

Networks in the Global World 2014

St. Petersburg, June 27-29

Bridging Theory and Method: American, European, and Russian Studies



The international conference ‘Networks in the Global World. Bridging Theory and Method: American, European, and Russian Studies’ took place at St. Petersburg State University on June 27-29, 2014. It was organized by the Center for German and European Studies (St. Petersburg State University – Bielefeld University) in cooperation with German Academic Exchange Service, Konrad Adenauer Foundation, International Sociological Association, Junior Sociologists

Network of The International Sociological Association, Council of Young Scientists (Faculty of Sociology, St. Petersburg State University), Inter-University Center for Science and Education Programmes in Social Communication, and The Center for Social Technologies.

The primary goal of the ‘Networks in the Global World’ conference series is to bring together networks researchers from around the globe. It seeks to unite the efforts of various scientific disciplines in response to the key challenges faced by network studies today, and to exchange local research results – thus allowing an analysis of global processes.

The previous NetGloW conference, subtitled ‘Structural Transformations in Europe, the US and Russia’, took place in St. Petersburg on June 22-24, 2012 and brought together more than 150 scientists, political practitioners and business representatives from all around the world. The conference also had a pronounced interdisciplinary character: involving sociologists, philosophers, culture researchers, management specialists and economists (for more information on the event, videos and photos see: <http://www.ngw.spbu.ru/node/326>).

The idea of the 2014 event was to discuss the key current issues and problems of linking theoretical and methodological developments in network analysis. There were several reasons for the choice of this focus. Moving from theory to methods and applications, one can consider networks as a useful metaphor, providing plenty of opportunities for theoretical speculations. However many of these are very difficult to operationalize. Graph theory allows analysts to build various theoretical models, yet those models are not always suitable for the theoretical design. Reliable and relevant network data are either difficult to obtain or – in the case of Big Data – hard to screen and handle. Moving reversely from methods to theorizing, it can be seen that the complex mathematical core of network

analysis methods and their applications are difficult to use for theory developers - who often have no mathematical background. Network data collected in numerous fields where network research is applied, as well as usage of the existing network analysis techniques and network metrics calculation, do not always provide clear evidence for grounded theoretical generalizations. This is particularly the case for the most intensely developing areas of network research, like communication and knowledge networks, sociosemantic networks, online networks, culture and identity networks, science and technology networks, organizational and innovation networks, economic networks, policy networks, civil society and social movement networks. These rapidly growing thematic fields of network studies experience a gap between the theoretical ideas they generate, and the sophisticated analytical methodology that is being produced by network analysts. Thus, there is a need for thorough reflection on the process by which we relate theories to methods.

Which methods in network analysis should be used to test certain theoretical ideas; how should specific metrics be interpreted with regard to theoretical constructs developed in the field; which data should be considered when dealing with particular theoretical concepts? – These are the questions NetGloW'14 conference sets out to answer. Also among the conference's aims was the goal of supporting students and practitioners in selecting proper tools and techniques when they apply network analysis in their areas of study and practice.



More than 160 participants from Australia, Austria, Belgium, Canada, Germany, Italy, Lithuania, Netherlands, Poland, Russia, Spain, UK, Ukraine, and the USA, representing various disciplinary backgrounds, registered for the conference.

The conference was preceded by a set of workshops on software tools for network analysis including the following: “Pajek for Beginners: From Data to Measures and Visualization” by *Wouter de Nooy*,

“Social Media Networks with NodeXL” by *Mark Smith* and “Exponential Random Graph (p^*) Modeling and Network Dynamics” by *Benjamin Lind* (National Research University – Higher School of Economics, Russia).

The three conference days that followed contained a variety of sessions and keynote talks in a set of thematic areas, including: Networks in Science, Technology, and Innovation; Network Perspectives on Knowledge, Communication, and Culture; Words and Networks; Network Analysis of Political and Policy-making Domains; Social Movements and Collective Action as Network Phenomena.

After the introductory remarks, the conference was opened with a keynote talk by **Thomas Valente (University of Southern California, USA)** entitled “**Models for the Diffusion of Innovations**”. The presentation outlined the history and current thinking on diffusion of innovations, with a focus on the social network analysis perspective. Valente presented the results of numerous empirical studies on the subject conducted in the recent decades, and highlighted the importance of theoretical conceptualizations encapsulating

both static and dynamic network properties and their influence on the rate and specifics of diffusion of innovation.

Loet Leydesdorff's (University of Amsterdam, Netherlands) talk “**In Search of a Network Theory of Innovations: Relations, Positions and Perspectives**” suggested studying innovation networks using an interesting synthesis of theoretical perspectives – Luhmann’s social-systems theory, on the one hand, and Latour’s “sociology of translations”, on the other. According to the speaker, the common focus on communications of these two approaches allows researchers to combine them and extend methodological opportunities in three dimensions, which should be developed as interconnected: relations that can be studied using graph-analytical tools; organization that can be studied factor-analytically as relational events; and self-organization as hyperspace of “horizons of meaning”.

The two keynote talks were followed by the session “**Networks in Science, Technology, and Innovation**” chaired by T. Valente and L. Leydesdorff. The session included papers on the network approach in science, technology, and innovation studies (STI). The topics mainly covered the issues of university-industry network interactions in regional innovation landscapes, innovation ecosystems and innovation clusters. Presenters discussed theoretical backgrounds and methods for the study of such interactions - primarily focusing on those between government, universities and industry. Using primarily patent and publications data, various factors of emergence and development of university-industry network relations were analyzed - including institutions, SMEs activities, university-industry teams, as well as conferences and similar events.

The next thematic block was drawn on the interplay between social, cultural and linguistic phenomena in networks:



The keynote talk “**Words and Networks: Leveraging Text Data for Network Analysis**” given by **Jana Diesner (University of Illinois at Urbana-Champaign, USA)** focused on the most recent developments of the methods for extraction of network data from text data and integration of text mining and network analysis, which are to complement the growing number of theoretical constructs in

network analysis linking language and social structure. The speaker illustrated that unless we (a) consider the content of text data produced or shared by network participants and (b) analyze text data and network data separately, we are limited in our ability to understand the effects of communication in networks. With this regard, the most recent findings and tools developed by the team led by Diesner were presented.

Peter Groenewegen (VU University Amsterdam, Netherlands) stated that social network analysis, focusing on structure of interactions and relations, on the one hand, and semantic network analysis focusing on connections between words, on the other hand, – each provide only a one-sided view of socio-semantic networks. In his keynote speech “**Socio-Semantic Networks: Social Structure and Content in Networks**”

Groenewegen suggested a framework incorporating the two traditions' theoretical views and combining them with relevant groups of methods into 3 distinct approaches: one dealing with the issue of differentiation and integration of structure, content and meanings in networks by comparing semantic structures of different groups; another one combining social structure of human agents and meaningful content at the same levels of aggregation using two-mode network analysis; and the third one focusing on the role of popular concepts vs. popular actors. Finally, constraints and opportunities for future development of theory and method based on synthesis of social network analysis and semantic network analysis were discussed.

The following session **“Words and Networks”** chaired by **Wouter de Nooy (University of Amsterdam, Netherlands)** explored connections between texts and social network structures and presented the most recent findings in the field. Jointly considering text data and network data enables the analysis of networks along multiple dimensions of human behavior, namely language use and social interactions, which ultimately helps to advance our understanding of the interplay and co-



evolution of socio-technical networks and information. To enable progress in this area, scholars have developed powerful and scalable methods and tools for analyzing text data authored or shared by network participants as well as language-based interactions. However, there is a gap between the theoretical foundations for these solutions and actual implementations in the form of empirical and computational work. The session included contributions intended to bridge the gap between theories related to language use and networks theories, linking those to methods and tools developed for utilizing text data for network analysis.

After the session, de Nooy's keynote talk **“Actor-Oriented Network Models and Socio-Semantic Network Data”** explored options for the study of sociosemantic networks using statistical approaches in dynamic network analysis developed in the last decades: Stochastic Actor-Oriented Models (SAOM) and Exponential Random Graph Models (ERGM). The presentation proposed ways to use these models to check if the dynamics of sociosemantic structures correspond to the principles suggested in well-



established sociological theories: Homans' balance theory, Bourdieu's field theory and Luhmann's autopoiesis theory.

The next keynote speech **“Complex Structures for Complex Problems: Understanding Transdisciplinary Groups Through Social and Sociosemantic Networks”** by **Johanne Saint-Charles (University of Québec at Montreal, Canada)** was devoted to a global

cross-cultural comparison of diverse ensembles of individuals interacting on a regular basis, face-to-face or through various media around complex social issues. Assuming that the combined study of social and sociosemantic networks is a promising means to approach such groups, Saint-Charles explored the opportunities and challenges of applying sociosemantic network analysis using longitudinal data. The presenter depicted the theoretical and methodological problems faced when moving beyond mere description to provide analysis of processes, mechanisms and meanings in such studies.



Contributors of the session “**Network Perspectives on Knowledge, Communication, and Culture**” chaired by **Johanne Saint-Charles** and **Nikita Basov** were to bridge theoretical and methodical issues of network research revolving around knowledge, communication and culture. Participants, on the one hand, suggested their views of these central concepts and of relations between the three,

and, on the other hand, proposed operationalizations of their conceptual developments delivering showcases of relevant network analysis methods used in empirical applications including – yet not limited to – organization and urban studies, as well as in the studies of politics, visual arts and literature.

A following keynote speech by **Dimitris Christopoulos (MODUL University, CEPS-Luxembourg, Austria)** entitled “**New Applications for Three-Mode Network Analysis**” provided an introduction to basic concepts and terminology of one of the rapidly developing approaches in network analysis: three-mode network analysis. Backed-up by theoretical and methodological background, in particular by Thomas Fararo’s and Patrick Doreian’s “theory of interpenetration”, the speaker presented a set of cases where three-mode network analysis was applied to social network data. It was shown how the extension of the familiar logic of two-mode (or bipartite) networks to a third entity significantly increases the complexity of matrix manipulations and requires development of a whole set of techniques to make even the standard network analysis calculations possible. Some advances in the area were presented, in particular, those in identifying densely connected subgroups, even when ties are restricted to between-entity relations.

This line of reasoning was further developed in the keynote speech given by **Mario Diani (University of Trento, Italy)**, which opened another thematic block of the conference addressed the topics of policy-making, politics and social movements networks. Entitled “**The Logic and Method of Social Network Analysis in Social Movement Research**” the talk pursued three main objectives (1) to specify the dominant ways of how the idea, the concept and the metaphor of network are used in social movement research, (2) to look at the conceptual relation of notions “network” and “social movement” as well as the concept of collective action, and (3) to identify possible analytical methods for understanding collective movements. According to the speaker’s idea, research into social movements can greatly benefit from connecting different analytic levels dealing with corresponding three-mode structures of individuals, organizations and events instead of

analyzing them separately. Consequently, relevant methods to study three-mode networks and their application to social networks research are to be developed.

The keynote talks were followed by two parallel sessions. The session “**Network Analysis of Political and Policy-Making Domains**” chaired by *Dimitris Christopoulos* included studies of policy-making and political processes through the network perspective, focusing on relational structures and interactions between governmental and nongovernmental organizations, interest groups, and individuals involved in policy-making and political processes.

In the session “**Social Movements and Collective Action as Network Phenomena**” chaired by *Mario Diani*, papers covered different dimensions of collective action at large, particularly through virtual online connections, such as social networking sites, the spatial dimension of social networks, the time evolution of collective action networks, and other issues.

The final keynote speech by *Marc Smith (Connected Action Consulting Group, USA)* entitled “**Mapping the Social Media Crowd: Tools and Models for Understanding the Stream**” introduced the new prospects for network analysis stemming from the use of rapidly growing social media networks. A vivid example of the new opportunities appearing reveals the variations present in online social spaces across societies and cultures around the globe. A review of images that have been produced by analyzing social networks of Twitter, flickr, YouTube, and email networks was presented.

Finally, the seminar “**How Can Network Analysis be Used by Globally Operating Practitioners?**” was aimed to introduce methods and technologies of network analysis to practitioners, such as representatives of global civil society actors, internationally operating foundations, NGOs, business, science and educational institutions, mass media, and international policy makers. Seminar design corresponded with three levels of application of network techniques in organization studies: clients networks, networks between organizations and networks within organizations.



Network structures, as they emerge and evolve in Germany, Europe and Russia, are studied in the framework of a key thematic area of the Centre for German and European Studies (St. Petersburg State University – Bielefeld University). The interests of the CGES primarily revolve around the dynamics of, and relations between, knowledge networks, semantic networks and communication networks, as well as around studying innovation networks within and between organizations, both at inter-personal and inter-group levels. To get more information on CGES research projects and events organized visit [the centre's website](#).

For more information on the conference outcomes [visit the NetGloW official page](#).