

Poster Presentation Abstracts

Title: The associations between sexuality and friendship networks among adolescents in Taiwan

Paper ID: 13

Authors: Yen-Ping Liu, Duan-Rung Chen, Yu-Wen Chen (National Taiwan University, Taiwan)

Abstract:

Purpose: Adolescents' s sexual health has become increasingly important issues in recent years in Taiwan. According to the survey from Ministry of Health and Welfare, the prevalence rate of having sexual intercourse increases 4.1% from 2008-2014 for junior high school students. Peer relationship is an important factor shaping sexual attitudes during adolescence, but few studies have explored the effects of friendship networks on sexuality. The purpose of this study was to examine the association of the characteristics of friendship networks with sexual attitudes and intimate relationship. **Methods:** A convenience sampling was applied resulting in a total of 146 students who were ninth graders in a public junior high school in northern Taiwan. Measures of networks characteristics included density, peer group (3-core) membership in classmate friendship network and popularity (in-degree centrality); sexual attitudes were measured by 10 items consisted of three aspects (attitudes toward intimate relationship, sex knowledge, and sexual behaviors). Multiple regression analyses were used to examine the association between network position (3-core group membership) between sexual attitudes and intimate relationship. **Results:** The adolescents who were not in the 3-core group in each of their classmate friendship network had more liberal and aggressive attitudes toward sexual behaviors and more likely to have an intimate relationship than their non 3-core counterparts. Popularity is not significant for attitudes toward sexual behaviors and having an intimate relationship. **Conclusion:** Attitudes toward sexual behaviors and having intimate relationship vary by the position in friendship networks among adolescents. Isolated adolescents have more liberal and aggressive sexual attitudes. Sexual educational programs and policies should address the impact of peer relationship on adolescents' sexual health.

Title: How to Build Your Network? A Structural Analysis

Paper ID: 21

Authors: Anastasia Moskvina, Jiamou Liu

Abstract:

The creation of interpersonal ties has been a fundamental question in the structural analysis of social networks. Socialization corresponds to a process of establishing ties from an individual to members of an existing social networks. In a 2005 Harvard Business Review article, Uzzi and Dunlap described how individuals may arrive at advantageous positions by linking with information brokers -- those who bridge and connect to diverse parts of the network, thus building influence and power. A classical example is the inter-marriages between members of the Medici, the leading family of Renaissance Florence, and numerous other noble Florentine families, towards dominance over the city. Another example is Paul Revere, a prominent Patriot during the American Revolution, who strategically created social ties to raise a militia. During the socialization process, a natural question for the individual is the following: How should I forge new relationships in order to take an advantageous position in the network? We present a simple mathematical formulation of information broker: Given a network G , and an individual vertex v not in G , the integration of v and G with respect to a non-empty subset of vertices S in G is the network formed from v and G by creating edges between v and all vertices in S . We call a set of members S of G a broker set if the integration of v and G with respect to S enables v to arrive at the center of the resulting network, that is, the distance between v and other vertices in G becomes minimal. Thus the question of socialization can be approached from an algorithmic perspective: In particular, the BROKER problem asks for an effective procedure that outputs a broker set for any given network G . In this talk we present several result about the broker problem. 1) The BROKER problem in general has a high computational complexity. In particular, the problem is NP-complete. 2) Nevertheless, there are efficient heuristics that output good solutions to the BROKER problem in most natural network structures. We present several such heuristics and perform experimental analysis to compare their performance. The size of broker sets remain small even for large networks. With our results, we aim to initiate a systematic effort to explore the general algorithmic problem of network building and socialization.

Title: The Two Sides of Social Capital: The differences between board and ownership interlocks on cost of capital in emerging markets

Paper ID: 32

Authors: Luciano Rossoni (UniGranRio), Alex Gonçalves (UniGranRio), Cezar Aranha (IBM), Wesley Mendes-da-Silva (FGV-SP)

Abstract:

Starting from the sociological and organizational perspective of corporate strategy, we show how the financial of companies listed on the Brazilian stock exchange is conditioned by the social capital of the networks of directors (the board) and owners they have. Using a different form to measure interlocks social capital, we present arguments that show that the effect of the relational resources found in the direct, indirect and heterogeneous ties of the board has an effect on cost of capital that is contrary to the effect found in ownership relationships. Our results show that while the increase in the relational resources of the board reduces the cost of capital ex-ante, an increase in these shared resources in the ownership relationships of the firm increases the cost.

Title: Segmentation and Clustering in professional network among surgeons in Taiwan

Paper ID: 42

Authors: Duan-Rung Chen (National Taiwan University), Chang-Hsien Yeh (National Taiwan University)

Abstract:

Background: Surgeons are embedded in informal networks that result from their sharing of patients, information and medical knowledge. This study is to identify professional networks among surgeons, examine how such network formulate and determine factors associated with surgeons' connections.

Methods: Using attributional and relational data collected from a sample of 119 out of a total 195 surgeons in Taiwan. Social network techniques were used to analyze the structure of the network representing professional interactions among the surveyed surgeons. Results: We found significant clustering phenomena in professional networks among Taiwanese surgeons. Both institutional and professional homophiles influence the formation of inter-surgeon networks. Surgeons who received their speciality training in same institutions or graduated from the same medical school were more likely to establish collaborative ties. Academic performance rather than surgical seniority determines the popularity/prominence in the professional networks. Conclusion: The collaborative ties were confined to institutional and professional homophiles. Collaboration of care is of great importance. Segmentation in professional network needs to be addressed

Title: Mapping Roma university students' personal network composition in relation to ethnic identity types

Paper ID: 51

Authors: Tünde Szabó (Institute of Mental Health, Semmelweis University, Budapest), Beáta Dávid (Institute of Mental Health, Semmelweis University, Budapest; Hungarian Academy of Sciences Centre for Social Sciences), Ágnes Lukács (Institute of Mental Health, Semmelweis University, Budapest; Department of Social Sciences, Faculty of Health Sciences, Semmelweis University)

Abstract:

In 2011, the Hungarian churches founded five Christian Roma Colleges for Roma university students. Special student colleges are part of a unique movement in Hungary aiming the talent management of vulnerable groups, such as Gypsies. To support this ethnicity in such a way is essential since according to the census in 2011 the ratio of Romas with higher education degrees was 1%, while the ratio of those with higher education degrees in the majority society is 17%.

Since the program's inauguration a longitudinal research has been designed to follow up these Roma students throughout the years of the college transition. The main focus of the panel survey is on the changes on the roma students' identity, personal network structure, norms and mental health status.

Our experiences so far suggest that the students' networks, and so their resources available through their ties, become significantly restructured in college transition. In the majority of cases, they need to move away from home; they often experience weakening ties with their families and Roma communities in case they were part of one. On the other hand, students establish new, non-Roma relationships at the university although from time to time they have to face the discriminative attitudes of their peers and teachers. At the university, they have to conform to new norms that many of them have no role models for in their immediate environments, and they have to integrate into a not always particularly welcoming milieu.

Mixed method is applied to map Roma university students' personal network composition in relation to ethnic identity types. Based on the life story interviews five different ethnic identity types are differentiated: assimilation, double-identity, marginal identity, dissociative and identity-crisis. Contact diary is used to conceive the students' egocentric network structures. We expect that the different ethnic identity types will reveal different network structures. The ego networks are visualized by EgoNet.

Title: Networks of Influence: Exploring Criminal Justice Campaign Finance in a Pennsylvania County

Paper ID: 58

Authors: Glenn Sterner (The Pennsylvania State University)

Abstract:

Post Citizens United, campaign contributions to elected officials in the US are a topic of great debate regarding the functioning of our democracy. The strongest opponents of financial contributions to elected officials' political campaigns allege the ability for individuals and organizations to utilize these contributions as a way to "buy campaigns" or leverage influence on elected officials. Even more insidious is the allegation that contributors aim to influence a network of campaigns, to manipulate a greater section of the democratic system of government. Much of the critiques and analyses regarding campaign contributions are aimed at high profile officials, i.e. US President, US Congress, or Governors. Less attention is given to local officials, especially those within the criminal justice system.

There are examples of corruption within the criminal justice system in Pennsylvania, ranging from bribery to hidden campaign contributions. However, most research and reporting on such cases focuses on the elected official or candidate and less so on those who contribute to candidates' campaigns. Collaboration amongst campaign contributors to systematically influence the criminal justice system would be considered corruption according to campaign finance law. However, given the current methods of tracking campaign contributions to candidates in Pennsylvania, it is difficult to ascertain if there is a systematic effort by contributors to influence campaigns through contributions.

This presentation highlights several findings from a study that utilizes a social network approach to examine the network of campaign contributions to elected criminal justice system officials in one county in Pennsylvania (PA). The study focused on two main research questions: do donors contribute to more than one elected criminal justice official in this county in PA? and is there a network of donors contributing to elected criminal justice officials in this county in PA?

To answer these questions, publicly available contribution data was collected from the state and county governments. These data were converted to a network format. Utilizing an innovative approach focusing on one- and two-mode network analyses, results indicate that there is a small group of contributors who make donations to multiple candidates in the criminal justice system in this county. However, with regards to collaboration among these contributors there are mixed results, indicating a need for further investigation and research. Several policy recommendations will also be presented with regards to the ways contribution data is collected, logged, and monitored.

Title: Personality, Homophily and Embeddedness

Paper ID: 79

Authors: Samuel Fraiberger (Northeastern, Harvard), Carlos Herrera (TraitPerception), Antonio Prada (TraitPerception), Arun Sundararajan (New York University)

Abstract:

Do opposites attract? To shed light on the mechanisms through which social networks form, we provide the first evidence of population-scale homophily in personality traits. We collect data from about 1 million volunteers who took a “Big-Five” personality test and provided access to their Facebook online social network profiles. Our results show greater similarity in personality traits across pairs of individuals who are Facebook friends than across pairs who are not, although the measured level of similarity varies across personality traits. For pairs of individuals who share friends, this gap grows with their level of network embeddedness. Our evidence supports a theory of individuals assessing network tie formation opportunities created by shared friends based on perceived trait similarity.

Title: Mapping Social Landscapes Using WRI Data for Building an Inclusive Global Restoration Movement and Beyond

Paper ID: 87

Authors: Kathleen Buckingham (World Resources Institute), Nitin Pandit (World Resources Institute), Sabin Ray (World Resources Institute)

Abstract:

Visually compelling, data-driven maps have consistently been one of WRI's greatest strengths. The Global Restoration Initiative, in the forests program, has thus far focused on inspiring commitments for restoration and conducting restoration opportunities assessment to identify suitable lands for reforestation, agroforestry, climate smart agriculture and increased vegetative cover. This has led to a focus on the biophysical rather than the social conditions in a landscape. To create the large-scale change that the environmental movement needs, mapping the social landscape (identifying actors who shape, influence and are affected by landscape action and decisions) should be given the same importance as mapping the biophysical landscape. After all, building a movement requires that we nurture connectivity and include people and organizations who are at the periphery or outside our usual network, i.e., we must reach across silos and scales. In the same way that we seek to map fragmented biophysical landscapes, decision makers need to understand the social landscape to make informed decisions. Connectivity is central to improving ecosystems as well as improving social systems.

Traditionally, social network analysis is conducted as an initial part of stocktaking and development research. Yet, the development community does not adequately use modern tools to leverage connections across scales, e.g., political connections to support community action and vice versa. As a result, we also tend to lose opportunities for scaling up of our initiatives through and across disciplinary programs. We propose to map social landscapes to assess how we could leverage the networks, platforms, and communication channels at different scales. A map of the social landscape at the international level will help us visualize and target constituencies that we could reach out to in creating a movement.

WRI possesses a wealth of networks—including the Global Restoration Council, New Climate Economy, NDC Partnership, Aqueduct Alliance, Champions 12.3, Better Buying Lab, and WRI international offices, among others. Better understanding the cross-sectoral connections within WRI's expansive networks could enable us to develop messages and identify messengers for more effective outreach toward an inclusive global restoration movement. To map the constituencies beyond WRI, we will test innovative technological tools such as crowdsourcing to drive greater public engagement.

The poster will present and discuss the findings from the research and identify on going challenges.

Title: Event and Character Networks

Paper ID: 92

Authors: Dingding Chao (The University of Tokyo)

Abstract:

The advancement in data and network science has helped researchers in the field of digital humanity develop new methods to extract meaningful information from the fictional stories and analyze them. However, the systematic analysis and modeling of the story through network analysis can still be very tricky. The networks obtained from the stories, just like the social networks in real world, are complex and seldom static: They intertwine and evolve with each other through “time” — i.e. the flow of the story. In this research, we propose a new method of character network analysis for studying the stories by capturing the dynamics between the characters over the development of the story. Using the scripts of a comic book series, we demonstrated the potential of our method to assess the stories and reveal critical information.

Title: The Language of Moral Panics: Contextualizing the Framing of the Refugee Crisis in Croatian Mass Media with Discursive Network Analysis

Paper ID: 93

Authors: Pasko Bilic (Institute for Development and International Relations, Zagreb, Croatia), Ivo Furman (Istanbul Bilgi University, Istanbul, Turkey), Savas Yildirim (Istanbul Bilgi University, Istanbul Turkey)

Abstract:

The purpose of this paper is to test how ownership and ideological leaning influence the discursive networks of mass media narratives framing the refugee crisis. The media are not only institutionally organized actors “mirroring” social reality. They actively construct, frame and mediatize that reality while the political affiliations, media owners and editorial policies define daily agendas, the flow of information and public opinion (McQuail 1994, Scheufele 1994). Political actors inevitably adapt their positions and strategies towards the refugee crisis depending on the public pulse and changes in media reports (Gamson & Modigliani 1989). Key, dramatic events alter the public mood and shift the dominant discourses in the public sphere.

The refugee crisis itself is one of the most dramatic events in recent European history. Within this context, mass media has played a pivotal role in shaping public opinion and influencing political decisions on managing the process. We focus on media reports in Croatia, a country on the so-called Western Balkan route. The country experienced the highest influx of refugees in late 2015 and was one of the key entry points to the European Union in the period. Ten media actors were selected to capture various ownership and ideological positions. More specifically, we look at two mainstream, commercial media actors with no immediately apparent ideological leaning; one center-right and one center-left commercial media outlet; two right-wing commercial media outlets; three left-wing nonprofit media outlets; and the public service broadcaster. We collected all articles published by these organizations (N = 352) in the period of two weeks before the sexual attacks that occurred in the German city of Cologne on New Year’s Eve, and all articles published two weeks after the attacks. The data was collected using Natural Language Processing (NLP) and studied with Correspondence Analysis as well as Discourse Network Analysis (Leifeld and Haunss 2012; Leifeld, 2013). Discourse network analysis is a combination of category-based content analysis of newspaper data and social network analysis (Wasserman & Faust 1994).

The resulting visualizations and bipartite graphs help to untangle the network of concepts associated with migration in Croatian media before and after the Cologne event and to interpret the spatial relations between the selected actors. The most noticeable change between the analyzed time periods is the relative diversity of concepts used in the sample before the event, and an evident clustering of most media actors in the period after the event. Some of the most used concepts in the first period were ‘shelter’, ‘migration’, ‘responsibility’, ‘protection’ and ‘better life’. In the second period the reporting shifted to new concepts such as ‘order’, ‘war’, ‘freedom’, ‘danger’ and a much more prominent and central use of concepts such as ‘control’ and ‘fear’. There is a noticeable change from a humanitarian reporting discourse to a security oriented discourse which mobilizes fear to impose stronger control of national borders. We

argue that our empirical data confirms the moral panic theory (Cohen, 1972), and in particular the political economy of moral panic approach (Cricher, 2011).

Title: The dynamics of marketer-customer interaction in online social commerce communities

Paper ID: 103

Authors: Joyce Yi-Hui Lee, Liang-Chih Yu, Chang-Yen Huang

Abstract:

The popularity of social network sites has created a new delivery platform in e-commerce called social commerce (SC). One of the most notable ways is the increasing use of SNS to form online communities, whereby the marketers view them as commercial channels that can be leveraged to provide access for communicating with the customers. Whilst it is believed that an SC community offers opportunities for marketers to connect with their customers, it has been found that many of them have failed to attract members and thus, have not been able to act as a conduit for interaction with the customers.

The power of SC is primarily due to the large number of members participating in the networked environment. Consequently, taking advantage of social sharing (such as Facebook's like and Twitter's tweet) to increase the positive effect of online networks. In this study, we argue that the content of posts is one of the drivers of social sharing and, in that if it is interesting to a wide audience, it leads to the generation of more online content. Understanding the actor-content of networks is important, because people in an online community are not only connected to other people, for they are also connected to the content, which can be connected to other content.

We investigated a Facebook-basis SC community founded by a supermarket in Taiwan, as we consider that it is a good example of active online SC communities. We collected 403,292 online messages posted by 5,599 participants from the supermarket fan page dated between March/2011 and December/2016. By investigating this case, we intend to gain an understanding regarding how the organizers construct and maintain the online content such that it encourages the participants to engage in online social sharing (including clicking likes and making comments).

We conducted mix-method social network analysis for this study. The natural language processing (NLP) techniques were applied to the substantial data collected to discover relevant online content (e.g. new product announcement, lucky draw activities, make-up tricks, etc.). Subsequently, we performed actor-content network analysis to gain understanding as to who were the active members that were participating in any specific online content. The preliminary findings derived from the early analysis reveal that: (1) messages with video clips resulted in more sharing than those sent as text or with photos. When they were complemented with lucky draw activities, greater numbers of participants were attracted. (2) Whilst we do not know whether these strategies brought improved business outcomes, we found that they attracted the lurkers to emerge so that the community's organizers had the opportunity to have conversations with them, which can be seen as being a positive effect. (3) During the development of the communities, we found that this case moved from involving leader-centric networked communication to a follower-centric form. This research is currently making good progress and we are confident that by the time of the conference we will be in a position to offer further research findings.

Title: Exploring Elementary Students' Help Networks Formation and Influence of their Help Networks on Achievement Goal Using Stochastic Actor-Oriented Models

Paper ID: 108

Authors: Hyunjung Lim (GINUE), Chongmin Kim (GINUE)

Abstract:

In Vygotsky's activity theory, activity of a learner includes a meaningful social context. In addition, when we analyze a learner's activity, we should consider not only who is engaging in the activity but also what her or his academic goals are (Jonassen & Murphy, 1999). In achievement motivation theory, a learner's motivation can be developed and adapted in the process of interacting with the learner's social and cultural background (McClelland, 1973).

The purpose of this study is to explore elementary students' help networks formation and influence of their help networks on achievement goals in Korea by using Stochastic Actor-Oriented Models (SAOM). The specific research questions are these: First, what affects elementary students' help networks formation? Second, do elementary students' help networks affect achievement goals?

We conducted students' surveys (N = 110, female = 50%, same age, same race, and same grade level) in four classes in one elementary school in Gyeonggi province in Korea during two years. We collected four times longitudinal data in Spring and Fall semester in 2015(5th grade level) and 2016(6th grade level). The dependent variables were elementary students' help networks and academic achievement goals in Spring and Fall in 2015 and 2016 (four time points), while the independent variables were academic achievements, same classrooms and same cohesive subgroup. We will use RSIENA (Simulation Investigation for Empirical Network Analysis) software for building and testing stochastic actor-oriented model.

The results of RSIENA indicated that same classrooms (+) and same cohesive subgroup (+) were statistically significant related to help networks formation. Providing help network formation related to academic achievement (+) and receiving help network formation related to mastery goals (+), performance avoidance goals (-) and academic achievement (-). In addition, there was homophily effect of academic achievement on help networks formation. Finally, elementary students influenced each other's mastery goals over time. Our finding indicated that mastery goals influence can involve in average of mastery goals of their help relation. Keywords: Help networks formation, influence effect, achievement goal, academic achievement, classroom, cohesive subgroup, SAOM.

Title: Exploring Peer Networks and Social Capital of Korean Elementary School Students in Multicultural Classrooms

Paper ID: 134

Authors: Hyun Hee Choi (GINUE), Chongmin Kim (GINUE)

Abstract:

Prior to entering a multicultural society, Korea is aiming to expand fair education opportunities and welfare through steady education reform and innovation. Specifically, government has implemented educational policies to solve social and cultural inequality through education. The purpose of this study is to examine the structure of peer networks and social capital of students in multicultural classrooms. We think these are related to the unequal educational factors both inside and outside multicultural class in Korean elementary schools. Two research questions were these: What affect the structure of peer networks in multicultural classrooms in Korean elementary schools? What affect social capital of students in multicultural classrooms in Korean elementary schools?

This study will collect survey data of 51 students in the third grade of elementary school, which is multicultural special classes (30 ~ 40% of multicultural students) in a school located in Gyunggi province in Korea. Our dependent variables are peer networks and social capital of students while our independent variables are gender, race, multicultural acceptance, social achievement goals as motivation, and grit. We will use hierarchical multiple regression for network influence models and p2 software for network selection models with cross-sectional data.

The expected results will indicate that multicultural acceptance, social achievement goals, and grit are closely related to the formation of social capital in multicultural classrooms, which affect the pattern of peer networks in multicultural classrooms in Korean elementary schools. Based on the results, the implication of this study will be to provide relevant information about the optimal peer networks to overcome the educational inequalities caused by the social capital of ethnicity in multicultural classrooms

Title: The influence of schoolchildren's friendship networks on their practice of walking to school in Taiwan

Paper ID: 136

Authors: Huang, S. (National Taiwan Normal University), Hung, W. , (Cardinal Tien's Nursing and Management Junior College), Huang, C., (National Taiwan Normal University), Wu, C. (Academia Sinica)

Abstract:

Rising rates of overweight children have called the attention of the governments worldwide to implement the programs of walking to school. Among various benefits of walking to school, social development and the formation of interpersonal relationship are of the utmost importance. This research aims to explore the influence of friendship networks with the practice of walking to school in schoolchildren.

The fifth graders in Taipei City and Miaoli County, which represented city and rural areas in Taiwan, respectively, were invited to participate in this research. 262 out of 536 students were composed of the sample with a response rate of 75%. SPSS for Window 22.0 was used for descriptive analysis, correlation, and logistic regression. UCINET 6 software was used to analyze social networks and draw the graphs.

The results indicated that: (1). 56% of schoolchildren walked to school and 44% went to school with other means. Those living in urban areas walked to school more than their counterparts who lived in rural areas. 60.4% of the family members supported schoolchildren to walk to school, and 39.6% did not. (2). Schoolchildren mostly nominated same-sex friends as good friends. In most classes, boys and girls were separated two big groups. (3). Schoolchildren with higher self-efficacy, more family support of active transportation, and closer proximity from the residences to schools were more likely to walk to school. (4). With above mentioned factors held constant, those schoolchildren in the clusters with higher transitivity were more likely walking to school.

Title: Complex Networks: Continuity of Care research in Rural China

Paper ID: 143

Authors: Li Boyang (Huazhong University of Science and Technology), Zhang Liang (Huazhong University of Science and Technology)

Abstract:

Abstract Introduction: The three tiered healthcare networks (county, township and village) in rural area of China undertakes health service needs of 0.8 billion rural residents. Multiple researches in this area indicates the healthcare system in rural area is suffering from lacking integrated networks not only among healthcare institutions, but also among all the participants from different interest related parties, this current situation causes numerous issues in rural healthcare system including huge waste of healthcare resources, overuse and misuse of medication between different tiered institutions and gaps of medical information transferring and sharing during the referral processes, etc. However, the traditional models and methods for healthcare system analysis usually not enough to elaborate the specific networks among all of participants in this system and to monitor the changing of the overall networks. We introduced the Complex networks theory into this area and try to build a new analysis aspect for future study of integrated healthcare researches.

Method: This study simulated and analyzed the characteristics of Complex networks system in rural area of China by introducing the Small world and Community structure theories from System Science. We designed a hypothetic complex networks environment of rural healthcare system with participants (Nodes=200), connectivity ($K=15$, means the average number of edges connected to a node), and $\beta=0.15$ which indicates the possibility of connection of each participant.

Result: In simulated environment of healthcare system in rural area, the Clustering coefficient (which measures the density of triangles in a networks) is high and the Scale-free Property (which refers to any functional form $f(x)$ that remains unchanged to within a multiplicative factor under a rescaling of the independent variable x) is quite obvious. Furthermore, the result also indicates that the networks of rural healthcare system shows the "Community structure" which means the groups of vertices that have a high density of edges within them, with a lower density of edges between groups.

Conclusions: We presume that the small world Effect, Scale-free Property and the Community structure does exist in interpersonal networks in rural healthcare system, it indicates that in an actual environment of rural healthcare system, the providers and users consisted millions of nodes, and most of these nodes only contact with their neighbors or acquaintances. At the same time, most of rural areas in China has no initial diagnosis or "Gate keeper"-General practice system at present, so service users could freely reach to any providers who has high professional position or good reputation in that area.

Discussion: This study was inspired by the innovative works in complex theory studies in recent years. We could use the theories from complex networks such as Small world and Community structure to simulate and to analyze the healthcare networks in rural China in order to find more specific characteristics among the integrated networks in rural area. For example, by analyzing the actual networks based on Small world theory, we could locate the high density “community” (it could be an institution or a physician) in networks and precisely change the healthcare resource structure to make the system more integrated.

Title: Do women network differently than men? Gender and contact mobilization in the search for managerial work

Paper ID: 146

Authors: Elena Obukhova (McGill), Adam M. Kleinbaum (Dartmouth College)

Abstract:

To date, research on network-based mechanisms that shape gender differences in career attainment has largely focused on documenting gender differences in network structure. Yet, there is another network-based mechanism that might also shape gender differences in career attainment – women and men might use their networks differently. It has been difficult to empirically investigate gender differences in contact mobilization, because in most research settings, the effects of gender differences in structure and gender differences in mobilization are conflated. In this paper, we leverage a strategic research setting to examine whether given the same access to contacts, women mobilize contacts differently than men. Specifically, we study contact mobilization in search for internship among female and male students in an elite MBA program who have access to their school’s alumni database, thus largely equalizing their access to networking opportunities. Using a unique dataset of server logs of students’ use of this database, we find that female MBAs searching for internships mobilize more contacts than men, more female contacts and more peer contacts. Additional analyses reveal that one important reason that female MBA network more than male ones is that they mobilize more contacts to explore career options. Our findings suggest that equalizing access to potential networks can be an important step toward promoting gender equity in career attainment.

Title: Exploring interdisciplinary collaboration networks: the effects of formal and informal network structures

Paper ID: 158

Authors: Chengyu Fang (University of Illinois Urbana-Champaign), Ly Dinh (University of Illinois Urbana-Champaign)

Abstract:

Increasingly complex scientific grand challenges are in need for individuals with diverse knowledge to work collaboratively to generate innovative solutions. However, existing research also points out that such interdisciplinary relationships are not only difficult to build but also hard to maintain. When collaborating across disciplinary boundaries, individuals encounter various challenges, from distinctive world views to linguistic barriers, that need to be overcome before achieving success. Maintaining interdisciplinary relationships is also costly considering the amount of time, effort, commitment, and resources people need to put in. Therefore, this study seeks to explore where the interdisciplinary ties (i.e. individuals who have distinct areas of expertise with their alters but maintain sufficient levels of linguistic familiarity with alters' expertise) are likely to exist within a scientific organization.

To foster interdisciplinary collaboration, both formal and informal networks could play important roles. While formal structures often provide incentives and additional resources for sustaining interdisciplinary relationships, informal structures are more apt for the causal exchange of knowledge and information within an organization. Using social network analysis, this study intends to examine the role of formal and informal relationships in interdisciplinary scientific organizations in fostering interdisciplinary collaboration. Essentially, this study seeks to identify the network structures, formal and informal, that are related to the ego's propensity to develop interdisciplinary relationships.

Using network data collected from a multiple name-generator network survey, this study reports on an egocentric network analysis of the 178 members of a large interdisciplinary scientific organization. The sna package in R is used to account for the missing data. Results showed clear differences in the role of formal and informal network structures in fostering interdisciplinary collaboration. Moreover, key members of the organization can exert influence and promote interdisciplinarity through informal structures, as they are denser when compared to formal networks. Further analysis also reveals the ways in which an individual's structural position within both formal and informal networks relate to interdisciplinary collaboration. Understanding role of network structures in the formation and maintenance of interdisciplinary collaboration can provide important implications as the relational features have a direct impact on the effectiveness and productivity of many frontier scientific organizations and projects.

Title: "Leadership of many": configurations, reciprocity and teams' outcomes

Paper ID: 167

Authors: Smadar Porat (Hebrew University), Amalya Oliver (Hebrew University), Micha Popper (Haifa University)

Abstract:

Recent advances in leadership research emphasize that leadership is primarily a relational and an emergent phenomenon. As such, we employed a social network analysis approach to our leadership study, allowing the analysis of influence connections among team members. The majority of leadership studies focused almost exclusively on the network connections and influence of formal leaders. Yet, the potential contributions of all unit members to leadership processes and outputs and the emergent structures of influence relations have been relatively overlooked.

We collected full network data on instrumental and expressive advice relationships in teams in three high-tech organizations. These networks reflect mutual influence and trusted social exchange. We identified three configurations of leadership, building a structural approach toward leadership at the group level and analyzed the connection between these configurations and three group outcomes: innovativeness, effectiveness and the collective efficacy. We also analyzed the reciprocity levels of the advice ties, as a relational group quality.

For identifying the leadership configurations, we use the centralization pattern of advice ties using both incoming ties (indegree centralization) and outgoing ties (outdegree centralization). The centralization measure does not take into account the location of the formal leader in the group. Therefore, we examine the indegree centrality of the formal team leader compared to other team members' centralities in team unit. Based on the centralization pattern and the relative formal leader centrality we suggest three types of leadership configuration: a. 'Traditional leadership configuration' where the formal leader has the highest centrality measure in a high centralization pattern. b. 'Hybrid configurations of leadership', which includes the formal leader as a central and influential actor among other influencers. c. 'Significant others' configuration' in which most of the connections are disperse among the team members (low centralization) and the position of the formal leader is not advantageous more than others team members.

Our dependent variables were all measured on the team level after three months. Indirect supervisors assessed the unit effectiveness and the level of innovativeness in the unit. Team members evaluated the teams' collective efficacy.

Our results depict that under the condition of expressive advice, when measured by the outdegree-centralization measurement, the 'hybrid configuration' was significant more innovative (based on managers assessments) than was the 'significant others' based configuration.

In addition, under the condition of expressive advice and when measured by the indegree-centralization measurement, the 'significant others' configuration had a significant higher

collective efficacy than the 'hybrid configuration' configuration. Moreover, the 'traditional configuration' was significant more effective (based on managers assessments) than was the 'hybrid configuration'.

Our results also reveal a significant positive correlation between the expressive advice reciprocity and the radical innovation measurement.

The research findings depict that different expressive configurations yield different group outcomes, suggesting a structural perspective towards a better understanding of organizational behavior. We also present the importance of ties' reciprocity quality in the group level, alongside the importance of formal and informal group leaders' proactivity for innovation-breakthroughs in organizations.

Title: How Do Communication Networks Among Volunteers Motivate More Volunteering?

Paper ID: 187

Authors: Jennifer Ihm (Kwangwoon University)

Abstract:

In answering the question: “what leads to more volunteering,” scholars have focused on moral identity, altruistic personality, or socially desirable contexts (i.e., affluent and educated to think of others) that induce such generous behaviors. They often overlook alternative motivations beyond prosocial ones to help others. However, social networks of volunteers could motivate them to volunteer more by fostering discussions of interesting volunteering stories or the significance of good causes. To explain why individuals volunteer to different degrees in one or more organization(s), this research focuses on communication networks of volunteers.

Volunteer communication represents interactions among volunteers as well as interactions between volunteers and outside members of the organization, which generates social connections and resources. In spite of this social value, volunteer communication has not been the focus of previous research; some studies allude to the existence of communication during volunteering, but they do not look specifically at communication networks. By using social network analysis, this research investigates the relationship between volunteers’ communication networks and the degree of volunteering. This paper examines communication partners of volunteers and the frequency and amount of communication about volunteering and good causes. Specifically, this paper distinguishes between volunteer communication within the organization and outside of the organization, a distinction that results in different social connections and resources. Intra-organizational communication creates social connections inside the organization, whereas inter-organizational communication creates broader social capital across multiple organizations. This distinction is also meaningful in the nonprofit sector which commonly aims to generate social change based on social connections. Moreover, intra-organizational communication can enhance the commitment to or pride in the organization and motivate more volunteering for a specific organization. Inter-organizational communication can induce greater awareness about the importance of volunteering for good causes in general rather than a specific organization, which will generate more volunteering to multiple organizations without as much focus on a specific organization. This paper also examines the frequency and amount of communication and suggests that the more communication among volunteers, the more they are likely to become committed to volunteering.

This study surveys 300 people who have recently volunteered (in the past three months) with a nonprofit organization in the United States. I use a general panel data from Qualtrics to recruit appropriate participants. The survey asks participants about frequency of communication, amount of communication, communication partners, and number of volunteering organization(s).

This research contributes to the social network research by providing a practical context for explaining alternative motivations of volunteering. Instead of emphasizing a prosocial attribute of volunteering, this research identifies communication networks as a significant indicator for

volunteering. Second, this study offers a way to operationalize the dynamic communication process in volunteering by using network concepts. Focusing on intra- and inter-organizational communication in volunteering, this study describes volunteering as a process which involves dynamic interactions within and across organizations.

Title: Polinode: A Web Application for the Collection and Analysis of Network Data

Paper ID: 190

Authors: Andrew Pitts

Abstract:

Polinode is a web-application that allows users to upload arbitrary network data (called Polinode Networks) and to also collect network data via integrated relationship-based surveys (called Polinode Surveys). It's designed to be relatively easy to use but also contains a number of advanced features such as advanced metrics and snowball relationship-based survey functionality.

This poster will provide an overview of the core functionality of Polinode including a visualisation of a topical network and callouts describing some of the key features. The poster will also list the 20 network metrics that can be calculated by Polinode and highlight some of the features on the future roadmap, particularly those requested by the research community.

Title: A randomized controlled trial of egocentric social network-based intervention to promote HIV testing behaviors among men who have sex with men in Guangzhou, China

Paper ID: 191

Authors: Xiongzi Fan (School of Public Health, Sun Yat-sen University, Guangzhou, China), Weibin Cheng (Guangzhou Centre for Disease Control and Prevention), Huifang Xu (Guangzhou Centre for Disease Control and Prevention), Zhongqi Liu (Sun Yat-sen University), Jing Gu (Sun Yat-sen University), Yuantao Hao (Sun Yat-sen University), Chun Hao (Sun Yat-sen University)

Abstract:

Objectives: This randomized controlled trial aimed to testify the efficacy of the egocentric social network-based intervention on promoting the HIV testing behaviors among men who have sex with men (MSM) in China.

Methods: 397 MSM were recruited from the MSM peer friendly HIV testing service center in Guangzhou, China. All these participants were defined as ego in egocentric social network, and were invited to generate alters in their own social support networks among MSM community. After the testing services and baseline questionnaire, egos were randomly assigned into intervention or control group. Egos in intervention group were asked to share their HIV testing experience and theories based intervention messages via Wechat to their alters in privacy, while control group received the standard pamphlets including HIV-related prevention information. After three months, alters' testing behaviors were recorded by the HIV testing services centers, and were self-reported by egos as well. The average percentage of alters' HIV testing behaviors in egos' social network were compared between intervention and control group.

Results: The 397 MSM egos nominated a total of 670 MSM alters, including 344 nominated by 200 egos in intervention group and 326 nominated by 197 egos in control group. The average age of MSM egos were 25 years old. The average network size of the egos were 1.7 ± 0.7 . Among 670 alters, 61.3% were egos' best friends, 22.1% were boyfriends, others were sex partner, or gay friend, etc. After three months, 27 (7.8%) and 26 (8.1%) alters in the intervention group and control group had physically tested HIV in this center in the past three months ($\chi^2=0.023$, $P=0.880$). According to the ego's self-report, 8.5% and 11.0% of alters in ego's social network of the intervention group and control group had tested HIV in the past three months (bootstrapping, $P=0.396$). In the final generalized estimating equations model, after controlling the confounding factors (e.g. ego's income, ego's disclosure, etc.), the efficacy of this intervention on promoting alters' HIV testing behavior showed marginal statistical significance (Intervention group vs. Control group: AOR= 1.365, 95%CI: 0.953, 1.954; $P=0.090$).

Conclusions: This was one of the first studies to design the intervention based on egocentric social network to promote HIV testing behaviors among MSM in China. Social network based intervention has the potential to influence the risk behaviors change among vulnerable population through their social support ties.

Key words: Men who have sex with men, social network, HIV testing, intervention, randomized controlled trial

Title: Each one has a role to play: Age influence on affiliative interaction patterns and social roles in rhesus macaque

Paper ID: 195

Authors: LIAO Zhijie (Sun Yat-sen University, School of Life Science), Zhangpeng (Sun Yat-sen University, School of Sociology and Anthropology)

Abstract:

Relationships of different life stages have non-negligible influence on current and future life of group-living animals. With prolonged life, primates are likely to have various tactics of social interaction with respect to environmental or physical condition changing to meet their needs. Here we used social network analysis method to examine patterns of three kinds of affiliative interactions (proximity, allogroom and social play) of different age and sex classes of wild rhesus macaque (*Macaca macaca*). We selected several direct and indirect social measures, including density, number of communities, modularity, degree, betweenness, eigenvector centrality, etc., to demonstrate biological correlates of social variation from group and individual levels. Our results showed that rhesus macaque of different age classes have different social interaction patterns that may fit their current situation and demands. Young animals tend to allocate social time on more groupmates, while the older animals prefer to focus on several fixed partners. Sex difference in social interactions was varied in three age classes with less dissimilarity in immature individuals and more significant difference in adults. Regardless of different social interaction strategies, individuals of all ages and sexes have their roles to play and occupy a position in the group social lives. This study depicted the age difference of primate in social interaction patterns and social positions, which may help them to meet their needs in different life stage. We suggest that immature animals, which also perform an important role in social communication of a group but are always neglected in present studies, should receive more attention in future research.

Title: Resilience in animal social networks: insights from an individual-based model of primates social behaviour

Paper ID: 198

Authors: Ivan Puga-Gonzalez (Department of Ecology, Physiology and Evolution. Institute Pluridisciplinaire Hubiert Curien, CNRS, Strasbourg, France), Sebastian Sosa (School of Sociology and Anthropology Sun Yat-sen University, China), Zhang Peng (School of Sociology and Anthropology Sun Yat-sen University, China), Cedric Sueur (Department of Ecology, Physiology and Evolution. Institute Pluridisciplinaire Hubiert Curien, CNRS, Strasbourg, France)

Abstract:

Group-living is a social condition that has arisen independently many times in evolutionary history with variable degrees of specialization and complexity. Societies are thus seen as an adaptive system ruled by selection pressures. Many adaptive advantages are associated with living in groups. However, group living also generates costs such as risk of infectious diseases. This work attempts to study the resilience properties of social networks of non-human primate's societies, particularly those from Genus *Macaca*. This Genus is well known due to the diverse degrees of dominance hierarchies expressed among the 20 species of macaques. In 'despotic' societies, contrary to 'egalitarian' ones, individuals ranking higher in the dominance hierarchy are known to be more central in affiliative social networks. Thereby, such individuals may play a crucial role in the cohesion of the group. Due to this difference in the hierarchical structure, macaque's societies represent an interesting biological model to study how different societies emerge, how they are stable and what are the different mechanisms that allow them to tackle selective pressure induced by natural selection. To this end, we simulated several affiliative networks of despotic and egalitarian societies using a well-known self-organized model in primatology where agents have to group and to perform competitive and affiliative interactions in a virtual world. We then performed deletions of most central nodes on these networks and measured the changes in diameter, global efficiency, number of unconnected clusters, and modularity of the network. Our results reveal dissimilarities in resilience between the affiliative networks of these two types of societies, which can be linked to their dominance styles. These findings clearly echo the issue of species preservation, highlighting the need for considering the types of social structure involved when improving the methods used for wildlife conservation of group animals.

Title: Multiplex referral and affiliation networks in relation to uptake of Pre-exposure prophylaxis among HIV-negative young men who have sex with men

Paper ID: 234

Authors: Kayo Fujimoto (University of Texas Health Science Center at Houston), Peng Wang (Swinburne University of Technology), Lisa Kuhns (Lurie Children's Hospital of Chicago; John Schneider, University of Chicago), John Schneider (University of Chicago)

Abstract:

Young men who have sex with men (MSM) in the U.S. have an elevated rate of HIV infection. Pre-exposure prophylaxis (PrEP) has been widely regarded as a promising biomedical strategy to prevent HIV infection and reduce the rate of new HIV infections. Engagement of most at-risk populations in PrEP care, such as young MSM (YMSM), however, remains a major challenge. There are numerous structural barriers, such as unemployment, lack of insurance, and complexities in referral networks even among those with insurance, that result in decreased linkage for marginalized populations such as black YMSM. This study analyzed complex network systems in the context of PrEP implementation by triangulating three nodal entities of: 1) YMSM, 2) community-based organizations (CBOs), and 3) PrEP providers, through which multiplex PrEP referral and affiliation networks are formed. This multiplex referral-affiliation network consists of client-referral ties from CBOs to PrEP providers, and affiliation ties from YMSM to both CBOs and PrEP providers. The objective of this study is to identify individual (sociodemographics), behavioral, and relational factors (referral and affiliation networks), as well as their interactions at multiple levels, that predict PrEP uptake among young MSM. Data were collected as part of Young Men's Affiliation Project (YMAP) in two U.S. cities, Chicago, Illinois and Houston, Texas; including two types of data: venue survey data and young MSM survey data. We used Auto-Logistic Actor Attribute Models (ALAAMs) to model YMSM's PrEP uptake behavior as the outcome variable, and test associations with other YMSM-related attribute data including but not limited to ethnicity, medical insurance types, etc.; their affiliated healthcare provider's attributes; their positions in the venue affiliation network; as well as the structure of the referral network among the healthcare providers. Results indicate that, in Chicago, uptake of PrEP was not dependent on the YMSM's affiliation network position; providing no evidence that attendance at healthcare venues in general encourages PrEP uptake. However, YMSM who attend venues with a greater percentage of black clientele tended to report having taken PrEP. YMSMs' own attributes are more relevant in predicting their PrEP behavior in Chicago, i.e. YMSM who are Caucasian, with unstable housing, inconsistent condom use, and who report more sex partners are more likely to take PrEP. In Houston, however, YMSMs' race/ethnicity but not their sexual risk behavior plays an important role: both Hispanic and black YMSM were less likely to take PrEP. YMSM in Houston were also more likely to take PrEP if they attended multiple venues, i.e. more venue affiliation encourages PrEP uptake. There was no evidence to support PrEP diffusion via the CBO-PrEP provider referral network among venues, indicating the need to more effectively develop referral network systems to implement and deliver effective venue-level HIV interventions tailored to YBMSM in the U.S.

Title: Social network influences on health service utilization among adults living in marginalized housing

Paper ID: 268

Authors: Andrea A. Jones (University of British Columbia), Louie Dinh (University of British Columbia), Sara A. Mostafavi (University of British Columbia), William G. Honer (University of British Columbia)

Abstract:

We present preliminary findings from a ten-year observational longitudinal study of the physical, mental, and social health of adults living in low-barrier, marginalized housing in an impoverished urban area of Vancouver, Canada. Individuals living in such substandard, marginalized housing complexes face accumulating challenges to achieving health and wellness. Many live in poverty and experience increased risk of premature mortality, severe mental illness, and co-morbid substance use disorders. Understanding the structure and context of the social networks that exist in these communities may help to identify risk and resilience factors to support mental and physical health and inform how we deliver services. We followed 308 adults living in four marginalized housing buildings. Name generator and name interpreter tools that do not limit the number of alters were used to collect relational data every six months. We used social network analysis to (1) examine characteristics of the personal support networks, (2) identify the sociocentric network structures of tenants within and between these housing complexes, and (3) explore how baseline social network and participant characteristics may relate to utilization of health services during six-month follow-up. Mental health service utilization was reported as having talked to a health care professional about their mental health or substance use. Physical health service utilization was reported for care accessed for physical health needs. Psychiatrists identified any mental and substance use diagnoses. Preliminary results from one building (n=70) suggested that egocentric network size was restricted in this population (median, interquartile range: 2, 1-4) and many (61%) identified at least one negative or conflictive tie. In this building, the tenant social network was comprised of four components, including one giant component with 43 nodes. Only 18% of ties were mutual. Unlike users of other substances, individuals who used methamphetamine had significantly greater degree centrality than those that did not. In six months of follow-up, 68% of participants used mental health services and 82% used services for their physical health needs. Simple logistic regression analyses suggested that mental health service utilization was associated with ego degree centrality, cannabis dependence, and psychiatric symptom severity, alter degree centrality and cannabis dependence, as well as depressive symptom severity of alters from outgoing ties only. In multiple logistic regression analysis, less ego cannabis dependence, more severe ego psychiatric symptoms, and lower alter degree centrality were independently associated with increased likelihood of mental health service utilization. Ego psychotic illness was associated with decreased likelihood of accessing services for physical health reasons. The impact of these health and network factors will be examined in the context of the other three buildings. Improved understanding of social network structure and dynamics in the context of these high risk inner city housing communities may help to improve access to care and direct health services more efficiently to those in need.

Title: Social scientists on semi-periphery: The difference in co-authorship egonets between the best and the “rest”

Paper ID: 305

Authors: Nikola Petrovi? (The Institute for Social Research, Zagreb, Croatia), Srebrenka Letina (The Institute for Social Research, Zagreb, Croatia), Stjepan Mateljan (The Institute for Social Research, Zagreb, Croatia), Maja Joki? (The Institute for Social Research, Zagreb, Croatia)

Abstract:

Scientific publications of researchers create a social structure which can influence their visibility and enhance their status. The choice of co-authorship strategies may be associated with productivity level and therefore, facilitate researcher’s success. Previous research has indicated that in general, co-authorship patterns of successful scientists are characterized by structural holes and diversity. However, less is known about strategies employed by scientists working in non-central scientific communities and in social science fields. In this work, the co-authorship ego networks were constructed by using the bibliometric data from Scopus. The query was limited on papers from journals in the field of social sciences and having an address from one of fifteen east European countries: Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Hungary, Romania, Bulgaria, Slovenia, Bosnia and Hercegovina, Macedonia, Montenegro and Serbia in time period between 2011 and 2017, resulting in the sample of 15156 scientific papers. For each corresponding author in the dataset a number of publications and citations is extracted. Based on the combined measure of number of publications and citations, 100 most productive researchers have been selected from initial sample. As a comparison group, representing the sample of “average scientists”, a sample of 100 researchers was created from the 5th centile according to the criteria of productivity and similarity in scientific age (the mean of the year of the first indexed paper in the database). Ego networks for those scientists as focal nodes have been created, taking into account: 1) the strength of ties (number of co-authored papers with the same author); 2) connections between co-authors; 3) productivity of the co-authors. Additionally, for all researchers (ego’s and their co-authors) gender is predicted based on their first name. Results of nonparametric tests suggest that the sample of most productive researchers had more productive co-authors, higher maximum strength of ties, higher measures of normalized ego betweenness than the sample of average scientists, and more first names identified as male. In the comparison with the average sample, most productive scientists tend to have hybrid network structure with both, clustered groups of coauthors and structural holes, implying that in this specific context a complex strategy in choosing collaborators is needed for researchers to be very productive. To describe dominant strategies identified by separate cluster analysis for two samples we visually summarized the ego co-authorship networks of researchers using the clustered graph technique with four groups of alters based on their productivity level: poor, extreme, moderate and high.

Title: Multilevel Collaboration between Software Developers and the Impact of Proximity

Paper ID: 402

Authors: Dawn Foster (University of Greenwich), Guido Conaldi (University of Greenwich),
Riccardo De Vita (University of Greenwich)

Abstract:

Dawn Foster (University of Greenwich), Guido Conaldi (University of Greenwich), Riccardo De
Vita (University of Greenwich)

Title: Network Canvas: Designing a digital tool for egocentric network capture

Paper ID: 427

Authors: Michelle Birkett, PhD; Joshua Melville, MSc; Patrick Janulis, PhD; Bernie Hogan, PhD; Michael Bass, MS; Noshir Contractor, PhD; Gregory Phillips II, PhD, MS

Abstract:

Since disease transmission often includes a social dimension, health researchers in particular have substantial interest in capturing social network data to develop an epidemiological understanding of diseases and to inform intervention development. However, the capture of network data remains a challenging pursuit for many researchers. Several methodological barriers exist in the capture of complex data – and many of the solutions to these barriers require technical expertise and resources beyond the capabilities of social and behavioral health researchers. This poster presents Network Canvas – a software suite currently under development by this team. Network Canvas is an NIH-funded project that hopes to simplify and streamline social network data collection.

This software suite has been made possible by a few recent technological advancements, such as emergence of cost-effective capacitive touch screen displays, the increasing power of standardized web technologies, and the development of graph databases. All of these are allowing our team to significantly improve the usability and decrease the complexity of network data capture for both respondents and researchers.

The design of Network Canvas draws heavily from HCI for optimal ease, engagement, and comprehension through a tactile and simplified user interface. For example, the generated alters themselves are treated as tactile ‘objects’ which can be moved and shuffled by the respondent throughout the interview. Further, our design allows redundancy to be minimized (i.e., smart skip logic can be easily embedded). And unlike others, our tool allows for multiple dimensions of complexity (multiple relation-types can be indicated, attributes can be assigned to alters or relations) and a back-end graph database (i.e., neo4j) built to efficiently store and manage complex data.

The Network Canvas Software Suite will be comprised of three main components: the Architect, the Network Canvas App, and the Server. The Architect will be used by researchers to design a customized interview protocol for their study. The App will be used in the field to deploy the survey instrument designed by the researcher. The Server will be used by the researcher to seamlessly and securely receive, query, and export interview data.

The Suite is being designed to be both free and completely open source, so that it is feasible for all members of the social network community to utilize and contribute to the Suite. Additionally, as we wish this to be a tool for the community, large portions of our project are dedicated to conducting needs assessments and obtaining feedback from both the social network community and from health and social and behavioral researchers who have strong interest in capturing social network data. This input even at early stages will allow us to design a flexible tool that will meet the needs of a broad array of researchers.

We believe the Network Canvas Software Suite has the potential to revolutionize the way that complex social data are captured by the network and health research communities.

Title: Simulating Sexual Contact Networks with ERGMs: an Investigation of the Parameter Space

Paper ID: 432

Authors: Yue Yu (University of California, Irvine), Carter T. Butts (University of California, Irvine).

Abstract:

Data on offline social networks, particularly sexual contact networks (SCNs), are extremely costly to obtain. Much of our insight regarding social processes on such networks hence comes from synthetic data generated by simulation tools. Calibration of such simulation tools nevertheless depends on observed structures, and differences in quantity and quality of available data can lead to potentially large differences in estimated model parameters; to the extent that these differences lead to substantively important variation in network structure, they pose a threat to our ability to draw appropriate conclusions regarding social processes. On the other hand, many important network-mediated phenomena are sensitive to structural properties only over a specific range of values. For instance, studies of disease transmission in SCNs are sensitive to connectivity and biconnectivity, which typically vary little across much of the space of potential networks. Here, we examine how and when changes in model parameters create substantively important differences in network structure, and how these affect conclusions that might be drawn from SCN studies. We use ERGMs as our primary modeling framework, and investigate parameter effects via a simulation study. We identify and analyze cases in which small changes in parameter values lead to the sudden changes in network properties, while also identifying stable regimes of model behavior within which parameter variation has little impact.

Title: Effects of Social Capital Development Behavior, Resource Exchange and Combination on Task performance

Paper ID: 439

Authors: Chitin HON (School of Management, Fudan University), Siyu SUN (School of Business, Macau University of Science and Technology)

Abstract:

This study examines a moderation mediated process linking social capital development behavior and task performance. Data were collected using multistage sampling with 287 casino workers from a hotel in Macau. Regression results reveal that (a) structural holes moderates the relationship between resources exchange and combination and task performance, and (b) resources exchange and combination is fully mediates the interactive effects of social capital development behavior on task performance. Thus, the interaction between resources exchange and combination and structural holes is negatively affects task performance.

Title: The social consequences of networked individualization

Paper ID: 445

Authors: Snorre Ralund (Institute of Sociology, University of Copenhagen)

Abstract:

Benefits of network ties that span across groups and dissolves the hard boundaries of tightly knit communities, have been piling up ever since Granovetter's famous paper on weak ties (Granovetter 1973; Burt 2004; Vedres and Stark 2010). Network theory has thus provided strong arguments against a purely negative and one-sided view of the individualization process (Wellman 1979; Wellman 2012), broadly speaking the alienating effects of modernity. While many studies have shown how the successful individual benefits from his wide ranging and crosscutting network, they failed to recognize the unequal distribution of these benefits, that indeed the sum of the individual benefits might not match the losses of the collective. This study investigates which global network structures are related to highest success rates.

Method

Using an acquaintanceship network dataset collected through Facebook consisting of >25.000 higher education students from 67 different study-programs at four danish universities, I compare global network structures of cohorts to retention rates and survey-based indicators of social wellbeing (e.g. loneliness).

Methodologically I contribute to a network analytical measure of individualization (Simmel 2010 (1955); Pescosolido & Rubin 2000; Wellman 2002), describing the degree to which ties are organized around tightly knit and delimited groups and not as complex intersections between loosely defined groupings. I propose a measure of groupness, that sorts out some of the deficiencies of Shwed and Bearman's (2010) measure of "community salience", and a methodological tradition not yet geared for comparative analysis of different networks that do not share fundamental properties of size and density.

Results

I compare the level of groupness of student cohorts to retention rates and loneliness. Results show that the retention rate increase consistently the more individual ties fall within well delimited groupings (increasing with 25 percentage point from the most scattered to the most grouped). Furthermore the level of groupness is also related to lower levels of reported loneliness and a range of other social indicators.

In line with McFarland et al. (2014) I show that variations in global network structures can be attributed to differences in organizational practices (the allocation of students into classes and course trajectories), spawning a discussion about networked features of social foci (Feld 1980). Furthermore I discuss the results in relation to network theories of friendship formation, and propose a formal sociological explanation in the Simmelian sense (Simmel 1950:175).

Title: Blockchain technology: a new stage in social network analysis

Paper ID: 446

Authors: Svetlana Chernozub (Institute for System Analysis of Federal Research Center "Computer Sciences and Control" of Russian Academy of Sciences), Victor Tishchenko (Institute for System Analysis of Federal Research Center "Computer Sciences and Control" of Russian Academy of Sciences)

Abstract:

This paper presents a novel methodological contribution to study “distributed trust” based on blockchain technology as a new stage (tech-based) in social network analysis.

The resource of trust and citizen solidarity that could be mobilized plays an important role in supporting innovations (e.g., R. Putnam, F. Fukuyama). So the trust becomes the basic condition for the effectiveness of an innovative product.

At the same time we can see how innovative technology is changing our understanding of the interaction between people in the same way as did the Internet. We mean Blockchain – a new coordination technology that relies on a decentralized network of computers in order to coordinate the action of many individuals interacting through a common (shared) database that is both non-repudiable and tamperproof. This technology enables people that do not know to coordinate themselves and interact on a peer-to-peer basis, without relying on any centralized authority or middlemen. In other words, what the Internet has done to enable global and interpersonal communication, the blockchain could do to achieve global and systematic cooperation — without intermediation.

On the blockchain, trust is established, not by powerful intermediaries or by the credibility of the protocol or a "smart contract". It is important to emphasize that the composing of a "chain" and its existence, both are impossible without trust in the very phenomenon of collaboration among the participants of blockchain communities. As a social network, the blockchain is effective only in the case when between users there is a certain level of trust.

So, there are a lot of adherents of social background of this technology and who see the blockchain is not just a powerful technology trend that is capable of producing a revolution in the field of finance. They are considering the Blockchain as a tech-based trust model that opens the possibility of a broader social innovation.

Further, we will present that the social consequences of the expansion of the blockchain technology could be the first count of countries with developed institutions of civil society. And we will show a fierce competition between different generations of social networks (centralized and decentralized) in the countries where is a lack of mutual trust and the network of trust structures are in their infancy.

E.g., how serious the Russian leadership fears the unpredictable consequences of emerging “networked trust” shows the discussion of the Act on Bitcoin, which is to determine the state's attitude to the tech core of the Economics of trust.

Title: Scalable ERGM Inference for organizational interaction and behavioral simulation data

Paper ID: 464

Authors: Fan Yin (University of California, Irvine), Carter T. Butts (University of California, Irvine)

Abstract:

Exponential family Random Graph Models (ERGMs) are parametric statistical models that represent the processes that govern the formation of links in networks. State-of-the-art ERGM computation focuses on the single network case, and scales poorly to multiple networks. Here, we introduce a scalable approach to ERGM inference from multiple network observations arising e.g. from experimental replicates or simulation output. Specifically, our approach exploits a previously unleveraged property of the moment equation for the maximum likelihood estimator (MLE), along with known results regarding the asymptotic behavior of the MLE and the existing estimation techniques for ERGMs. We show here how we can obtain MLEs and associated standard errors in certain multiple network cases at no additional computational cost versus the single graph case. Furthermore, we show how we can perform conjugate Bayesian analysis (via MAP estimation) using our approach, and compare its performance to that of the full posterior analysis with similar prior information. Applications of our method to organizational interaction and behavioral simulation data are discussed.

Title: Discussing Missing Data Issues for Two-Mode Network Analysis based on Influence Model

Paper ID: 467

Authors: Tingqiao Chen (Michigan State University), Kenneth A. Frank (Michigan State University)

Abstract:

Missing data has always been an issue in social network analysis, which undermines the validity of inferences based on network data. There have been some studies about missing data in social network analysis, for example, the effects of missing data on the structural properties of social networks, different imputation methods for missing network data, etc. There has not been so much literature about missing two-mode network data in particular. This paper focuses on missing data issues for two-mode network analysis based on influence model (Frank and Field et al, 2006). At first a formal influence model is specified with six different exposure terms and two non-exposure terms. The model describes a complete picture of how a person's behavior or beliefs could be influenced by other people or events he/she attended from time $t-1$ to time t . Different causes of missingness such as non-response, boundary specification problems, fixed choice design, etc. will be discussed under this two-mode scenario when influence model is used. Different types of missing mechanism such as missing at random (MAR), missing completely at random (MCAR) and missing not at random (MNAR) will also be discussed. In addition, the implication of parameter estimation for influence model under different combinations of conditions mentioned above will be addressed. Imputation methods for missing data in this kind of scenario will be explored.

Title: When it rains, it pours: A triple-pathway model of collective turnover based on causal mapping analysis

Paper ID: 513

Authors: Song Wang (Zhejiang University), Bowen Dong (Zhejiang University)

Abstract:

As modern organizations become increasingly knowledge intensive, collective turnover, a phenomenon of knowledge spillover or transfer, is gradually receiving greater attention from scholars. Given that most studies have focused on the detrimental organizational consequences of collective turnover, this paper proposes a relational perspective to explore three distinct process models of dispersed, translocated, and entrepreneurial collective turnover. Based on a causal mapping analysis conducted in China of 25 collective turnover events that can demonstrate complex turnover processes over time, this study found that dispersed collective turnover, in which a group of members quit and scatter, is more likely to be triggered by shared job dissatisfaction. While translocated collective turnover, in which organizational members collectively mobilize in the same organization, is highly associated with attractive external lures. In contrast, entrepreneurial collective turnover, in which a group of members leave to start a new business together, is developed through a group process of entrepreneurial passion contagion. The ensuing triple-pathway model helps to enrich the theoretical understanding of collective turnover by clarifying the contextual differences regarding the effects of turnover destination on the important process of collective turnover.

Title: Understanding Online Survey Data as a Bipartite Network: A Case Study on pol.is

Paper ID: 518

Authors: Tzu-Chi Yen

Abstract:

Pol.is is a new kind of open-sourced commenting and survey system, where users click “agree”, “disagree”, or “pass” in response to statements others have contributed. The user can also enter their own statements for others to take positions on. The system clusters users who voted similarly using matrix factorization and visualizes these groups in real-time. It was deployed to Taiwan by the vTaiwan community – v is for “virtual” – to facilitate public discussions on controversial issues. It has attracted the on-line participation of more than thousands and saved the volunteer moderators through the crowd-sourced agenda on topics such as Uber/Airbnb regulations, Internet liquor sales, and death penalties. In the survey thread of Uber regulations, the Administration has pledged to ratify all the pol.is consensus items into a new regulation. The pol.is discussion tool has opened up Taiwan’s democratic imaginations.

In this poster, we explore the pros and cons about the built-in analytic core of pol.is to an alternative representation – the bipartite network. By default, the pol.is treats the survey data as a voting matrix that takes the users and comments as two independent dimensions, with values “1”, “-1”, or “0”, specifying user’s positions to an opinion, “agree”, “disagree”, or “pass”. It uses the Principle Component Analysis (PCA) to obtain the principle components that capture the major variances in opinions for different voters. Subsequently, these voters are clustered via the k-means method, using the silhouette score to determine the number of clusters. The PCA belongs to a subset of matrix factorization methods, common in opinion dimensionality analysis. In our work, we investigate the bipartite stochastic block model (biSBM) to describe and cluster the users and opinions, an arguably more principled way to study these on-line survey data. In a bipartite network, nodes are composed of two types, and only edges that connect two opposing types can present. Here, the voters are of one node type, and the comment nodes are of the other type. We expand the comment node set by merging each node with its respective edge annotations; that is, each comment can correspond to three different nodes in the network representation, capturing the three voting positions. Since the biSBM is a parametric method, meaning that users must choose the number of communities a priori. We use a newly developed model selection method that based on the Minimum Description Length principle to select the number of communities which best compresses the model and data. Using real dataset, we study the coherence, detectability, and interpretability of opinion clusters generated by the PCA and the biSBM methods. Finally, we address the parametric regimes where the outcome of the two methods coincides.

**Title: Financial and Information Interactions in the Area of Nanotechnology of Iran;
Application of Network Analysis for Identification of the Agent Network**

Paper ID: 612

Authors: Kioomars Ashtarian (University of Tehran), Hannaneh Mohamadi Kangarani (University of Hormozgan), Ali Khaje Naieni (University of Tehran)

Abstract:

The purpose of this research is to study and analyze the status of financial and information exchange networks among the main agents in the area of nanotechnology in Iran through quantitative study of their relationships by using Network Analysis. Identification and plotting of financial and information exchange networks and the subsequent disclosure of formidable and influential agents as well as the strong and weak points regarding the position and relationship between the agents in this area is the ultimate conclusion of this research. The research findings at the level of individual agents reflected the high centrality of Iran Nanotechnology Initiative Council as the most formidable agent-network. The nanotechnology in current situation of Iran has not sufficiently entered the commercialization phase since the institutions established by the government for development of this technology are of high centrality in both networks. Moreover, the group of nano-product manufacturing companies is the most dominant group in the information exchange network while the policy making institutions are the most formidable group of financial network. On the other hand, the policy making institutions have the least information and financial exchange with the media, non-state communities and promotional institutes. Therefore, the social approach of policy making institutes toward nanotechnology must be extremely strengthened. Another policy recommendation is that the information and financial communications of nano companies as well as the market and product development services companies –with mediocre intensity- has been consolidated and enhanced for development of nanotechnology in Iran.

Title: Research on Distribution of Power within the Forest Policy Networks in Iran through Network Analysis

Paper ID: 613

Authors: Hannaneh Mohamadi Kangarani (University of Hormozgan)

Abstract:

In this paper Network Analysis was used to analyze an important political problem relating forests located in Iran: inappropriate distribution of power in forest policy networks. This paper tries to underline some of the reasons having led to the failure of the forestry policy in Iran through an overview on power distribution in legal network of institutions with "New Institutionalism Theory". The networks were analyzed by UCINET and Netdraw Softwares. The results show that there are no significant relationships between coordinator and executive institutions as the main power centers. There is no distinctive border between the stage of strategy codification and its implementation under the Forth Development Plan. In the Provincial Development Plan, there are no common legal relationships between environmental administrations and other institutions. This article offers the necessity of paying attention to commensurate distribution of power between institutions through codification of subsequent developmental documents and plans by policy-makers.