reconstruction. Based on a survey conducted in Sichuan, China after the 2008 earthquake, this paper investigates how government organization affects the outcomes of social capital. Findings show that both individual and community social capital mobilize survivors to participate in government-led collective planning. Moreover, survivors with stronger community and individual social capital measured by neighbor guanxi network are more likely to be satisfied with reconstruction, while instrumental individual social capital does not yield a significant impact. Contrary to the bottom-up voice in democracies, survivors with stronger social capital in authoritarian regimes experience bottom-up consent and are negatively influenced by government involvement.

Title: The social embeddedness of adolescents' media use. A multilevel network approach

Paper ID: 324

Authors: Matthias Bixler (University of Zurich), Thomas N. Friemel (University of Zurich)

Abstract:

In this paper a stochastic actor-oriented model is used to analyze how media use of adolescents is embedded in their social networks. Data were collected with a three-wave panel survey in four classes of a German middle school (10th graders). Use of the three most popular types of media content among adolescents (TV, YouTube, and video games), interpersonal communication about media content, and friendship are taken into account and modeled as seven mutually coevolving social networks, while controlling for their inner dynamics as well as gender homophily and classroom membership.

Media use is represented in the form of three two-mode networks (one per media type), where the adolescents are linked to the specific media contents they use on a regular basis. For each media type one interpersonal communication network about its content was measured (that is to say, communication about TV programs, YouTube channels, and video games, respectively) as well as the friendship network between the adolescents as distinguished from interpersonal communication.

Several hypotheses on network coevolution are tested: The three two-mode networks of media use are hypothesized to show patterns of content co-nomination across media types. Also, each two-mode network is hypothesized to coevolve with its corresponding interpersonal communication network in the way that interpersonal communication about media content leads to an alignment of content preferences (social influence) and shared content preferences lead to interpersonal communication about this type of media content (social selection). It is further hypothesized that interpersonal communication about one type of media content stimulates interpersonal communication about other types of media content (dyadic coevolution between the interpersonal communication networks). Finally, it is assumed that interpersonal communication about media content serves a basis for the creation and maintenance of friendship and vice versa (dyadic and triadic co-evolution between each of the interpersonal communication networks and the friendship network).

Results show a complex pattern of media use and social context. In particular, the most important findings are: 1) In most cases the effects for content conomination between the two-mode networks of media use are either negative or non-significant. This indicates that the media under study compete for the scarce time budgets of the adolescents instead of being used complementarily. 2) There are positive and significant effects for both social influence on media choice and social selection of communication partners for all three media types under study. 3) Coevolution between the interpersonal communication networks mirrors the pattern found for the two-mode networks of media use. 4) As can be expected, friendship and interpersonal communication are strongly interlinked for all three communication topics, whereas friendship seems to be more important for stimulating and maintaining interpersonal communication than vice versa.

Title: Assessment of Adolescent Body Mass Index (BMI) and Sedentary Activities within Their Social Networks in Kunming, China

Paper ID: 326

Authors: Jenna Hua (Stanford University), Edmund Seto (University of Washington), Yan Li (Kunming Medical University, China), May Wang (University of California Los Angeles), Mark Pachucki (University of Massachusetts Amherst)

Abstract:

The prevalence of childhood overweight and obesity has increased rapidly in the past decades worldwide. In China, childhood obesity has increased more than 15 fold, and more than 23% of boys and 14% of girls under age 20 are overweight or obese. Recent research in Western countries indicated that obesity is likely to spread among family and friends' networks via social influence mechanisms on individual's health behaviors such as diet and sedentary activities. However, relatively very little research has been done to investigate obesity-related health behaviors among Chinese adolescent social networks, and the impacts of Chinese adolescent social connections on such behaviors. Therefore, the purpose of this study was to assess adolescent's BMI and sedentary activities within their social networks in Kunming, China. This research was part of a larger Kunming Food Environment Study examining the effects of changing food environment on adolescent's diet and obesity risk.

284 adolescents aged 16-18 with roughly 1:1 male to female ratio were recruited from two local high schools in 2015. All adolescents from the entire freshmen class (10th grade) in each school were recruited to build a complete network. Each adolescent was asked to name up to five their male and female friends separately in rank order, and list the activities they had done with each identified friend in the previous week. Their weights (kg), heights (cm) and waist circumferences (cm) were measured by trained study assistants to the nearest 10th digit. Body Mass Index (BMI) was then calculated by using their weight divided by height squared. BMIs were categorized into underweight, normal, overweight and obese using two cutoffs including those established by the Capital Institute of Pediatrics (CIP) and Working Group on Obesity in China (WGOC) and International Obesity Task Force (IOTFa, Asian specific).

The mean BMI of the cohort was 21.6 kg/m² with standard deviation of 3.87 kg/m². Different cutoffs generated different percentages of each BMI category. IOTF Asian cutoffs generated the higher percentages (33.6% for male and 25.3% for female) of overweight (combined overweight and obese) adolescents, and WGOC cutoffs generated 19.0% for males and 17.2% for females. In terms of underweight, IOTF cutoff generated 14.6% underweight males and 12.6% underweight females, and WGOC cutoff generated 2.3% and 2.0%. On average, adolescents reported equal numbers of male (3.99 with standard deviation of 1.43) and female (4.27 with standard deviation of 1.30) friends. Although not significant, male adolescents reported equal numbers of male and female friends, but female adolescents reported more female friends than male friends. Adolescents engaged more sedentary activities such as studying, talking, watching TV and playing video games with their friends than physical activities such as walking and exercising.

The prevalence of overweight and obesity among Chinese adolescents deserves immediate attention. Current study is limited in its sample size and cross-sectional nature. Future longitudinal studies in larger scale are needed to examine Chinese adolescent social networks, how they evolve over time and the impacts of the networks on adolescent health behaviors.

Title: ESG (Brazilian War School): the use of the Gephi program to analyze the social political network

Paper ID: 327

Authors: Gilberto de Souza Vianna (Federal University of Rio de Janeiro) and (Brazilian Army)

Abstract:

The study refers to ESG (Brazilian war school), it brings together military and civilians in their courses, an important and unique feature of the School is that an associative network after a time becomes a public sphere of debate, as Habermas says. As a background, ESG has an associated network that teaches courses and applies the same teaching methodology: ADESG (association of graduates of the Superior School of War), founded in 1950, by former students and encouraged the Brazilian general Farias and Brazilian Admiral Benjamin Sodré, the first President of ADESGs

For this initial study, a survey was made of the people, military and civil, involved in the groups of implantation studies and those who actually worked in the School in its early years. From the elaboration of a database, a clipping was made looking for to map the initial influences that acted in its formation and to analyze the elements related to its emergence in the Brazilian politics in the period from 1949 to 1961, mainly of the Government of President Dutra to the Government of President Janio. An arduous and time-consuming undertaking in this initial survey. I had the support of Captain Luiz Américo, statistician and member of the ESG, at the time of this work. We use the Microsoft Access 2007 Program for database creation and naming lists, along with Open Source software called Gephi, used for social network analysis, for its easy interface to create social data connectors in the mapping of community organizations and networks Associations.

This analysis allow us to know the political power that ESG had on Brazil on the last 6 decades.

Title: Ethnic Homophily in Multicultural and Hegemonic Mixed Israeli Schools

Paper ID: 328

Authors: Yossi Shavit (Tel Aviv University), Uri Shwed (Ben Gurion University of the Negev) and Yuval Kalish (Tel Aviv University)

Abstract:

This is a study of friendship choices among Arab and Jewish students in Israeli schools. Israel's population consists of about 75 percent Jews and 20 percent Arabs. In most areas of life there is a sharp separation between the two groups. In the school system, segregation is formal with Arabs and Jews attending Arabic and Hebrew schools respectively. Recently, however, educational integration is rising slowly. The two main carriers of this process are Arab families of lower and middle class that prefer Hebrew (Jewish) schools over Arab alternatives, and Jewish and Arab upper middle class families that participate in a handful of bilingual-multicultural schools, with an explicit agenda of promoting coexistence. This study examines separation and integration between Jews and Arabs in the few instances where they meet in real life – in primary school classes attended by both groups. We collected and analyzed student networks in 61 integrated classrooms, estimated the extent to which Arabs and Jews prefer ethnic homophily over inter-ethnic friendships, and compare homophily in bi-lingual and Hebrew schools. We analyze the data using graph-level segregation and homophily indices, multilevel diad models and ERG models. Contrary to expectations, findings generally, reveal a modest degree of homophily in Hebrew schools and a much larger degree of homophily in bilingual schools. Differences between the analytic approaches and the nuances of their results are discussed. The policy implications of these findings are discussed. Proponents of multiculturalism oppose the attempt to impose hegemonic education on cultural minorities. Multicultural education is said to liberate minorities from denigration by the Hegemony. Our results challenge this proposition: while multiculturalism can empower minorities, it also enhances closure between groups.

Title: Do Mayors' Social Networks Increase Local Governments' Performance?: Network Analyses of 300 Local Governments in the Philippines

Paper ID: 329

Authors: Jun Kobayashi (Seikei University), Kenichi Nishimura (Osaka University), Hiroko Osaki (Seikei University)

Abstract:

This paper examines whether mayors' social networks increase local governments' performance. Putnam suggests that politicians' social networks with residents may deteriorate political transparency and thus decrease performance. However, no direct relationships have been clarified. So, we focus on the Philippines as a case and conduct a survey on national representative 300 cities and municipalities in 2011. We find that (1) by distributions, among three indexes of performance as dependent variables, valuing fundamentals of governance have the highest scores. Social governance and administrative governance follow. Among mayors' networks as independent variables, mayors meet residents most, and local politicians, provincial politicians, and the central government officers follow. (2) By regression analyses, meeting residents promotes social governance, while meeting central government officers increases administrative governance. Multi-level analyses support these results. Therefore, mayors' social networks increase local governments' performance as social capital. Yet different social networks promote different performance.

Title: Social Capital and Political Upward Mobility in Reforming China: Evidence from Chinese Provincial Leaders from 1990 to 2013

Paper ID: 330

Authors: Rongrong Lin (School of Government, Center for Chinese Public Administration Research and Center for Anti-Corruption Studies, Sun Yat-sen University)

Abstract:

This study attempts to study how social capital affects political elite upward mobility in China. The analysis of social capital has long been at the crux of the studies on status attainment, career mobility and social stratification. Previous literature has emphasized the notable role of social capital. Yet little is understood about whether the effect of social capital can be observed in upward mobility for political leaders, or to what extent social capital is rewarded in promotion dynamics over different career stages. Thus, this study develops promotion models for Chinese provincial leaders from 1990 to 2013. The promotion analyses address two specific research questions: how does social capital affect promotion outcomes? And how do these effects change across administrative ranks and over different historical periods?

A strong body of the current scholarly research locates the study of Chinese political mobility in the context of factional politics. Accordingly, it focuses analytic attention on the factional affiliation with specific factional camps or superior leaders, family backgrounds or blood ties, and social connections accumulated through shared birthplaces, educational institutions or work units. In comparison, social capital in this study is related to the configuration of social network arising from formal work contacts. Such an analysis implicitly assumes that the acquisition of network resources hinges on the expansion of network size, the increase in network diversity and social ties to dominant leaders.

Based on occupational histories of a sample of 1,891 provincial leaders drawn from 31 provincial-level administrations in China, this study constructs a comprehensive Chinese provincial leadership dataset with the detailed information on demographic attributes, political mobility processes, the timing of promotion event occurrences and the social network characteristics for provincial party secretaries, provincial governors, deputy party secretaries and vice governors from 1990 to 2013. The promotion analyses focus on the pathways from deputy-division head level to the state-leader level. Social capital in this study is measured by social networks emerging from career experience and formal social interactions in the workplace. It centers on the accessible network resources rather than the mobilization of contact resources.

This study produces the first promotion analysis from a dynamic perspective where the promotion models at different administrative ranks draw from the full upward trajectories for individual provincial leaders. It sharpens the understanding of the operationalization of social capital in the political leadership selection in the Chinese context. This is the first empirical study to evaluate social capital for Chinese provincial leaders from a networking perspective.

The findings of this empirical study emphasize the significant career rewards for social capital, which could be summarized into three essential points. First, social capital functions as a robust

predictor of upward mobility in both the overall promotion model and the rank-specific promotion dynamics. Second, social capital, in the form of network size or upper reachability, exerts more favorable effects on deputy positions than the succeeding full positions for advancing to the lower and middle ranks. Finally, the significant impact of network diversity is limited to the promotion towards the deputy-bureau/director level.

Title: A Social Network Analysis on the Mechanism of Community Policing

Paper ID: 331

Authors: Xiaozhan Wang (Central University of Finance and Economics, School of Government), Yun Geng (Central University of Finance and Economics, School of Government), Wenjuan Wang (Central University of Finance and Economics, School of Government)

Abstract:

The great social transformation in China has caused tremendous influence on social governance. Community policing, as one essential part of it, calls for synergetic reform urgently. Based on social network analysis, this study aims to compare two types of community policing, i.e., the traditional mode and the cooperative mode. We identify the actors of each mechanism, characterize the relationship among them, and develop two mechanism models accordingly. The results imply that the residents' committee is an overarching and critical component in both mechanisms. Compared with the traditional one, cooperative governance mechanism can effectively promote connections between actors in community policing network. It also works better in enhancing the cohesive affinity and avoiding excessive concentration of authority and responsibility. Our discussion on structural holes of each network shows that the residents' committee still occupies the dominant position in community policing network, and controls the dissemination resource configuration greatly, although cooperative governance mechanism can narrow the gap of Constraint between residents' committees and other actors to a certain degree.

Title: Guanxi Violates Justice? Marketization and Public Attitudes towards Guanxi Practice

Paper ID: 332

Authors: Felicia F. Tian (Fudan University, China), Xujian Yang (Fudan University, China)

Abstract:

As a Chinese term for social networks that emphasizes obligations and reciprocity (Barbalet 2014; Bian and Zhang 2013), The pervasive of guanxi in Chinese everyday life also entails the deep controversy towards it (Chen and Bian 2015; Yang 1994). Some view guanxi as morally neutral, a reality operates by its own morality and serves necessary social function (Yang 1994); Others see it as morally rejected, as an aberrant instrumental behavior that based on self-interest, a manipulation of personal relations, and a behavior often associated with bribes and corruption (Chen and Bian 2015).

Since The economic reform in the 1980s poses a new question: will the introduction of market alter public attitudes towards guanxi practice? Some scholars argue that guanxi practice will increasingly be viewed as morally rejected as marketization progresses. Guanxi practice opposes the logic of market. Guanxi offers a moral logic of particularism, which holds double standards for those who are connected and who are not (Luo 2012). This directly opposes the moral logic of market, which requires social interactions to be based on universalism and equal to everyone (Weber 1961[1923]). The introduction of market limits the benefit of guanxi practice in social interactions and thus reduces the legitimacy of using guanxi in everyday life (Guthrie 1998; Hanser 2002). Others claim guanxi is resilient even to the introduction of market. It is a repertoire of cultural patterns and resources which are continuously transformed in their adaptation to, as well as shaping of, new social institutions and structures (Barbalet 2015; Gold 1985; Yang 2002).

Yet few studies have empirically examined how marketization shape the public attitudes toward guanxi practice. In this study we aim to fill the gap. By examining public attitudes about to what extent guanxi practice violates justice, our results show that individuals' perception of guanxi practice violates equality is positively associated with the level of marketization. In other words, individuals are more likely to feel guanxi practice violates justice in places with higher levels of marketization.

Title: Emergence and causality: the role of ties in the process of job hunting

Paper ID: 333

Authors: Jing Nie (Department of Sociology, School of Humanities and Human Sciences, Xi'an Jiaotong University, China), Jun Liu (Department of Sociology, School of Humanities and Human Sciences, Xi'an Jiaotong University, China)

Abstract:

In 1970s, Granovetter (1973) 's classical work proved that people were more often or more effectively to get jobs through weak ties rather than strong ones. After that, Yanjie Bian (1997) found that in China, jobs are acquired through strong ties more frequently than through weak ties, both direct and indirect ties are used to obtain help from job-assigning authorities, and that job seekers using indirect ties are more likely to get better jobs than those using direct ties. In addition, the topic is also covered in economics, psychology and anthropology, etc. Different disciplines have different concerns and different approaches. Economics is concerned with economic policy and the relationship between cost of job-hunting and benefit. Some psychological researches explore the relationship between psychological status and behaviors of job seekers. According to Schwab (1987), there are two types of predictors of job hunting: individual characteristics and labor market factors. Wanberg et al (2000), used the NEO personality scale to explore the relationship between personal characteristics and social connections utilization degree, and found a high correlation between extroversion, responsibility and social connections utilization degree. They also found that social connections utilization degree has a close relationship with the re-employment pace, re-employment status and job satisfaction.

From these studies and everyday experience we see that, job-seeking is a complex process which is influenced by various implicit or explicit factors, such as personal attributes (gender, age, education level, family SES, the meaning of job that is affiliated by the job seekers, etc.) dyadic social capital (resources mobilized in ego network, social ties), and macro social structure. These factors co-exist simultaneously and bring the emergence of finding a job. Emergence refers to a process that higher level phenomenon could not be reduced to lower level, which means in this case that finding a job is a synthetic results of various influencing factors, and it cannot be reduces to these factors. To put it simply, the whole system is greater than the sum of the parts; new properties will suddenly be born at the system level. In some previous studies, however, reductionism is usually used to explain job hunting; In other words, regression analysis is a kind of linear causal relationship, which cannot be employed to examine the non-linear emerging process of job seeking. Using more than 40 in-depth interviews, this study explore the role of relational ties in the process of finding a job in daily life. The hermeneutical thick description method is employed to understanding the meaning of job that is affiliated by job seekers and other factors. These methodological reflections will improve the study of the role of relationship in the process of job hunting.

Keywords: ties, job hunting, emergence, thick description

Title: The Jiusan Study Group: A Chinese Academic Network Under Early Communist Rule (1944-1956)

Paper ID: 334

Authors: Henrike Rudolph

Abstract:

As their struggle against the Nationalist forces (Guomindang, GMD) heightened in the late 1930s, the Chinese Communist Party (CCP) sought to expand its network of supporters not only among workers and peasants but also among the countries' elites. Especially the intellectuals and scientists who had graduated from modern Chinese or even foreign universities were to take a crucial role in administering educational and rural land reforms as well as economic reconstruction under Communist rule.

One of those so-called minor parties and groups invited to join ranks with the Communists was the Jiusan Study Group (Jiusan xueshe, hereafter short Jiusan), which was convened by leading Chinese scientists in 1946. The fifty founding members of this group were teachers and professors of the university in Chongqing, the city which served as the provisional capital of the GMD government at the time. These founders were a very heterogeneous group and initially did not clearly side with the CCP but instead called on both Communists and Nationalists to constructively engage in a peaceful transformation of the government based on democratic principles and civil rights.

This relatively small group of intellectuals was successful in securing influence and being recognized as a political party and within a decade its membership had grown to around 25,000. After a period of persecution during the Cultural Revolution, the Jiusan continued to grow and had nearly 150,000 members from all fields of science in 2014.

This paper seeks to shed light on the early development of the Jiusan since the founding of its predecessor the Democratic Science Forum (Minzhu kexue zuotanhui) in 1944 to the Hundred Flowers Campaign (Baihua yundong) when many of its leaders came under attack in 1956. Among the central questions this paper seeks to answer are the following: How did membership structures of the Jiusan change over time and can key actors be identified who were decisive in facilitating its enlargement? Were affiliations to certain universities or academic fields overrepresented? Which features of the network might have rendered membership in the Jiusan attractive and thus help to explain its rapid expansion? In which ways was the Jiusan connected to the CCP and were Jiusan members in a position to influence political decision making? And finally, how did the CCP integrate the Jiusan into the political system?

To answer these questions historical material such as membership records, contemporary publications, and memoirs are collected and analyzed to reconstruct an affiliation network showing how Jiusan members were linked to one another as well as to other organizations and institutions such as the CCP or certain Chinese universities.

Thus, this research does not only pertain to the Jiusan Study Group but grants insights into the CCP's ties to alternate political forces and foreign-educated intellectuals in the process of

consolidating their rule and modernizing industrial, agricultural, educational, and cultural structures in the 1940s and 1950s.

Title: A Taste of Discrimination: Intergroup Bias Communicated through Yelp Reviews

Paper ID: 337

Authors: Chao Yu (Cornell University), Drew Margolin (Cornell University)

Abstract:

When making evaluations, research indicates that people discriminate based on group identities. This paper examines how people's group identities, inferred from their ego-networks, influence their evaluations of different types of restaurant on Yelp. In this paper we analyze and compare four competing theories that address this phenomenon: Black Sheep Effect (BSE), Extremity Complexity Model (ECM), Expectancy Violation Theory (EVT) and Exoticism (EXO). Specifically, BSE suggests that people are more likely to give extreme evaluations to ingroup objects, but ECM claims people are inclined to give extreme evaluations to outgroup objects. According to EVT, people give extreme evaluations based on their expectations while EXO argues that people are more likely to give extremely positive evaluations to outgroup objects which are culturally distant. The common ground of the four theories is that people tend to give extreme evaluations to either ingroup or outgroup objects.

Our data are comprised of the ratings of restaurants in New York City and information about the users who wrote them. We operationalize evaluations by Yelp users' star ratings (from 1 to 5 stars and more stars means more favorable). These quantitative ratings allow each review to be quantified in terms of its extremity from the norm for that individual or that restaurant. We operationalize group identity as ethnicity, such as Chinese or Korean, which can be assigned to both reviewers and restaurant cuisines. In particular, to infer the user's ethnicity we collect the demographic information they list on their public profiles on Yelp. To further refine our understanding of their identity, we also assess the demographics of their ego-networks drawn from their friends (mutual ties), followers and followees (directional ties). We plan to find out the evaluation patterns of different group identities, which may provide us implications on how intimate networks influence people's evaluations.

Keywords: discrimination, network embeddedness, group identity

Title: Emergence of scale-free networks and small-world properties in psychosocial feelings expressed on Twitter

Paper ID: 339

Authors: Kaushalya Premachandra (Department of Applied Sciences, Rajarata University of Sri Lanka), Thejan Rajapakshe (Department of Applied Sciences, Rajarata University of Sri Lanka)

Abstract:

Traditionally, humans have used social sharing of emotions as a medium of communication. Before the emergence of social media, emotional sharing was limited to a dyadic context, where people shared their feelings only among trusted recipients or complete strangers. However, after the emergence of social media, people tend to share emotions with large and diverse groups through social networking websites.

This project analyses the patterns of social sharing of emotions of $N=71,027$ social media users and the influence of specific emotions on the community using social network analysis measures. These measures include three of the most robust measures in network topology: degree distribution $P(k)$, characteristic path length L , global and local clustering coefficients C and C_i . Moreover, the emergent network structures (random, regular, small-world and scale free) of each emotional communication network are analyzed.

Four complex networks based on four emotions: fun, sad, happy and love (edges) shared by Twitter social media channel users are constructed. The robustness of power-law, truncated power law (expect for scale-free behavior from both models) and exponential distribution (expect for random Poisson distribution) model fits to the degree distributions of the four networks are tested using model selection approach, i.e. Akaike information criterion, AIC to analyze the connectivity of individuals. The four emotional sharing networks could be characterized by scale-free networks with a power-law exponent between 2 and 3 (ultra small world networks) showing that fewer number of individuals are highly connected (called super spreaders) and the flow of emotions is more focused among these highly connected individuals. In addition, these networks could be characterized as small-world networks with $C_{\text{random}} < C$ and characteristic $L_{\text{random}} \approx L$ showing that a small change in the network structure makes a big difference in emotional spreading. Since there is a high probability of clustering sub groups, the message penetration is very effective.

The network properties such as network density D and C suggest that there is more affinity toward individuals who are light hearted rather than those who are sad. The individuals who use social media to share emotions do not either experience love or like to share the feeling of love. In addition, these properties also suggest that sad individuals are drawn towards other sad individuals making cliques. However, comparatively smaller value of L obtained for the sad network suggests that the propagation of sadness is not encouraged within the network.

The individuals with fewer connections of all networks have high C_i values suggesting that sharing emotions takes place among diverse communities. The correlation between C_i and degree k shows scale-free behaviour with a power-law exponent, α between 1.024 and 1.837 that

are significantly larger values for large N than that of a random network, $C(k) \sim k^{-1}$ demonstrating that the information penetration in these networks are more efficient than that of a random network. Higher α of the love network suggests that love propagates more efficiently than the other feelings. The power law behaviour of C_i vs. k correlation shows that the spread of emotions could be hierarchical.

Title: Analysing Balance in Social, Biological, and Political Signed Networks using the Frustration Index

Paper ID: 343

Authors: Samin Aref (Department of Computer Science, University of Auckland), Andrew J. Mason (Department of Engineering Science, University of Auckland), Mark C. Wilson (Department of Computer Science, University of Auckland)

Abstract:

The frustration index of a signed graph is a key to solving problems in different fields of research including social networks, physics, material science, and biology. In social networks the frustration index determines network distance from a state of structural balance. Although the definition of frustration index goes back to 1960, an exact algorithmic computation method has not yet been proposed. We investigate balance in a wide range of real-world signed networks using new optimisation models and the Gurobi solver. This study provides the first exact evaluation of the frustration index on various social, biological, and political networks with up to thousands of nodes and edges. We use well-known datasets from the sociology literature, such as Read's New Guinean tribes, and much more recent ones involving senate bill co-sponsorship. There are also signed networks inferred from students' choice and rejection as well as datasets from the biology literature including gene regulatory networks. We also analyse the frustration index of a political network of countries over time. We find that most real-world social networks and some biological networks exhibit a relatively low level of frustration which indicates that they are close to balanced.

Title: Private Lands, NGOs, and Landscape Conservation: Assessing Opportunities through Social Network Analysis in the Texas Hill Country

Paper ID: 345

Authors: Patrick Bixler (University of Texas at Austin), Clare Zutz (University of Texas at Austin), Ashley Lovell (Texas Land Conservancy)

Abstract:

Environmental and natural resource planners, policy-makers, and practitioners are increasingly developing and employing strategies to address conservation challenges that span boundaries and land uses. These initiatives – increasingly referred to as landscape conservation – also seek to engage a range of stakeholders that represent different communities (of place and interest) into the governance process. Through a mixed-methods approach that includes social network analysis and qualitative research, we analyze a conservation network in the Hill Country of Central Texas. The Hill Country presents a unique institutional context with approximately 96% of the land in private ownership, little land regulation and rapid growth along its urban corridor. Findings include an abundance of nongovernmental organizations, the homophilic central actor, and the influential regional NGOs. We discuss how the network findings can be interpreted in the context of the qualitative analysis as they relate to the barriers and benefits of collaboration in the Hill Country landscape. These results have been applied in practice to ongoing efforts to establish a “Hill Country Conservation Network.”

Title: Multilevel scale mismatches in estuary restoration: challenges and opportunities

Paper ID: 347

Authors: Jesse S. Sayles (Department of Geography, McGill University)

Abstract:

Resource management boundaries seldom align with ecological systems leading to social and ecological problems. One way to overcome these misalignments, also known as scale mismatches, is through collaboration and coordination networks among organizations working in different parts of a landscape at local and regional levels. Most network studies of scale mismatch focus on single governance levels (e.g., local or regional) as opposed to integrated multilevel assessments (e.g., local to regional), hindering our understanding of scale mismatches and potential solutions. In response, this presentation integrates findings from two multilevel scale mismatch studies. The first develops and applies a novel quantitative approach using network science to map and analyze scale mismatches. Social network survey results from 140 natural resource managers involved with salmon restoration in Puget Sound, Washington are integrated with spatial bio-physical data. Scale mismatches are identified by looking at how collaboration strength and configuration among local and regional organizations align with biophysical landscape patterns and processes. The second study grounds the quantitative research using 95 interviews about the effects of scale mismatches on practitioners' abilities to do restoration. Results show how scale mismatch is a complex socio-environmental landscape pattern that affects the flow of financial, human, and natural capital across the landscape. Some flows create challenges. Others create opportunities. Social factors are considered part of the very landscape fabric being managed; to improve ecological conditions it is often first necessary to improve the social infrastructure to do so. A systematic multilevel understanding of scale mismatch is essential for natural resource planning.

Title: Networks of Policy Change and Continuance: Mapping the Post-Fukushima Energy and Environmental Policy Networks in Germany

Paper ID: 348

Authors: Leslie Tkach-Kawasaki (University of Tsukuba), Manuela Hartwig (University of Tsukuba), Junku Lee (University of Tsukuba)

Abstract:

In March 2011, the world's first earthquake triggering a nuclear catastrophe occurred in Fukushima prefecture on Japan's east coast. In the post-Fukushima energy debate, decisions by Germany's Christian Democratic-led government to ban nuclear energy drew international attention. Four years later in 2015, the Paris agreement to implement a binding mitigation framework for participating countries was enacted after a record deliberation time of less than a year. These rapid developments suggest that policy transformations can take place on the national level in relatively short periods of time.

Yet, in delving into the nature of policy change, how sudden was the emergence of policy movements that championed Germany's "Energiewende" or energy transition? Concentration on significant yet discreet policy events may often masquerade the gradually pervasive transformation in policy networks over a period of time.

This paper analyzes the policy networks in the actor networks of Germany's renewable energy sector in the pre- and post Fukushima period. First, we draw on the descriptive results from the first round of the Global Environmental Policy Network (GEPON) Survey undertaken in Germany in 2000, as reported by Foljanty-Jost and Jacob (2004), which classified German environmental policy actors, and compared information, cooperation, and support among actor classifications. The top information exchange partners in Germany and Japan were also identified and compared by Foljanty-Jost (2005). In order to delve more deeply into the nature of the current policy network, we utilize the results from the second round of the GEPON Survey also undertaken in Germany in 2016-17, which included qualitative interviews with major actors from related policy fields, civil society actors, research institutes, business entities, and mass media channels. Data from the second survey was used in turn to construct networks identifying the main actor relationships in the environmental and energy policy processes in Germany. The analysis suggests that Germany's environmental policy network, which has dominated the "post-Fukushima" renewable energy policy arena, has in fact developed and stabilized over an extended period of time.

Using this approach to mapping actor networks allows for a more precise analysis of emergent policy processes. Furthermore, comparing actor interaction, emphasizing the results of the second GEPON Survey, may have significant implications for governance and policy research. These shifts over time, particularly in terms of economic entities and civil society actors, may reveal new configurations in power relationships and coalition building. Overall, the interests, self-perception, and opinion about other actors in the network may be key points in understanding the process of policy outcomes.

Title: Investigating the Stance and Rhetorical Structure of Longer Spans of Written Academic Discourse

Paper ID: 349

Authors: David L Elliott (University of Missouri)

Abstract:

This paper reports on a pilot study within a larger investigation of the stance and rhetorical structure of written academic discourse. The sample for the pilot study consists of a chapter of the influential textbook, *The Principles of Biomedical Ethics* by Beauchamp and Childress, of which seven editions have been published between 1979 and 2012. The larger investigation will analyze each edition of the entire textbook.

Stance is defined here as acts of rhetorical claim-making and position-taking by an author(s), through which the author(s) seek what White (2008) calls footing in written interactions with other authors. As such, stance is taken to mean more than an author's use of subjective or evaluative language. DuBois's (2007) triangular model of stance acts in the oral discourse of dialogic, face-to-face encounters is adapted to the interactions between authors in written academic discourse. A working assumption is that the hierarchical rhetorical and coherence structure of a written text can be shown to be directly related to the text's stance structure, with central stances relating to subsidiary stances. Analogous to the dialogic other of Du Bois's stance triangle are the cited authors of written academic discourse, and this study seeks to contribute to citation analysis by identifying the context of each citation and its position within a hierarchical rhetorical structure of a written text.

The sample textbook chapter is analyzed at the levels of clauses and of contiguous spans of clauses. After the chapter's clauses are parsed, the rhetorical relations between clauses are determined using the taxonomy of Mann and Thompson's (1987) Rhetorical Structure Theory (RST) as well as relations from other similar taxonomies as deemed contextually appropriate. According to Taboada and Mann (2006), RST has not been successfully applied to texts of longer length. They suggest that considerations of genre are needed to supplement RST for academic article- or book-length texts. What van Dijk (1980) outlines as macrostructures and superstructures, along with schematic structural markers such as layout, are used here to supplement RST and similar taxonomies. This study thereby seeks to contribute to a taxonomy for annotating longer texts. Also, whereas most analytic techniques such as RST represent the rhetorical structure of texts as tree diagrams, this study models the structure as a multiplex network.

Title: Are there Core Frames in Framenet? An Exploratory Network Analysis on Frame-to-frame Relations of Framenet

Paper ID: 350

Authors: Joseph Wai-ip, Lam (Faculty of Education, The University of Hong Kong)

Abstract:

The study aims at conducting network analysis on Framenet to identify the Core Semantic Frames as the most basic Pedagogical Content Knowledge (PCK) of Chinese language learning in early childhood education in Hong Kong.

Framenet <<https://framenet.icsi.berkeley.edu/>> is a lexical database based on a theory of meaning called Frame Semantics developed mainly by Charles J. Fillmore since 80's of the last century. It is a network of semantic frame which is conceptual structure of event, relation, or entity and the participants in it. For example, frame "Commerce_goods-transfer" describes the concept of commercial transaction typically involves Seller, Buyer, Goods, Money and other non-core elements such as Place, Purpose, Means, Time, etc on which the event "the Seller gives the Goods to the Buyer in exchange for the Money" is represented. Frames are connected by "frame-to-frame relation". For example, frame "Commerce_goods-transfer" is inherited from frame "Transfer", has subframe of "Commerical_transaction", and is perspectivized in two frames "Commerce_buy" and "Commerce_sell". Framenet can be used to interpret the meaning and form of usage of language. Frame semantics is conceptually oriented and is easily applied in cross-linguistic context.

Network Analysis, in particular, cluster analysis, is conducted on frame-to-frame relations of Framenet to analyze the core and periphery structure of Framenet. The result is further investigated qualitatively to identify the Core Semantic Frames for early childhood education.

The study is part of project "Provision of School-based Support in the Learning of Chinese Language for Non-Chinese Speaking (NCS) Students at Primary Level (2014-2017)" aims at developing a progressive curriculum framework for the learning and teaching of Chinese Language in the partner schools in accordance to their needs and objective conditions, so as to facilitate the smooth transition of their culturally and linguistically diverse students from kindergartens to primary schools and their transitions from primary schools to secondary schools <<http://www.edb.gov.hk/en/edu-system/primary-secondary/applicable-to-primary-secondary/sbss/sbps/usp/USP-NCSP1/index.html>>. One of tasks of the project is to identify the Chinese language system which is pedagogically suitable for South Asian ethnic minority children to learn Chinese as an additional language in Hong Kong.

The study also has implication on how network analysis can be used for research on Framenet.

Title: Uncovering Relational Meaning through Discussion Networks

Paper ID: 352

Authors: Neha Gondal (Boston University)

Abstract:

The social network component of the 2004 General Social Survey is well known for demonstrating increasing isolation in the United States or a rise in the proportion of persons who said they had “no one” with whom they could discuss important matters. Here, I focus on the non-isolates or those respondents who positively identified one or more persons in their discussion networks. More specifically, contributing to the burgeoning literature on network structure and tie-meaning, I conceptualize relational content as an interaction between order of choices and relational categories used to describe those choices. Using two-mode network analytic techniques, I find that the meanings of some types of relationships vary on the basis of choice order, while others remain stable. Respondents who report spouse/significant other as their first choice, are more likely to view their partner as a friend and/or advisor. Those who report spouse/significant as a second or subsequent choice, frame that relationship only in spousal terms. Thus, individuals who are more closely reliant on their spouse view that relationship more diffusely than those who turn to their spouse only as a second or later choice. The role of children also varies by choice order; however specificity and diffuseness are reversed in this case. Those who name their child as the first choice view it as a stand-alone relationship; respondents who report their child as a subsequent choice tend to view them as friends. In contrast, parents and co-workers are likely to be described as friends and advisors independent of choice order suggesting that these relationships are viewed more diffusely than those with one’s children. More generally, I show that survey data can be used to study the meanings we attribute to close personal ties.

Title: The relation between anger and crime: analysis of discourse structure of violent crimes in Korea

Paper ID: 353

Authors: Sunhyoung Lee

Abstract:

In Korea, there is growing recognition that anger is a cause of crime. From this perspective is easy to overlook the motive or circumstances of the offense therefore treating people with an anger disorder like a potential criminal. This being the case, what is the relation between anger and crime? How are the words linked? This paper aims to examine the discourse structure of crime and anger through analysis of media reports of violent crimes in Korea. 176,626 articles from 2006-2016 were analyzed applying the Word2Vec algorithm, an extension of the neural network algorithms that are trained to reconstruct the linguistic contexts of words. The results show that "murder" connected with various types of criminal behavior, such as "poisoning," "kidnap," "robbery" related sentences. "Violence" also consists of words related to patterns of offense such as verbal abuse, family violence, rape, and bullying but has no relation to punishment. "Anger" does not appear in the discourse of crime but invokes the context of the offense. The first corpus includes "hostility," "hatred," "frustration," etc., emotions of the offenders. The second corpus is about feelings such as "shock," "fear," "sympathy," and "pity" after hearing reports of crime. The last corpus refers the characteristic of criminal action, "impulse" and "accidental." Anger is associated with crime but its existence cannot confirm that it is the cause of the offense. In other words, anger is the parent category in the discourse of violent crimes, and the subjects who feel it are victims, the public, and perpetrators. Therefore, the causes of crime are relevant to types of violence or emotions in a subcategory of rage.

Title: Pragmatics of e-Language: Irony in online networked communication

Paper ID: 355

Authors: Joyce Lee, Chien-Lung Chan, Chang-Yen Huang

Abstract:

Social media are fundamentally changing the way people communicate, interact, consume and create, as well as having an increasing impact on businesses. In particular, online discussion forums are full of user opinions, experiences, wishes and complaints regarding products and/or services and thus, can be a gold mine for exploring customer value. This research aims to study how the user-generated content in online discussion forums can be used to learn what are customer wants and preferences. However, capturing customer value in the vast amount of online comments and opinions can be very challenging, mainly because an array of new and special web languages have been created by the users, which can be hard to understand, particularly by firms who want to know “what is happening” and “what is going on” on the forums. Regarding this study, it is argued that in order to understand better what customers need and like, it is critically important that companies systematically observe and work to interpret both the semantic and pragmatic meanings of the content in the commentaries of online discussion forums. Through this process, this research discovers the language patterns of the textual meaning interactions in the online discussion forums as well as answering important customer value questions in these domains.

The popularity of online discussion forums has led to exponential growth of user-generated content in both volume and significance. This study focuses on the automobile industry. A statistical report shows that 94% of car buyers gather information online and 23% say they use social media to share and communicate their purchase and use experience. However, many car companies and manufacturers have not succeeded to tap the power of social media so as to enhance market effectiveness. This research intends to tackle the challenges of capturing customer value based on online discussion forums in relations to automobile industry. To support the purpose, this researcher is conducting social network analysis based on qualitative data collected from the most popular online car discussion forum in Taiwan MyCar (a pseudonym). Specifically, the online discussion posts related to the car brand Toyota is chosen for data analysis (approximately 8743 posts, dated September 2016- January 2017).

The early findings of this study reveal that (1) a large amount of web language containing irony and/or sarcasm has been created by the users and quickly spread, (2) these gradually form a specific opinion climate in the forum and (3) have an influence on customer value in relation a firm’s goods or services. Currently, the researchers are making good progress with the study and we will be in a position to offer further significant research findings at the conference.

Keywords: Web language, semantics, pragmatics, social media, user-generated content, online discussion forum

Title: Intergenerational learning through advice seeking relationships in school teams

Paper ID: 357

Authors: Kendra Geeraerts (University of Antwerp), Jan Vanhoof (University of Antwerp), Piet Van den Bossche (University of Antwerp, University of Maastricht)

Abstract:

Nowadays, the role of knowledge management within schools as an organizational context has received more attention due to its potential to encourage innovative practices and to avoid knowledge loss within school teams (Thambi & O'Toole, 2012). Facilitating intergenerational learning processes seems to be a promising way to prevent knowledge loss within organizations (Gerpott, Lehmann-Willenbrock, & Voelpel, 2016; Ropes, 2013; Starks, 2013). Intergenerational learning in school teams is mainly conceptualised as an interactive process between and among teachers of different generations that results in learning from one or both parties (Novotný & Brücknerová, 2014; Ropes, 2011). Individuals of generational groups are found to possess different kinds of knowledge (Gerpott et al., 2016). Also, previous research within the context of school teams showed that teachers' knowledge varies depending on their generational cohort or level of experience. For instance, young teachers are perceived to possess innovative teaching methods and ICT skills, while teachers of the oldest generational cohort are perceived to have excellent classroom management skills and content knowledge (Geeraerts, Vanhoof, & Van den Bossche, 2016). Simultaneously, classroom management skills are known to be a challenge for beginning teachers (Wolff, van den Bogert, Jarodzka, & Boshuizen, 2015). These findings makes age diversity and intergenerational learning within school teams relevant (Geeraerts et al., 2016). Moolenaar (2010) highlighted the importance of professional interactions between school team members to facilitate knowledge sharing and learning from each other. Consequently, intergenerational knowledge sharing can be understood as a socio-constructive process in which interactions such as asking advice or collaboration play a facilitating role (Geeraerts et al., 2016; Novotný & Brücknerová, 2014). In this study, we examine the role of age features and years of experience in the formation of asking advice relationships in secondary education school teams. Our asking advice relationships are linked to the specific content of advice. Consequently, the following four advice networks will be investigated: asking advice about content knowledge, classroom management, ICT, and innovative teaching methods. Data were collected in 10 secondary education schools in Flanders (Belgium) during the school year of 2016. School size ranges from 43 to 167 school team members. In each school we reached a response rate of at least 85%. Data will be analysed by using social network analysis, more specifically, by using p2 modelling and QAP (Quadratic assignment procedure).

Title: Online gay communities as communities : A space for Gay Rights Movements in India

Paper ID: 359

Authors: Somrita Ganchoudhuri (National University of Singapore)

Abstract:

Drawing from the Social Network Analysis (SNA) paradigm, this study examines how social media offers a public sphere for the gay rights movement in India. In India, as in many other countries, homosexuality is a criminal offence and therefore clandestine. Section 377 of Indian Penal Code, an 1861 colonial law criminalizes same-sex behaviour among consenting adults, punishable up to 10-years in prison. The criminalization of homosexuality further stigmatizes this sexual minority group; this leads to the denial of access to fundamental rights such as health care, free speech, life and liberty, etc. But with the proliferation of ICTs, online communities on social media create an online space of dialogue while bridging the gap among the distant and diversified ties. This study analyses how online gay communities of India create a space on Facebook for the gay rights movement. Using qualitative content analysis, this study uses the emergent themes to understand how social networking through virtual communities continues the gay rights movement by facilitating discussion and community mobilization. I identify the salient issues addressed on this platform. The application of SNA approach illustrates that in contemporary India, Facebook has become a platform for solidarity, communication, and knowledge construction for online gay communities--as it is for many other spatially-dispersed communities.

Title: Social networks and individual innovative behavior ----- A Case Study of H Hospital in Beijing

Paper ID: 360

Authors: Wang Youqiang (School of Public Policy and Management, Tsinghua University, China),
Cai Yuanqing (School of Public Administration and Policy, Renmin University of China)

Abstract:

Abstract: In the process of deepening the reform of public hospitals, to enhance individual innovative behavior of public hospitals is of great significance. At present, the multi-center network structure of public hospitals has not been formed yet, and the synergistic effect is not obvious. Understanding comprehensively the characteristics of network structure of innovation behavior is necessary both theoretically and practically, in order to improve the accuracy of regulation policy and establish a cooperation regulation mechanism. Based on 256 data of H Hospital in Beijing from October 2016 to December 2016, this paper employs the method of social network analysis (SNA) to empirically examine the characteristics of network structure and its influential factors of innovation behavior.

With the framework of SNA, we study the impact of innovation behavior on the interaction among physicians, nurses, technicians and hospital administrators, and characterize the intra-hospital network from two aspects. On the one hand, it is to integrate physicians, nurses, technicians and hospital administrators into the framework of the same network, analyzing the overall properties of the hospital innovative collaborative network; on the other hand, this paper focuses on analyzing the position of each actor and the relationship among network subgroups.

Title: A Proposed Temporal Model of Networked Conflict Among Wikipedia Page Editors and Conflict's Impact on Article Quality Scores

Paper ID: 361

Authors: Chris Robbins (University of Southern California)

Abstract:

Controversies are discursive spaces where different narratives compete to record the version of reality that will eventually become history (Goodnight, 20012). Wikipedia is built upon crowd-constructed entries (Chen, Xu, & Whinston, 2011) that enable contributors to form networks of opinions that ultimately shape a communally constructed version of reality. It is a controversy-laden discursive space where multiple realities compete.

A variety of factors have been shown to impact Wikipedia's content production, including technological affordances (Treem & Leonardi, 2012; Swarts, 2009), temperaments of collaborators (Kittur & Kraut, 2010), organizational network structure (Ransbotham & Kane, 2011), and gatekeeping and curated information flow (Thorson & Wells, 2016; Leavitt, 2016). However, there is no proposed framework has provided a complete picture of networked, temporal interactions in that digital space.

This paper proposes a model of the network structure of conflict among page editors and corresponding quality scores over time on high interest Wikipedia pages. The model has three network stages and three quality/ performance stages that reflect one another. A Wikipedia page's network begins as a diverse collection of disparate, scattered nodes with virtually no conflict ties; this is a structural representation of many people separately contributing original content to a new page. As time passes and users begin to edit others' text, the network will shift to polarized clusters of individuals with shared beliefs about the page's content. This is a conflict-heavy time period which is reflected in a low quality score. Over time, contributors begin to group themselves around particular narratives and the Wikipedia page becomes largely static rather than something constantly shifting. However, new events (known as abnormalities) occur that alter the context for the original topic. The three stages of the network and of quality/ performance are thus often interrupted as the temporally based process loops back on itself and begins again each time an abnormality occurs. Over time the results for articles based on positive abnormalities is likely to be of a higher quality—as measured by Wikipedia article quality scores—because the diversity of Wikipedia editors attracted to the article forced the network was forced to remain in a contentious state where many meanings competed, rather than just a few, as would occur in a low-interest Wikipedia article.

To detect Wikipedia pages that qualify as abnormalities, this study will use the Seasonal Hybrid Extreme Studentized Deviates algorithm (S-H-ESD) which can detect anomalies within existing trends in social media data and has been previously used on Twitter (Kejariwal, 2015), Reddit (Leavitt, 2016), and Wikipedia (Koehler, 2015). Once the information has been sorted and labeled, the study will use history flows visualization (Viégas, Wattenberg, and Dave, 2004), to visualize the temporal, back-and-forth relationships. Finally, a variety of network techniques will be used, particularly longitudinal (temporal) exponential random graph modeling (ERGM) to detect

whether and how the overall static and temporally-bound structure of the model deviates from what could be predicted by random chance (Robins, Pattison, Kalish, & Lusher, 2007).

Title: The Role of Hierarchy for Tacit and Codified Knowledge Transfer in Advanced Manufacturing Settings

Paper ID: 363

Authors: Dean Lusher (Swinburne University of Technology), Julia Brennecke (University of Liverpool), Graham Schaffer (University of Melbourne), Michael Gilding (Swinburne University of Technology)

Abstract:

This paper unpacks the diverging rules underlying the transfer of tacit knowledge and the transfer of codified knowledge in advanced manufacturing settings . We argue that employees' formal and informal hierarchical status in the organization will influence how they transfer the two types of knowledge and will thus shape the structure of tacit and codified knowledge networks. Drawing on data collected in the engineering department of an Australian aerospace organisation, we apply exponential random graph models for multiplex networks to examine empirically the alignment, divergence, and interplay of such knowledge networks. Results show that hierarchical superiors are more active providers of tacit but not of codified knowledge. Likewise, status similarity drives tacit, not codified, knowledge transfers. Finally, tacit knowledge is more likely to be transferred down the organisational hierarchy while codified knowledge is more likely to flow upwards. These results suggest a distinct articulation for tacit and for codified knowledge transfers and organisational hierarchy with implications for knowledge diffusion and innovation.

Title: The relational dimensions of ideas development: A case study of an innovation contest in car manufacturing.

Paper ID: 365

Authors: Marco Tonellato (LMU Munich), Dirk Deichmann (Erasmus University, Rotterdam), Thomas Gillier (Grenoble Ecole de Management)

Abstract:

Organizations constantly seek to innovate their practices and competencies in order to respond to rapid technological developments, economic uncertainty, global competition, and demographic changes. Vital activities that sustain organizational innovation are the creation and development of novel and useful ideas within organizational boundaries, a process known as ideation. In particular, a critical aspect of how ideas can be steered towards implementation is how well an idea generator can convince potential idea implementers to commit to a new idea. Using original field data collected within an innovation contest in a large car manufacturing company in France, we contribute to the discussion on networked innovation by exploring how the networks generated by different social activities revolving around a newly submitted idea influence idea commitment. During our observation period of approximately three months, 1200 participants contribute to 250 ideas submitted as part of an innovation contest effort. We record each of the activities that organizational participants undertake in order to contribute to the development of ideas during the observation period. We reconstruct four different two-mode networks by coding four different types of activities linking participants and ideas: submitting an idea, discussing an idea, evaluating an idea and committing to an idea. We define idea commitment as a strong propensity to support an idea, as reflected by a participant's stated desire to join the project if the idea gets eventually selected. Other conditions being equal, we expect the probability of idea commitment to increase for ideas that are embedded in clusters of shared discussion (i.e., clusters of ideas repeatedly commented on by the same set of participants). We argue that this is the case because ideas can benefit from vicarious learning processes triggered by patterns of repeated discussion among participants. Furthermore we expect the probability of idea commitment to increase as ideas are embedded in clusters of shared evaluation (i.e., cluster of ideas repeatedly evaluated by the same set of participants). We argue that the explanation may lie in the fact that multiple individuals liking the same set of ideas reveal that these ideas carry a sharper identity, which makes them more likely to gather attention and commitment. We test our hypotheses by estimating multilevel ERGMs that allow us to model the multiplex relations that link our different networks. Our results suggest that idea commitment is embedded in a complex structure of relational activities that affect the development of ideas within innovation contexts. These results contribute to the ongoing discussion of the relationship between social networks, ideation processes and innovation contests.

Title: The Global Structure of Knowledge Networks

Paper ID: 366

Authors: Spyros Angelopoulos (University of Lugano), Alessandro Lomi (University of Lugano)

Abstract:

In this paper, we treat patent citations as knowledge networks connecting pieces of formalised knowledge and people, and focus on how ideas are connected, rather than how they are protected. We focus on the global structural properties of formalised knowledge network, and more specifically on the connective micro-mechanisms of network formation underlying such structures. Our main objective is to build the information infrastructure needed to address more focused questions about the global structure of innovation and knowledge production.

Innovation and the creation of knowledge are increasingly understood as network phenomena, emerging from complex systems of dependence relations linking different social actors. The production of innovative ideas is best seen as collective enterprises involving transfer and recombination of existing knowledge through the interaction among people, resources, and institutions. Recent research recognises the social character of knowledge production, where ideas are embedded in complex networks connected to other ideas. The large space spanned by knowledge networks is not homogeneous, and certain areas are more likely to produce innovation than others. Understanding how knowledge is produced by recombination of existing knowledge is the key to understand and predict technological, scientific and social innovation. This finds wide applicability in the analysis of patent data, which represent a clear example of how knowledge exchange becomes amenable for quantitative analysis.

Against this general background, we construct what might be the largest and most complete knowledge network currently available, by merging separate patent datasets made available by the OECD, covering the last 40 years of global knowledge production. The resulted combined dataset reports patents data for 784,668 EPO, 690,227 PCT and 1,989,501 USPTO patents. Using this dataset, we extract the patent citation network that includes a total of 21,585,409 nodes and 111,233,700 ties, making it one of the largest longitudinal network datasets, and the largest knowledge exchange network. In this paper, we use graph-theoretic measures and measures developed in scientometrics to calculate the importance of patents, technologies, and inventors, and report the preliminary findings of our research project.

Title: When the Governance Structure Choice Overshadows Competitive Advantage

Paper ID: 367

Authors: Tao Wang (University College London)

Abstract:

This study examines the influence of structure and governance design of a firm's alliance network on its innovation performance. Using a combination of propensity-score weighting and difference-in-difference estimation strategies to address endogeneity, I find that the alliance governance design contingently determine the innovation performance under dense network. More specifically, new partner and non-equity relationship weaken the influence of dense network when the density is low, but mitigate the influence when the density is high. These results indicate the benefits of network closure contingent on alliance governance design and firms embedded in a certain type of network structure should clearly recognize such contingency and implication and devise optimal alliance strategy to manage it.

Title: Supply Chain Disruptions and Trade Credit

Paper ID: 369

Authors: Yi Lu (Tsinghua University and National University of Singapore), Yoshiaki Ogura (Waseda University), Yasuyuki Todo (Waseda University), Lianming Zhu (Waseda University)

Abstract:

The modern production processes are becoming more complex and usually consist of multiple stages. Production of goods and services are increasingly organized along the supply chains where intermediate inputs flow through many firms. Understanding how the role of supply chain as a mechanism to propagate in the aggregate economy has attracted a lot of attention among academics and policymakers. For example, many industrial policies were adopted by policymakers with the aim of promoting firms in a certain industry influential to the aggregate economy. A large literature has investigated how sectoral and regional linkages can explain the aggregate business cycle fluctuations. However, studies on how firm's input-supply linkages along the supply chain affect firm performance in the co-movement are scant. There are two potential reasons. The first reason is a lack of data which provides relatively complete information on firm-level input-output linkages. The second is the difficulty in identifying plausible exogenous micro-level shocks in firm-level data.

In this paper, we explore whether firm-level shocks propagate in the production processes. We quantify the propagation of firm-level shocks along the supply chains and study whether these shocks to customers would affect their suppliers' financial performance. To deal with the identification challenges, we use a natural disaster as an exogenous shock to examine how firms alter their financial performance when firm's production networks are disrupted. Specifically, we use the exogenous nature of the Great East Japan Earthquake of 2011. We use precise information on firm addresses prior to the earthquake to identify whether or not firms are located in the disaster-hit area, which creates variations across firms for identification.

The data on firm-level input-output linkages are collected from Tokyo Shoko Research Ltd (TSR). The data contains approximately one million firms across all 47 prefectures and industries in Japan. The survey provides exhaustive data on supply-customer production networks in Japan.

We examine the effect of the presence of firm-level input-output linkages in propagating disruptions on firm's trade credit. Specifically, we compare the utilization of trade credit between firms with one of their customers located in the disaster-hit areas (our treatment group) and firms that none of their customers located in the earthquake areas (our control group).

The analyses yield three classes of results. First, we find that customers located in the earthquake areas impose a larger amount of trade credit on their suppliers (i.e., utilize fewer cash transactions) even two years after the earthquake. Second, trade credit of indirect suppliers (e.g., suppliers of suppliers) of affected customers also increase, indicating that the effect of supply chain disruptions on trade credit propagates through production linkages. Furthermore, there is a decreasing trend of the propagation effect. The propagating disruption effect of firm's

intermediate customer is the largest, with this effect diminishing with the distance to firm's indirect customer.

Third, to understand the positive effect of supply chain disruptions on firm's trade credit, we examine the heterogeneous disruption effect across firm's financial health. Our empirical results show that the positive effect is more pronounced for suppliers with a better financial performance. As financially healthier firms are easier to get bank loans, they can afford the costly delays in the collection of receivables from their customers.

Title: Linking structure and content: college-related support networks of Peruvian disadvantaged students

Paper ID: 370

Authors: Martin Santos (Pontificia Universidad Catolica del Peru)

Abstract:

Social network research tends to focus either on network structure (pattern of ties) or on network content (what is actually exchanged within the network). This study argues that social networks matter because of the interplay between structure and content. Against this backdrop, this multimethod case study seeks to understand how (if so) the structure and content of college-related personal networks jointly matter for academic achievement. Several types of ties within personal networks were measured: kinship, friendship, student-professor and acquaintanceship. Ego-network structure was measured as egonet betweenness and egonet density; while ego-network content was measured as different dimensions of social support (emotional, cognitive, economic and brokerage-related). Academic achievement was measured as student's grades.

The core hypothesis is that egonet betweenness and egonet density may enhance or limit the positive effects of a particular dimension of social support on academic achievement. This would occur due to the fact that ego is more (or less) likely to be exposed to normative influence, social learning, diffusion and brokerage mechanisms.

The data for this study come from a set of in-depth interviews conducted in the year 2016 in four Peruvian universities. Students who are part of the sample were granted a fellowship by the Peruvian government since their families are below the poverty line. The name generator technique was used to collect students' personal networks. In-depth interviews asked for demographic characteristics of respondents, the educational and occupational background of parents, quality of the parent-child relationship, child's educational trajectory, college enrollment and college adaptation, field of study and academic achievement, among other key variables. Network analysis techniques were used to analyze college students' personal networks, while content analysis was used to analyze in-depth interviews. Preliminary findings show that kinship, friendship, student-professor and acquaintanceship ties provide Peruvian disadvantaged students with different dimensions of social support which, in turn, positively affect their academic achievement, depending on the ego-net structure.

Title: Investigating the Relationship Between Teacher Professional Networks, Self-Efficacy, and Capacity for Diffusion of Computer Science Standards in an Urban District

Paper ID: 371

Authors: Rebecca Mazur (University of Massachusetts - Amherst), Rebecca Woodland (University of Massachusetts - Amherst)

Abstract:

Social Network Analysis is still largely nascent in education research (Daly, 2010) but it is an especially powerful approach for school improvement. In a field that largely privileges qualitative and psychological methods, SNA represents a new way to describe schools, investigate them, and frame questions about how to attend to social capital within them. This paper contributes to a growing body of work in education research that uses SNA both as a way to frame questions and as a method for analyzing data. This study (1) investigated links between teacher self-efficacy, role, gender, and network centrality with schools and between schools in one large urban district and (2) compares capacity for innovation in instructional support networks and in computer science-focused networks. The work of increasing and improving opportunities for K-12 students to experience high-quality Digital Literacy and Computer Science (DLCS) education entails the careful management of a myriad of obstacles that look different at each level of schooling. Therefore, district and school administrators looking to place a significant and meaningful emphasis on DLCS education will need to consider a complex set of variables. It is known that organizational patterns and structures are within and across schools are key components of any educational goal or outcome (Dufour, 2011; Gajda & Koliba, 2008; Hord, 2009; Leana, 2011; Little, 2003; Pounder, 1998). Any lasting improvement, therefore, will be in large part determined by the support network available to the teachers and administrators charged with carrying out the changes. Early results from a comparison of two types of networks (general instructional support and DLCS-related support) suggest that even in schools with diffuse and connected instructional support networks, sparse and highly-centralized networks characterize DLCS support networks. Often, only one network actor provides the bulk of the support for DLCS instruction. Further, many teachers are isolated from DLCS support networks, making them unable to access any support. This study also looked at teacher self-efficacy and seniority relative to network centrality. Closely connected to both social capital, networks, and instructional improvement is the notion of self-efficacy. Teachers' self-efficacy has been shown to be positively correlated with student performance (Ashton & Webb, 1986; Berman, McLaughlin, Bass, Pauly, & Zellman, 1977), student motivation (Ashton & Webb, 1986), teacher longevity (Burley, Hall, Villeme, & Brockmeier, 1991), and the development of teachers' professional goals (Muijs & Reynolds, 2002). There is also a strong connection between self-efficacy and positive interpersonal teacher networks (Caprara, Barbaranelli, Steca, & Malone, 2006). Though research into school networks is on the rise, few studies have looked at the question of how teacher self-efficacy might be related to how an individual is situated in a network. This question may be important to consider, however, as teacher networks become more robustly modeled and as network theory becomes more prevalent in educational research. Early results of this study suggest that self-efficacy may have a significant (and positive) association with in-degree centrality; teacher seniority may have a significant (and negative) association with out-degree centrality.

Title: Informal instructional resource acquisition and diffusion within Pinterest: A study of early career teachers' physical and virtual social networks

Paper ID: 373

Authors: Zixi Chen (Michigan State University), Kaitlin Torphy (Michigan State University), Sihua Hu (Michigan State University), Yuqing Liu (Michigan State University)

Abstract:

Much research has identified that participating in induction programs, assigning mentorship, and interacting with colleagues in schools can help new teachers adjust their instruction to new conditions (Coburn, Russell, Kaufman, & Stein, 2012), and collect teaching resources from colleagues (Jimerson, 2014). However, less clear is whether and how new teachers identify external teaching resources to complement professional development programs and existing collegial support.

In this paper, we will discuss Pinterest as a specific external channel that early career teachers employ to acquire teaching resources. Pinterest is a virtual platform that extends beyond traditional physical school boundaries, in which teachers collect, share, and store teaching resources, called “pins” (Torphy & Hu, 2016). Given the potential for knowledge accumulation and diffusion, we argue the number of teaching related pins may be treated as a measure of teaching resources a new teacher possesses, and further, we may conceptualize one’s behavior of collecting teaching related pins as a proxy of a one’s engagement in collecting external instructional resources beyond their school setting.

This paper employs 2015 fall survey data from an NSF funded research study on early career teachers’ (ECTs) elementary mathematics instruction in several Midwestern states. Survey results provide 99 ECTs’ physical network nomination data in their schools. Within this sample, we identify 49 ECTs’ Pinterest pages and corresponding mathematical pins. ECTs nominate 395 colleagues, of which 136 have confirmed Pinterest pages. These nominations include dyadic relationships which reflect 55 virtual following/follower relationships within Pinterest. The average number of mathematical pins for ECTs and nominated colleagues are 122 and 147, respectively.

To assess the extent teachers’ social networks impact their engagement in seeking out additional instructional resources, we measure physical and virtual social network effects. ECTs’ physical network includes professional interactions regarding mathematics teaching in formal school settings. Virtual networks include teachers’ follower/followee relationships within Pinterest. For these relationships, we estimate virtual network effects through the association across the number of mathematical teaching pins and collegial ties. We will model the impact of ECTs’ physical and virtual networks on mathematical pin acquisition controlling for ECTs’ prior pinning behavior and a vector of teacher characteristics.

This paper may contribute to research on the effects of physical and virtual networks, their interplay in teachers’ professional development, and help schools and policy makers consider

highly effective professional development programs and school culture of collegial interactions for early career teachers.

Title: The effects of social value orientation, punishment on bypassing immediate leadership

Paper ID: 375

Authors: Jun Liu (Department of Sociology, School of Humanities and Human Sciences, Xi'an Jiaotong University, China), Mingjiu Zheng (Department of Sociology, School of Humanities and Human Sciences, Harbin Engineering University, China)

Abstract:

“bypassing the immediate leadership” (BIL hereafter) is a phenomenon widely existing in society which received little attention in academia. Putting social value orientation, punishment together, this paper analyzes their effects on BIL under triadic relations from network exchange theory and public choice theory. According to dictatorship/coercion, upward/downward in resource flow, the structures of BIL actions are divided into four types: upward BIL dictatorship; downward BIL dictatorship; upward BIL coercion; downward BIL coercion. This paper discusses the impact of punishment and social value orientation on BIL action specific to “upward BIL dictatorship” structure and verifies the following hypothesis: the individualist will be more inclined to bypass immediate leadership when information is asymmetrical. There is the effect of slow-boiling and heavy punishment prestige, i.e., if the punishment intensity is ever-increasing, thus the punishment intensity is positive correlated with bypass immediate leadership desire. Otherwise, the heavy and instant punishment to the bypasser could block the action effectively. The study also found that the superior is tend to share resource equally with the inferior under conditions of complete information and the BIL action will more likely to be terminated.

Key words: Social value orientation; Dictatorship; Punishment; Network exchange theory

Title: Social Network Characteristics that Influence Seller's Decision to Join a Sharing Economy Platform

Paper ID: 376

Authors: Kristina Maiksteniene (ISM University of Management and Economics)

Abstract:

Sharing economy platforms are lucrative examples of rapid business growth in diverse industry sectors, such as car sharing (Uber, Lyft), hospitality and dining (Airbnb, CouchSurfing), retail and consumer goods (Tradesy, SnapGoods), or media and entertainment (Spotify, Earbits). Such platforms typically have two sides of value-creating platform users: "the sellers" and "the buyers". According to multi-sided platform theory, platform sides are networks, and it is established that mere size of those networks has potential to attract even more users on each side and contribute to a self-reinforcing mechanism of platform growth.

In this research, we are interested in network structures that attract more platform users on the seller side. Specifically, we aim to analyze seller's mutual acquaintance networks and their potential to attract more sellers to the platform (same-side network effects). Taking car sharing platforms as research context, we design a full profile conjoint experiment to estimate relative effects of same side network structure on car drivers' choice to join that network. In designing conjoint task, we treat networks as mental entities (Mehra et al, 2014), and rely on stylized network images from which research participants choose the optimal configuration of network to be joined. Dual quantitative and qualitative research question is formulated: "What is the relative value of various configurations of sellers' acquaintance network and how such differences in assigned value can be explained?". Varying the stylized network images as key defining characteristics of a network, conjoint algorithm estimates incremental utilities that each network configuration brings to or subtracts from the overall value of decision to join. During course of conjoint experiment, qualitative interviews are conducted where respondents are asked to substantiate and explain their choices.

Our main conclusion is that high network density negatively affects seller's willingness to join the platform (supposedly because of the perceived competition effect), however, this negative effect is outweighed by respondent's potential to occupy bridging position in that network.

Title: Trajectories analysis of Chinese hosts' flow across different TV stations

Paper ID: 377

Authors: Jinmiao Wang (University of Kentucky)

Abstract:

This paper discusses hosts mobility and its effect on TV stations' performance. First, we examine how hosts manager their careers by moving across different TV stations. Matching theory suggests that employees are most likely to work in organizations that best match their needs. What's more, employees' needs and the resources they have change as their careers progress. Earlier in their careers, they are more likely to get trained and gain status; later in their career, they are more interested in obtaining pecuniary benefits with their accumulated experience and status (Bidwell & Briscoe, 2010; Rider & Tan, 2014). Accordingly, organizations that best match these different needs change. Specifically, in our case, we argue that hosts are more likely to work for high status TV stations earlier in their career and work for low status TV stations later in their career. Status is measured by betweenness centrality using trajectories analysis in UCINET. Second, we draw on social capital theory to explore the effects of hosts flow; namely whether hiring hosts from high betweenness centrality TV stations will improve the low betweenness centrality TV stations' ratings? We test our hypotheses with the longitudinal data set of the trajectories of Chinese hosts' flow across different TV stations.

Title: High-Status Affiliations and Task Performance: The Analysis of Categorical Alignment as a Moderator

Paper ID: 378

Authors: Jongyoun Baek (Seoul National University)

Abstract:

This study attempts to extend the theoretical argument on the effect of high-status affiliations and the role of audiences in the process of performance evaluation. Because the status of an actor is dependent on the context that the actor is located in, it is problematic to conclude that positive effect of high-status affiliations is constant regardless of the category-based identity of affiliating actors. I suggest that an actor's rewards from high-status affiliations are contingent on the extent to which category-based identity of the actor overlaps with that of its affiliates. Two types of audiences -conformity-seeking and novelty-seeking- are expected to draw different judgments on the category overlap between affiliating parties, moderating the effect of high-status affiliations on actor's reward. I tested the predictions by investigating the collaboration between actors and directors in the context of Korean film industry from 2006 to 2015. Confirming the earlier researches, I found that actors who collaborated with high-status directors were likely to attain greater box-office success and receive more awards than those with low-status directors. For actor's box-office success, the positive effect of directors' status was strengthened with the overlap of genre identity between them. For actor's artistic recognition, however, the favorable effect of high-status affiliations was attenuated with genre overlap.

Title: Diversity Initiatives and Network Advantage: Examining the effects of the NFL's Rooney Rule on Minority Hiring

Paper ID: 379

Authors: Stephen P. Juza (pro-football-history.com), Wyatt S. Taylor (University of Kentucky), Andrew A. Hill (Army War College)

Abstract:

Following the 2002 season the National Football League was heavily criticized by a number of minority rights groups. That season had seen the only two minority head coaches in the league both lose their jobs, despite rather successful performance records. These firings, along with a general lack of minority coaches in a league largely consisting of minority players, led to claims of racial bias against minorities. In response, the NFL instituted the “Rooney Rule” which mandated that teams interview minority candidates for head coaching positions. There are, however, serious questions as to the effectiveness of this Rule in ameliorating the racial disadvantages faced by minority coaches.

Here we examine the Rooney Rule as an exogenous shock to NFL coaching networks. Traditional research examining the social networks of minorities has occurred in a more or less “free market” network setting; individuals chose to create or drop ties through some personal evaluation system. Much like traditional social networks, earlier NFL coaching networks displayed significant evidence of homophily: minority coaches tended to work with other minority coaches. The Rooney Rule was intended to alter this process by forcing interactions between minority and majority members which otherwise may not have taken place.

In this presentation we examine the effects of this external mandate on both the structure of NFL coaching networks and the manner through which coaches are able to gain advantage through those networks. Our findings suggest that the Rooney Rule affected both minority and majority coaches in opposing ways. After its enactment, minority coaches gain advantage through broad, unconstrained networks, which was not the case previously. Surprisingly, the opposite effect occurs in white coaches, who benefit most strongly from constrained networks in the post-Rooney era. We further explore this finding and discuss the implications for both the NFL as well as for our understanding of how minority or majority status affects an individual’s ability to gain advantage through their network.

Title: Gender salary gap and job network

Paper ID: 380

Authors: Youngjoon Bae (University of Massachusetts Amherst)

Abstract:

The gender pay gap is an ongoing contentious issue. Some argue that a significant part of the gap comes from discrimination against women through hiring and promotion processes. Others refute that the gap results from differences in individuals' achievement that depend on education and job experience. They also emphasize that women end up with lower wages due to their choices such as quitting their job early for domestic responsibilities. Hence, the question remains: if women have an equivalent seniority and career to men, do they earn equal money? Otherwise, do they still experience organizational difference in their wages?

Though much discussions of the gender pay gap gives attention to individual attributes, one's baseline wage is most directly determined by one's job level. Based on the understanding, this paper focuses on jobs and job networks within a company to examine the gender pay gap. To deal with the mechanism closely, I use 6-years of personnel records (1992-1997) of eleven organizations under the umbrella of the same firm. Because the data is longitudinal and the frame of analysis is hierarchical (individuals are nested in jobs), a multilevel mixed method is employed. Along with considering individual attributes, job level characteristics are included in the analysis. The process of analysis is two-fold. First, this paper examines whether the intrinsic characteristics of jobs (e.g. the ratio of women in a particular job and the number of workers) are associated with the gender pay gap. Second, this study investigates whether the degree of job connectivity is longitudinally associated with the gender pay gap. Much wage growth takes place through job changes, and thus well-connected jobs are likely to provide a better opportunity for wage increase. However, it is important to know that job connectivity yields its maximum effect on wages not in the current job, but in the next job.

One finding is that gender is not a statistically significant predictor of the pay gap when the ratio of women in the prior job is included, but this does not suggest there is no gender discrimination. The ratio of women in the prior job is negatively related to wage growth, which implies that employees who had a career in women-dominated jobs experience the stigmatization on their salary. The effect is a bit stronger for women. Regarding job connectivity, greater connectivity in one's prior job is correlated with one's higher salary increase. Importantly, this result is not statistically significant with a gender interaction term, which suggests that the network effect does not benefit women. This may be interpreted as women's segregation is not just limited to job level but constrained in the network of jobs. In conclusion, this paper reveals that gender discrimination is generated through an implicit manner of job system.

Title: Development of a Psycho-structural Approach to the Study of Groups and Teams

Paper ID: 381

Authors: André Escórcio Soares (Coventry University), Miguel Pereira Lopes (ISCS, University of Lisbon)

Abstract:

Research about groups and teams have been developed mainly around two traditions: psychological shared constructs (e.g. Morgeson and Hofman, 1999), fundamentally from psychology and the structural perspective, more related to sociology, organisational studies and social network analysis (e.g. Borgatti and Foster, 2003). These two traditions can also be found in organisational studies in general. However, more recently, there has been an increasingly interest on the study of both social networks and psychological variables together.

This paper explores how these two traditions can be integrated into a new perspective at the group/team level. To do so it presents the main characteristics of each approach based on four components: focus, group boundaries, levels of analysis and process of emergence of shared perceptions. It also presents a new and alternative approach to the study of groups and teams by integrating these two traditions into a psycho-structural approach.

At the research level, this paper presents new lenses to study the emergence of shared cognitions, perceptions and meanings in groups and teams. It does that by calling for the importance of integrating the importance of social networks on the emergence of shared cognitions. At the practical level, it calls for the importance of managing social networks within teams and groups in order to influence the emergence of desirable shared cognitions

Title: The Structure of Organizational Ecosystems: A Holistic Approach to Niche Space and Market Dynamics

Paper ID: 382

Authors: Brian Aronson (Duke University)

Abstract:

Organizational ecology explains how the life chances of organizations are dependent on their environments, and how these competitive dynamics lead to broader changes across markets. Previous research has shown that organizations are more likely to disband when located in a crowded niche, whereas organizations' life chances can improve from physical proximity to organizations with complementary needs. However, organizational ecology still lacks a comprehensive theory and methodology for examining how the structure of organizations within niche space influences market dynamics. Many environmental factors that could affect an organization's life chances have been neglected in organizational ecology, such as the effect of occupying structural holes in niche space, or the effect of sharing resources with seemingly unrelated organizations. This gap is predominantly influenced by past work's reliance on ambiguous methodologies for defining niche space, typically based on an arbitrary set of shared product characteristics among an arbitrary set of organizations.

This presentation draws from social network analysis to provide a structural account of organizational ecology. The key promise of network analysis in organizational ecology is that it can provide clear, unambiguous, and mathematically derived definitions of complex relational concepts among organizations. With a sample of 25,581 small businesses from the restaurant and food industry, and 1,482,907 reviews of those businesses drawn from 394,282 consumers on Yelp.com, this article takes a duality-based approach to identify organization's positions within their markets. The findings indicate several ways that the position of organizations within niche space influences their outcomes: Structurally equivalent organizations were significantly more likely to influence each other's life-chances. Organizations that occupied structural holes had variable life-chances based on ongoing transitions within the market's niche space. In addition, models that defined niche space by consumer overlap and controlled for higher level structural properties of niche space were significantly better at predicting organizational disbandment than traditional density dependence models derived from past research.

Title: Formation of Hierarchically Structured Teams

Paper ID: 384

Authors: Fan Xia (East China Normal University), Gopakumar Gopalakrishnan (Infosys Ltd), Cheng Ding (East China Normal University), Weining Qian (East China Normal University)

Abstract:

The matching of modular components of the project with right set of individuals is a fundamental challenge in both commercial and open source software projects. However, most of the extant studies on team formation have focused on the problem of creating flat teams, i.e., teams without communities and central authorities. In this paper, we study the problem of forming a hierarchically structured team. We emphasize local density of sub teams to assess communication costs of newly formed teams and propose two heuristic team formation algorithms. Results of experiments with a large dataset suggest that our methods achieve good balance between efficiency and effectiveness as compared to the existing ones. Finally, we demonstrate a web-based application that allows managers to interactively form a project team based on proposed algorithms.

Title: Hyperlink Connectivity: An Analysis of Western Australia’s Tourism Industry

Paper ID: 385

Authors: Hossein Raisi (Edith Cowan University), Rodolfo Baggio (Bocconi University), Llandis Barratt-Pugh (Edith Cowan University), Greg Willson(Edith Cowan University)

Abstract:

Millions of tourism websites compete in promoting their respective tourism destinations. Hyperlinks can considerably influence the online visibility of tourism destinations and the effectiveness of information flow between tourism organizations, tourists, and supporting enterprises that complete the tourism network. This research presents a critical analysis of the current hyperlink structure of the Western Australia (WA) tourism industry. Data was collected from a primary list of tourism organizations and businesses in WA obtained from the Australian Tourism Data Warehouse; websites were then crawled using VOSON. The resulting network comprised 1515 nodes and 6059 directed links. Data was analyzed and visualized using UCINET, Gephi, Pajek and the Python Networkx library. Different properties of the network were analyzed at three levels: global, sectoral, and individual. Analyses indicated that the structure is consistent with a scale-free topology. The network is very sparse, centralized and hierarchical, wherein organizations tend to form communities based on their geographical position rather than their tourism sector. In addition, the network shows a clear ‘bow-tie’ structure as well as a discernible but not excessive ‘small-world’ property. The paper proffers that the connectivity of tourism websites in Western Australia is inefficient and that the state’s tourism organizations are not appropriately collaborating in the online space. Destination managers and policymakers may improve the connectivity of the network by adopting policies and actions to educate the industry businesses on the importance of hyperlinks and encourage them to create more links to other tourism websites in the destination.

Title: Complexity of Organisational Interdependencies

Paper ID: 386

Authors: Justyna Tasic (Nanyang Technological University; Future Resilient Systems Programme, Singapore-ETH Centre)

Abstract:

This paper addresses the major challenge of understanding the complexity of organisational structure. Organisational behaviour—human decisions, routines, and actions—tremendously affects organisational performance. However, human interactions within a complex organization are hard to detect and measure, and cannot be described by a linear model. In this study, the organisational structure is examined from a multi-layered perspective. More specifically, the structure is analysed as social networks embedded in the specific organisational context. Thus, to investigate organisational interdependencies, the research focus embraces both formal and informal organisational structure seen as multi-layered networks of actors. This study aims to identify and measure the degree of organisational interdependencies and develops a multilayer model of organisational system to locate fault-prone and fault-tolerant interactions. By identifying vulnerabilities within the structure of organisational interdependencies, this study seeks to provide new insights on the consequences of organisational interdependencies on system resilience. Additionally, the analysis of fault-tolerant areas allows indicating good practices and guidelines for proactive management and anticipation of risk to enhance organisational capacity in coping with disruption and crisis.

Keywords: multiplex networks, organisational interdependencies, organisational resilience, crisis.

Title: Network embeddedness, knowledge diversity and performance in teams: The case of robotic surgery

Paper ID: 387

Authors: Alessandro Lomi (University of Lugano and University of Melbourne), Daniele Mascia (Catholic University of Rome), Valentina Iacopino (Catholic University of Rome), Marco Tonellato (LMU Munich)

Abstract:

Central to our understanding of how organizations create, share and transfer knowledge is how teams combine their members' heterogeneous competencies, experiences and interests and convert them into desirable collective outcomes.

Using original fieldwork and data collected on the performance of surgery teams adopting a new robotic surgical system, we contribute to the conversation on knowledge transfer in teams by studying how network embeddedness and knowledge diversity jointly affect team performance. For each of the approximately 1000 surgery events recorded since the introduction of the new robotic surgery technology in a major European private-accredited teaching hospital, we reconstruct the composition of the surgery teams in terms of the personal characteristics, competencies and knowledge of each of the approximate 100 surgeons who ever adopted the new technology. We reconstruct the network of professional collaborations of the surgeons in terms of joint involvement in surgery events. Two surgeons working together have an embedded relation to the extent that they share common partners, i.e., to the extent that they have worked together with the same surgeons in the past. The robot surgeon operated by two human surgeons measures with unique accuracy the surgery time – our operational measure of team performance. Other conditions being equal, we predict that team performance will improve (surgery time decrease) as the strength of embedded ties between team members increases. We argue that this is the case because: (i) embedded ties facilitate the transfer and sharing of knowledge among team members, and (ii) vicarious learning is accelerated when individuals are exposed to convergent experiences.

We also explore how team performance is affected by team diversity and individual knowledge focus, which we reconstruct in terms of combinations of professional surgical competencies and experiences accumulated by surgeons through their use of the new robotic technology across various categories of surgery (e.g., prostatectomy, and hysterectomy). We expect that embeddedness will have a stronger effect on performance in the presence of high levels of knowledge diversity within the teams. We report results suggesting that team performance emerges from complex combinations of knowledge elements that are both internal, as well as external to the team. This result invites reconsideration of our current understanding of the relation between network embeddedness, knowledge diversity and team performance.

Title: Structures within and between individuals: Combining psychological and social networks

Paper ID: 389

Authors: Srebrenka Letina (Central European University, Center for Network Science), Balazs Vedres (Central European University, Center for Network Science), Kinga Andras (Central European University, Center for Network Science)

Abstract:

The aim of this paper is to present an integrated framework for the study of the effect of individual psychological attributes on his/her network related measures. In this framework we try to combine the typical social network research aimed at examining the structure of interpersonal relationships of an individual with the new field of network psychometrics in which personality is seen as system of connected affective, cognitive and behavioural components within the individual (so-called psychological networks), and it is a result of the connectivity structure that exists between those psychological attributes. Firstly, we review recent research and state of art methods used to examine the relationship between different psychological attributes and network measures and then proceed to describe the psychological networks and how using them could enhance our understanding of the relationship between psychological attributes and network measures.

We demonstrate our approach on the small dataset of 21 employees in one organization (11 females), with additional data about personality traits using the Facet5 questionnaire (Buckley & Williams, 1990) that measures five factors (Will, Energy, Affection, Control and Emotionality) and 13 subfactors. Social network data was based on the self-reported information about several types of ties for every employee. Four types of ties were used for constructing the data for informal network: i would sit together with j; i meets j after work; i shares personal information with j; and i turns to j with anything. Four types of ties were used for constructing the data for formal network: i turns to j for advice; i receives work information from j; i says j is important collaborator; i says j has professional knowledge. Network variables are classified in four groups of measures of: i) individual position in the whole network; ii) ego-network; iii) reciprocity of ties, strength of ties or transitivity; and vi) triads.

The correlation matrix between all variables is used to construct network of relationships among them, for formal and informal network separately. In both, informal and formal networks, network variables tend to be more highly connected among themselves than with personality traits. In correlation network of informal ties and personality traits, Emotionality traits are the "closest" to network variables. Triadic measures are scattered around the whole network, often having a "bridging" position between other, more connected groups of network variables and even personality subfactors. In correlation network of formal ties, Energy and Affection traits are related the most to network variables, which are in general more interrelated than in the informal network data.

Title: The Impact of Open and Closed Informal Boundary Spanning Ties on Leadership Emergence in the Field of Large Collaborative Science

Paper ID: 390

Authors: Zhiya Guo (Michigan State University), John R. Hollenbeck (Michigan State University), Ralph A. Heidl (University of Oregon), Andrew Yu (Michigan State University), Mike Howe (Iowa State University)

Abstract:

Organizations are increasingly employing team-based structures as a means of organizing work (Ilgen & Kozlowski, 2010). A recent survey of more than 7,000 companies from over 130 countries indicates that 62% of companies and 76% of the largest firms have adopted team-based structures (Bersin, 2016). Although much of the research on teams has focused on intra-team processes and emergent states (Ilgen, Hollenbeck, Johnson & Jundt, 2005), team-based structures also create a strong need for managing inter-team relationships (Hogg, van Knippenberg, & Rast, 2012). Among varying means for managing this relationship, one of the most critical one revolves around informal internal boundary spanners (Tushman & Scanlan, 1981).

Interestingly, although there is a general consensus in the literature that informal boundary spanning does promote the performance of teams and multiteam systems (Ancona & Caldwell, 1992; DeChurch & Marks, 2006), there is a clear lack of consensus regarding the impact that informal boundary spanning has on the individuals who engage in the activity. Indeed, it is this lack of theoretical and empirical consensus regarding the effects of informal boundary spanning on individuals that led Marrone (2010) to conclude that this was one of the major research needs within this literature—that is, “does member boundary spanning behavior positively affect one’s reputation and leadership as perceived by teammates?” (p. 935).

The purpose of this study is to directly answer this call by making a critical theoretical distinction between informal boundary spanning ties that reflect open or closed ties. Specifically, we suspect that one potential reason for these inconsistent findings is that scholars have not discriminated between direct, isolated informal boundary spanning relationships and reinforced ones that are embedded in a closed system of ties. A closed set of ties (or a Simmelian bridge) exists when a third party, who is in a different team, is linked to both partners of a dyadic informal boundary spanning relationship (Simmel, 1950). We theorize that there will be curvilinear relationships for both the number of closed advice ties and the number of closed friendship ties on leader emergence, such that too many and too few closed ties reduce the likelihood of leader emergence. Furthermore, because of the differential nature of advice and friendship relationships, we suspect that the nature of the inverted-U relations will vary depending on whether the boundary spanning relationship is an advice or friendship type, such that the apex of the curve occurs at a far lower frequency for friendship ties versus advice ties. Using a multi-wave and multi-source design with a combination of network and traditional survey responses, we test these predictions in a unique field context that involves scientists working as part of multiteam systems in the area of high particle physics. All hypotheses are supported. Finally, we conclude the paper by discussing future research directions as well as theoretical and practical implications of our findings.

Title: Discussion topics and social cleavages: is there social segregation in what we discuss with whom?

Paper ID: 391

Authors: Gerald Mollenhorst (Utrecht University & Stockholm University), Beate Volker (University of Amsterdam), Jens Rydgren (Stockholm University), Christofer Edling (Lund University)

Abstract:

From existing research on ego-centered networks that used a name-generating question on the discussion of important personal matters or another relevant discussion topic, we have learned: a) that there is substantial topic-alter dependency, which suggests that research findings regarding differences in terms of network composition and structure may partly be due to the data-collection instrument used (Bearman and Parigi 2004), b) that to predict the supportiveness of ties, relationship characteristics are much more important than characteristics of the alters themselves (Wellman and Wortley 1990), and c) that role of the discussant – not the topic of discussion – predicts the availability of support from discussion partners. Thus: differences in measured network structure may be due to variations in topics discussed, but topic says little about supportiveness once we are dealing with important matters discussants (Brashears 2014).

What is unclear, however, is to what extent topic-alter dependency is associated with the crossing of social divides, for instance in terms of socioeconomic background or (parental) country of origin. Are political or financial matters only discussed with higher educated alters – and if so, does that imply that if the lower educated discuss such matters they do turn to the higher educated peers? And is religion only discussed with (other) religious persons and/or with those who originate from a religious country – and if so, does that increase the likelihood of interethnic social networks? Further, do people discuss different topics with others, depending on the degree to which alters are similar to them? We will address these and related issues using data from more than two thousand young native Swedes and first and second generation immigrants from Iran and Former Yugoslavia who currently live in Sweden. Among many other things, these respondents were asked for the five persons with whom they meet and hang around most often in their leisure time. Follow-up questions were asked about whether or not they would discuss important personal matters with each of these alters as well as about whether or not they would talk to these persons about politics and social issues, sex, culture, literature, sports, religion, and/or economics. Furthermore, respondents were asked about various socio-demographic characteristics of themselves as well as of their network members. Using these data we will show to what extent there is topic-alter dependency among young native Swedes and first and second generation immigrants in Sweden, and importantly, to what extent this is associated with social cleavages in their personal networks in terms of socio-economic background and (parental) country of origin.

Title: Quicker antiretroviral therapy initiation through organizational network strengthening

Paper ID: 392

Authors: Bernard Agala (University of North Carolina, Chapel Hill), James C. Thomas (University of North Carolina, Chapel Hill), Heidi Reynolds (University of North Carolina, Chapel Hill)

Abstract:

Background: Services for people with HIV in low-income settings are typically fragmented and uncoordinated. The World Health Organization recommends that antiretroviral therapy (ART) begin as soon as one is diagnosed with HIV, yet when testing and treatment are not in the same facility ART initiation can be delayed. We sought to improve HIV services through referral coordination for HIV-infected women in Addis Ababa, Ethiopia, using an organizational network approach.

Methods: The USAID- and PEPFAR-supported MEASURE Evaluation project conducted organizational network analysis on two networks in sub-cities of Addis Ababa. There were 25 HIV-related organizations in one sub-city network and 26 in the other. In one of them we sought to increase referrals through three network strengthening meetings. We then conducted the network analysis again in both sub-cities to measure any changes since baseline. In both sub-cities, we also conducted two cross-sectional samples of face-to-face interviews with clients (459 at baseline and 587 at follow-up). We quantitatively measured reported client time since learning of their HIV infection, whether they were currently on ART, their satisfaction with HIV-related services, and their perceived levels of adherence to ART and quality of life. We assessed changes in proportions with difference in differences between the two communities. To assess the effect of the intervention on levels of delay in ART, we used maximum likelihood ordinal logistic regression.

Results: In the sub-city with the intervention, the number of referral connections between organizations, measured as network density, increased 55%. In the control community, the density decreased over the same period. Reported unmet client service needs declined more consistently across services in the intervention community, and the average time to ART initiation decreased by 15 days. Moreover, decreased treatment delay was associated with better perceived treatment adherence and quality of life ($p < 0.05$).

Discussion: This quasi experiment demonstrated a modest organizational network strengthening intervention can enhance client referrals, resulting in quicker initiation of ART, better adherence, greater satisfaction with services, and a better perceived quality of life. These outcomes were achieved by making better use of resources already deployed in the community, making the intervention relatively cost-effective.

Title: Social Networks and Direct Caregiving in Rural Senegal

Paper ID: 393

Authors: Laetitia Douillot (George Washington University), Wubin Xie (GWU), Yacine Boujjja (Universite de Montreal), John Sandberg (GWU), Valerie Delaunay (l'institut de recherche pour le developpement), Steven L. Rytina (McGill University), Simona Bignami (Univer

Abstract:

Direct care-giving support (both given and received) through social networks in case of illness may be critical to many health outcomes, especially in areas of the less-developed world such as Sub-Saharan Africa where institutional support and health systems are less extensive. Despite this, no prior research has addressed the breadth and heterogeneity of direct care-giving support in these contexts. As a result, we are largely ignorant of the structure and characteristics of these fundamentally important care-giving networks.

This research begins to address this deficit by describing the characteristics of both care-giving and receiving networks in a rural population in Senegal, using data from the Niakhar Social Networks and Health Project (NSNHP). In 2014 and 2016, the NSNHP collected from both a representative sample of an entire rural population under continuous demographic surveillance as well as for the entire population of one village within the surveillance catchment area. The network component assessed ties across 16 discrete types of association, yielding an average of 27 unique social network alters per respondent, linkable to their corresponding records in the surveillance system. For this analysis, we focus on two types of network ties elicited, those who provided help to respondents, and those who respondents helped when they or a member of their immediate families were sick.

Our analysis describes the size, relative distribution and multiplexity of ties across respondents' broader personal networks of both care-giving and receiving ties. We further examine the reciprocity of care-giving and receiving, the characteristics of caregivers and recipients, and multiple measures of the types of care provided and received. We also describe the structural position of care-givers and receivers within respondents' wider social networks – their centrality to those networks and their relative prestige within them. Finally, we estimate a series of classification models using the information described above to identify a latent network typology and explore the association of this to selected health outcomes.

Our preliminary results suggest network alters play a primary role in therapeutic, household, and financial/logistical support when respondents are ill. We find substantial heterogeneity in care-giving and receipt by age, kinship, geographic proximity to respondents. Helping relations are highly reciprocal and concentrated in, but not exclusive to, close affective and exchange ties and neighbors, while migrant alters at a distance also play an important role. The preliminary classification analysis suggests two major types of networks. The first is labeled 'household support' (58% of the population), strongly reciprocal and localized within the household, household group and neighborhood and focused on kinship and strong affective ties. The second, 'heterogenous support at distance', involves greater support from individuals outside the

household and household group, including migrants, and broader heterogeneity of alter characteristics.

Title: Influence of a patient transfer network of US inpatient facilities on the incidence of nosocomial infections

Paper ID: 394

Authors: Juan Fernández-Gracia (IFISC, UIB-CSIC), Jukka-Pekka Onnela (Harvard School of Public Health), Michael L. Barnett (Harvard School of Public Health), Víctor M. Eguíluz (IFISC, UIB-CSIC), Nicholas A. Christakis (Yale Institute of Network Science)

Abstract:

Antibiotic-resistant bacterial infections are a substantial source of morbidity and mortality and have a common reservoir in inpatient settings. Transferring patients between facilities could be a mechanism for the spread of these infections. We wanted to assess whether a network of hospitals, linked by inpatient transfers, contributes to the spread of nosocomial infections and investigate how network structure may be leveraged to design efficient surveillance systems.

We construct a network defined by the transfer of Medicare patients across US inpatient facilities using a 100% sample of inpatient discharge claims from 2006-2007. We show the association between network structure and *C. difficile* incidence, with a 1% increase in a facility's *C. difficile* incidence being associated with a 0.53% increase in *C. difficile* incidence of neighboring facilities. Finally, we used network science methods to determine the facilities to monitor to maximize surveillance efficiency. An optimal surveillance strategy for selecting "sensor" hospitals, based on their network position, detects 80% of the *C. difficile* infections using only 2% of hospitals as sensors.

Selecting a small fraction of facilities as "sensors" could be a cost-effective mechanism to monitor emerging nosocomial infections.

Title: The Influence of Social Networks on Infant and Young Child Feeding Behaviors in Burkina Faso, West Africa

Paper ID: 395

Authors: Leanne Dougherty, Emily Stammer

Abstract:

We collected data using a household survey to measure behaviors related to maternal, infant and young child nutrition (MIYCN). Approximately 500 women with children between the ages of 0-23 months were interviewed from two provinces in the East Region of Burkina Faso. Using an egocentric approach, we asked respondents to name up to three contacts that the respondent had discussed MIYCN issues with in the two weeks preceding the survey. Based on our results, we found some indication that women were more likely to adopt recommended child feeding practices if they reported speaking with a family member about child feeding practices such as exclusively breastfeeding. We found that women who cited network partners who lived outside the village or district were less likely to practice healthy behaviors while the majority of women adopting appropriate feeding and hygiene practices spoke with someone who lived in the same household. We hypothesize that the frequency of communication may be limited with partners outside the village and therefore women received less information or resources to support healthy behaviors.

Title: Structural network position and performance of popular opinion health leaders within an HIV prevention trial in Dar es Salaam, Tanzania

Paper ID: 396

Authors: Marta Mulawa (Duke University), Thespina Yamanis (American University), Lusajo Kajula (Muhimbili University of Health and Allied Sciences), and Suzanne Maman (University of North Carolina at Chapel Hill)

Abstract:

Popular opinion leaders, people who influence the attitudes, beliefs, and behaviors of others, are frequently used in global HIV prevention interventions. Previous research suggests that the effectiveness of popular opinion leaders may depend on the position they occupy within their networks. For example, individuals who bridge sub-groups that are otherwise minimally connected (i.e., have high betweenness centrality) may be more effective in initiating HIV-related conversations because they experience less peer pressure to support prevailing norms than individuals who are centrally located within a network (i.e., have high degree centrality). Our team is currently evaluating the efficacy of a health leadership intervention (based on a popular opinion leader approach) combined with microfinance in reducing STIs and intimate partner violence among networks of mostly men that are locally referred to as “camps” in Dar es Salaam, Tanzania. Thirty of 59 randomly selected camps were randomized to the intervention arm of this cluster-randomized trial (R01MH098690; PI Maman). In the intervention arm, we identified camp health leaders (CHLs) through a peer nomination process in which camp members first discussed salient characteristics of leaders and subsequently nominated up to three camp members with these qualities. We tallied the nominations and invited those with the greatest number of nominations to serve as CHLs, seeking to engage 20% of members in each camp. Study assessments, including behavioral questionnaires and sociocentric network enumerations, were conducted as baseline and 12-months post-intervention launch. At the 12-month assessment, CHLs were asked to report the number of conversations they had about HIV and gender-based violence (GBV) in the past week (response options for both topics were: 0= “none”; 1= “1-4”; 2= “5-9”; 3= “10-15”; 4= “More than 15”) as well as their confidence in educating fellow camp members about HIV and GBV (confidence in both topics was assessed using a 4-point Likert scale). In this study, we describe the structural network position (i.e., degree and betweenness centrality) of the CHLs at baseline and examine the associations between these structural network positions and 1) total number of conversations about HIV and GBV at 12-months and 2) self-reported confidence in educating network members about HIV and GBV. Models were fit using generalized estimating equations with standardized predictors, controlling for age, gender, and education. Of the 180 eligible individuals nominated as CHLs, 170 completed CHL training. Of these, 153 are included in this analysis because they participated in the 12-month assessment, answering questions about their conversations and confidence. The mean degree centrality for CHLs at baseline was 34.1 (std. dev. 17.4) and the mean betweenness centrality was 27.3 (std. dev. 46.8). Neither degree or betweenness centrality were significantly associated with the number of conversations. Increasing degree centrality was marginally associated with increased confidence ($\beta=0.22, p=.051$). As betweenness centrality increased, however, reported confidence was significantly higher ($\beta=0.18, p=.01$). Our results suggest that opinion leaders who occupy spaces

between sub-groups of network members have greater confidence when engaging their peers in HIV prevention conversations, and thus may be more effective at changing prevailing norms during interventions.

Title: The Social Network of Volunteers Working on Tobacco Control in Beijing

Paper ID: 397

Authors: Wen-Juan Wang (Central University of Finance and Economics), Ri-Han Wu (Central University of Finance and Economics) ,Min Fu (Central University of Finance and Economics)

Abstract:

The process of tobacco control in Beijing has been accelerating over the years, and different social actors have participated in the campaign, of which volunteers play more critical parts in it ever. With the expansion of smoking control intervention, the network of volunteers working on tobacco control in Beijing has been formed and expanded. What are the primary activities of tobacco control volunteers? And in light of the fact that the social network research in the area of public health has developed rapidly, we study the volunteers engaged in tobacco control in Beijing.

Under an empirical survey of 421 volunteers in Beijing, most of which are affiliated with Beijing Tobacco Control Association, we first analyze the structure of ego-centered networks and the whole network. The results show that, there are very big differences in the centrality of single members and the relationships between different types of actors are weak. Second, our study also has shown that social networks have a positive impact on the promotion of knowledge sharing between volunteers working on tobacco control, which means the network features of single members affects their abilities of information access and utilization, which have contributed to the difference of their work performance.

To improve the volunteers' social network structure and increase their effectiveness on smoking control, we suggest that both the government and organizations should take actions to strengthen their contacts, especially to enhancing the knowledge sharing between different type of actors. First, we need to speed up the legal construction to motivate volunteers to participate. Second, the government should play a leading part in providing preferential policies and facilitation measures for non-governmental sectors. Third, civil organizations need to improve volunteer management to incentivize sustainable volunteering.

Title: Why online cancer information goes viral? Role of personal influence, homophily, and network structure

Paper ID: 398

Authors: Xiaohui Wang (Nanyang Technological University), Jingyuan Shi (Nanyang Technological University), Liang Chen (Nanyang Technological University), Tai-quan Peng (Michigan State University)

Abstract:

This research is motivated by the tremendous growth of health information transmitted on social media. Microblogging, characterized by short status updates posted frequently to social media sites, make it easy for users to create and post health information that can be exposed instantaneously to a wide audience. However, only a handful of information reaches to a large amount of audience on social media, while most languish in obscurity. It has thus become imperative for scholars and practitioners to understand the characteristics of health-related information diffusion on social media.

There are two tie-generating theories utilized in this study, include: influence-based contagion, in which a node influences behavior of its neighbors, and homophily-driven diffusion, where dyadic similarities between nodes may create related behavior patterns. Moreover, it is also suggested that information diffusion may be driven by purely structural effects (i.e., the internal process of tie-formation), such as degree-based effects, embeddedness, and brokerage. In sum, this paper disentangles the driven forces behind the health information diffusion that (i) influence-related individual attributes, (ii) homophily, and (iii) network structural factors may contribute to the spontaneously diffusion of health information.

To address the research questions, this study takes a social networks approach to examine the cancer-related information diffusion on Weibo, the Chinese equivalent of Twitter. Weibo data is collected during seven randomly selected single days (one composite week) between April 2015 and March 2016. Any cancer related tweets posted in this composite week are captured. Then, content and contextual features of the tweets, their retweet networks, and profile of users in this retweet network are also recorded. The final dataset consists with 16,654 tweets, 262,265 retweets, and 124,864 Weibo users. Exponential Random Graph Modelling is employed to investigate the factors that may affect the diffusion of cancer information on Weibo. Findings of our research could provide guidelines for designing health campaigns on social network sites.

Title: Whom to Talk to about Diabetes? Exploring the Formation of Online Network of #DSMA

Paper ID: 399

Authors: Ye Sun (University of Utah)

Abstract:

Given the increasing importance of social media in expanding and enhancing health communication, this study examines the conversational network of the tweet chat group #DSMA (Diabetes Social Media Advocacy). Founded in 2011, #dsma has been an active online space for the diabetes community to exchange information and support. An hourly chat on Twitter takes place every Wednesday night at 9 pm EST, generating about 800 tweets per week. This study sets out to uncover how conversational ties are formed in this online conversational community. Specifically, we focus on two types of generative dynamics underlying the pattern of tie formation: structural effects and actor-relation effects. For structural effects, we assess tendencies for reciprocation and triad closure. For actor-relation effects, we focus on how attributes of the Twitter handlers may influence tie formation.

Using data from January 1st, 2015 to January 1st, 2017, network data involving the top 500 edges (i.e., if a tweet contains another twitter handle via “mention” or “reply to”) were extracted. The twitter handlers were coded in terms of two characteristics: 1) whether the user account belongs to an individual or an organization, and 2) the type of healthcare stakeholder (patient, health providers, caregiver and support groups, research/academia, and others). Analyses were conducted via exponential random graph models (ERGM). Key network parameters included in the model were “mutual” and “gwesp” to assess the structural effects (i.e., reciprocity and triad closure respectively), as well as “nodefactor” and “nodematch” to examine attribute-based effects (i.e., main effects and homophily effect respectively).

Results from ERGM showed that both structural and actor-relation effects were underlying the formation of conversational ties. Specifically, there was a significant tendency for reciprocity and transitivity (estimated coefficient = 1.85, $p < .001$, and 3.48, $p < .001$, respectively). The differential homophily terms were significant and positive for the categories of patients and health providers/doctors, suggesting that they were more likely to be in conversation within their group (estimated coefficient = 1.34, $p < .001$, and 1.45, $p < .05$, respectively). Within the category consisting of caregivers and advocacy groups, however, they were significantly less likely to form ties with each other (estimated coefficient = -.81, $p < .001$). For individual and organizational accounts, the homophily term was also significantly negative (-.23, $p < .01$). In terms of main effects of the attributes, there was no difference between individual vs. organizational accounts in the likelihood to form ties. Compared to patients, caregivers/advocacy groups were significantly more likely to have ties in the network (estimated coefficient = 1.43, $p < .001$), whereas there was no difference between patients and healthcare providers/doctors. The model was shown to have adequate goodness of fit.

Title: Understanding Public Mindset on Weight Loss From Consumer-generated Online Data

Paper ID: 400

Authors: Bo Liang (Saint Vincent College)

Abstract:

Research Questions

With the growing popularity of internet use, consumer-generated data has become an important data source for researchers. More and more consumers are engaging in health-related online activities such as online search for health-related issues or communicating with others in online communities. Data generated from these activities demonstrates how consumers feel, think, and behave on health issues. The widespread use of search engines and social media platforms by internet users has attracted growing attention from researchers especially in the fields of business, information science, computer science, epidemiology, medicine, and public health informatics.

Overweight and obesity is one of the major health concerns facing U.S. consumers. In this study, we aim to investigate the public's mindset (i.e., beliefs or concerns) on two major approaches to weight loss (exercising and dieting) by exploring two types of consumer-generated online data: Google search data and Twitter data. We suggest that weight loss-related online searches and social updates reflect the public's mindset on approaches to weight loss. Specifically, our study will investigate how the public's mindset on approaches to weight loss is associated with obesity rates by geographic regions. Our research questions are:

(1) Does the public's mindset on approaches to weight loss vary by geographic regions?

(2) Is the public's mindset on approaches to weight loss associated with obesity rates by geographic regions?

Methodology

We will compare the public's mindset between "fat" cities (cities with high obesity rates) and "slim" cities (cities with low obesity rates). We will select two "fat" cities, Houston, TX and Jackson, MS; and two "slim" cities, San Diego, CA, and Boulder, CO. We will first collect and analyze Google search data. We will use Google Trends to download Google Search data on selected keywords (e.g., "workout" and "dieting"). We will use SPSS Paired Sample T-Test to compare the means of search volumes for selected keywords between the two groups of cities.

We will further explore Twitter data. We will work with The Center of Human Dynamics In the Mobile Age at San Diego State University to collect Twitter text data on selected keywords (e.g., "go to gym"). We will first investigate the frequency of selected keywords used by consumers in the four cities. Next, we will analyze Twitter text messages using Microsoft Azure, which is a machine learning app for text analytics. Our goal is to investigate how the public's mindset on approaches to weight loss (demonstrated in their Twitter messages) is different between fat cities and slim cities.

Title: Why Are You Quoted by Others Within A Thread? An Exploration of Reference Ties Among Posters In Online Health Communities

Paper ID: 401

Authors: Bo Liang (Saint Vincent College), Debra Scammon (University of Utah)

Abstract:

In today's healthcare environment, it is difficult for consumers to get all the support they need through communication with their doctors within a 20-minute clinic visit. Online communities are becoming a common means for health communication. Social learning theory suggests that people learn in their social contexts (Bandura, 1971). Online communities may be of value in facilitating health-related social learning. Online social learning is attracting a great deal of attention among researchers. A major gap in this line of research is the lack of attention to discussions among posters and the role of these discussions in social learning process in online health communities.

The essential feature of social learning is that people learn within social structures. Following Walther(1992, 1996), we view social learning in online communities as a process in which participants learn from each other through interactional activities such as referencing posts. Within online communities, participants create threads and within threads, participants can make a post. When a post is made quoting/referring to a previous post, an interaction or a discussion is built between the poster of the current post and that of the referenced post. It is important to determine the role that discussions have in online social learning.

Previous research in communications and education in online contexts has used message reference analysis to explore the role of discussions between students in facilitating online learning (Ahern, Peck, & Laycock, 1992; Bullen, 2007; Ingram & Hathorn, 2004; Pena-Shaff & Nicholls, 2004; Wise, Hamman, & Thorson, 2006). Through observation of several health-related forums, we identified two types of threads based on reference relationships between posts: Q & A threads and discussion threads. A Q & A thread is featured with one-time and unidirectional relationships between an initiator and one or multiple responders. A discussion thread is featured with multiple-time and two-directional referencing of posters and represent stronger interactions.

Our study aims to explore the development of threaded discussions by investigating reference relationships between posters in ongoing threads. Our study makes both theoretical and managerial contributions. We develop a conceptual framework that incorporates reference measures into the understanding of online social learning. Previous studies have used the number of friends listed on an individual user's friend list to measure the social influence of a user on other members in online communities. We argue that influence can be better understood by exploring the interactions between users. We investigate the actual interaction between users demonstrated by reference relationships. We then suggest strategies for social media marketing that could enhance opportunities for health-related social learning.

We used mixed methods to assess our three hypotheses. First, we used qualitative analysis to explore data collected from an online forum related to diabetes. We developed and implemented

a coding scheme allowing us to create measures of patterns of communication and content of posts in the threads analyzed. Secondly, we applied quantitative analysis to the data collected in the first step in order to determine the association of reference relationships and posters' engagement in community activities and the content of communication in ongoing threads.

Title: Intraorganizational Communication Networks and Climate for Implementation

Paper ID: 403

Authors: Alicia Bungler (The Ohio State University), Rebecca Lengnick-Hall (University of Southern California), Kun Huang (University of New Mexico)

Abstract:

Prior network studies examining innovations in health and human services focus on an organization's external ties and access to information about service innovations. This stream of research overlooks internal organizational networks (e.g. communication and information sharing), which are also important for creating a healthy and supportive environment for implementation. Investigating internal organizational networks and conditions for implementation may enhance our understanding of the variation in innovation uptake among recipient organizations. To address this gap, we examine how communication networks within work teams in behavioral health organizations influence the climate for innovation implementation. Within organizations, successful innovation implementation depends on a supportive climate, where workers share similar beliefs that an innovation is expected, rewarded, and supported. Communication among workers can influence the degree to which organizational members share similar perceptions about their agency. Examining communication networks within organizational teams allow us to begin to understand what network structures support (or hinder) strong, shared perceptions about climates that can ease the implementation of a new practice. Our study is conducted in the context of a naturally occurring, regional training initiative to implement a new children's mental health treatment (trauma-focused cognitive behavioral therapy) in an urban, mid-western US city. We draw on survey data gathered from 135 clinicians from 21 organizational teams (94% of those who completed training) 8-10 months after initial training. Respondents reported on the frequency of communication with each of their team members, which was used to construct network metrics for each team including size, density, reciprocity, and transitivity. Implementation climate was measured using 8 survey items; for each team we calculated the average score (to reflect the strength), and the within-team standard deviation (to reflect agreement). Correlation analysis at the team level suggests that communication was not associated with implementation climate. Instead, size was positively associated with climate, and negatively associated with variation in team scores indicating that the larger team, the stronger the implementation climate scores, and greater agreement among staff. Because network metrics are sensitive to size, further analysis (using qualitative comparative analysis) is planned for investigating the role of internal organizational networks for building supportive climate for implementation.

Title: Exploratory ICF Core Sets for Stroke with Network Analysis

Paper ID: 404

Authors: Chun Feng (University of Nebraska), Feng Lin (The First Affiliated Hospital of Nanjing Medical University)

Abstract:

Abstract:

This research applied functioning mapping in the stroke patients' function based on the International Classification of Functioning, Disability and Health (ICF). We defined 166 categories of comprehensive ICF core sets for stroke as variates in the graphical model with 59 categories on body functions(b), 11 categories on body structures(s), 59 categories on activities and participation(d), 37 categories on environmental and individual factors (e).129 stroke patients were enrolled to participate the interview in the study. Then Missing values were imputed with multiple imputation method. The "least absolute shrinkage and selection operator (LASSO)" was used for mining conditional dependencies between the variates. Bootstrap resampling method and confidence interval approach were used to enhance the reliability and validity of model selection. R software and Pajek 5.01 were used for graphical model and network analysis. In the 166 ICF categories, it shown 165 interconnected categories in the maximal independent component, and only "s120 spinal cord and related structures" was excluded. We also found the distance between "b340 Alternate vocalization functions" and "e415 Individual attitudes of extended family members" is the most distant. Clustering analysis for this main independent component revealed 15 clusters. "b114 Orientation functions", "b735Muscle tone function", "d630Preparing meals" and "e575General social support services" categories were centrally positioned in the graphical model due to their high connections. The "b114 Orientation functions" owned the highest value in the entire model and the cluster it represented was also the most powerful cluster. In conclusion, functioning mapping implied complex relational structures existed in the functioning variates of stroke patients. Furthermore, on the basis of exploratory network analysis, this study provided the clue to embed ICF in guiding future clinical intervention and home care for stroke patients..

Keywords:

stroke

international Classification of Functioning

disability and Health

graphical modeling

rehabilitation

network analysis

Title: Team Dynamics in Spaceflight Analogs: Shared Mental Models, Informal Social Roles, and Team Viability and Conflict in the Human Exploration Research Analog (HERA)

Paper ID: 405

Authors: Jeffrey C Johnson (University of Florida), Michael Zurek (University of Florida), Noshir Contractor (Northwestern University), Leslie DeChurch (Northwestern University)

Abstract:

A large body of work has shown that the more accurate an actor's mental models of group structure, as in cognitive social structures, the greater their power and the higher their psychological well-being. At the group level, the higher the agreement or consensus about group structure and informal role properties the better the group performs. In this talk we examine the relationship among shared mental models of task and teamwork elements, team consensus on team members' informal social roles, isomorphism between formal and informal role properties, particularly leadership, as well as team structure and team viability and conflict within NASA's HERA project. The data involve four 30 day missions each composed of four crewmembers (Commander, Flight Engineer, Mission Specialist1, Mission Specialist2) and highlight the importance of factors that contribute to the production of effective teams. Relational data (advice, work, look to for leadership, hindrance), informal role data (social director, leader, clown), ratings of the importance of mission task and team elements, measures of team viability and conflict, and peer evaluation data were collected over time. It is hypothesized the greater the overlap in team mental models and agreement on informal social roles the better the teams will perform over the 30 days of the mission. Also, it is hypothesized that the greater an individual shares the mental models of the overall group the higher their centrality and the more positive their peer evaluations. Finally, it is hypothesized that the more the isomorphism between formal and informal role properties of the teams the greater the team effectiveness.

Title: Predictors of community cohesion in two communities of wild eastern chimpanzees (*Pan troglodytes schweinfurthii*)

Paper ID: 406

Authors: Joseph T. Feldblum (Duke University), Anne E. Pusey (Duke University), Ian C. Gilby (Arizona State University), Kevin Langergraber (Arizona State University)

Abstract:

Researchers studying animal behavior have proposed a number of costs and benefits associated with living in groups. When costs of group membership increase relative to benefits, group fissions can occur. Anecdotal evidence from fissions in a number of primate species suggest that group cohesion may be influenced by group size, changes to the dominance hierarchy, and changes to food availability or distribution. But fissions are rarely observed in some primate species, including those most closely related to humans: bonobos and chimpanzees. In these species, patterns of subgrouping may offer more information about the costs and benefits of group membership. Here we use data on the association patterns of males in two communities of eastern chimpanzees (*Pan troglodytes schweinfurthii*) to investigate 1) how social and ecological factors influence community subgrouping structure over time, and 2) whether these factors have consistent effects across different communities.

Chimpanzees forage in fluid and frequently-changing parties, making it possible to identify social preferences based on association patterns. We created networks of male joint arrivals into foraging parties in 6-month periods from 1976 – 2015 in the Kasekela community (mean number of males = 11.3) in Gombe National Park, Tanzania and from 2003 – 2015 in the much larger Ngogo community (mean number of males = 41.2) in Kibale National Park, Uganda. We then calculated modularity scores in each period using Newman’s leading eigenvector algorithm. Finally, we ran a series of linear regression models with data from Gombe, using both ecological and social factors as predictors of modularity. We found that modularity was higher in the dry season (when food is less plentiful and more dispersed), during periods of dominance hierarchy instability, and during periods when more adult males lived in the community. Preliminary analysis found that the larger Ngogo community had significantly higher average modularity than did Gombe. Taken together, these results indicate that groups with more males are more modular, both longitudinally and between communities, and that both social and ecological factors can influence chimpanzee community structure. It also appears that similar factors govern chimpanzee and human community structure, as human groups, too, can become more modular and fission in response to large group size and leadership struggles.

Title: Social Intelligence and Social Networks Explain Collective Intelligence in Teams

Paper ID: 407

Authors: Kayla de la Haye (University of Southern California), Jennifer Labrecque (University of Southern California), Young Ji Kim (MIT), Thomas Malone (MIT)

Abstract:

Collective intelligence (CI) has emerged as an important indicator of team performance (Malone, 2010; Woolley et al., 2010). Like individual IQ, CI reflects a stable factor that explains team performance across varied tasks. Interestingly, the ability to perceive emotions in others, one dimension of Social Intelligence, has emerged as an important predictor of team CI; and an even stronger predictor of CI than teammates' academic abilities (e.g., average IQ) (Woolley et al., 2015). However, the role of broader, more complex Social Intelligence factors (e.g., social knowledge and skills) in team performance is not well understood. Additionally, how individual social abilities shape emergent team social networks—networks that are known to impact team performance—is yet to be investigated. The current study combines psychological theory and social network analysis to evaluate teams as social collectives whose performance is driven by social factors and emergent group social networks.

Mixed-gender groups of three to five participants participated in a laboratory study in which they completed MIT's Test for Collective Intelligence (TCI) as a team, along with several individual measures of Social Intelligence and holistic thinking. Team social networks were measured by objective audiovisual data and self-report items assessing multi-dimensional relationships of advice-seeking, trust, influence, and leadership. We evaluated the role of team social networks in explaining CI, and tested the mediating role of social networks in explaining the link between group members' social intelligence and group CI. Findings indicate that group Social Intelligence predicts the overall team network structure, and individual Social Intelligence predicts teammates' centrality within the network. The relationship between Social Intelligence and team CI was found to be mediated by team social network structure, although whether or not Social Intelligence enhances team performance was found to be dependent on complex interactions between team social abilities, academic abilities, and network structure.

Keywords: networks and teams; social intelligence; social psychology

Title: Perturbations, behaviour, and disease: network insights into woylie response to fire and range expansion

Paper ID: 408

Authors: K.L. Jones (Murdoch University), C. Rafferty (Whiteman Park), R.C.A. Thompson (Murdoch University), and S. Godfrey (Murdoch University)

Abstract:

Habitat expansion and prescribed burning are key conservation tools. However, secondary effects on behaviour, parasitism, and their interaction are poorly understood. We investigated the impact of expansion and fire on movement, interactions, and parasitism in the critically endangered woylie (*Bettongia penicillata*), using social network models to assess the epidemiological consequences of behavioural changes. We expected:

- 1) expansion would lead to reduced home range overlap, reducing connectivity of woylie networks and, subsequently, parasitism
- 2) fire would result in nests shifting to unburnt areas, leading to increased network connectivity, but impact on parasitism would vary by transmission mode

From February 2014 to 2016, woylies were trapped seasonally and fitted with GPS collars ($n \approx 30$) within a fenced reserve in Western Australia. In August 2014, tunnels were opened connecting the original 50ha area with a 150ha expansion. In December 2014, a fire burnt 87% of the reserve. Comparisons will include: home/nest ranges; social networks reflecting different transmission modes (e.g., overlapping home ranges for environmentally-transmitted ticks, nest sharing for lice); and parasite prevalences. By November 2014, 96% of animals used the expansion; home range sizes increased accordingly but ecto-parasitism was not immediately affected. Following the fire, woylies showed a preference for unburnt areas in both nesting and overall home ranges. Other results are pending. Understanding how perturbations impact wildlife behaviour and parasitism can aid conservationists in risk assessment, especially for species like the woylie where parasites have been implicated in population declines. This study also demonstrates the utility of social networks in wildlife epidemiology.

Title: Risk communication networks in families affected by Alzheimer's disease

Paper ID: 409

Authors: Laura M. Koehly (Social and Behavioral Research Branch, National Human Genome Research Institute, National Institutes of Health), Sato Ashida (Community and Behavioral Health, College of Public Health, University of Iowa), Jennifer Cleary (Social and Beha

Abstract:

There is a rich literature investigating patterns of genetic risk communication in families affected by Mendelian conditions, with such patterns representing relatively dense network systems with between 36% and 77% of members enumerated as family involved in some conversation related to risk. Much less is known regarding patterns of communication in families affected by common, complex conditions with known increased risk due to family history. In the current paper, we examine communication processes among networks of families affected by Alzheimer's disease (AD). Family history incurs increased lifetime risk of disease, yet there are still no treatments for or ways to prevent AD. This makes the risk communication process unfolding between members of these family networks particularly interesting because there are no known risk-modifying behaviors or treatments available. Our data come from the Caregiving Roles and Expectations Networks (CaRENet) project. Seventy-two members from 30 families with a relative affected by AD enumerated family network members and important others of both their AD affected relative and themselves. Respondents indicated with whom they discussed AD, the health of their affected relative, and their family risk of AD among their network enumerants. Here, we characterize how actor's personal attributes and family roles shape patterns of communication across different conversation topics within these families. Our analyses focused on family and important others who were not formal care providers, were 18 years of age or older, and were enumerated in families with at least two network informants, resulting in 777 total relational ties. Preliminary results indicate variability in family engagement in such discussions with 60%, 55%, and 20% of members on average involved in discussions about AD generally, the health of their affected loved one, and family risk of AD, respectively. Across all conversational content areas, we observe a significant tendency for information to flow amongst biologically related family members (ORs ranging from 3.00 to 5.89, $p < .001$). General discussions about AD and about the health of their family member affected by AD tend to involve those who provide emotional support (OR=4.06 and OR=5.74, respectively; $p < .001$). Discussions about AD generally are more likely to engage social kin (OR=2.52, $p = .001$), but not those members in younger generations, such as children (OR=0.30, $p = .012$). Discussions about the health of the relative affected by AD tend to occur amongst those of the same generation, rather than engaging those in older and younger generations (OR=0.45 and OR=0.27, respectively; $p < .025$). In addition to biological family, discussions about AD family risk also occur amongst spouses (OR=3.16, $p = .025$). These results suggest that there are important nuances in how members choose health discussions partners due to conversational content. Understanding those network characteristics, including member attributes and the quality of social relationships (i.e., emotional support exchange), can inform future health education programs that address potential communication barriers within families.

Title: Beyond Profiling: Modelling Affiliation Behavior with Criminal Organizations Using Blau Status Analysis

Paper ID: 410

Authors: Michael Genkin (Singapore Management University)

Abstract:

This paper uses the recently-developed method of Blau Status Analysis (BSA) to identify membership in deviant organizations. The mechanism of organizational competition is developed to explain how it affects organizational affiliation generally and gang membership specifically. Using the restricted version of the Add Health dataset that contains the “ground truth” of actual gang membership, this paper deploys the BSA approach to predict persons belonging to gangs and then evaluates the sensitivity and specificity of the models using ROC curves. It compares the Blau status variables, with more conventional variables used to predict gang membership and finds the former to be strongly predictive, particularly in models that incorporate Blau status variables along with conventional variables. The paper discusses the implications of the research for identifying not only gang members but other members of deviant organizations such as terrorist groups, as well as issues that this work raises for civil liberties.

Title: Known Devils or Unknown Angels: Which peers matter when? A network approach to understand group formation in a higher-education setting

Paper ID: 411

Authors: Ranjeet Numbudiri (Indian Institute of Management Indore), Santosh Kumar Tiwari (Indian Institute of Management), Swati Ghulyani (Indian Institute of Management), Rihana Shaik (Indian Institute of Management)

Abstract:

ABSTRACT

Grounded in social dominance, collective identity and homophile theory, this working paper examines the formation and evolution of different kinds of groups in a closed competitive set up across three time periods. In a higher education institute, wherein students are given freedom to choose their peers for accomplishing academic (directly linked to the grades i.e. CGPA), non-academic (socializing and building social capital) and competition-based (platforms for winning scholarships, internships) group assignments, it becomes interesting to examine the role of social bonds, group objectives, homophile (in terms of regional dialect, gender, lifestyle) and signalling effect - occurring through the initial informal socializing on the formation and evolution of groups. Based on Emile Durkheim's argument that a group has its own properties that affect the actions of the individuals, we additionally highlight the role of prior peer exposure and group objectives in how students switch their groups across three time periods.

The sample consists of post graduate management students in the second year of their course work from a premier business management institution located in central India. The average age of the sample is 24.6 yrs. Being a residential programme, immediately preceding the first wave of data collection these participants spent nine months together during their first year course work (both on and off-the classroom settings). However, they don't have the choice of forming their own academic and non-academic groups during the first year course work. At each wave, data pertaining to 450 students across academic domains forming various academic, non-academic and competition-based groups is collected.

To develop a better understanding of evolution of different networks, we have conducted semi-structured interviews on randomly selected 30 participants. Given the longitudinal nature of the present study, we propose to use stochastic actor-oriented models (SAOM). In specific, RSiena software package, would be employed to conduct the data analysis.

Key words: SAOM, RSiena, peer networks, network evolution

Title: Capability, Role, or Relation: Collaboration in Dota 2 Combat Teams

Paper ID: 412

Authors: Bo Xu (Northeastern University, China), Julia Neidhardt (Technische Universität Wien), Yun Huang (Northwestern University), Noshir Contractor (Northwestern University)

Abstract:

Collaboration is essential for virtual team success. This paper studies potential antecedences of virtual collaborative activities and their impacts on the performance of swiftly assembled ad-hoc teams. We propose three perspectives of collaboration – collaborative capability, role, and relationship—and measure collaboration at the individual, compositional, and relational levels, respectively. Instead of individual skills and expertise, collaborative capability captures a person’s ability, experience, and sometimes willingness to help others. Roles are non-relational attributes that require specific skills. A successful team usually contains multiple roles, like core and support, to carry out tasks from different domains. Some positions in team composition are dedicated to supporting roles, such as coordinators and facilitators. Relationship reflects the members’ experience of previous interaction. Many studies suggested that the previous experience working together makes people better in future collaboration.

In this paper, we explore the effects of virtual collaboration on team performance from the above three levels using Dota2, a multiplayer online battle arena (MOBA) game where geographically dispersed players are assembled and dismissed in an extremely swift manner. In Dota2, the members of each team are randomly selected before each game starts, and the in-game matching mechanism ensures that the two teams of a match have similar skill levels. These features exclude the possibility of sampling bias and control the influence from skill difference of different teams, which enable us to focus on the effect of team collaboration itself. More importantly, Dota2 provides a team-versus team testbed, where the performance of one team not only depends on the intrinsic properties of its members but also relies on the performance of its opponent. Therefore, team performance can be evaluated directly by observing the game result, rather than subjective assessment dependent on the nature of team task.

To capture the features mentioned above, we adopt simultaneous equation models to analyze the data, where the dependent variable of one equation is the endogenous independent variable of the other. The two regressions are estimated simultaneously to predict the corresponding team outcome. We find that all collaboration factors improve team performance. At the individual level, teams whose members have a greater level of collaborative abilities tend to have better performance; at the compositional level, teams with more support roles tend to have better performance; at the relational level, teams with members of more previous collaboration ties tend to have better performance. More importantly, our work reveals some interesting interactions between the collaboration measures. The step regressions suggested that previous collaborative relationship is the key factor in predicting team performance - given the previous

collaboration relations, individuals' collaborative capability has no significant impact on team performance.

Title: The impact of personal networks on conjugal and psychological vulnerability of heterosexual couples in a long-term relationship: a longitudinal perspective

Paper ID: 417

Authors: Rita Gouveia (NCCR LIVES - Université de Genève), Eric Widmer (NCCR LIVES - Université de Genève)

Abstract:

Personal networks and social support are paramount for the well-being of individuals, couples and their families as they provide emotional and material resources to cope with critical events and transitions over the life course. Several features of personal networks have been empirically proved to have an impact on conjugal quality, such as the density of support, the level of ties' overlap between partners, and the level of family interference on conjugal interactions. However, little is known about the longitudinal effects of those indicators on partners' psychological and conjugal adjustment. Therefore, the main aim of this paper is to investigate the role of personal networks on both psychological and conjugal vulnerability of couples, by taking a longitudinal approach. For this purpose, we draw on data from the Swiss longitudinal survey "Social Stratification, Cohesion and Conflict in Contemporary Families", which has been following an initial sample of 1534 heterosexual couples residing in Switzerland over three waves (1998, 2004 and 2011). In this paper, we focus on couples who remained together between wave 1 and wave 3 (N=721). In order to explore the network effects, we focus on both functional indicators (perception of emotional and financial support available, level of family interference) and structural indicators (level of friendship overlap, frequency of contact, and the level of transitivity between friends, siblings and parents). Psychological vulnerability was measured through a 6-item scale of depressive symptoms. In order to assess conjugal vulnerability, we rely on three indicators: conjugal satisfaction, separation thoughts, and frequency of conjugal conflict. Findings show that networks have a significant impact on both individual and conjugal vulnerability, although with different effects on men and women.

Title: Is having enemies an important feature in adolescents' networks?

Paper ID: 418

Authors: Stéphanie Baggio (Life Course and Social Inequality Research Centre, University of Lausanne)

Abstract:

Friendship is an important aspect of adolescents' life, but unfriendly relationships are under-investigated. Some findings of this emerging area of study suggest that antipathetic relationships are associated with maladjustment, such as externalizing problems (e.g., aggression), internalizing problems (e.g., depression), lower academic achievement, and peer rejection. However, few studies investigated associations of well-being with unfriendly relationships using social network analysis. This study aimed to fill in this gap and tested whether having enemies in the same class was associated with deteriorated well-being. Two classes of Romanian adolescents aged 12-14 years participated in the study (n=26 in each class). We assessed network of enemies within the class, well-being (PANAS scale, with positive affects and negative affects), self-esteem, and perceived discrimination. Exponential random graph models (ERGM) were used to test whether well-being was associated with the probability of having enemies in each class. The results first showed that densities of enemy networks were low in both networks (respectively 7.7% and 8.0% in classes A and B), and that reciprocity was low (4.6% and 2.1%). Reciprocity and transitivity were non-significant in the ERGM. Second, there was no significant association between well-being variables and the probability of having enemies, except the relationship between negative affects and the probability of tie in class 2 ($b=0.14$, $p<.001$). Participants with negative affects were more likely to have enemies. To conclude, it seemed that having enemies had no important adverse association with well-being and that unfriendly relationships did not structure the social network. These findings are susceptible to tone down previous studies suggesting that antipathetic relationships are detrimental for child and adolescent development. Unfriendly relationships are part of the group's dynamic and may not be a "dark side" of social networks. This study also raised some unanswered questions: are unfriendly relationships detrimental for well-being when they are reciprocal? Further studies with a larger sample size and longitudinal assessment are needed to achieve a better understanding of the consequences of having enemies for children and adolescents.

Title: The Strategic Pursuit of Black Homophily

Paper ID: 421

Authors: Tamara Gilkes (Stanford University)

Abstract:

The process of Black homophily (finding Black others) is complex, yet little research explores same-race network formation (Clarke and Antonio 2012). For many of the Black informants at a selective West Coast university, finding Black friends was fraught with obstacles and required strategy. Some manipulated their campus placements and time commitments to access predominantly Black spaces at the expense of cross-racial relationships. Many students perceived Black friendships as uniquely supportive for academic, social, and racial identity development. Students who did not actively manipulate time and/or place to form these friendships never developed same-race networks. Social network research neglects to explore same-race network formation and often struggles to tease out the role of agency versus structure. Through 42 interviews with students and administrators and campus observations over three years, this study sheds light on how and why these relationships form and provides insight into the role of choice in Black homophilous friendship formation.

Title: A Plea For Interdisciplinarity: The Benefits for the Structural Analysis of Social Networks

Paper ID: 422

Authors: Verena Knerich (Ludwig Maximilians University Munich), Christian Böhm (Ludwig Maximilians University Munich), Claudia Plant (University of Vienna)

Abstract:

Structure in social networks can be explored in several ways and has been an area of interest, especially in the natural sciences such as mathematics, physics, chemistry and computer science. Potential contributions of the humanities are increasingly appreciated in this context, yet they don't always develop their full potential. I argue for an extensive approach to exploit the mutual advantages of each subject to the fullest. In my work, I concentrate on the three subjects computer science, cultural anthropology and psychology and aim to examine their potential additional benefits for the structural analysis of social networks. Based on an overview of the existing theories, I demonstrate that a prior knowledge of cultural anthropological theories can aid in the following: in the identification of possibly new structures, in the explanation of the nature of existing ties, in the description of the overall network structure, of the content, and of the function. Taking psychological concepts into account, we not only gain a deeper insight into the meaning and formation of ties, but it also helps us recognise nodes for what they are in the network - actors with individual attributes and behaviour. Considering these backgrounds can further our understanding of dynamics in networks as I shall illustrate in selected examples. In conclusion, I argue that a profound analysis of structure necessitates not only a high level perspective as obtained by the majority of computational methods, but also a knowledge of the underlying social mechanisms and the attributes of individual actors. By considering theories from various subjects we can therefore achieve a more thorough interpretation of the complex reality.

Title: Influences of Social Capital on Political Participation in Rural Areas in China

Paper ID: 424

Authors: FanMu Zeng (Tsinghua University), JiFan Liu (Tsinghua University), and Jar-Der Luo (Tsinghua University)

Abstract:

This paper examines how community social capital and micro-level social capital influence political participation in several villages of rural China. By using survey data, this paper found that there are two splits between villagers: Elites vs. lower class villagers, and between elites in village. This study examines community social capital using relationship and cognitive measures: Villagers who have a high sense of community belonging are more likely to vote; Villagers who hold high village-trust tend to vote initiatively—i.e. to vote without being asked to by other people. At the same time, lower class villagers and a section of the elites initiate political participation, however a different section of village political and social elites are not involved. The integration level among the political and social elite is low, which explains why there are these two splits in village political participation.

Title: Modelling Online Social Network Users by Attitude to Key Events

Paper ID: 425

Authors: Karpov Ilia (Higher School of Economics), Lebedev Innokentii (Higher School of Economics)

Abstract:

This study implements the mathematical model that represents Online Social Network (OSN) actor as a set of sentiment vectors in the multidimensional space of topics. We perform state of the art entity based sentiment detection method to determine user attitude to the specified sentiment object and combine sentiment objects to topics with AdaGram distributional semantics model. Supposing that the user has the same attitude to the topic i.e. all sentiment objects inside, we limit topic growth by natural threshold – new sentiment object can be added to the existing topic only if all users have no attitude contradictions between new object and the topic. Resulting list of topics describes key problems, discussed by the set of OSN users so that each user in the set can be described as a vector of topics labeled with his attitude to them.

Until now textual analysis based approaches were significantly limited by low quality of the natural language processing of texts, written by OSN users. The latest results in automatic sentiment detection based on deep neural network architectures show F1 measure 0.6-0.7, which makes them efficient enough for generating a dataset suitable for model training. Our evaluation on political groups in Russian segment of Facebook and Vkontakte social networks shows strong correlation with manually annotated texts. We study communities, involved into the discussion of the Russian Revolution in 1917 and political aspects of recent election to the lower house of the Federal Assembly in 2016. The first dataset contains 5 862 posts and 375 236 comments, written by 67 388 actors, and the second dataset includes 67 662 posts and 5 523 399 comments, written by 390 288 actors.

The following research questions are addressed in this work: whether the proposed model is commutative – can the user be described by mean vector of his groups and will the group post messages like its average user? Do OSN actors tend to be homophilic in their discussions within the proposed model?

Proposed method can be used for collaborative filtering, political and sociological surveys. The model can be used to predict community reaction to the specified newsmaker before it will be widely widespread in the OSN.

Title: Socio-Cultural Cognitive Mapping: A new approach for network inference

Paper ID: 426

Authors: Kathleen M. Carley (Carnegie Mellon University), Geoff Morgan (Carnegie Mellon University), Joel Levine (Dartmouth)

Abstract:

Socio-cultural cognitive mapping is a statistical & algorithmic procedure for inferring a network from either attributes or two-mode data. The inferred network is the best-fit network model of the underlying data. A key feature of the social network is that when graphed in 1, 2 or 3 dimensions the distances are interpretable. Thus there is more visual analytic power in assessing these network images. This method is described and then illustrated with multiple data sets. The challenges and methodological decisions in creating socio-cultural cognitive maps are discussed. These include: similarity assessment procedure, impact of collinear data, procedure for handling binary attributes, and optimization procedure. These challenges, and the methodological impact of various coding choices can be seen when looking at real data.

This new procedure is used to provide insight into a wide range of data. For example, it is used to infer the possible full social network that underlay the famous American Feud - the Hatfields & McCoys. This goes beyond intermarriage ties to include other possible alliances. This example shows how types of ties can be linked. Socio-cultural cognitive mapping is also used to infer a network among science fiction books. This network provides a spatial mapping of the “distance” between top works in the genre. Finally, it is used to infer the group-level among ethnic groups in a middle eastern country. This shows the potential for alliance based on socio-cultural similarity.

A key feature of the socio-cultural cognitive mapping approach is that it also supports counterfactual reasoning about the social network. That is, it is possible to reason about whether the nodes (e.g., people, books or groups) would become more structurally similar if we changed their position in attribute space. Using this method we can now ask and answer questions like, if we were to increase the educational level of a particular group, would it change which other groups they are likely to ally with. This is illustrated by asking, what ethnic groups are likely to change their alliances if the least educated group received more schooling.

Another key feature of this approach is that it can be used to assess the changing structure of networks over time in a way that accounts for not just the presence or absence of nodes and links, but also changes in the underlying attribute space. For example, using this approach we can see how the advent of “data science” in science fiction has altered the social network landscape of this genre.

Title: Network cognition and online dating:

Paper ID: 429

Authors: Bernie Hogan, Patrick Janulis, Joshua Melville, Brian Mustanski, Michelle Birkett,

Abstract:

Prevailing wisdom within public health suggests that while online dating has led to increased potential for sexual contact, it cannot explain increases in the diffusion of STIs, particularly HIV. This is due to the assertion that individuals met online are trusted less than individuals met offline. As noted in network theory, less closure is associated with less trust. Those met online are met as networked individuals, not peers associated with mutual friends or mutual shared contacts. Thus this lack of trust leads to increased condom use thus compensating for the increases in sexual contact frequency.

We examine this assertion through the personal sexual networks of a longitudinal cohort study of young men who have sex with men (YMSM) in Chicago (RADAR). By exploring the multiplex networks in this cohort we can disentangle whether structural position (particularly isolation) is associated with decreased trust and concomitant increased condom use relative to sexual contact initiated through other contexts.

The RADAR study is a longitudinal cohort study of 1000 young men who have sex with men [YMSM]. The participants use Network Canvas in order to self report their personal networks in semi-structured interviews. Ties between network members signified social, sexual and drug contacts.

We note that sexual contacts initiated through online media (Grindr, Scruff, Tinder, etc...) were neither the least nor the most likely to engage in condomless anal sex. Nor were they the least nor the most likely to know the serostatus (i.e., HIV status) of their sex partners. This undermines the prevailing thesis. However, there was a notable difference within this cohort in the structural position of people met online. Relative to people met through other contexts, such as work, school, bars and parties, people met online were considerably more peripheral in the personal network. Their average degree in the social contact network was half that of those met through other ways. These contacts stayed peripheral even when the people met online were known for long periods of time and when there was multiple sexual interactions between partners. This suggests that according to the prevailing theory, there was indeed the structural basis for assuming a lack of trust. However that lack of closure did not translate into the hypothesised increase in condom use. This is partially explained by variation in sexual contact between respondents: A small number of individuals were disproportionately responsible for the high degree of risky sexual contacts. However, for others this finding persists. This suggests that new interventions and more specific messages need to be crafted in order to ensure greater safer sex practices through online interaction as well as through certain types of offline contact, especially parties.

Title: Drivers of network structure in sexual contact networks: implications for disease modeling

Paper ID: 430

Authors: Nicole Bohme Carnegie (University of Wisconsin-Milwaukee)

Abstract:

There is significant evidence in the complex networks literature that the structure of contact networks has significant effects on the potential spread of and control strategies for infectious diseases, particularly in sparse contact networks, as are observed for sexually transmitted infections (STIs). Structural properties such as degree distribution, degree correlation, community structure, and, to some extent, global clustering have been shown to have an impact. Two questions remain: 1) what high-level structural features are present in real contact networks, and 2) how much of that higher-level structure can be accounted for by dyad-level mechanisms such as homophily? Evidence exists that, in friendship and other social networks, homophily only partially accounts for clustering patterns, however, such evidence is lacking for sexual networks. While network-based epidemic models are often used to evaluate potential prevention interventions to disrupt transmission, typically no data is available to inform network structure above the dyad level, and assumptions must be made. Knowledge of likely values of high-level parameters and how well the network structure can be described by observed data on partner counts, homophily, etc., will improve the accuracy and usefulness of such modeling work. We use data from the HIV Transmission Network Metastudy Project, a collection of transmission networks from eight different settings in the United States and Canada. We first profile the observed clustering, degree assortativity, and other high-level structural features to give an idea of the distribution of the features in sexual contact networks. We then use exponential random graph models to examine whether those features can be accounted for by dyad-level properties.

Title: Group-level isolation, depression, and ADMA (Asymmetric Dimethylarginine) among older adult population of a Korean rural village

Paper ID: 431

Authors: Sungyae Shin, Ji Won Baek, Yoosik Youm (Yonsei University Graduate school)

Abstract:

The paper aimed to investigate the association of group-level isolation and depression on ADMA concentration, as a predictor of cardiovascular risk among older adults. Using the Korean Social Life, Health, and Aging Project (KSHAP) interviewed older adults aged over 60 and their spouses from a rural township between December 2011 and March 2012 (response rate: 95%), we evaluated 631 participants and built a global network of the people. Multivariate regression models were used to assess the association of group-level isolation and depression (CES-D) on ADMA.

Both group-level isolation and depression were independently associated with increasing ADMA concentration among older adults. The level of ADMA increased with increasing severity of depression. But the magnitude of the cardiovascular risk of depression was much smaller than that of group-level isolation. Persons who live in an isolated group, with contrast to those who live in a more integrated group, were more likely to feel lower intimacy with their network members and limit geographically socially access to social activities, thereby increasing the likelihood of ADMA concentration. However, there was no differences in ADMA concentration between a more integrated group and individual-level isolation (i.e. dyadic only component). Individual-level isolation was seen not to be that much more fatal than group-level isolation. This is because those who have few social network ties maintained emotional closeness with their partner and enjoyed community-level social gathering. Contrary to expectations, the results indicate that group-level isolation, regardless of whether one has social network ties or not, is seen as a more critical factor for cardiovascular disease than individual-level isolation in a given community. Even though both depression and social isolation are associated with increasing ADMA concentration, depression has no correlation with a link between social isolation factors and ADMA concentration.

Title: Network Structure of Russian Sociological Journals

Paper ID: 433

Authors: Aleksandr Semenov (ANR HSE), Katerina Guba (IPS EU SPb), Vladimir Glazachev (ANR HSE)

Abstract:

Network analysis is very popular in scientometrics and has been applied to bibliographic coupling, author citation and coauthorship networks for long time. Journals and their co-citation patterns have been studied on the disciplinary and sub-disciplinary levels but studies covering entire discipline on a country level are still rare. Hence we present the first study of citation networks among Russian sociological journals.

We used the Russian Index of Scientific Citations (RISC) -- large database which covers almost all scientific journals in Russian language as a primary source of data. The initial sample consisted of 589 journals that were included in the thematic category of sociological journals. To show the structural position of sociology in the general context of Russian academy through scientific journals we collected additional data on all journals that have cited articles from the primary sample sociological journals since 2012. Thus the extended dataset consisted of 3,090 journals which comprise approximately 50% of all the journals indexed by RISC. The journals were classified according to their type: established sociological journals, university journals, interdisciplinary journals, and other disciplines. We also classified the publishers into commercial, state and NGO owned.

Based on these data we were able to visualize the structure, main authorities and major thematic clusters of Russian sociology. A key result is that the position of the journal in the field of Russian sociological journals vary greatly depending on the journal type, especially in the case of interdisciplinary and sociological journals.

Besides that we also checked a number of hypothesis about the network properties of the field:

1. Center-periphery: our journals network has a pronounced center-peripheral character, where the most central and connecting journal is "Sociological Research ("Sociologicheskie Issledovania", Socls)";
2. Homophily: we did not find statistical evidence to the hypothesis that journals of the same type are more inclined to cite each other rather than other types of magazines. The same applies to the classification by type of publishers. However, for the projected network of publishers based on self-citation of their journals we were able to detect a small tendency to homophily which can be considered as a symptom of fraudulent activity in the citation patterns of these journals;
3. Degree correlation: using degree correlation as a measure of assortativity among journals, we have found that the most central journals do not tend to cite each other and have more citations from periphery journals.

Although the presented results are primarily exploratory because of the early stage of the project we managed to get useful insights based on it. Visual inspection of the network of Russian sociological journals allowed us to find outliers in terms of their network positions and citation

patterns which can be seen as a first step towards detection of predatory and otherwise fraudulent journals. Future steps in our research include adding bibliometric attributes of the journals to the analysis and statistical modelling with ERGM.

Title: Weighting Relationship Strength in Online Social Networks Based on Text Clustering

Paper ID: 434

Authors: Karpov Ilia (Higher School of Economics), Gradoselskaya Galina (Higher School of Economics)

Abstract:

Many researchers confirm the importance of weighting Online Social Network (OSN) actor relations with complex models because trivial metrics like friendship or group membership provide only a coarse representation of actor closeness. For instance, one can have best friends, casual friends and accidentally added individuals in the same list. This noisiness is usually caused by the low cost of link formation and mental efforts needed to delete it when the link becomes obsolete.

These proposed weighting models are based on the hypotheses that given two actor profiles as an observed variable, we can describe the actor similarity by modelling hidden interaction variables such as communication or liking. It causes the following limitations: (1) it is difficult, if not impossible, to collect all possible interaction variables from the OSN, which requires selection of the most important variables only, (2) the actor similarity is based on profile information which restricts comparison between actors of different types.

We study the problem of weighting relationship strength between three different actor types (users, groups, public pages) in a social network graph using two metrics. The first one is based on hidden actor interactions; the second one is based on actor's texts topic modelling. The first metric computes various interaction data about two actors. Over 30 different relations, provided by OSN, such as "amount of comments", "joint membership" and "amount of simultaneous likes" are included in our research. Having statistics for two relations $\{R1, R2\}$ we compute the causation coefficient as the difference between the conditional dependencies, $p(R1|R2) - p(R2|R1)$ to get the initial ties of OSN actors. The second metric is based on the hypotheses that texts, written by two actors can be described by a mixture of document distributions. The more the topics tend to be written by only one user, (all documents of the topic in the worst case) the further actors are from each other.

Our evaluation of Facebook data confirms the fact that friendship is not the strongest relation between Facebook users. According to the proposed metric, the strongest relations between users are mutual post liking and simultaneous commenting the same post. One of the key features of the proposed method is obtaining links between different actor types, e.g. the strongest relation between user and group is group posts commenting. Evaluation of the second metric on three class classification task (friends, best friends, relatives) shows accuracy 0.63 that proves this metric to be useful when we lack interaction data, but suppose some interrelation between two actors.

Title: Dynamic Evolution of Patients-to-Patients Network in Online Health Community: an Empirical Study based on Stochastic Actor-oriented

Paper ID: 435

Authors: Li Shi (School of Information Management, Wuhan University), Lusha Zhou (School of Information Management, Wuhan University), Shanshan Li (School of Information Management, Wuhan University), Jingxuan Cai (School of Information Management, Wuhan University)

Abstract:

The integration of Internet technology and medical industry has promoted the development of online medical industry. Online health community can break the limitations of time and space to provide medical and health information for users. Furthermore, users can interact with others, which promotes the formation and evolution of the friendship between users. This paper takes the largest diabetes community in China - SweetHome (<http://bbs.tnbz.com/>) as the research object, and uses the dynamic analysis method of social network, which is based on stochastic actor-oriented models, to study the impacts of individual attributes such as demographic attributes, disease type, activity, etc., and network structure such as transitive triads, etc., on the evolution of users' friendship network. SIENA is applied to estimate model parameters and take statistical analysis. We collect the data of three phases of friendship networks from December 2015 to April 2016. In the dataset, male users accounted for 56.8% of the community, while female accounted for 43.2%. this paper chooses four sub-forums as the research object, which are "juvenile diabetes", "new user promotion", "diets and sports", "prediabetic state" sub-forums. The average age of the users is 36. For the part of the disease type, people with type 1 diabetes accounted for 41.1%, people with type 2 diabetes accounted for 55.1%, people with other type diabetes accounted for 3.8%. The results show that in the sub-forum, which has a high correlation with diabetes, gender, age, disease type and other basic user attributes have significant impacts on the formation of the relationships between friends. However, in the sub-forum of sharing and accompanying, the detailed attributes of users such as the number of friends, online hours, bonus points and so on also have a significant impact on the formation of the relationships between friends. However, transitive triads have no significant influences on the formation of friends in these online health communities. In this paper, we study the main factors that affect the formation of user friend relationships in the online health community that patients interact with others. In online health communities, medical experts and patients, family members belong to the same level of users, with equal rights to diffuse information, express feelings, seek help and discuss. Compared with the aptotic cause of the formation of users' friend relationships in online health community that patients interact with doctors (patients-to-doctors), the cause of the formation of user friendships in the online patients-to-patients community are more complex and diverse. Regarding the practical implications of this study, platform managers can take certain incentives to attract users to increase the length of online hours to encourage users to participate in discussions and increase the probability of establishing a friend relationship between users. Besides, in this way they can enhance community cohesion and activity, improve the sense of trust between users on the platform, and promote the healthy and rapid development of online medical platform.

Title: Who get the advice on weight loss from physicians? Network effects on receiving advice on weight loss.

Paper ID: 436

Authors: Keunbok Lee

Abstract:

This study examined the effects of personal networks on the probability of getting advice on losing weight from health professionals. Among 1158 respondents lived in northern California in USA, 45.7% respondents were overweight or obese. Half of overweight or obese respondents have heard from their doctors that they need to lose some weights, whereas another half of them did not. I found that respondents who actively engaging in organizational activities and have many advice and practical help exchanging relationships in their personal network are likely to get weight loss advice from their doctors after controlling BMI score, health status and SES. These network effects, however, are only significant in young respondents aged 21 -31 years.

Title: Do we really discuss important things with unimportant others? On the tie strength of discussion networks and important tie networks

Paper ID: 438

Authors: Beate Volker

Abstract:

Recently, the assumption that the well-known ‘important matters’ name generator elicits the names of strong social ties was questioned (Small 2013). The important matters or core discussion name generator asks respondents about partners with whom they discussed important matters during the last six months, and should measure people’s ‘core network’. Small found that almost half of the discussion partners are not listed by respondents whom they ‘would consider important’, and concludes that the important matters question does not only elicit strong but also relative weak ties. These weaker ties would either be particularly useful, or available when people need to discuss specific important matter with others. This conclusion, however, stems from the assumption that important ties are the same as close ties and that both are strong ties, as well as that the important ties respondents have listed are all the important or strong ties they have. What is lacking is a theoretical and empirical assessment of differences between discussion and important ties in terms of their tie closeness. We analyze the characteristics and the overlap between discussion networks and important tie networks. We compare discussion and important ties with respect to various features such as closeness of the relationships, duration, frequency of contact, role relationship, and geographical distance. By this we contribute to the ongoing discussion about whether strong ties (should) reflect actual or potential resource flows, and whether the defining feature of tie strength is resilience of relationship or frequency of contact and what is their empirical relationship to closeness. We also look at the sociological importance of both ‘discussion’ and ‘important ties’ by examining their impact on people’s behavior and attitudes. Finally, we model the two types of networks on background characteristics of the focal actors. We use newly collected data from an online survey in The Netherlands and Slovenia (n=1000 respondents in each country).

Title: Social Network Structure and Social Capital

Paper ID: 440

Authors: Joseph F. Cabrera (University of La Verne)

Abstract:

This study uses data from a network study of a residence halls to determine which network structures and other network properties are more likely to be present in residence halls with a strong sense of community (measured using Nasar & Julian's Psychological Sense of Community Scale (1995) a proxy measure of social capital. Data from this study suggest that resident halls 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. Halls with a higher percentage of within floor ties have a stronger sense of community, while those with a higher percentage of out of network ties have a weaker sense of community. In addition, halls in which residents have a more similar number of ties (i.e., fewer hubs or stars) have a stronger sense of community than floors that contain more unequal distribution of ties (i.e., more hubs or stars). A second phase of the study is examining network structures related to a triad census to understand how triad structures effect the overall composition and outcomes within a social network.

Title: The Association of Leisure Activities and Cognitive Functioning in Old Age: The Role of Social Capital

Paper ID: 441

Authors: Julia Sauter, Matthias Kliegel, Eric Widmer, Andreas Ihle (University of Geneva)

Abstract:

Social relationships and the engagement in social activities often act as a buffer against cognitive decline and the risk of dementia in old age. It is argued that social interactions sustain the brain's plasticity, therefore enhancing cognitive functioning. However, research on the relationship between social resources, especially those coming from personal networks (e.g. social capital), leisure activities and cognitive functioning has still not yet investigated all aspects of this relationship. While previous studies have focused on network measures, such as complexity, size, etc., or on social engagement in a very large sense, our study focuses on the social capital component that can be derived from personal networks. We expect that social capital mediates the relationship between leisure activities and cognitive health, as the participation in those leisure activities facilitate the construction and maintenance of one's personal networks in old age. Data come from the "Vivre-Leben-Vivere" Study conducted in Switzerland in 2011 and include 2788 participants aged 65 and older. We assessed cognitive functioning using three measures, the Mill-Hill test (verbal abilities), TMT-A (processing speed) and TMT-B (cognitive flexibility). Participants' family networks were assessed through the Family Network Method (FNM) and based on the collected information indexes indicating the level of social capital within the network were calculated. We expect that participating in leisure activities enhances the individual's available social capital and therefore cognitive health in old age.

Title: Personality and Creation of Social Capital

Paper ID: 443

Authors: Marina Tulin (University of Amsterdam), Beate Volker (University of Amsterdam), Bram Lancee (University of Amsterdam)

Abstract:

The aim of this paper is to explore the extent to which personality can explain differences in the creation of social capital. Social capital refers to resources that are embedded in people's social networks, which can be used to improve one's life chances (e.g., Coleman, 1988; Lin, 2001; Lin & Erickson, 2008). Social capital is created by investing in one's social relationships, and the decision whom to invest in is guided by expected future returns. Previous research has mainly focused on structural explanations for differential creation of social capital. People who have more access to valuable resources as the result of their advantageous position in society create more social capital, because they are more attractive targets for other people's investments. However, people will only invest in another person if they trust that this person is willing to return previously received favors by actually sharing his/her resources. In the present paper we suggest that personality might play a role in this matter, because personality is linked to the ability to create trusting and reciprocal relationships. For instance, individuals who score high on agreeableness are considered to be more generous and concerned with others' well-being. Moreover, individuals who score high on conscientiousness are more trustworthy and reliable. Based on social psychological research studying the link between personality and social relationships, we derived hypotheses for each of the Big Five personality dimensions. Specifically, we hypothesized that extraversion, openness to experience, agreeableness and conscientiousness are positively linked to social capital, while neuroticism is negatively linked to social capital. We tested these hypotheses using the Social Survey of the Networks of the Dutch (SSND; Volker, Schutjens, & Mollenhorst, 2014), which contains data of 1062 respondents on the Big Five personality measure and social capital as measured by the position generator. We ran multiple regressions with social capital (i.e., number of positions accessed) as dependent variable, and the Big Five personality dimensions as independent variables. In all analyses, we controlled for gender, age, education and ethnicity because these variables were previously shown to be related to social capital. The results support our hypotheses by showing that conscientiousness, openness to experience, extraversion, and agreeableness are positively related to social capital, while neuroticism is negatively related to social capital. We discuss the findings of the present study in light of existing structural explanations of differential creation of social capital.

Title: Exploring Female Felons' Access to Resources with Egocentric Networks

Paper ID: 444

Authors: Marva V. Goodson (Michigan State University)

Abstract:

Despite the large body of literature on social support, social network theories and techniques have rarely been applied to understand criminal justice problems. Specifically, the egocentric network of female offenders has yet to be explored to understand structural and composition characteristics which predict access to resources. Instead, emphasis has been placed on the number of core network members, the proportions of core network members which fall into a specific category (e.g., family member, felony), and the provision of core network members' social support (e.g., instrumental, emotional, informational). Although informative, this method fails to reveal structural attributes (e.g., the connections between network members) and identify specific resources attained from network members. This study aims to fill this gap by utilizing a unique interactive software to complete face-to-face interviews with 40 female felons regarding their egocentric social networks and access to employment, financial support, housing, and educational resources from each network member. Multilevel modeling is used to understand ways in which ego and alter level variables affect women's access to resources. Specifically, this presentation will focus on the odds of women receiving access to resources from alters, with special consideration for dyadic use of illegal substances and criminal activity. Within level and cross level effects are also explored. Additionally, the research provides visual representations of example networks which place women at greatest risk for resource deficits and advantage for gaining access to needed resources. Such information could be key to aiding women offenders in altering their existing network to increase their odds of gaining resources. Additionally, the findings will inform the feasibility of existing correctional supervision policies, such as the feasibility of removing all felons from one's social network.

Title: Social Capital, Institutional Constraints, and Employment Inequality: Evidence from Well-Educated Urban Migrants in China

Paper ID: 447

Authors: Du Shengchen (Hong Kong Baptist University)

Abstract:

This article focuses on how institutional constraints influence well-educated urban migrants in their job searching processes in China. Drawing data from the Social Capital Project survey in mainland China with almost 3,500 respondents, this article finds out that institutional constraints bring influences to well-educated urban migrants through determining their capacity to access and mobilize social capital in job searching processes. According to regression models and structural equation modeling, institutional constraints of economic policies and cultural discrimination are key factors that make well-educated urban migrants have less accessibility to social capital in comparison with their local counterparts. Moreover, the substantial inequality in access to social capital leads to the disadvantaged status of those migrants in mobilizing social capital in job hunting processes, which is an important reason for the employment inequality. The paper concludes by arguing the non-negligible role of institutional factors and the net effect of social capital in explaining the inter-group inequality in China.

Title: Towards an understanding of the dark side of social capital in developmental networks: Effects on compulsory citizenship behaviour and relational inertia

Paper ID: 448

Authors: Jiafeng Jin (Dublin City University), Patrick Flood (Dublin City University), Janine Bosak (Dublin City University), Claire Gubbins (Dublin City University)

Abstract:

Research has acknowledged the strength of weak ties in the flow of information and influence (Burt, 1992; Granovetter, 1973, 1982; Weimann, 1983). Further, social capital refers to the actual or potential assets in personal social networks (Putnam, 1995). Yet, scholars also argue that individuals might suffer from network inertia and feelings of obligation due to the reciprocal nature of relationships. Despite this, most studies are oriented towards network benefits: the bright side of social capital. As Granovetter (1982) pointed out social structure can be both a source of opportunities and a source of constraints for individual behaviour, with both the bright side and dark side of social capital co-existing.

This paper focuses on developmental networks defined as egocentric networks composed of people whom take an active interest in and action to advance the protege's career by providing career sponsorship and psychosocial functions (eg., friendship) (Higgins & Kram, 2001; Yan & Richard, 2013). It proposes and tests multi-mediator model which examines the mediating effect of network benefits in developmental networks (i.e. career sponsorship and psychosocial functions), so as to shed light on the mechanisms underlying the relationship between tie strength and outcomes indicative of the dark side of social capital (i.e. compulsory citizenship behaviour and network inertia).

Standard egocentric network survey techniques were utilized including name generator questions to identify alters (contacts) in a respondents' (ego) network from MBAs at five universities in north China. Each respondent reported on four relationships (Higgins et al, 2006, 2008; Levin & Cross, 2004). A total of 530 respondents completed the entire survey (response rate 30%) and a total of 2120 alters (contacts) were listed.

Results showed that (1) Tie strength has a negative influence on compulsory citizenship behaviour; (2) Tie strength has a positive influence on relational inertia; (3) Network benefits: both career sponsorship and psychosocial functions are significantly mediating tie strength and the dark side of social capital in men and women. These preliminary findings indicate that social capital is not one-sided and the networks benefits could be constraints as well, without a gender difference.

The study contributes towards a better more balanced understanding of social capital with a consideration of the dark side of social capital. This is useful in understanding, all things considered, the benefits as well as the costs, the impact of social capital in ego's developmental networks. The implications and limitation of the study are discussed.

Title: Social Capital and Sharing Practices of Social Media Users in Poland: A Quantitative Study

Paper ID: 449

Authors: Kamil Filipek (Interdisciplinary Centre for Mathematical and Computational Modelling, University of Warsaw)

Abstract:

Introduction:

Nowadays, much of the sharing and collaboration can be found in social media. Social media became a tool enabling access, delivery, exchange and mobilization of resources embedded in personal networks (family members, friends and acquaintances). For example, Facebook groups help users to access information, knowledge, support or more tangible goods such as music or video. Moreover, members of these groups engage in different forms of sharing e.g. information and knowledge distribution, swapping, bartering, freecycling or car/office sharing. This may suggest that access and ability to mobilize certain resources from personal networks may encourage/discourage social media users to/from participation in variety of sharing practices. Although, the impact of such resources on instrumental and expressive actions is well documented in the subject literature (Lin, 2001, Flap & V?lker, 2001, Finsveen & van Oorschot, 2008)?, little is known about relationship between resources embedded in personal networks and sharing practices of social media users.

Objective:?

The main purpose of the research was to find out whether and how resources embedded in personal networks (family, friends, acquaintances) influence different forms of sharing practices among social media users. In doing so, Lin's (2001)? definition of social capital captured through social relations is employed. In order to achieve the research goals the following questions are pursued:

? Do the embedded and/or mobilizable resources (social capital) in personal networks affect sharing practices?

? Whose resources, namely family, friends, acquaintances or respondents (personal resources) have an impact on users' participation in different sharing practices?

? Which resources (material, support, knowledge, recommendation) are responsible for which effects on different sharing practices?

Methods and Measurement:

The core of the measuring tool was based on the Resource Generator instrument (Van Der Gaag & Snijders, 2005)?. Items included in RG are the major independent variables. The RG items are directly referred to the four types of resources, i.e. support, knowledge, recommendation, and material resources, accessed and/or mobilized through personal ties.

The dependent variable was represented by twelve items (5-point Likert scales) reflecting the respondent's participation in different sharing practices. Data has been collected through the

online questionnaire among social media users in Poland. The research project has been conducted between December 2016 and January 2017 on sample of 1 500 residents of Poland.

Results:?

? Resources embedded in and/or mobilized through family, friend and acquaintance ties have an impact (positive and negative) on the dependent variables.

? Weak ties are greater source of embedded resources while strong ties are better source of resources that could be mobilized.

? The effect of resources is enhanced by variables describing users practices on social media platforms (non-RG items).

? There is a contradictory impact of embedded and mobilizable resources (material, support, knowledge, recommendation) on different practices of sharing.

? The effect of resources is enhanced by variables describing users practices on social media platforms (non-RG items).

Title: Bring Guanxi Ties Back in: Causal Effects of Guanxi-based Corporate Social Capital on Business Performance of Chinese Small- and Medium-sized Enterprises

Paper ID: 450

Authors: Lei Zhang (University of Colorado Colorado Springs)

Abstract:

This study demonstrates causal effects of guanxi-based corporate social capital on business performance of small- and medium-sized enterprises (SMEs) in the context of China's relational collectivist culture and gradualist institutional reforms. Corporate social capital derived from managerial ties connecting focal entrepreneurs to other business players is a multi-dimensional concept; its effectiveness of facilitating business performance is contextually contingent. It is largely true that in a Western context of individualism and matured market economy entrepreneurs' weak-tie social capital is effective to bring information diversity, establish channels of marketing and production factors, build up trust and mutual understanding for smoother business transactions, and eventually promote business performance. However, such a widely accepted conclusion oversimplifies the innate dimensional complexity of social capital as either relational benefits of weak ties or structural advantages of brokerage and thus fails to explain why corporate social capital derived from Chinese entrepreneurs' strong-tie-dominated guanxi networks for favor exchanges accomplishes all of aforementioned business functions and contributes to the remarkable success of China's network capitalism in the past four decades of economic transition.

To ease this tension between theoretical predictions and observed exceptions, a general social capital theory is needed to advocate conceptual multidimensionality and incorporate cultural richness of social capital. As the first response to this theoretical gap, this research introduces a concept of "isotopes of social capital" – social capitals with different configurations of relational, structural, and moral dimensions are isotopes of each other if they fulfill similar functions. In each context, one social capital isotope will be more productive than other isotopes. Applying this concept to Chinese SMEs, this study argues that higher business performance is a result of guanxi-based corporate social capital, a social capital isotope derived from managerial guanxi ties that are mutually particular in relations, structurally multiplexed to fulfill multiple functions, and morally obliged to long-term reciprocal favor exchanges. On the contrary, Chinese SMEs cannot easily achieve high business performance by mobilizing entrepreneurs' weak-tie social capital, an isotope prevailing in the West and configured with universalist mutual relations, each one of which fulfills a specific function and carries weak or no reciprocal obligations. Confined to questionnaire survey data of 830 SMEs in the Pearl River Delta Region of China, this argument is causally demonstrated and cross validated by counterfactual models of propensity-score weighting and propensity-score matching.

Title: Towards an ecology of ties: How weak ties challenge activist sustainment

Paper ID: 451

Authors: Hjalmar Bang Carlsen (University of Copenhagen, Department of Sociology), Snorre Johan Ralund (University of Copenhagen, Department of Sociology, Copenhagen Centre for Social Data Science (SODAS))

Abstract:

We recast the notion of social ties, strong and weak, within an ecological framework. Ties are thought of as more or less stable patterns of interaction that happen within certain situations and relate to another within certain environments. Ties are not just resource, but demand resources - they should be thought of as investments. Using dynamic interaction data at scale we can investigate the (in)stabilities of tie formation instead of assuming them. Actors need to continually interact and invest time and effort in their relations. These investments happen in situations with certain interaction orders, certain morally and emotional expectation, that condition actors investment. Furthermore ties relate to one another within an environment that condition whether ties are in competition with one another over attention or not. This theoretical conceptualization is used to analysis social movement mobilization processes where membership inflow increases the size of networks and the demand for interaction. Furthermore the setting where activists interact have specific situational features that are important for understanding tie formations. Our ecology of ties framework lead to 3 theoretical claims about activist engagement processes in social movement groups:

- 1) The interaction order, under which ties are made, conditions ego investment in alter.
- 2) The size of membership influx poses problems for membership integration. This can lead to social congestion effects where initially mobilized actors not integrated due to the overburdening of core activist.
- 3) Strong and weak ties stand, under certain conditions, in direct competition with one another. The influx of weak ties can thereby undermine the reproduction of strong ties which in turn can lead to movement withdrawal.

We test our theoretical claims on the Danish Refugee Solidarity Movements. Our data consists of 163 Facebook groups, capturing the activity of 86.251 users, amounting to 34.740 posts, 3.777.037 likes, 446.906 comments. This enables a highly interactional approach, but of course also provoke questions of validity beyond Facebook. We end the paper by addressing the virtues of Facebook data both as a proxy of engagement beyond Facebook and as an interesting political arena in and of itself.

Title: Person-organization Fit : A Conceptual Framework for Social Commerce Design Based on Social Relations Management

Paper ID: 452

Authors: Xiao Liu (School of Management, Jinan University)

Abstract:

Social commerce is increasingly drawing the attention of practitioners and academics. Evidences from previous studies on grouping shopping and collective shopping show that the purpose of social commerce is to take advantage of relationships in a social network through the adoption of Web 2.0 capabilities to enhance customer participation and achieve greater economic benefits which may be measured by increased transactions (i.e., sales of product/service) or higher customer loyalty. With Web 2.0, customers' perceptions, preferences and decisions are not only based on information presented on e-commerce websites, but are also influenced by content generated by people on social networks (Constantinides and Fountain 2008).

Even those studies that investigate social commerce design focus to explore the design process and principles within the two categories of social commerce , i.e., e-commerce-based and social network based social commerce platforms, and to guide an enterprise technology architecture that enables and drives social commerce. However, the research question on what features need to be considered in social commerce design still needs to be explored further.

In addition, there is little research on guiding the design of social commerce for social enterprises like business association or entrepreneurs' association. Social enterprises differ from traditional not-for-profit institutions in that the social businesses must have profits to successfully function. And, they differ from traditional profit-based businesses in that their profits are used to support social causes rather than to increase the wealth of investors, managers, and owners. (Masseti, 2008). Hence, our study primarily focus on the design features required for social enterprises.

Based on the design model for social commerce (Huang & Benyoucef,2013) which consists of four layers: Individual, Community, Conversation,and Commerce, we propose an Online to Offline (O2O) commerce service model and a methodology to model and analysis social relations. Especially, we emphasis on maintaining a "good?fit"?between people?and situation interactions when planning design principles. Person-organization fit (P-O fit) is the most widely studied area of person-environment fit, and is defined by Kristof (1996) as, "the compatibility between people and organizations that occurs when (a) at least one entity provides what the other needs, (b) they share similar fundamental characteristics, or (c) both". So, the P-O fit can serve as a framework to guide social enterprises' culture and value building.

In order to better understand design principles developed in this study, we apply the model to design an O2O platform for a local entrepreneurs' association (EA), aiming to improve operational performance by providing attractive activities or value-added services, and to create an effective communication atmosphere between entrepreneurs through taking advantage of Web2.0 and social media attributes. By using SNA tools, we analysis the form and change of social relations between entrepreneurs, and provide some suggestions on community management which the

purpose is help EA's managers to understand their members and adjust some activity strategy more responsively. Results of management practice show that a harmonious community lead to more engagement and "customer stickiness".

Title: Networks of (Dis)information and the Ukrainian Crisis: Exploring the Role of State and Non-state Actors in the Struggle over MH17

Paper ID: 453

Authors: Yevgeniy Golovchenko (University of Copenhagen), Rebecca Adler-Nissen (University of Copenhagen), Mareike Hartmann (University of Copenhagen)

Abstract:

This paper explores how contesting depictions of the war events in Ukraine spread through networks of (dis)information on Twitter. Scholars and media have predominantly understood the social media coverage of the conflict in terms of information war, i.e. state-driven strategic campaigns in the struggle for global public opinion, with Kremlin and pro-Western authorities as the main protagonists. This paper nuances this analysis by empirically examining the social media engagement with one of the war's most important events: the downing of the Malaysian Airlines Flight 17 (MH17) in 2014. Doing so, the paper addresses the relation between state and non-state agents (civil society and non-state media) in the production and dissemination of competing "truths" surrounding the conflict. In order to capture the scope and character of opposing flows of information about MH17, the research methodology is profoundly interdisciplinary, drawing upon computer science and datamining techniques as well as insights from political sociology to analyze approximately 800.000 tweets. The competing narratives about MH17 crash are identified with the help of machine learning tools. Subsequently, Social Network Analysis is used to map networks of users who re-tweet the competing representations of the war events. Based on this in-depth-analysis, the paper demonstrates how notions of 'information warfare' do not capture the complex interconnectedness between state, mainstream media and citizens in the contentious struggle over truth in the context of war.

Title: Over-Time Social Network Analysis on Cellular Phone Network Data

Paper ID: 454

Authors: L. Richard Carley (ECE, Carnegie Mellon University) and Kathleen M. Carley (ISR, Carnegie Mellon University)

Abstract:

This talk addresses the problem of identifying network structures and over-time changes in network structures for dynamic networks in which substantial data on the interaction between agents is missing. The talk will focus on the particular case in which the data source is data from cell phone usage logs. All cellular carriers normally collect usage logs on all users of their network in order to appropriately bill for usage. In particular, we focus on call data and SMS messaging data logs because those are widely collected by carriers. We note that the carriers normally track the cellular data usage as well, but normally that does not include detailed information on the IP addresses to and from which data was transferred. This paper focuses on the data that is already available to the carriers – call logs and SMS logs. By modifying Android smart phones, many studies have collected such data sets from small user populations. This talk will focus on analysis techniques for such data sets and not on their collection. One extremely important data point that is missing in cell phone usage logs is face-to-face communications. In order to assess the impact of missing face-to-face communications, one data set we will analyze includes Bluetooth proximity data collected from cell phone users in addition to call and SMS data. Although not precise, Bluetooth proximity data can easily be used to identify potential opportunities for face-to-face communications. We present several analysis techniques and apply them to several publicly available cell phone data sets. The talk will also discuss the potential for the modern smart phone platforms to deploy applications to capture social context in ways beyond call logs and SMS logs. The growing pervasiveness of the smart phone offers the potential to develop an extremely rich dataset with minimal intrusion on the smart phone user. We conclude this talk by speculating on possible smart phone applications that would allow smart phone users to collect such data about themselves and ways to incentivize smart phone users to share that data with appropriate controls on who has access to that data.

Title: A comparative study of environmental policy actor networks in Japan and Germany

Paper ID: 455

Authors: Junku Lee (University of Tsukuba), Leslie Tkach-Kawasaki (University of Tsukuba), Manuela Hartwig (University of Tsukuba)

Abstract:

Based on the awareness of environmental issues and with the creation of the UNFCCC (United Nations Framework Convention on Climate Change) in 1992, international society has been trying to find solutions through global governance. Through these efforts of international society, Germany and Japan have played important roles among leading nations. However, in terms of environmental policies in Germany and Japan, there are major differences between the two countries in dealing with environmental issues. Germany is known for its strong environmental policies with consensus from all major political parties and input from civil society actors. Since the 1980s drives to nuclear phase-out and energy self-sufficiency, there has been strong promotion of renewable energy technologies following two oil-crises. In contrast, Japan has been reluctant to introduce new technologies based on renewable energy sources. Prior to the Fukushima Dai'ichi nuclear disaster in 2011, Japan has been mainly dependent on generating nuclear power as clean-energy to meet the targets of greenhouse gas emissions based in Kyoto protocol. DPJ the ruling party during that time made an effort towards a nuclear phase-out, yet, these plans had been abandoned soon after the LDP returned as ruling party since 2012.

In accordance with social capital theory, collaboration and cooperation by networking increases social capital. The increased social capital improves the proportion of problem-solving on outside of the governmental sector, and it makes governance more active and efficient. Traditionally, the social capital has been considered to mainly form by offline networks in person and it has been. Nowadays, on the contrary, online networks and new ICTs such as social media can increase the level and quality of social capital, and actor and stakeholder networks that participate in environmental policy area have potential as the basis of growth in governance. Moreover, growth of governance decreases dependence on authority and control of a government, as well as increase the participating and influence of actors and stakeholders.

This paper describes the sociographs and compares German and Japanese actors and stakeholder networks including the government, political parties, research institutes, corporations, NGOs and mass medias organizations that participate in the environmental policy area through inter-organizational network analysis. By analyzing the social media networks, this research measures connectivity and relationship among major actors in the environmental policy area, and compare the results for both countries' online actor networks. The results show that the connections in the case of Japan's actor network are weaker compared to a denser and larger network of environmental actors in Germany. Additionally, the actor network in Germany is more balanced in terms of actor categories. Analysis of the differences and similarities between the two network formations in Germany and Japan explain the different approaches toward renewable energy policy as part of governance.

Title: Before the Trump: Emotional Responses to Climate Change in YouTube

Paper ID: 456

Authors: Xanat Vargas Meza, Matthew Shaphiro, Han Woo Park.

Abstract:

Prior studies have analyzed public responses on Climate Change related videos. This paper discusses comments on the trailer of Before the Flood, a documentary released on October 2016, in order to trace changes on trends in public discourse. A combined methodology of webometrics, semantic and sentiment analysis will be employed with a focus on emotions related to Climate Change. The result of sentiment analysis on comments from previous studies videos will be compared with the result for Before the Flood. Preliminary results show an acute politicization of the comments across time, partly due to the electoral campaign procedures in United States; while scientific terms usage has decreased. Therefore, relevant influencers on the comments network will be detected and their discourse analyzed more in depth. Further results are expected to advance the comprehension of how emotions influence environmental issues on public discussions in the YouTube environment.

Title: A Social Network Analysis of Venues Serving Young Latino MSM in Miami

Paper ID: 457

Authors: Mariano Kanamori (Center for Research on U.S. Latinos HIV/AIDS and Drug Abuse, Florida International University), Kayo Fujimoto (Center for Health Promotion and Preventive Research, The University of Texas), Mark Williams (The Robert Stempel College of Pu

Abstract:

Introduction: In Miami-Dade Florida, HIV has heavily affected adolescent and young adult Latino men who have sex with other men (MSM). As of December 2016, Latinos accounted for more than half of HIV cases in this county in the 13-29 years old age group. Most Latino males who were HIV positive were exposed to male-to-male sexual contact. Social Venues where young Latino MSM (YLMSM) congregate to meet sex partners (e.g. bars, clubs) have the potential to provide information leading to the reduction of HIV risk as well as information on Health Venues where HIV testing and care are provided. For this study, the collaboration relation was defined as: [VENUE] and [ALTER VENUE] for every pair of nodes that (1) worked together, formally or informally, on an activity, project, or event; and/or (2) had a referral agreement; and/or (3) had sponsorship collaborations. The research aims for this study are: (1) Identify structural characteristics of the network in relation to the venue's classification (health or social), (2) Describe collaborations between and within Social and Health Venues networks, and (3) Identify characteristics of collaboration based on the number of services provided by each venue (up to 18 services).

Methods: The study uses cross-sectional data collected in 2016 by the Young Men's Affiliation Project (YMAP) in Miami-Dade. Investigators, staff members and community consultants developed a list of 59 Social and Health Venues serving YLMSM in Miami and 40 venues from this list were randomly selected. At each venue, an owner, manager or front-line person was interviewed. Network visualization analyses including symmetric data were performed using UCINET6 and NetDraw 2.160.

Results: Participants reported that both venue types were part of the MSM community. The mean number of services provided was seven for Health Venues and one for Social Venues. One Social Venue and two Health Venues had high degree centrality (many venues reported collaborations with them). Five additional Social Venues and three additional Health Venues had high Eigenvector Centrality scores (these venues had connections with other venues that have high levels of collaboration). Social Venues with high degree centrality or Eigenvector Centrality scores mostly provided free condoms and HIV prevention materials. Social Venues with low Eigenvector Centrality scores were not providing any services to YLMSM. Health Venues providing comprehensive services (more than 10 services) were not collaborating with other venues (low Eigenvector Centrality scores).

Discussion: Findings from this research are relevant for developing culturally tailored, venue-based network interventions and/or modifying existing HIV interventions targeting YLMSM by effectively incorporating Social and Health Venues. Investigation of venue-based collaboration networks provide a good understanding into the mechanisms on how to increase the cost-

effectiveness of current available services. By promoting collaboration and referrals between and within Health and Social Venues, programs can expand the reach of their resources across the whole county.

Title: How Does Your Friends' Socio-Economic Status Affect Your Subjective Well-Being? A Social Network Analysis on Chinese Undergraduates

Paper ID: 458

Authors: Ji-Dong Wang (Central University of Finance and Economics), Wen-Juan Wang (Central University of Finance and Economics)

Abstract:

Research on subjective well-being (SWB) (or happiness) in economics implies that social comparison of income can affect individual SWB. Previous studies tend to use aggregate measures of relative income, e.g., average income of a city, to characterize the extent of relative deprivation which may worsen individual happiness. This overlooks the pattern and orbit of actors' reference groups, since people tend to compare their socio-economic status (SES) against their social contact networks. Although networks, which bring social support, trust and other benefits, have been emphasized by researchers, there has not been much literature in SWB studies about how the network works as a vehicle for social comparison.

In this paper, we conduct a whole network analysis on the friendship network of 40 undergraduates from a university class in China with data collected during January 2017 via a web survey, and we focus on two of the actors' properties: self-reported happiness and SES of the ego. We model the bilateral relationship between them, where we take the friend network structure and the actor's position in the network into specific considerations. We try to answer the following questions: Will one be happier if the ego's friends are of higher SES or if the ego has more friends of high SES, or otherwise? Previous studies indicate that the effect of friends' SES is double-edged: On one hand, a "rich" friend can promote one's living standard through spillovers, thus can enhance one's happiness; on the other hand, the relative "richness" of friends can cause relative deprivation, thus may worsen one's happiness. This paper discusses in detail which effect of the foregoing two may dominate in the college student population.

Logit model regression analysis of the data shows that when measured by parents' occupation, income, and education level, one's SES has no significant effect on the ego's friends' SWB; when measured by student living expenses per month, SES has significant positive contribution to both one's and one's friends' SWB. Notably, the number of friends one reported have significant positive effect on the ego's SWB, and this effect is larger than that of living expenses. These results suggest that in a university class, the effect of social support provided by friendship networks dominates that of social comparison; connections themselves outweigh material interactions in terms of their influence on happiness.

Title: Multiplexity of personal networks and well-being

Paper ID: 460

Authors: Keunbok Lee (UC Berkeley)

Abstract:

Although effects of personal networks on well-being has been well studied, it is less examined the effects of multiplexity of personal network on psychological wellness. Using social networks of respondents in northern California in US, this study measured three multiplexity indices (multiplexity with family member, spouse/romantic partner, and non-family members) and test the effects of each multiplexity on respondent's welling being. Young females with high multiplexity with their family members are less likely to feel depression, while old females with high multiplex relation with their spouse and non-family members are likely to have good psychological wellness. Old males are less likely to feel anxiety and depression and more likely to report that they enjoy life when they have a multiple exchange relationship with their spouse or romantic partner, while multiplexity with family and non-family members are not significantly associated with old male's well-being. None of multiplexity measures were significantly associated with young male's well-being.

Title: How do depressive symptoms shape face-to-face interaction networks?

Paper ID: 461

Authors: Timon Elmer (ETH Zürich), Christoph Stadtfeld (ETH Zürich)

Abstract:

Depressive symptoms are associated with various social deficits and thus reduced psychosocial functioning. Such deficits potentially contribute to changes in an individual's social network. Recent studies suggest that individuals with depressive symptoms tend to have fewer friends and become friends with others who have a similar level of depressive symptoms. Similar mechanisms should operate in face-to-face interaction networks. Assessing social interactions directly can improve our understanding of how depressive symptoms affect social embeddedness and thus the reinforcing cycle of social isolation and increase in depressive symptoms. This study investigates how an individual's level of depressive symptoms affects his/her social interaction ties. The following research questions are explored: (1) Do individuals with higher levels of depressive symptoms have fewer social interactions? (2) Do individuals with higher levels of depressive symptoms prefer interacting in smaller groups? (3) Do individuals interact more frequently with others that have similar levels of depressive symptoms? In particular, we analyze how these patterns change over the course of two days and in dependence on preexisting friendship ties. We do so in a newly formed community of 50 students attending a social event on the first weekend of their studies. Throughout the weekend, students participated in social activities that intended to facilitate social integration. Prior to the event, 48 (96%) of the students administered an online survey assessing social ties within the cohort (e.g., friendship) and depressive symptoms. During the course of the weekend social interactions were assessed using radio frequency identification (RFID) badges. Research questions are investigated using time-stamped network models.

Title: The relative importance of similarity, contact opportunity, and balance in friendship transitivity

Paper ID: 463

Authors: András Voros (Chair of Social Networks, ETH Zürich), Christoph Stadtfeld (Chair of Social Networks, ETH Zürich), Zsófia Boda (Chair of Social Networks, ETH Zürich)

Abstract:

Friendship transitivity is one of the key processes behind clustering and segregation in social networks. However, the social mechanisms that generate friendship triangles are not self-evident. Prior social research suggests that there are three main factors that contribute to transitive closure among friends: similarity, contact opportunity, and cognitive balance. Dynamic social network analysis allows us to study the relative impact of these social mechanisms on the emergence of transitivity.

Most dynamic social network studies into transitivity to date are either survey-based or solely rely on automatically collected network data. The first type of study design is well-suited to investigate similarity- and balance-based processes. However, data in such studies are rather sparse and underlying patterns of collocation are mostly ignored. The collocation of individuals creates contact opportunities that may lead to transitive closure. In this paper, we present an approach to combine both types of study designs in a novel explanatory network model.

We analyze friendship and contact opportunity data from the “Social Evolution” study of the MIT Media Lab. Friendship relations were collected four times among 84 inhabitants of a US graduate community over a period of nine months. Contact opportunities were through detected WiFi routers by smart phones in five-minute intervals.

We analyze the data with a novel combination of Stochastic Actor-oriented Models both for survey-based and time-stamped data (SAOMs). SAOMs model changes in social networks (such as friendship or spatial closeness) as dynamic processes that depend on the individuals' preferences and their opportunities to establish connections. At the core of SAOMs are individual (actor-oriented) objective functions that express the satisfaction of an individual with the state of a network. Based on the empirical data, the SAOM estimates parameters that relate to specific social mechanisms, for example, how similarity, contact opportunities and balance explain friendship transitivity.

Our approach and method allow us to open a new high-resolution perspective on the dynamics of friendship transitivity and the emergence of segregation. By combining survey-based and automated data collection with novel explanatory network models, we can shed light on how similarity, contact opportunities, and balance explain the formation of friendship transitivity.

Title: Inferring Bivariate Association for Respondent Driven Sampling

Paper ID: 465

Authors: Dongah Kim (University of Massachusetts, Amherst), Krista J. Gile (University of Massachusetts, Amherst), Honoria Guarino (National Development and Research Institutes, INC.), Pedro Mateu-Gelabert (National Development and Research Institutes, INC.)

Abstract:

Respondent-Driven Sampling (Heckathorn 1997) is a sampling method designed to collect data from hard-to-reach populations; injecting drug users, sex workers, and men who have sex with men. Beginning with a convenience sample, the sample recruits other participants using a small number of uniquely-identified coupons to distribute among his/her social network. Coupon recipients can accept or reject participation in the survey study, and also receive a small number of coupons to recruit other participants. Using these processes, the survey team can reach a desired sample size of the target population.

This method is very effective to collect a data from hard-to-reach populations. However, valid statistical inference for these kinds of data relies on many strong assumptions. Most of all, statistical tests for between pairs of variables has strong limitations. In standard survey samples, we can assume observations from pairs of individuals are independent. In RDS, however, this assumption is not satisfied because of the sampling dependence between individuals. Therefore, we propose a method to non-parametrically estimate the null distributions of standard test statistics in the presence of sampling dependence, allowing for more valid statistical testing.

Title: Patterns and Variation in Homophily by Seeds and Waves in Two Men Who Have Sex with Men Samples Recruited through Respondent-Driven Sampling Method in Southwest China

Paper ID: 466

Authors: Hongyun Fu (Eastern Virginia Medical School), Jianghong Li (Institute for Community Research), Lisa Johnston (Tulane School of Public Health and Tropical Medicine), Chunmei Duan (Yunnan Institute for Drug Abuse), Xiushi Yang (Old Dominion University),

Abstract:

Introduction: Respondent-Driven Sampling (RDS), a link-tracing network sampling strategy, has been used worldwide in population-based surveys targeting hard-to-reach populations, including Men who have Sex with Men (MSM). Some methodological concerns were raised regarding homophily, which emphasized that individuals tended to over recruit those with similar characteristics in RDS network-based samples, leading to sampling bias. Using data collected in two MSM RDS studies in China, we examined the patterns and variation in sample homophily of key demographics, HIV related behavioral and health outcomes by seeds and waves, and discussed the implications of the findings.

Methods: A behavioral survey was conducted in 2013 in Kunming and Nanning in Southwest China. RDS recruitment started with 10 seeds in each city. Each seed was given 3 coupons to recruit peers from his social network, according to five criteria: (1) biological male at birth; (2) aged 18 or above; (3) had anal sex with a male in the past 90 days; (4) living in Kunming or Nanning for a minimum of one month; (5) speak and comprehend Mandarin to a sufficient level to respond to survey questions. Each participant received \$8 for completing the survey and \$5 for each successful recruitment. We recruited 290 respondents in Kunming (reaching 11 waves) and 490 respondents (reaching 18 waves) in Nanning. Respondents were interviewed face-to-face, using a structured questionnaire. Using RDS Analysis Tool, we calculated sample homophily scores of key demographics, sexual behaviors, condom use, HIV testing and STI symptoms by waves and seeds in each RDS samples and examined the patterns and variations in homophily by cities, seeds and the length of recruitment waves.

Results: Homophily scores of key variables were overall close to 1 (not sig) in both samples. Some variation existed between cities: In Kunming, significant homophily was revealed for age (score=1.213, $P<0.05$), income<2500 RMB (score=0.958, $P<0.05$), transgender (score=1.048, $P<0.01$), having bisexual partnership (score=1.048, $P<0.01$), having ≥ 6 sexual partners (score=1.088, $P<0.01$) in past 3 months, and participation in peer-led HIV intervention program in past 12 months(score=1.080, $P<0.01$). In Nanning, significant homophily was found for condom use with casual partners (score=1.133, $P<0.01$), and having STI symptoms (score=1.026, $P<0.05$) in past 3 months. Homophily decreased as recruitment waves increased. For example, the probability of a recruiter who attended peer-led HIV intervention program in Kunming recruiting peers who attended peer-led program was reduced from 50% by wave 3 (score=1.548, $P<0.01$), to 12.7% by wave 8 (score=1.127, $P<0.01$), and 8% by wave 11 (score=1.080, $P<0.01$). Some differences were found in homophily for ethnicity, sexual debut, anal sex role, and STI symptoms

by seeds. However, the differences did not show a clear pattern of association with the characteristics or the recruitment productivity of the seeds.

Conclusions: The levels and patterns of homophily for key indicators indicate low recruiter-recruitee dependency in the two MSM RDS samples. Although homophily does not fully disappear as recruitment waves increase, RDS methodology was able to provide a diverse and heterogeneous sample of MSM for social and behavioral health research.

Title: The serendipity of friendship

Paper ID: 468

Authors: Zsófia Boda (ETH Zürich), Timon Elmer (ETH Zürich), András Voros (ETH Zürich), Christoph Stadtfeld (ETH Zürich)

Abstract:

An extensive line of research into the evolution of friendship networks in communities emphasizes the importance of endogenous structural processes, individual characteristics, and meeting opportunities. First, much has been discovered about how endogenous structural processes such as reciprocity or transitivity shape friendship networks, inducing dependencies between network ties. Second, the role of individual characteristics is well-studied: people prefer others similar to them in their sociodemographic, behavioral, and intrapersonal attributes. Third, meeting opportunities for dyads or groups are essential in stimulating friendship formation between individuals.

While structural mechanisms and individual characteristics can be considered more or less stable, at least in an initial period, the quantity and quality of meeting opportunities seems more arbitrary. This is crucial, since even little changes in initial network patterns could lead to significant differences over the evolution of the network. Investigating the randomness in meeting opportunities and its effect on social ties is thus a key to better understand social network dynamics.

Using a unique combination of survey, observational, and experimental methods, our aim is to better explain the long-term role of initial random factors in friendships and dislike relations. For this, we focus on the complete network of over 200 first-year students at a Swiss university starting their studies together at the same department. We investigate network dynamics of the first semester (3 months). Survey data were collected in two different ways. First, detailed surveys, including questions about social ties, individual social background, and personal and behavioral characteristics, were administered three times: during the students' first week; four weeks later; and during the last week of the semester. Second, mini-questionnaires were sent out 21 times (twice a week), collecting information about students' interactions with each other. Observational data were collected using RFID-tags, which recorded actual face-to-face interactions during a socializing weekend at the beginning of the semester attended by almost third of the students. An experimental element has also been added to the study design. Three months before the semester started, freshly admitted students had a chance to attend an informal informational event at the university. Part of the event was organized in small groups, for which we randomly sorted students into groups.

Data were analyzed using longitudinal network models. Results show that the initial grouping of students still has an effect on social ties six months later, mediated through a series of social interactions over the semester. This provides evidence that randomness in initial meeting opportunities can indeed strongly influence network evolution.

Title: The Life Cycle of One Triad: An Alternative Perspective from Weibo

Paper ID: 469

Authors: Hong Huang (University of Gottingen), Lu Zheng (Tsinghua University), Xiaoming Fu (University of Gottingen)

Abstract:

Triad—a group of three people in sociology—is one of the simplest and most fundamental human groups, which serves as the basis of social network analysis. The three people in a triad can create different interactions and relationships, which makes the study of triad more typical and representative than that of other groups. Triadic closure, a closing process of an open triad, has attracted much research attention until now. Previous studies paid attention to understanding the triadic closure process and triadic structure, for example, how an open triad becomes a closed triad and even more how network evolves and community grows. These discoveries have been widely used in web mining and solving social issues like political movements, professional organizations and religious denominations.

On the other hand, the increasing popularity of social networks, especially microblogging service encourages more and more users to participate in various online activities, which are becoming a bridge that connects our physical daily life with the online world. The prosperous of online social networks and the availability of data have provided us unprecedented possibilities and opportunities to explore the unknown world, which has been rather difficult before, due to the unavailability of data. With the huge data collected from online users, we can better explore the triad closure process.

In this study, we move one-step further. We aim to trace the life cycle of one triad – how it develops into an open triad from one user alone, why the open triad becomes closed and how the closed triad dissolves. Based on data collected from Weibo, a famous Chinese microblogging service, we did an empirical study to investigate the underlying principles that govern the network dynamics. We find some interesting phenomena including that people who have more common friends are easier to become friends themselves.

With the knowledge of life cycle of one triad, we can better understand network evolution and community development. In addition, this study will be a good guide to practical application for online services, like friend recommendation.

Title: Network Structures and Subsequent Contact Size on Social Media

Paper ID: 470

Authors: Ming-Yi Chang (Academia Sinica), Yang-chih Fu (Academia Sinica), Po-Chun Lee (Academia Sinica)

Abstract:

An individual's precise network size has been difficult to estimate, because it is unlikely to obtain reliable and comprehensive empirical data to draw definite personal network boundaries. Some of the difficulties, such as research designs and costs of data collection, however, could be somewhat offset by the recent rapid growth of social media. Using recorded interaction data from Facebook, we aim to understand how the structure of one's contact network affects the total size of the subsequent social interactions on social media, which include replies, likes, and tags in their posts. Data will be drawn from a representative sample of 897 college students nested in 21 university departments (or classes) in Taiwan, in which 70-100% of students from the same class completed an online survey in their senior year and authorized the use of their interaction records from Facebook. We plan to use a multilevel analysis to examine how the size of a student's contact network in a given semester varies by network features and position in the previous semester (Level 1, N=6,279), individual attributes (Level 2, N=897), and the network composition of the department (Level 3, N=21). The findings are expected to shed light on how active personal networks change due to one's location in previous contact networks as well as individual attributes and other network features.

Title: Understanding Urban Mobility from Public Transportation Perspective Using Smart-Card Data: The Case of Shanghai

Paper ID: 471

Authors: Hong Huang (University of Göttingen, Germany), Shichang Ding (University of Göttingen, Germany), Taoxiaong Liu (Tsinghua University, China), Xu Wang (Shandong University, China), Xiaoming Fu (University of Göttingen, Germany)

Abstract:

Urban mobility has posed a huge challenge for most world's cities nowadays, which not only brings society problems like traffic congestion and air pollution, but also pave the way for optimizing city facilities, such as public transport. To discover human mobility patterns is of fundamental importance to our understanding of urban dynamics, and essential to providing one solution to above mentioned society problems. Previous researches have focused on understanding urban mobility patterns based on various datasets, like mobile phone datasets, credit card transactions, bank notes dispersal, check-ins in internet services and so on. In this study, we aim to explore urban mobility issues from another point of view – focusing on the group of people who use public transportation and build urban social networks to better solve these issues.

In this paper, we use the data of smart card directly from cities' public transportation to extract the general urban mobility patterns. We take Shanghai as a case study. The data from Shanghai covers almost half of the whole population's travel behavior for more than two weeks in the city, which shows almost the full picture of public transit. We study the collective spatial and temporal mobility patterns at a large scale and reveal some regularities. We find that the peak flow appears at two times: the first is from 8.am to 9 am when people go to work and the second is from 6 pm to 7 pm when people go off work. At both times the station with the largest number of people is Lujiazui Station which is the one at the center of Shanghai CBD (Center Business District) area . We also explore the correlation between city mobility patterns and underlying city behavior. In this sense, we divide the city into several regions according to their functions, i.e., residential areas, business district, and entrainment areas.

In addition, we investigate patterns of travel behavior at an individual level. With the regularity of human mobility patterns, we are able to guess and tell individual's working and life style type. For instances, we can identify whether a person is a typical office worker with regular working hours or a hard-working person who always work late. The empirical analysis in Shanghai shows that about 58% of people usually get off work before 7 pm and 42% of people tend to work very late at night.

This work could be a good indicator for public transportation user to make their travel plans and can offer direct implications for government to design and optimize transportation networks as well.

Title: Breaking the Glass Ceiling: The Social Capital of Senior Female Executives

Paper ID: 501

Authors: Heather McGregor (Edinburgh Business School, UK), Shauna Killen (Edinburgh Business School, UK), Dimitris Christopoulos (Edinburgh Business School, UK & MU-University, Vienna)

Abstract:

We examine the progress of women on the board of directors of companies in the UK FTSE100. Since the establishment of the 30% Club in August 2010 there has been a marked increase in the number of female directors in British corporate boardrooms. This study assesses their career progression and examines key factors associated with their success. We have created an original dataset that entails quantitative data from official records and data bases, coupled with a series of targeted interviews with senior actors among the UK corporate elite. We focus on two alternative hypotheses. First is that it is their own agency that causes their progression. For instance, that successful female executives have cultivated relevant relational assets (i.e. ties in the corporate hierarchy beyond their line manager; tie diversity; brokering structural holes etc). The second is that big corporations have changed their hiring policies to improve gender balance as a result of peer pressure (30% Club) and increased scrutiny by external stakeholders (especially institutional shareholders) and government (Davies review, now Hampton-Alexander review). In our analysis we examine the number of women appointed to a FTSE 100 board since January 1st 2011 and analyse their educational and institutional ties as well as their ego networks. We also examine the time-lines of major gender initiatives against the rate of female appointment to assess their influence, and establish what ties are the most influential in securing the a FTSE100 appointment.

Title: Social Networks of Women and Business in China

Paper ID: 503

Authors: Jing Song (The Chinese University of Hong Kong), Danching Ruan (Hong Kong Baptist University)

Abstract:

Previous studies have illustrated that business has become an increasingly masculinized sphere under China's market reforms. Traditionally, business activities often involve traveling alone and interacting with non-kin men, which is considered not appropriate for women. In recent decades, business networking requires participating in entering entertainment places and other male-dominated consumption behaviours. This study examines how women develop and navigate their social networks in doing business at the grassroots level, and carve out a space for their individual and collective agency by promoting both the bonding of pseudo sisterhood and the family-centred networks. Drawing on interview data from women entrepreneurs in a coastal county in China, who are mostly in small and informal business sectors in the local market centre, this study finds the flexible roles and strategies adopted by women to challenge the male-dominated business networking, which are more successful in some cases and situations than others. This study examines the different underlying mechanisms of men's and women's business networking and explores the institutional and cultural backgrounds that contributed to such mechanisms. Such networking activities are an important part of the gendered entrepreneurial dynamics in the contemporary China.

Title: Extensions of the Network Change Model to Political Realms

Paper ID: 504

Authors: David Krackhardt

Abstract:

The "network change" model was designed to suggest to leaders how they can easily diffuse a controversial innovation in a large organization or population. The model is comprised of two separate stages, one focused on a micro process to convert a relatively small, manageable group. The second addresses a serious roadblock to network diffusion identified by Watts and his colleagues in large populations -- that is, diffusion almost always dies, even if you have successfully identified and converted the key, central actors (high degree actors) in the population as early adopters. By drawing on a viscosity model of diffusion, one can successfully predict the conditions under which the controversial change or idea is likely to be adopted. I suggest that this model offers one explanation for how the political landscape in the recent US elections was so dramatically changed in an alt-right direction, despite all the predictions to the contrary.

Title: From Virtual Space to Public Space: Online Activism and Political Mobilization during the Arab Spring

Paper ID: 507

Authors: Harris H Kim (Ewha W University), Fabio Rojas (Indiana University)

Abstract:

Scholars have often lamented the fact that Middle Eastern and other Muslim-majority nations are “exceptionally resistant to democracy.” That description no longer fits, as the region has undergone major political transformations driven by grassroots pro-democracy mobilization. Better known as the Arab Spring, ordinary citizens, young and old alike, have taken to the streets en masse, successfully toppling despotic rulers who had been in power for decades. How did this happen? Why did so many individuals in authoritarian regimes decide to participate in such high-risk collective action? What were the dynamics and mechanisms underlying the emergence of this successful social movement? The purpose of this study is to seek answers to these questions from a network perspective. The Arab Uprising has often been referred to as “the Tweeter Revolution,” in light of the powerful role online social media played. Using Arab Barometer Wave III (2010 – 2012), which consists of nationally representative samples from Algeria, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Palestine, Sudan, Tunisia, and Yemen (N = 14,809), we investigate the relationship between what we call “cyber activism” (using social media activities) and movement participation. We estimated 2-level (L1 = respondents; L2 = geographic regions or administrative divisions) hierarchical generalized linear models (HGLM) and also used propensity matching methods (covariate adjustment and inverse probability of treatment weighting) to analyze the data. Net of a host of control variables, we find that being politically active online significantly increases the likelihood of participation. Moreover, irrespective of individual-level cyber activism, being embedded in a region with others who are active also increases the odds. Statistical models using propensity scores provide further supporting evidence. Based on a subsample of participants only, we also show that those who had been active online were much less likely to act according to herd mentality. Our study demonstrates that network diffusion was a primary driver of the Arab Spring. We conclude that individual decision to participate in a social movement is a complex process that must be explained in terms of both individual and contextual (network-mediated) factors.

Title: A Social Network Analysis of the Relationship between NGOs and Foundations in China

Paper ID: 508

Authors: Qingyan WANG (Hong Kong University of Science and Technology)

Abstract:

The financial relations between NGOs and public foundations in China are important for understanding the development of NGOs, which are regarded as important actors in the rise of Chinese civil society. Based on the NGOs and public philanthropy foundations' annual financial reports from the years 2011-2015, we build an annual bipartite network capturing the major stakeholders and any specific structure of the whole relationship. We illustrate the dynamics of their development and the influence of public foundations. We argue that at the beginning, NGOs in China relied heavily on public foundations and a limited number of large-amount donations, but gradually, with the introduction of new social media, the funding sources of NGOs in China have become more diversified. This might decrease their dependence on public foundations and give them more freedom to execute specific projects. This social network analysis offers the first large-scale empirical study of the relationship between NGOs and public foundations in China. The results not only deepen our understanding of the development of Chinese NGOs, but also contribute to our understanding of an increasingly complex state-society relationship in contemporary China.

Title: Relation between social influence and discourse similarity in workgroups through time

Paper ID: 509

Authors: Johanne Saint-Charles (Université du Québec), Pierre Mongeau (Université du Québec)

Abstract:

We explore the relation between social influence and discourse similarity in workgroups through time considering strength of ties and actor centrality in the influence network and the sociosemantic network (where relationships are based on the proportion of shared elements of discourse). Postmes et al. (2005) have shown a weak but significant augmentation of homogeneity of the exchanges through time. As most models of group development have in common three main stages: forming, storming and norming, we hypothesized positive correlations between discourse similarity and centrality in the influence network at all time, but that this correlation should be weaker during the second stage (storming). Data consist of transcripts of video recordings of 45 3-hour group meetings and of weekly sociometric questionnaires. The observed correlations support globally the alleged relation between social influence and discourse similarity, but changes through time suggest a similarity threshold above which the relation between similarity and influence reverse.

Title: Knowledge externalities and production in networks: game equilibria, types of nodes, network formation

Paper ID: 510

Authors: Vladimir Matveenko (National Research University Higher School of Economics - St. Petersburg), Alexei Korolev (National Research University Higher School of Economics - St. Petersburg)

Abstract:

Our model describes situations in which utility of each agent in network depends on her consumption in two time periods. In period 1 the agents may diminish their current consumption to make investments to increase their consumption in period 2. Consumption in period 2 depends not only own investment, but on the investments made by the near neighbors in the network. Such situations are typical for families, communities, firms, countries, international organizations, etc. In the framework of the model we consider a series of questions related to interrelations between the network structure, intensives and behavior of the agents. We study game equilibria in network in terms of welfare (utilities) of the agents. The main attention is devoted to a new concept of Nash equilibrium with externalities under which the agents are less free in changing their behavior in equilibrium than under the common definition of Nash equilibrium, since the agent's behavior is defined by her environment considered as exogenous at the moment of decision-making. We do compare the consequences of such equilibrium with the common Nash equilibrium. We prove uniqueness of the inner equilibrium (i.e. such that all the agents invest but only part of their resource) and demonstrate multiplicity of corner equilibria. We prove also that utility depends monotonously on the environment and find the precise dependence. We prove that in case of the inner equilibrium the investment of each agent is defined by her alpha-centrality in the network; this result complements results of some other authors in which behavior is defined by some forms of centrality. We find that the two components of the alpha-centrality (position of the agent and the exogenous importance) always influence the equilibrium investment level in different directions. We introduce several new concepts and develop the methods of network analysis which can be useful in research of equilibria. In particular, we introduce a concept of type of node, propose a classification of networks based on this concept, describe an algorithm of subdivision of the set of nodes to types, and show the role of this typology in characterization of the agents' behavior. We derive explicit formulas for inner equilibria in networks with 1 or 2 types of nodes and for such classes of nodes as chains, stars, core-periphery networks. For some of them we provide also exhausting descriptions of all corner equilibria. We explore also some questions of network formation. In particular, we study the role of passive (not investing) nodes as connectors allowing to form networks from the components being in inner equilibrium. We find conditions under which regular networks can be connected by a chain of passive agents without change in behavior. We find consequences of appearance of new links and of connection with new components. In particular, we identify agents potentially interested in one or another way of network formation. For example, we find conditions under which center is interested in increasing the number of periphery nodes (rays) of the star network (we show that the periphery nodes are never interested to be included into the star).

Title: Analysis of the influence of social networks on the innovation capacity of individuals

Paper ID: 511

Authors: DESI RAULIN (Center fo Research in Management Toulouse Capitole University)

Abstract:

Innovation is recognized as a driving and strategic force enabling a firm to survive and remain competitive with its competitors. Individuals' innovative capacity promotes organizational performance. Knowledge creation and professional networks are strongly linked because networks play a central role in the processes of knowledge combination and exchange (Nahapiet and Ghoshal, 1998, Tsai and Ghoshal, 1998). Empirical studies carried out in research laboratories and R & D units of high-tech firms have shown that individuals' social networks favor individuals' creativity and innovation capacity (Perry-Smith, 2006, Rodan and Galunic, 2004; Obstfeld, 2005, Wang, Rodan, Fruin and Xu, 2014). Research on the relationship between knowledge diversity and social network structure neglects the role of individuals' positions in networks that may prove beneficial and foster individuals' capacity for innovation (Rodan and Galunic, 2004; Rodan, 2010, Wang, Rodan, Fruin and Xu, 2014). Researchers estimate that the personal characteristics of individuals are often neglected and tend to be treated as "residual variables" of the structure of social networks (Kilduff and Brass, 2010; Burt, Kilduff and Tasseli, 2013). The research objective is to understand the advantages of accessing the diversity of knowledge, to identify the position of the individual within the social networks that determines his capacity for innovation and to answer the question about the effects of characteristics of the individual on his or her ability to innovate. The research objective is to answer the main question: How do social networks influence the innovation capacity of individuals? In order to address the current limitations of the literature and to extend this work, we propose to decompose the research question into several questions: (1) How do the intermediation and the centrality of individuals in a social network, as well as the heterogeneity of the knowledge accessed by these individuals, influence their capacity for innovation? 2) To what extent do the personal characteristics of individuals influence the innovation capacity of individuals and how these characteristics interact with variables related to social networks? Our research is based, on the one hand, in the work considering knowledge as a competitive advantage (Kogut & Zander, 1992) and on the other hand in social network theory by putting forward the positions of individuals in networks (Burt, 1992; Freeman, 1979). Our thesis is also based on a set of works from the field of social psychology: the Self-Monitoring theory (Snyder, 1974) and the Big Five personality theory (McCrae and Jhon, 1992). In order to answer our research questions, we adopt a hypothetico-deductive approach. The design of the research is based on a complementarity of the qualitative and quantitative methodologies.

Title: Knowledge Contribution in Open Source Communities: The Salience of Reciprocity

Paper ID: 514

Authors: Jyun-Cheng Wang (National Tsing Hua University), Ming-Jing Chiang (Ta-Tung Institute of Technology), You-Shuan Li (National Tsing Hua University)

Abstract:

Online Open Source Software (OSS) community, as well as other community of practice, is looking forward to the growth of member number in order to maintaining the sustainability community. As member growth, two challenges to open source software development in Internet-based communities have been raised by previous studies. One is "The Mythical Man-Month" due to team members are voluntarily contribute to a collaborative software project, the other is "Free riders" due to the source code is distributed and accessible via the Internet without charge or limitations on modifications. It is noted that "man and month are interchangeable commodities only when a task can be partitioned among many workers with no communication among them." However, knowledge coordination and communication are critical to software project, and this implies that the knowledge contribution may not increases as the community size expands. According to social exchange theory and social capital theory, we would argue that reciprocity is critical to these ambiguously relationships. The research questions of this study are, 1. How the reciprocity mitigate the negative effect of "The Mythical Man-Month" when the size of project member grows? 2. How the reciprocity affect the negative effect of "Free riders"

Title: Gendered associations between network size and self-rated health (SRH): a multilevel analysis of primary survey data on Lao adults

Paper ID: 516

Authors: Harris Hyun-soo Kim (Ewha Womans University)

Abstract:

A growing body of research, largely based on North American and European contexts, have shown that social capital (e.g., network size) plays a critical role in promoting subjective mental and physical well-being. This study contributes to the extant scholarship by focusing on a novel empirical case: Lao PDR (Laos). Specifically, it examines individual- and community-level associations between network size and self-rated health (SRH) among adult residents, and how this relationship may be moderated by gender. Data come from the original survey collected by authors in Laos in 2015, a project funded by KOICA (Korea International Cooperation Agency). The dataset contains a probability sample of 979 adult residents clustered in 50 urban and rural communities in the capital city of Vientiane and its vicinity. Using pooled and gender-segregated subsets of data, we fitted a series of (2-level) hierarchical generalized linear models to investigate the network size-SRH linkage, while adjusting for confounders. For the pooled sample, intraclass correlation (ICC) indicates that 10.5 % of the variance in individual SRH is due to contextual (community-level) effect. For the male and female subsamples, the values are 11.6% and 8.1%, respectively. Net of age, gender, ethnicity, partnership status, educational attainment, household economic background, life satisfaction, social support, and physical conditions (BMI and number of adverse bodily symptoms), we find that larger network size (number of confidants) is negatively related to SRH (OR = .76, $p < .01$). Similar results are reported for male and female groups. Based on pooled (OR = .52, $p < .05$) and female (OR = .49, $p < .05$) samples, findings further show that living in a community with a higher average network size is associated with lower odds of being healthy. No such contextual relationship exists, however, for men. To our knowledge, this is the first study to probe multilevel gendered associations between network size and health using a large survey dataset on the Lao population. In doing so, it offers evidence that diverges from the conventional view concerning the health benefits of social capital. In light of our findings, we suggest a more critical examination of the functionalist view in the literature concerning the linkage between interpersonal networks and subjective health.

Title: Social Networks and Meritocracy in Elite Recruitment: The Chinese Civil Service Examinations, 1400–1580

Paper ID: 519

Authors: Enying Zheng, Yasheng Huang, Rongzhu Ke, Wei Hong

Abstract:

The Chinese civil service examination (CCSE) system was a meritocratic institution, whereby talented men, regardless of family background, achieved upward social mobility. Using information on 12,752 successful examinees between 1400 and 1580, we provide evidence that although academic ability positively affected CCSE outcomes and facilitated social mobility, social networks had a smaller yet substantial effect. To disentangle how and how much academic ability and social networks mattered, our identification strategy is based on a crucial CCSE institutional feature: some examinations were strictly anonymized, whereas others were not. This feature provides a nuanced setting to test the relative effects of social networks, identified either by interpersonal ties or by group affiliations. Our research has policy implications for network-induced labor-market inequalities, which may be attenuated by anonymous evaluations.

Title: Towards a Theory of Open Entrepreneurship

Paper ID: 520

Authors: Zeynep Yetis-Larsson (Stockholm School of Economics)

Abstract:

While scholars have studied extensively how entrepreneurs can benefit from user communities, no model exists to understand entrepreneurship in an open-source software (OSS) setting. In OSS communities, entrepreneurs derive business value from a collective resource, are restricted in how intellectual property can be protected, and need to work through a community over which they may exert influence but no control. This article draws on the literatures on entrepreneurship, OSS, social capital, and collective resources to conceptualize an OSS project as a common-pool resource and an OSS community as a socialized reservoir of knowledge, experience, and other socially embedded resources. Under these characterizations, entrepreneurs can potentially utilize a spectrum of strategies to derive business value from OSS projects by striking a balance between two sets of counteracting forces. First, depending on their need for long-term access to the OSS project's collective resource, they need to balance extraction from the resource with replenishment. Second, they need to find the right balance between the enabling and constraining effects of being socially embedded within the community; access to resources on the one hand and the risk of becoming locked into the emerging technological path of the OSS project on the other.

Title: The Measurement of Guanxi Circles—Using Qualitative Study to Modify Quantitative Measurement

Paper ID: 601

Authors: Luo, Jar-Der (Tsinghua University), Huang, Hong (University of Göttingen), Burt, Ronald (University of Chicago Booth School of Business), Chou, Cao-Wen (Tsinghua University), Xiao, Han (Shanghai Finance and Economics University), Cheng, Meng-Yu (Feng-Chia

Abstract:

This study illustrates an integration of qualitative and quantitative evidence in a network analysis using Chinese guanxi circles as an example. We first conducted various qualitative studies: collecting second-hand data, noted field observations, in-depth interviews, and informal surveying of all workers with open questions, to classify all actors by roles in guanxi circles that were centered on the organization's supervisor. This is the "ground truth" used for testing the accuracy rate of our various methods of quantitative measurement. We then computed a measure of guanxi proximity (G_{ji}) by which we further classified individuals into guanxi roles using quantitative methods. By comparing the quantitative results with the "ground truth", we found the five best questions in our survey for sorting people into guanxi roles and a preferred measurement of guanxi proximity.

Title: Guanxi Circle and Performance: Do Structural Holes Matter in China?

Paper ID: 602

Authors: Yang, Kuan Hao (Tsinghua University), Cao, Xiao-Yun (Renmin University of China), Luo, Jar-Der (Tsinghua University)

Abstract:

This article explores how structural holes theory applies in Chinese context. On the organizational level, we propose the impact of structure holes is not linear depending on circles positions. Empirical results of surveys confirm our hypotheses. At the network frontier, structural holes bring the information benefits to employees, bridge tie forms social capital. However, in the circles of leader or inform leader, one is closer to the power can gain better performance rating. The effectiveness of structural holes is deeply influenced by guanxi circles in organizations.

Title: Organizational Justice in Chinese Guanxi Circles

Paper ID: 603

Authors: Cao, Xiao-Yun (Renmin University of China); Zhang, Ya-Juan (Tsinghua University)

Abstract:

Research on leader-member relationship demonstrates positive effects in both western and eastern cultures on numerous employee and employer outcomes. In the context of social exchange, the broader theory on which this line of research is based, differentiating between in-group and out-group members raises concerns regarding both inequity for coworkers and long-term adverse consequences from non-standard treatments. However, this dark side has rarely been examined in the contexts of Chinese Guanxi circles. The present study departs from existing Guanxi research by examining both unintended negative consequences and alternative theoretical perspectives. In doing so it contributes to our understanding of organizational justice implications of manager's Guanxi circles.

Title: Admire from Heart in the view of power distance: Examining the relationship between Guanxi circle, emotion labor and job satisfaction

Paper ID: 604

Authors: Zhang, Ya-Juan (Tsinghua University), Song, Ji-Wen (Renmin University of China), Li, Zheng-Yi (Tsinghua University), Cao, Xiao-Yun (Renmin University of China).

Abstract:

This study adopts a managerial focus by examining the role of Guanxi circles as factors affecting the employees' emotion labor and job satisfaction in a hospital. Drawing on organizational research that focuses on the actor (employee) rather than the recipient of resources (i.e., subordinate), it addresses whether and when the relationship quality affects the degree to which emotion labor and power distance influence an actor's job satisfaction. We thus have the following five hypotheses:

H1: Guanxi circle is associated with surface acting in that Type 2 employees have lowest surface acting.

H2: Surface acting is negatively associated with job satisfaction.

H3: Deep acting is negatively associated with job satisfaction.

H4: Power distance positively moderates the relationship between surface acting and job satisfaction.

H5: Power distance positively moderates the relationship between deep acting and job satisfaction.

Title: Key players in conservation diffusion: Using social network analysis to identify critical injection points

Paper ID: 605

Authors: Emmanuel K. Mbaru (James Cook University; Kenya Marine and Fisheries Research Institute), Michele L. Barnes (James Cook University; University of Hawaii at Manoa)

Abstract:

Identifying the right stakeholders to engage with is fundamental to ensuring conservation information and initiatives diffuse through target populations. Yet this process can be challenging, particularly as practitioners and policy makers grapple with different conservation objectives and a diverse landscape of relevant stakeholders. Here we draw on social network theory and methods to develop guidelines for selecting 'key players' better positioned to successfully implement four distinct conservation objectives: (1) rapid diffusion of conservation information, (2) diffusion between disconnected groups, (3) rapid diffusion of complex knowledge or initiatives that specifically target behaviour change, or (4) widespread diffusion of conservation information or initiatives that target behaviour change over a longer time period. Using complete network data among coastal fishers from six villages in Kenya, we apply this approach to select key players for each type of conservation objective. We then draw on key informant interviews from seven resource management and conservation organizations working along the Kenyan coast to investigate whether the socio-economic attributes of the key players we identified match the ones typically selected to facilitate conservation diffusion. Our findings show clear discrepancies between the current strategies applied and the ideal strategy identified here for selecting individuals to engage with, highlighting missed opportunities for progressing more effective conservation diffusion. We conclude with specific criteria for selecting stakeholders to facilitate each distinct conservation objective, thereby helping to mitigate the problem of stakeholder identification in ways that avoid blueprint approaches.

Title: Energy Networks and Individual Performance in Organizations

Paper ID: 606

Authors: Tiziana Casciaro (University of Toronto)

Abstract:

Research has demonstrated that people in organizations form task-advice networks not only for access to task knowledge, but also for the relational energy they derive from social interaction with colleagues—a feeling of energized activation experienced when interacting with someone. Recent work has also shown a positive correlation between having an energizing leader and a follower’s job engagement and performance. To establish that seeking task advice from energizing people enhances a person’s job performance, three additional questions need to be answered. First, is relational energy distinct from either the pleasantness of a social interaction or from the task knowledge derived from a colleague? Second, is the correlation between an energizing leader and a follower’s job performance a mere artifact of selection of great performers to great leaders? Third, is the association between relational energy and performance causal? Social-network and performance data on 430 technology salespeople in a global IT corporation show that, controlling for a person’s tendency to seek advice from competent, pleasant and generous colleagues, the preferential selection of energizing colleagues for task advice uniquely enhances performance. Results from a supplemental laboratory experiment provide evidence that the relationship between relational energy and performance is causal, and it generalizes across tasks. I discuss implications for motivation and rational action in organizations.

Title: Why Do Chinese Venture Capitals Invest Jointly?—A Proposed Analytical Method by Using Big Data

Paper ID: 607

Authors: Jie Ren, Kuan-Hao Yang, Jar-Der Luo (Tsinghua University), Rong Guo (Institute of Science and Technology Investment, Ministry of Science and Technology)

Abstract:

Why do Chinese venture capitals invest jointly? Instead of rational choice or resource-dependency approaches, this paper utilizes network theory to analyze the networking behaviors behind syndication in China. This research thus aims to analyze the VCs' consideration behind building relations, rather than the motivations for investing behaviors. In interviewing some informants in this field, we find that Chinese VCs tend to group old partners and new entrants together for conducting a series of joint investments. They highly emphasize the importance of long-term social relations and status in the industrial network. In other words, they are *guanxi* (the Chinese term, relationship) oriented, rather than driven by short-term self-interest in each transaction. They build ego-centered investment networks, in each of which various layers, from the innermost core to the peripheral circle, play different, yet valuable functions in syndication. The innermost core members are always the go-to team in the ego's investment. Outside the core, the circle of frequent partners works together to hedge against environmental uncertainty. The peripheral circle formed by occasional co-investors helps extend the ego's access to neighboring networks. In order to gather data for an investor's *guanxi* circles, we developed a method to combine an investor's personal network and his company's syndication network. Telephone data was collected to illustrate the various layers of an investor's ego-centered personal network. A computational method was designed for measuring their *guanxi* circle. Analysis of the combined data helped us identify resources embedded in an investor's network.

Title: International Syndication through Social Embeddedness: A Comparison of Foreign and State-Owned Venture Capital (VC) Firms in China

Paper ID: 608

Authors: Rong Ke, Jar-Der Luo (Tsinghua University)

Abstract:

This paper explores the different syndication behavior of foreign and state-owned VC firms when faced with institutional uncertainties. Mixed methods data analysis was conducted using the Simuton database of 1,173 VC firms and snowball interview was also used. Findings indicate foreign VC firms are more willing to build much denser relationships than Chinese state-owned VC firms to overcome the liability of foreignness. This result poses a challenge to traditional social network theory where Chinese firms do business based on close relationships or guanxi circle. Furthermore, this paper develops propositions on how VC firms establish syndication influenced by high institutional uncertainty.

Title: Clustering analysis for venture capital companies based on social networks and extra data

Paper ID: 609

Authors: Hu yang (Central University of Finance and Economics), Ying Fan (Beijing Normal University), Li Zhu (University of Chinese Academy of Sciences)

Abstract:

Social network analysis models are widely used to represent relations between interacting units or companies. Network data often exhibit a set of social actors, sets of dyadic ties, and other social interactions between actors which can reveal the social capacity and social position of venture capital companies to some extent. Clustering algorithm which is one kind of network analysis models can be applied to investigate the situation of social actors to find common features or symptoms. If the clustering analysis modeling venture capital companies only based on the social network data, it can only explore or mine the network features of these companies. Similarly, as the supplementary data, the financial data can only reveal financial situation and abilities of these companies. How to combine the social network data with other supplementary data is an interesting study, which will make the clustering results more interpretable. This paper therefore proposed a clustering model to cluster venture capital companies not only based on social network data, but also other supplementary data. To represent social networks and extra data, detect the unknown number of clustering and handle missing values are three critical issues in the process of clustering analysis. In order to solve these issues, this paper studies the different feature representation of mixed data before clustering; the regularization technique is utilized to obtain the unknown number of clusters during clustering; and the multi-imputation method is introduced to handle missing values under the assumption of missing at random (MAR). Finally, the proposed clustering model is applied to analyze the synthetic data to evaluate its clustering accuracy and divide venture capital companies into clusters to explore or mine their common features. Keywords—clustering; social networks; extra data; missing values; penalization

Title: Social processes of regional industrial symbiosis networks for SMEs

Paper ID: 610

Authors: Sarah King, Dean Lusher, John Hopkins, Greg Simpson (Swinburne University of Technology)

Abstract:

ASPIRE (Advisory System for Processing, Innovation and Resource Exchange) is a proof of concept, Australian designed, web-based system for small to medium enterprises (SMEs) looking for industrial symbiosis (IS) solutions. It captures waste and by-product data and makes suggestions for business to business (B2B) collaboration and has been successfully deployed in four Melbourne local government regions. Much of the literature for IS explores regionally co-located heavy industry, neglecting the unique need of SMEs. It also has a focus on engineering or economic disciplines. There is a greater need for the application of social sciences to understand underlying features of resource transfer between companies. IS is a form of sustainable innovation and while inter-organisational collaboration between SMEs occurs predominantly within an economic context, it is laden with social drivers and behaviours that influence the likelihood of relationships forming. This research reviews the social processes of IS and inter-organisational collaboration within a network. By understanding the interaction between digital and social processes at micro, meso and macro scales, we can improve the effectiveness of the ASPIRE network and our understanding of IS at regional scale.

Title: Analysis on the Dynamic Evolution Model of Joint Investment Network

Paper ID: 618

Authors: Weiwei Gu (Beijing Normal University), Jifan Liu (Tsinghua University), Jar-Der Luo (Tsinghua University)

Abstract

The operation of Venture Capital industry deals with high risks and uncertainties. Joint investment among VCs is a common strategy for sharing resources and hedging uncertainties. Based on Social Network Theory, this paper proposes three hypotheses for a network dynamics model: 1) Frequent cooperation increases the possibility of new joint investment. 2) Relational distance is associated with the possibility of joint investment. 3) No common neighbor is associated with the zero possibility of joint investment. Three simulation 2-mode network models are built. The first one is a two-mode random graph with the controls of network size, growth rate and density. The parameters in the complex network models are calculated from the real data. The second model builds the Hypotheses 1 and 2 into the two-mode random graph. The third one puts the third hypothesis in the second dynamics model. The simulation result gets three joint investment networks from the proposed models.

We then choose several network indexes to compare the different between the simulated network and the real VCs' syndication network. The indexes include three macro-level indicators: degree distribution, K-shell distribution, and tie strength distribution. There are also several micro-level indicators, i.e. motif number of reciprocal ties, closed triad and closed quadrangles. By comparing these indexes, we find that the second and third simulated networks are more similar to the real network than the random graph.