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Workshops

Using R and igraph for Social Network Analysis

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The workshop introduces R and package igraph for social network data manipulation, visualization, and analysis. The material will cover: 0. Brief introduction to R; 1. Creating and manipulating network data objects; 2. Working with node and tie attributes; 3. Creating network visualizations; 4. A tour through computing selected SNA methods including: degree distribution, centrality measures, shortest paths, connected components, quantifying homophily / segregation, network community detection; 5. Connections to other R packages for SNA, e.g.: statnet, RSiena, egonetR.

The focus is on analysis of complete network data and providing prerequisites for other workshops including those on ego-network analysis, e.g.: "Introduction to ego-network analysis" by Raffaele Vacca.

The workshop have been successfully organized on earlier Sunbelt conferences (since Sunbelt 2011) and on European Social Networks conference (EUSN 2014). The workshop attracted a lot of attention (total of over 130 participants since 2011) and positive feedback (80% report being satisfied, 75% would recommend the workshop to a colleague). The earlier workshop title was "Introduction to Social Network Analysis with R". The content have been updated to catch up with newest developments in igraph and related packages.

Target audience and requirements: The workshop is designed to be accessible for people who have limited experience with R. The participants are expected to be familiar with basic R objects (e.g. matrices and data frames) and functions (e.g. reading data, computing basic statistics, basic visualization). Some brief introduction to R will be provided. To be absolutely on the safe side we recommend taking an internet course on the level of R programming course on Coursera (<https://www.coursera.org/course/rprog>), which you can take every month, or skimming through a book on the level of initial eight sections of Roger D. Peng book "R programming" (<https://leanpub.com/rprogramming>).

Participants are encouraged to bring own laptops. We have prepared examples and exercises to be completed during the workshop. Detailed instructions how to prepare will be distributed in due time.

Keywords: R, igraph

Introduction to ego-network analysis with R

Raffaele Vacca

University of Florida – United States

Prerequisites: None.

Topics

- Short introduction to ego-network research and data.
- Data structures for ego-networks in R: vectors, data frames and lists.
- Network objects in R.
- The split-apply-combine strategy: creating ego-level summary variables.
- Looping over multiple ego-networks (for, while, repeat loops).
- Writing your own R functions.
- Applying your functions to multiple ego-networks: The "apply" family of functions (apply, lapply, sapply, etc.).
- The plyr package for easier split-apply-combining.

More information is available at www.raffaelevacca.com/teaching/workshops/ego-network-r/.

Technology requirements: A laptop with RStudio installed. More details will be emailed to participants before the workshop.

Background: This workshop offers an introduction to ego-network analysis with R, presenting essential facilities available in R to store and manipulate ego-network data, to visualize ego-networks, and to perform compositional and structural analysis on large collections of ego-networks.

The central idea behind ego-network analysis is that the people (alters) that an individual (ego) knows, and the way that these people interact with each other, affect outcomes in that individual's life such as mental wellbeing, smoking behavior, or assimilation to a foreign culture. A typical ego-network study involves identifying a sample of focal individuals (the egos), and collecting a network of personal contacts (the alters) from each. Ego is asked about characteristics of each alter, characteristics of each ego-alter relation, and characteristics of alter-alter relations. This information is then frequently aggregated into ego-level variables that summarize ego-network characteristics, which can subsequently be linked to other ego attributes and outcomes.

Typical ego-network analysis requires handling dozens or hundreds of datasets, each representing one ego-network with ego attributes, alter characteristics, and alter-alter ties. The analysis involves running the same set of operations on each dataset, e.g. to extract compositional and structural summary variables on each ego-network; and joining the resulting metrics into a single dataset, together with other ego-level or alter-level variables. This has been called the split-apply-combine process in data analysis, in which raw data are split into pieces (in this case, each piece representing one ego), the same analysis is applied on each piece, and results are then combined together into a single dataset.

Handling the split-apply-combine process in traditional point-and-click software for statistical analysis is inefficient. Pointing and clicking is repetitive, boring and prone to errors. It typically does not allow users to run the same set of operations on many objects in batch, without the user's intervention. Perhaps more importantly, pointing and clicking makes research not reproducible. R overcomes these limitations and opens up a whole different way of doing ego-network analysis. It eliminates pointing-and-clicking entirely, and allows users to write reproducible scripts that batch analyze hundreds or thousands of ego-networks simultaneously in few seconds.

This workshop will use real-world ego-network data, in combination with the main R packages for network analysis (igraph and statnet). The workshop can be taken as an introduction to the workshop "Simplifying ego-centered network analysis in R with egonetR" by Till Krenz and Andreas Herz. Students interested in a general introduction to social network analysis with R should also consider taking the workshop "Using R and igraph for Social Network Analysis" by Michal Bojanowski.

Keywords: egocentric networks, ego networks, ego nets, personal networks, R, quantitative methods

Introduction to NetLogo and agent-based models of networks

Paola Tubaro ¹, Yasaman Sarabi ²

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² University of Greenwich – United Kingdom

Workshop Length: 2 sessions of 3 hours each. Participants may choose to register only for the first session (for novices), only for the second session (for beginners with some prior knowledge of agent-based models), or both.

Attendance Limit: none.

Description: There is a growing interest in the economic and social sciences for agent-based models, a computer simulation technique which represents socio-economic processes as

open-ended dynamic systems of interacting agents. They can support both theory-building and empirical analyses, and are particularly well-suited to study complex and multi-faceted phenomena that standard social science methods struggle to comprehend, from financial crises to traffic congestion, the rise of extremisms, and urban riots. Interestingly, the dynamics of social network effects can be explored in depth with agent-based models.

This workshop aims to introduce the potential of agent-based models, for the social sciences in general and for social network analysis in particular. It provides participants with basic knowledge of the simulation methodology and insight into the design and analysis of computer experiments. NetLogo, the software that is introduced in this workshop, is a widely used package that provides tools to build models; run experiments; produce, store and analyze simulated data. Participants will have the opportunity to explore NetLogo's functionalities by working on different versions of a model. They will gain hands-on experience on how to modify existing models in the NetLogo library, and will understand the basic steps towards writing their own model from scratch.

Participants are not assumed to have any preliminary knowledge of computer simulation or agent-based models.

Participants are advised to bring their laptops, on which they will have downloaded the NetLogo package and the User's manual. Both are available freely from <https://ccl.northwestern.edu/netlogo/>

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Keywords: agent based models, Netlogo, computer simulation, complex systems

The Positional Approach to Network Analysis

Ulrik Brandes

University of Konstanz – Germany

The positional approach is a recent methodological innovation intended to narrow the gap between substantive theory and mathematical analysis of social networks. By breaking down current methods into meaningful and manageable decision steps it explicates hitherto tacit assumptions, suggests means to overcome them, and smoothly generalizes approaches to valued, multiplex, multilevel, and temporal data. It also facilitates the incorporation of more qualitative observations and produces more nuanced results.

All of this is achieved with the help of a simple conceptual change, defining the network position of an actor as the aggregate of direct and indirect relationships and attributes. Starting from this key concept, the network position, state-of-the-art methods of analysis turn out to be special cases of positional comparisons and evaluation. The characterization of actors by their positions can be thought of as a form of conjoint measurement, and exploits a richer array of non-quantitative mathematical tools. Methodologically, it allows to separate the substantive argumentation of what defines a position from the formal analysis of the network it is embedded in. An important benefit of the genericity of the positional many new methods obtained from alternative instantiations. Moreover, it facilitates basic research by identifying relevant problems without requiring domain-specific background knowledge.

The workshop is an introduction to the positional approach starting from first principles. It is centered around use cases that cover a broad range of social network application domains. We will discuss the relative utility of positional and current state-of-the-art approaches and identify how method selection can be better informed by substantive theory. If desired, participants can submit example data or research designs to be discussed in the workshop.

This is a half-day workshop. Elementary previous knowledge of network analysis is required.

Keywords: methodology, positional network analysis, centrality, roles, tutorial

Exponential Random Graph Models (ERGM) using Statnet

Lorien Jasny * ¹, Michal Bojanowski † ²

¹ University of Exeter – United Kingdom

² University of Warsaw – Poland

This workshop will provide an introductory tutorial on exponential-family random graph models (ERGMs) for social networks, emphasizing a hands-on approach to fitting these models to empirical data. The ERGM framework allows for the parametrization, fitting, and simulation from models that incorporate the complex dependencies within relational data structures, and provides an extremely general and flexible means of representing them. This session will provide a tutorial to ERGM modeling with statnet software in R.

Topics covered within this session include: an overview of the ERGM framework; defining and fitting models to empirical data; interpretation of model coefficients; goodness-of-fit and model adequacy checking; simulation of networks using ERG models; degeneracy assessment and avoidance; and modeling and simulation of complete networks from egocentrically sampled data. Attendees are expected to have had some prior exposure to R, but extensive experience is not assumed.

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Prerequisites: Familiarity with basic descriptive network concepts and statistical methods for network analysis within the R/statnet platform is recommended. Attendees are expected to have had some prior exposure to R, but extensive experience is not assumed.

Keywords: ERGM, Statnet

Temporal Exponential Random Graph Models (TERGM)

Lorien Jasny * ¹, Michal Bojanowski † ²

¹ University of Exeter – United Kingdom

² University of Warsaw – Poland

This workshop will provide an introduction to the estimation and simulation of dynamic networks using TERGMs in statnet. We will cover the statistical theory and methods for separable temporal ERGM modeling, with a hands-on tutorial using the TERGM software package. TERGM can be used for both estimation from and simulation of dynamic network data, and it provides a wide range of fitting diagnostics.

The topics covered will include estimation from network panel data, from a single cross-sectional network with link duration information, and from cross-sectional, egocentrically sampled network data. Simulating dynamic networks with both fixed and changing node sets will also be covered. We will demonstrate how the results of a dynamic network simulation can be visualized as an animated "network movie" using the ndTV package in statnet. An example of the type of "network movie" these tools can produce can be found at statnet.org/movies.

Prerequisites: This workshop will assume familiarity with R, and the network, SNA and ergm packages in statnet. The "Exponential-family Random Graph Modeling (ERGMs) with statnet" workshop is recommended as preparation.

Keywords: TERGM, Statnet

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Using Net-Map for co-producing SNA knowledge and co-designing networks

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² Université de Nîmes (Institut ACTE, Equipe Projekt) – France

Urban design, spatial planning, natural resource management and other processes important to sustainability, typically involve many actors from different domains who are not all connected by hierarchy and whose behavior cannot easily be mandated. Thus, successful processes rely on networks of actors who collaborate and on the quality of their collaboration. To understand success factors or management failures and to improve existing structures it is thus crucial to understand the underlying formal and informal social networks. In many cases Social Network Analysis (SNA) has been used to provide answers to these questions.

This workshop goes beyond mere understanding of network structures but introduces a tool that allows the co-production of network knowledge for immediate use to solve sustainability problems and anticipate possible solutions. The workshop introduces approaches, which allow the participants to facilitate the use of SNA knowledge in diverse situations, using participatory, learning oriented network mapping exercise. Using the Net-Map method for diagnosis of collaborative relations between actors will be the baseline for change and for thinking potentialities or gaps to foster and negotiate collective and individual interests.

This workshop is a 3 hour workshop, the maximum number of attendees is 20. This workshop is oriented to researchers interested in participatory approaches of co-producing social knowledge. Professionals in the field of management, policy and design in urban areas, natural resources, environmental issues, public health other areas are welcome. After a brief introduction of the approaches, the participants are encouraged to share actual or potential cases where the actual use of network knowledge is planned in management situation is aimed for. We will conclude the workshop by proposing to the participants a co-design oriented approach to modify, complement or add relations to reach a sustainable goal based on network maps.

Keywords: participatory network mapping, Net Map, knowledge, co production, co design, sustainability

Simplifying ego-centered network analysis in R with egonetR

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Ego-centered network analysis is tricky because most often you have n+many networks which you want to analyse simultaneously and performing multivariate analyses, where network data and attributional data of ego are combined. An ego-centered network is commonly known as the network of a focal actor (ego), including the relationships of ego to alters and the relationships between these alters. Analysis can be conducted on two different levels: On the alter level the analysis focusses on the qualities of the ego-alter-relationships e.g. provision of support or contact frequency. The network level analysis focuses the structure and composition of the ego-centered network. The most reasonable way to analyse multiple ego-centered networks is to use R because it allows both the calculation of various network measures for n+many networks simultaneously (e.g. what is the density of all networks) and multivariate analysis of network and attributional data (e.g. how does density vary between men and women). The workshop focuses the analysis of ego-centered networks using data from current research projects. We introduce the R-package "egonetR" which simplifies the import and manipulation of ego, alter and network-level data in different formats and allows to calculate a range of network measures. Using "egonetR" users will be enabled to conduct ego-centered network analysis with very basic R programming knowledge.

After a short introduction into data management and data import to R we calculate network measures on alter level (e.g. multiplexity, homophily) and network level (size, density, EI-Index, diversity, components, proportions of ties with specific attributes). Afterwards we go on with multivariate analyses, both on alter and the network level. For both levels we exemplify explorative and hypothesis testing procedures using additional packages in R (e.g. cluster, lme4, FactoMineR): On the network level we focus cluster analysis and standard regression. With cluster analysis we present a way to typologize ego-networks along network-level information. In standard regression analysis, network measures can be used as dependent or independent variables, just as any other characteristic of ego e.g. to test whether network size differs by gender or age. On the level of the analysis of ego-alter dyads we demonstrate multivariate correspondence analysis and give a short introduction to multilevel analysis. Multivariate correspondence analysis is used to explore the dependencies between categorical alter-level variables using visualisations. Multilevel analysis is used to treat with the nested nature of alter level data when dependent variables lies on the alter level.

Major parts of the workshop will be "hands-on" utilizing R (R-Studio). A short intro into the basics of R will be given in the beginning while prior knowledge in R is preferable. For more in depth introductions to R it is recommended to visit the workshop "Introduction to ego-network analysis with R" by Raffaele Vacca, where data collection, data management and data transformation between different levels of data are discussed in detail and Michal Bojanowski's "Introduction to R and Social Network Analysis with igraph" for a general introduction to (whole) network analysis with igraph in R.

Further information will be available on (<http://rego.tillt.net>).

Technology Needs: Laptops with internet access. Installation of R (<http://cran.r-project.org/>) and R-Studio (www.rstudio.com) before the workshop is required.

Workshop Length: whole day (6 hours)

Attendance Limit: 30

Keywords: ego-centered network analysis, R

Network visualization based on JSON and D3.js

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This is a half day (3 hours) workshop.

D3.js (<http://d3js.org/>) is a powerful Javascript visualization library that enables users to produce professionally looking (interactive) data visualizations that can be viewed in web browsers. The produced pictures can also be exported into SVG (Scalable Vector Graphics) format and afterwards imported into a vector graphics editor (such as Inkscape or Illustrator) and manually enhanced and saved in a selected format for inclusion in other publications. We developed netD3 – a set of additional network visualization procedures over D3.js that provides network analysts with different ways to display their networks.

To prepare network data for netD3 visualizations we defined a special netJSON format for describing networks and their layouts in JSON.

In the workshop we will first learn how to describe networks in netJSON and afterwards explore different ways to visualize them using netD3 options. The developed framework can be used by network analysts to produce visualizations of their networks that can be put on the WWW or used in other publications (reports, slides, papers, books, etc.). The authors of network analysis programs can export their results in netJson format and use netD3 for their visualization.

The netD3 library will be available at <http://vldowiki.fmf.uni-lj.si/doku.php?id=vis>.

Keywords: network visualization, layout, javascript, json, svg

Mining (together with a bit of web scraping) of large social networks from Twitter using Python (and Ruby)

Moses Boudourides

University of Patras – Greece

This workshop is going to focus on how to construct certain networks from Twitter data after mining them from the Twitter API or/and possibly using a bit of web scraping.

An API (Application Programming Interface) of a social networking service is, roughly speaking, a set of routines that has been set up to allowing users to access specific chunks of data hosted in the social media. Needless to say that nowadays social media provide easily accessed sources of big data among which those displaying relational features may supply easily to access examples of large empirical social networks representing the underlying structures of action. The reason we are using Python to implement such data mining tasks is because Python exhibits a number of advantageous qualities in data gathering, data manipulation and data visualization and analysis. Social media allow content that is created in one place can be dynamically posted and updated on the web. For instance, content (including texts, photos and videos) can be embedded, dynamically posted and shared together with certain user information (profile). In general, since the Twitter API is more open when comes to sharing information and given the existing restrictions in the Facebook and LinkedIn APIs, we are going to focus here just on data mining from Twitter.

The main mining tool in Twitter includes two RESTful APIs. Through the Twitter REST API methods users may access and interact with core Twitter data (such as update timelines, status data and user information) and Twitter Search data. Through the Streaming API method, users may access streaming tweets in real time as they happen. In all cases, retrieved data are in the JSON data format. JSON is the acronym of JavaScript Object Notation, i.e. an open standard format that uses human-readable text to transmit data objects consisting of attribute-value pairs.

Twitter users may access the API through an authorization provided by the OAuth tool, which is an authentication protocol that allows users to approve their application to act on their behalf without sharing their password. After getting authorization, users may employ different API methods for accessing information on tweets (including the occurrence of hashtags, search terms, embedded media etc.), users, following relationships (friends, followers), retweets, etc. Furthermore, in certain situations, when the API of a service does not sufficiently provide all of the functionality that one requires, there is an alternative resort to collect data directly, the way they are actually displayed in a website, through web scraping, i.e., a programmatic method of extracting data from websites. For this purpose, we are using a Ruby script together with a few libraries (ruby germs, like Nokogiri) that grab the Twitter server's response to a browser's request (like a Twitter search) and parse it in such a way that that all the contents of the served Twitter data might be retrieved in a nicely-formatted list. From the social network analysis point of view, our purpose is to extracted from the mined (or/and scrapped) Twitter data a multilayer network consisting of the following three layers: (i) the layer of retweeted data (or RTs) among Twitter users, (ii) the layer of friendship (follower-following) relationships among

these users and (iii) the layer of co-occurring hashtags included in the tweets sent by the Twitter users.

For example, the following network visualization:

<https://github.com/mboudour/TwitterMining/blob/master/ThreelayerCommunitiesTwitter.jpg>

shows the 3-layer network extracted from Twitter data (about 500 K tweets), retrieved under the search term “Obamacare” and mined in the period October 18–31, 2013.

Furthermore, the main Python scripts we are using for Twitter mining are accessible here:

<https://github.com/mboudour/TwitterMining>

Of course, the above repository will be constantly updated to fit the needs of the Sunbelt 2016 workshop (and also to include the required Ruby scripts for Twitter scraping).

Prerequisites: Very elementary familiarity with Python. Workshop Length: 1 session (3 hours)

Attendance Limit: 21-30

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Keywords: Twitter networks, mining

Extracting Social Networks from Literary Text

Moses Boudourides

University of Patras – Greece

In this workshop, we intend to use certain natural language processing, text analysis and machine learning techniques in order to extract social networks from texts of literary fiction (or other texts such as archives, biographies, transcripts of movies or theatrical plays etc.). In the workshop, we are going to elaborate on a mixed automatic and manual approach, which is driven by the extraction of three entities: (1) character names, (2) a direct and indirect speech attribution and (3) a categorization of attributes to characters and quoted speech (and other referrals).

(1) Text is processed with the Stanford Named Entity Recognition (NER) tagger that seeks to locate and classify textual elements into pre-defined categories such as the names of persons, organizations, locations, expressions of times, various quantities, etc. The outcome of this task is to identify the actors of the social network to be extracted from the text.

(2) Although there are many methods for direct and indirect speech attribution (so that one might be able to identify occurrences when one character refers to or interacts with another one inside quoted speeches), due to existing time limitations in the workshop, we are going to follow a "primitive" approach in which a first automatic retrieve of all speech quotes will be subsequently annotated manually so that one might be able to get a first (rough) approximation of the extracted social network ties among the previously identified actors. A particular (and rather easily implemented) case of this task is when quoted speech consists of (well defined) conversational chunks, as it is the case in many theatrical plays (or transcripts of movies etc.).

(3) Similarly, due to the same limitations of presenting the general methodology of textual social networks extraction in the workshop, the distribution of attributes and attitudes to characters (actors) and the assignment of a certain categorical tags (labels) to speech interactions or other referrals (ties) will be done by annotators who process manually the set of sampled quotations (and possibly resorting to the context of the plot of the text). Nevertheless, in certain cases, one is able to apply the machine learning technique of sentiment analysis in order to obtain a signed social network, by evaluating the affective state of characters (actors) and the emotional effect of their speech or observational interactions or judgements (ties).

Keywords: machine learning, text analysis

The Analysis of Longitudinal Social Network Data using RSIENA

Tom Snijders¹, Christian Steglich^{* 1}

¹ Rijksuniversiteit Groningen, Department of Sociology, Groningen – Netherlands

This workshop is about statistical inference for longitudinal observations on social networks. Longitudinal social network data are understood here as two or more repeated observations of a directed graph on a given node set (usually between 30 and a few hundred nodes). The workshop teaches the statistical method to analyze such data, for which a tutorial is given in Snijders, T.A.B., Steglich, C.E.G., and van de Bunt, G.G. (2010), Introduction to actor-based models for network dynamics (Social Networks, 32, 44-60), and implemented in RSiena, a package of the statistical system R.

The statistical model is the actor-oriented model where the nodes are actors whose choices

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determine the network evolution. This allows to include various network effects (reciprocity, transitivity, popularity, etc.), effects of individual covariates (covariates connected to the sender, the receiver, or the similarity between sender and receiver), and of dyadic covariates. An important extension is to have, in addition to the network, one or more actor variables that evolve in mutual dependence with the network; an example is a friendship network of adolescents where drinking behavior is a relevant actor variable which influences, and is influenced by, the friendship network. This leads to models for the simultaneous dynamics ('co-evolution') of networks and behavior, which are a special option in RSiena. Further information about this method can be found at the SIENA website (see below).

The statistical analysis is based on many repeated Monte Carlo simulations of the network evolution model and therefore is a bit time-consuming. The workshop will demonstrate the basics of using RSiena. Attention will be paid to the underlying statistical methodology, to examples, and to the use of the software. The first part will focus on the intuitive understanding of the model and operation of the software. The second part will present models for the simultaneous dynamics of networks and behavior and other more advanced topics such as model specification, multivariate networks, structurally determined values, and goodness of fit checking.

Participants are requested to check the SIENA website (Courses-activities tab) in the week before the workshop to download the workshop materials. For optimal benefit, it is advisable to bring an own laptop with R and RSiena already installed, such that some steps of data manipulation and analysis can be followed hands-on. Participants for whom R is new are requested to learn the basics of R before the workshop: how to run R and how to give basic R commands. This is to reduce the amount of new material to digest at the workshop itself. The Siena website (RSiena tab) has some links which can be helpful for this purpose: it's not hard!

Prerequisites: general knowledge of social network analysis, and of statistical inference up to at least logistic regression analysis; some experience with R is advisable.

SIENA website: <http://www.stats.ox.ac.uk/~snijders/siena>

Keywords: network dynamics, longitudinal networks, selection and influence, Siena

Advanced RSiena users' workshop

Tom Snijders¹, Christian Steglich¹

¹ Rijksuniversiteit Groningen, Department of Sociology, Groningen – Netherlands

This workshop is intended for experienced users of RSiena, the package in the statistical software system R for analyzing longitudinal data of networks, and of networks and behavior. A number of new features of RSiena, and some possibilities that may be considered advanced options, will be discussed and demonstrated.

Some of the following topics will receive attention:

- Goodness of fit checking with `sienaGOF()`.
- Parameter interpretation; selection and influence tables.
- Multilevel analysis of network dynamics with `sienaBayes()`.
- Dynamics of two-mode networks.
- Dynamics of multiple (multivariate) networks.
- Dynamics of networks with ordered categorical tie values.
- The Settings model for dynamics of larger networks.
- Analyzing network and behavior for continuous behavior variables.
- Other recent developments – if any; e.g., newly implemented effects.

The choice between these topics will be made dependent also on interests of the participants.

Participants are invited to email the organizer (tom.snijders "at" nuffield.ox.ac.uk) in the period May 30 – June 3 to indicate differential preferences for these (or other!) topics, since it will be impossible to treat all of them in depth.

Participants are requested to check the SIENA website (Courses-activities tab) in the week before the workshop to download the workshop materials. Participants might consider bringing their own laptop with R and RSiena installed, and these materials available, such that some steps of the data analysis can be followed hands-on.

Prerequisites: experience with using RSiena.

SIENA website: <http://www.stats.ox.ac.uk/~snijders/siena>

Keywords: network dynamics, longitudinal networks, selection and influence, Siena

Mixed Methods Research in Social Networks (2)

Elisa Bellotti ¹, Betina Hollstein ²

¹ The University of Manchester – United Kingdom

² Universität Bremen – Germany

The workshop focuses on the use of mixed-methods research design when studying whole and ego-centered social networks. The workshop will be conducted in two parts. The first part introduces social network qualitative research and the principles of mixed methods research designs and its contributions to the study of social networks, pointing out advantages and challenges of this approach. Illustrations of the theoretical and methodological aspects are given by bringing examples from a variety of fields of research. The second part is devoted to the presentation of concrete procedures to apply mixed methods in network research both at the level of data collection and analysis. This part includes an introduction of different approaches to the data collections, ie: interviews, ethnographic methods, archival data, together with some graphical instruments. It then moves to the analysis of the quantitative and qualitative dimensions of network relationships and structures in a mixed method perspective

Keywords: qualitative methods, egonetwork, whole networks, qualitative interview, ethnographic methods

Plenary & special sessions

Ethnography and multilevel networks in the study of migration and transnationalism

Miranda Lubbers *¹, José Luis Molina¹

¹ egolab-GRAFO, Department of Social and Cultural Anthropology, Autonomous University of Barcelona – Spain

When we study the transnational livelihood strategies of immigrants in Spain, or the strategies of survival of the poor in Catalonia, we are faced with complex social realities of relatively unbounded groups that are difficult to capture in research.

In order to address such realities, we propose a framework that combines ethnography with multilevel network analysis of unbounded social groups. To conceptualize these social groups, or "social fields", we draw on the literature that induces larger network structures from more local, personal networks. The multilevel framework conceives the dynamic ties in these networks as part of a multilayered reality where institutions and organizations provide the basis for interaction, but where agency also plays a role for building (emergent) social structures, with their own dynamics and functionalities, sometimes beyond the knowledge of the actors, in order to overcome existing barriers and systems of exclusion. Ethnography on the other hand gives us a tool to explore in depth the meaning, functioning and dynamics of these social fields.

We contend that this framework provides a privileged perspective for exploring the dualities of society and culture, structure and agency, change and stability, and the different levels of observation, and therefore for formulating better informed answers to relevant social questions. Drawing on our former research experience we provide examples about how these interactions can be conceived and measured, and discuss our agenda of future enquiries.

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New Scalable Techniques and Tools to Visualize and Explore Static, Dynamic, and Multivariate Social Networks

Jean-Daniel Fekete *

INRIA/AVIZ – France

For decades, networks have been visualized using the node-link visual representation where vertices are visualized as points or small glyphs, and edges as lines between their endpoints. The overwhelming majority of network visualization tools use that representation, which arguably remains the most effective for communication purposes.

However, more than 10 years ago, multiple experiments have shown that, for exploratory purposes and dense networks, this representation is far less effective than the adjacency-matrix visual representation. These experiments have led to multiple alternative visual representations that are far less known by the social network analysis community; they include the standard adjacency-matrix visual representations, augmented matrices, hybrid node-link and matrix representations, Biofabric, and time-curves.

Through multiple examples, I will demonstrate why and how these novel visual representations for networks allow better exploration than the traditional node-link representation. I will present multiple case studies on the exploration of networks of various structures and sizes, such as genealogies (up to 10,000 individuals), large co-authorship networks, and recently time-evolving networks of growing sizes. I will present multiple examples of dynamic networks, exploration methods, and results from experiments regarding time-navigation in dynamic networks.

There are two main challenges to address for exploring large networks using the novel representations: the algorithmic problem of finding a suitable order for vertices so as to exhibit meaningful patterns in the visualization, and the social resistance to new visual representations. I will present an overview of solutions for the first issue, and leave the second open for discussion.

Authors meet critique

Ronald Breiger

E.Lazega & T.A.B. Snijders (eds), 2016, *Multilevel network analysis for the social sciences: Theory, methods and applications*, Springer

<http://www.springer.com/us/book/9783319245188?token=prtst0416p>

Selected presentations followed by Ronald Breiger's critique

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Authors: Filip Agneessens, Elisa Bellotti, Julien Brailly, Julia Brennecke, Josiane Chatellet, Noshir Contractor, Guido Conaldi, Guillaume Favre, James Hollway, Luigi Guadalupi, Johan Koskinen, Valentina Kuskova, Emmanuel Lazega, Alessandro Lomi, Petr Matous, Olaf Rank, Garry Robins, Tom A.B.Snijders, Mark Tranmer, Peng Wang, Stanley Wasserman, Paola Zappa, Mengxiao Zhu, Aleš Žibera.

This volume provides a description of multilevel analysis and social network analysis and the contributors show how they can be combined in developing theory, methods and empirical applications in the social sciences. The book maps out the development of multilevel reasoning and shows how it can explain behavior through two different ways of contextualizing it. First, by identifying levels of influence on behavior and different aggregations of actors and behavior, as well as complex interactions between context and behavior. Second, by identifying different levels as truly different systems of agency: such levels of agency can be examined separately and jointly since the link between them is affiliation of members of one level to collective actors at the superior level. It is by combining these approaches that this work offers new insights. The book presents new case studies and datasets that explore new avenues of theorizing and new applications of methodology for the study of organizational, managerial and market societies.

Socialization and social integration

Claire Bidart

LEST - UMR 7317, Aix-Marseille University – France

From June 15th to June 17th, Room S13 is dedicated to coworking. In this room, you will also find a posters exhibition by Claire Bidart. These posters present a qualitative longitudinal panel "Socialization and social integration", that focuses on the evolution of social networks at the beginning of adulthood.

Thematic sessions

Social Networks of Entrepreneurs: Causes, Variations and Consequences

Veronique Schutjens * ^{1,2}, Giacomo Solano † ³

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² Amsterdam Institute for Social Science Research, University of Amsterdam – Netherlands

³ School of Innovation Sciences, Eindhoven University of Technology – Netherlands

Over the last two decades, social networks received increasing attention in research on entrepreneurial activities. Studies indicated, for example, that the creation and success of firms are significantly affected by entrepreneurs' social networks. Access to relevant information, brokerage opportunities, financial support as well as social and emotional support are important for opportunity identification and opportunity seizing – the necessary ingredients of business success. Other studies revealed that small and medium-sized firms' practices are influenced by inter-firm and inter-entrepreneurial relations, albeit differently for strong and weak ties, and for local and more geographically dispersed contacts. Furthermore, it has been found that entrepreneurial networks and their effect on business success appear to vary substantially among different types of entrepreneurs (e.g., native/immigrant entrepreneurs; male/female entrepreneurs), types of firms (e.g. domestic/international businesses) and types of contexts (local, urban or regional contexts; market and institutional contexts). Although most research on the interface of social networks and entrepreneurship focused on inter-firm relationships, relatively little is known about a) how entrepreneurial networks vary, come about and change over time and b) the interrelation between personal, social, and professional supportive relationships of entrepreneurs and its effect on firm creation and success.

For the session, we welcome original and innovative contributions on the interface of social networks and entrepreneurial activities. Questions to be addressed may include, but are not limited to, the following:

- What are specific compositional and structural characteristics of entrepreneurial social networks and to what extent do these characteristics differ between types of entrepreneurs, firms, and contexts?
- How do the composition and structure of entrepreneurial social networks affect both the start-up and success of firms – and to what extent is this a recursive relationship?
- To what extent and how (and why) do social networks of entrepreneurs evolve over time, and does this affect entrepreneur's and firm's development?

Keywords: entrepreneurs, personal networks, small business

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From international to global networks? Investigating social dynamics of globalization

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Globalization processes nowadays involve most aspects of social life (economic, financial, scientific, media, public opinion and so on). However, many flows and interactions still remain internationally organized, which could be partially explained by the national character of available statistical data. Several workgroups, and notably the GAWC (Globalization and World Cities Research Network), tried to propose alternative scales of analysis but exhaustive data collection on a world scale often remains a challenge. The aim of this session is to propose concepts and methods able to overtake the inter-national scale and to highlight which phenomena can be studied on a world scale.

We expect three kinds of papers:

- reflections regarding network analysis concepts and methods available to allow global studies;
- empirical studies on networks on a global scale;
- papers questioning the visualisation of world relational data.

Abstracts should be proposed from January 19, 2016 until February 16, 2016 and not overtake 3 000 characters. Papers selection will be made by the organizers of the session and notification to authors send by March 16, 2016.

Keywords: globalization, world networks, visualization

Changes in Personal Networks: Causes, Differences, and Consequences

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Scholarly research confirms that personal relationships and the composition and structure of personal networks are far from static, both on the short run and over the longer course of people's lives. But we know comparatively little about: (a) the reasons for, or causes of these network changes, which may be found on multiple levels, including the individual level (e.g., life course transitions; strategic choices), the network level (e.g., structural network embeddedness), and the contextual level (meeting opportunities; institutional conditions; cross-national variations); (b) differences between social groups (e.g., young and old, ethnic groups and interethnic contacts, subcultures); and (c) the consequences of these network changes in terms of, e.g., the changes in the resources embedded in these networks that affect individual life chances.

For this session, I invite original contributions on these issues, which address theoretical perspectives, innovative methodological approaches/issues, and/or present empirical findings.

Keywords: personal networks, changes, causes, consequences, social resources

Typologies of personal networks

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Building typologies is a good way for examining and discussing relevant indicators of network qualities. It allows to analyze combinations of indicators rather than indicators used separately, thus to compare networks on multiple dimensions rather than reducing them to a single quality. It also allows a generalization grounded on empirical data.

Typologies are involved in a tension between complexity and simplicity. They must be sufficiently complex and account for enough characteristics for the social scientists not to stray too far from the social reality, which is itself complex; but, ideally, they should also be simple enough to be applicable to larger numbers of personal networks stemming from various surveys. Typologies may concern size, composition and structure of networks, but they often imply also sociological (or economical, historical, geographical or other) criteria for testing relevance and correlations. Having stable typologies of personal networks based on structural criteria (among others) becomes more and more interesting given the increasing amount of available data generated by online activities. It may allow to process automatical classifications. Different surveys and datasets, with different scales and from different disciplines may thus be involved in comparisons, cross-analysis and discussions about typologies.

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Keywords: personal networks, methodology, structure, typology, data analysis, data mining

Multilevel Network Perspectives in and around Organizations: Theory, Structure and Dynamics

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The multilevel nature of organizations creates a complex ecosystem where individuals, groups, units, practices, as well as other organizations are entangled. Such entanglement shapes organizations and more generally collective action in a dynamic way, and affects organizational outcomes at multiple levels. This session focuses on recent advances in modeling and understanding networks in and around organizations from a multilevel perspective. We welcome both theoretical as well as empirical contributions that address the various aspects and implications of the multilevel nature of networks. We are also interested in presentations of software development in this area.

Possible examples of networks include, but are not limited to the following: Corporate networks ; Communities of practice networks ; Entrepreneurial networks ; Innovation networks ; Collaboration networks ; Investments networks ; Online networks.

While a non-comprehensive list of perspectives is: Multilevel network analysis ; Multilevel analysis of networks; Dynamics of Multilevel networks; Diffusion processes in multilevel networks.

Keywords: multilevel networks, multilevel models

Social Networks from Interaction Events

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The network structure of human interaction is rapidly gaining prominence in social network analysis. Theoretical developments in relational sociology or in network exchange theory refocus on human interaction as the foundation of social relations. New data collection techniques, for example Big Data from communication and tracking devices, offer data on what people do and with whom they are doing it with an unprecedented time and spatial resolution. The traditional apparatus of social network analysis, focusing on relations as stable social ties, is not designed for relational events that last only for a very short time. This session is dedicated to the development of new theoretical concepts, models, and analytical techniques for analyzing social networks of interaction events. We welcome papers theorizing or testing the links between social relations and interaction, proposing or applying network models to event data, or exploring the possibilities and limits of collecting relational event data. Relevant research techniques include quantitative analyses of relational event dynamics (in event history models or regression analyses) as well as qualitative investigation of the negotiation of the meaning of relations and identities, drawing on discourse analytical approaches like conversation analysis and sociolinguistics.

Keywords: interaction, dynamics, time, events

Egocentric networks and social integration processes

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Integrative and disintegrative processes at both the societal and the individual level can be understood and empirically studied by egocentric network approach. In this session we invite papers that concentrate on methodological issues as well studies that actually use egocentric network data to explain social integration processes. The accepted and presented papers are also welcome for future submission for a thematic issue, Network and Integration processes in EJMh (European Journal of Mental Health) to be published in 2017.

Keywords: egocentric networks, integrative and disintegrative processes, theory

Political Networks

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Sponsored by the ECPR (European Consortium of Political Research) standing group on Political Networks

Chairs: Karin Ingold, University of Bern, karin.ingold@ipw.unibe.ch; Manuel Fischer, Swiss Federal Institute of Aquatic Science & Technology -Eawag, manuel.fischer@eawag.ch

Potential discussants (tbd): Philip Leifeld, Dimitris Christopoulos, Mark Lubell, Manuel Fischer, Karin Ingold, Mario Diani

Political network studies focus on structural and relational patterns related to different issues and elements of politics. Political processes at the individual, group, state or international level automatically involve many different (types of) actors. They all have some influence on outputs and outcomes, but the influence of their behavior and strategies is often the result of a complex process of interactions. A network perspective focuses on how individuals and organizations interact beyond formal and traditionally hierarchical political procedures. A network perspective on politics is therefore especially important. Such a perspective can include many different types of political actors (individuals, organizations and/or institutions), and network ties can consist of exchanges of resources, information, as well as of conflict, collaboration and communication that may occur both on- and offline. A network approach to politics is thus important as it allows political scientists to disentangle how political actors mobilize and exchange resources, how they coordinate actions, and how relational performance shape decision-making and outputs.

Questions involving network aspects in political science abound: How do actors in policy processes coordinate and influence policy-making within coalitions or in the role of policy brokers? How do actors in networks deal with uncertainties, and what are their strategies of gathering and dispersing information? How do different types of networks between actors and natural resources contribute to the management of natural resources in an integrated way? How does the perceived network environment and interdependence between issue sectors shape actors' strategic behavior? How do networks among individuals influence group dynamics such as mobilization within social movements? What is the effect of online communication on individuals' political preferences and behavior? Some of these questions have been discussed in the literature for some time, whereas others have rarely been examined systematically. Yet, re-examining older questions is crucial, given the rapid development of new methods in the field of network analysis, which could lead to new insights and questions.

The session welcomes both theoretical work and empirical applications of network theories and social network analysis to any question related to politics. It is open for scholars in public policy analysis, international relations, political sociology, political economy, and other domains of political sciences. A similar session at the 2014 EUSN conference in Barcelona was composed of three panels, containing presentations and discussions on highly diverse, interesting and qualitatively excellent work. The session was very well attended. Depending on paper submissions, we would think of the best way to organize the session into panels.

Keywords: political networks, policy networks, public policy, social movements, political science

Network Science and Agent-Based Models: What cooperation?

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Social life could not be conceived without social interactions. Concepts and techniques to describe the empirical patterns, and the temporal changes, of these interactions exist and now constitute a thriving research field, today often referred to as network science as opposed to traditional social network analysis (Brandes et al. 2013). Patterns of social interactions can also themselves be regarded as an emergent property of interacting actions and, on the other hand, they are likely to shape social dynamics at a higher level of aggregation. Advanced statistical models for network data attempt to grasp the complex dynamic interplay between actions and interactions, for example Exponential Random Graph Models (Lusher et al. 2013), Stochastic Actor-Oriented Models (Snijders et al. 2010), and relational events models (Butts 2008). They tend to reach their limit however when more fine-grained chains of events want to be modeled and macroscopic consequences of network dynamics are the focus of the investigation.

Computational agent-based models constitute an attractive alternative for these tasks. From within the network camp, some have argued for seeking more fine-grained, object-oriented modelling techniques (Hummon & Fararo 1995; Monge & Contractor 2003; Padgett & Powell 2012: ch. 1). Others have shown that, conceptually, some statistical models for network dynamics can be conceived in terms of agent-based models (Snijders & Steglich 2015). On the other hand, computational modelers frequently attempt to generate statistical features of observed social networks from the bottom-up (Pujol et al. 2005). Fruitful exchanges between network and AB modelers start to exist in the field of strategic networks (Buskens et al. 2014: 673-677). In addition, in many agent-based models, specifying network topologies is a crucial step of the analysis (Axtell 2001). Sources of tension also exist among the two approaches, in particular because a different emphasis is placed over statistical estimation and causal inference (Snijders & Steglich 2015). Although social network science and computational agent-based models promise to capture overlapping aspects of social life and obviously knowledge cumulativeness may gain from a synergy between the two approaches, dialogue is still limited and several unsolved issues remain. What are the specific limitations of the two families of approaches? How can they be combined in specific pieces of research? These are the questions this session has the ambition to address.

While we are open from a thematic point of view, submissions should engage with a confrontation between network science techniques and computational agent-based models. We seek papers built on a real exchange, possibly a mutual cooperation, between the two approaches. This could be at a foundational level, epistemologically and/or technically, or in terms of applications, showing for instance concrete examples of agent-based models empirically calibrated with real-world network data, or results from statistical network models generated through explicit, theoretically-oriented agent-based models.

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Keywords: network science, ERGM, stochastic actor oriented models, relational events models, network topologies, agent based models

Doing qualitative network analysis

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In the recent past, more and more network researchers have relied on qualitative approaches to social networks. The state-of-the-art, however, is somewhat biased: While there is ample discussion on qualitative network data collection there is much less discussion on analytical strategies of qualitative network data. Future developments in qualitative network analysis need to address this imbalance since, ultimately, advancements in social network research have always been advances in analytical rigor. The organized session "Doing Qualitative Network Analysis" contributes to this agenda. It invites contributions that engage in methods, methodology and theoretical prerequisites of qualitative network analysis. All papers should focus on the research process, i.e. on qualitative analysis as a research practice.

Amongst others, papers may focus on the following questions:

- What do the various strands of qualitative research (such as narrative inquiry or ethnography) offer for the analysis of social networks?
- How can network maps be analysed in a qualitative manner?
- What role do visualisations play in a qualitative analysis process? Are there specific qualitative approaches to the analysis of network visualisations?
- How can qualitative analysis software be integrated in the qualitative network research process?
- What methods are applied to analyse and code network data?
- How do methodical procedures relate to methodological and theoretical positions?

Keywords: qualitative methods, ethnography, ego network, theory, mixed methods, narrative, story/stories, network maps

The Inequality–Social Network Nexus

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This session investigates the inequality–social network nexus. Both the structure and dynamics of social relations in which individuals are embedded have been consistently shown to be crucial for the production and persistence of different forms of inequalities. For example, social networks have argued to be crucial in finding employment, housing, adapting to a new

environment, and securing better health conditions. In other words, knowing diverse people who has resources such as information, has advantages, while isolation and/or having a closed circle might cause redundancy, and thus, disadvantage. This session will provide a forum for presentation of ideas on how to investigate inequalities in social networks as well as to understand whether and how network structure for certain categories of persons yield inequalities. The contributions with innovative research designs and mixed-method approaches with SNA are welcome to address the questions of inequalities.

Keywords: inequalities

Historical and Archaeological Network Research

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Network analysis, be it inspired by sociology or physics, is making its way in historical and archaeological research on all periods and topics. Over the last decades, a substantial number of studies has shown that both network theories and network methods derived from other disciplines can be fruitfully applied to selected bodies of historical and archaeological data and go beyond the metaphorical use of network-related metaphors. However, most of this work has paid little attention to the specific challenges skills of historical and archaeological research, e.g. concerns with sources, missing data, data standardization, as well as the situation of networks in time and space.

In recent years, a burgeoning community of historians and archaeologists have taken on these challenges and begun to adapt and develop formal network techniques to address the substantive questions and challenges key to their disciplines. This has been made possible thanks to collaboration and interaction with scholars from other disciplines.

The aim of this session is to further develop this community by promoting contacts between the various disciplines that aim at making sense of past phenomena through methods derived from network analysis; and between the various geographic and language-based communities in Europe.

We welcome papers on any period, geographical area, and substantive topic, using any network research method. The authors may be historians, archaeologists, as well as scholars

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from other disciplines. To be eligible, the proposals should:

- Address and clearly formulate research questions concerning past phenomena.
- Critically address issues related to the sources/materials/construction of data used.
- Explain why it is substantively interesting to consider their topic in formal network terms (i.e. as ties between nodes), what the added value of such a view is, and what methodological choices it implies.

Paper which address questions related to time or space in networks are encouraged but not a requirement.

This call for papers is jointly issued by The Connected Past, Historical Network Research, and Res-Hist - but feel free to submit if you don't know any of these groups! It will be an opportunity to meet them.

The working language for the conference will be English, but the organizers will be happy to help those who do not feel confident with their English during the discussions. Please note that the oral presentation will be short (ca. 15 minutes, as there will be at least 4 papers per 2-hour time slot, and we want to keep some time for discussion). The papers are not intended to be published together. Feel free to present either work in progress, so as to receive useful suggestions, or work that has already been published, but not in English or not widely circulated: the EUSN will allow a wider audience to discover your research.

The proposals will be selected by: Tom Brughmans (University of Konstanz); Marten D'uring (CVCE, Luxembourg); Pierre Gervais (University Sorbonne Nouvelle Paris 3, Paris); Claire Lemerrier (CNRS, Sciences Po, Paris).

Keywords: history, archaeology, longitudinal networks, missing data, mixed methods

Personal networks and the development of individual vulnerability or strength in the life course

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In the last decade research on personal networks (or so called "ego-networks") has surged, with a focus on their impact on a variety of issues such as health and consumption, norm reinforcement and values, work and family lives. We propose a session on personal networks and the development of vulnerability in the life course in order to focus on situations where personal networks play a key role in either increasing individual vulnerability throughout the life course, or, quite differently, moderating the effect of adverse life events on individuals.

Vulnerability has been defined in various ways in the social sciences. In the perspective of this session, we refer vulnerability to personal situations where individuals lack reserves (financial, cultural, health, etc.) to meet social expectations associated with their roles and statuses. Personal strength, on the other hand, represents situations where individuals have enough personal resources to meet social expectations. We wish to better understand the role of personal networks for the accumulation or non-accumulation of such personal reserves.

Research offers various evidences that personal networks are closely interrelated with the development of vulnerability in individual life courses. Life transitions and life trajectories are enmeshed within webs of interpersonal relationships. Such enmeshment may have positive or negative consequences, as personal networks provide individuals with resources that help them to manage life transitions or to deal with non-normative events. Personal networks however not only provide social capital, but also in many instances limit individuals' life chances, by increasing stress, conflict and interference. We encourage submission of papers that focus on network processes that increase either resources or strain in life courses, with likely consequences for individual vulnerability.

Papers on the following issues are welcome:

- Composition of personal networks as factors of individual vulnerability or strength in the life course. The relational origin of personal vulnerability stems not only or mainly from the number of alters who belong to one's personal networks, but also from their statuses (family, occupations, gender, type of ties, etc.). We need to know more about the effect that the composition and the heterogeneity of personal networks has on individual vulnerability and strength.
- Relational structures of personal networks as factors of individual vulnerability or strength in the life course. The effects of density, centrality, reciprocity, transitivity, but also size of personal networks need to be better understood. Conflict structures as well as support structures of personal networks need to be better known.
- The impact of life events and transitions on personal networks. Such events, either normative or non-normative, often have consequences on personal networks, which may add up in trajectories of cumulated advantages/disadvantages. It is important that the role of personal networks in such cumulative processes be researched.
- Personal networks of individuals in high risk or ostracized social subgroups. The composition and relational structures of personal networks of individuals at the margins of society, truly disadvantaged, must be better identified. In a quantitative perspective, the resources and strains might be compared with those present in the mainstream population. In a case study perspective, the interpretation of network graphs in connection with life events and situations might constitute straightforward method for identifying potential risk factors for vulnerable individuals.

- Methodological developments for the study of personal networks in life course research. Collecting and analyzing personal network data is also challenging, particularly in a quantitative perspective when the multiple dimensions of composition and structural features that might intervene with regard to the processes of development of vulnerability and strength in the life course have to be considered.

Papers with a longitudinal design (several interview waves) are particularly encouraged, although research on specific life stages are also welcome. Quantitative research as well as case study research are of interest.

Keywords: personal networks, life course, vulnerability, social resources and social capital, conflict and stress

The role of social networks in the transition towards sustainable food systems

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Food systems are defined as "all processes involved in feeding a population" (Goodman, 1997). Beyond sanitary crises emphasized by the 'mad cow crisis' and its aftermath, food systems have been challenged during the last decade by a set of challenges in European countries: increasing economic competition, pressure on natural resources, responsibility of agriculture in climate change as well as new requirements addressed by social movements in consumption and by the new generation of farmers claim for systemic changes in production, processing and distribution models towards more sustainable practices (Esnouf et al., 2012). Questioned by sustainability (Barbier, 2010), renewed by 'alternative food networks' (Renting et al. 2003), challenged by technological advances but also controversies (Vanloqueren, Baret, 2009), European agricultures appear as exemplary cases to question the emergent processes of responsible innovation, from models of open innovation taking care of users' requirements and skills (Joly et al., 2013), to other approaches addressing 'social innovation' (Moulaert et al., 2013).

Highlighted in the diffusion of technological innovations in agriculture modernisation during and after the 2nd World War (Ryan, Gross, 1943; Mendras, 1967), the role of social networks remains little investigated in the late evolutions of this sector. Beyond few works showing how professional networks specific morphologies and dynamics favour learning processes around localized technical changes in the French case (Compagnone, Hellec, 2015), social networks in this sector are often put forward, in the literature on 'alternative/local food networks' especially, but

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rarely deepened concretely (Chiffolleau, 2009), as it has been the case in industry, service and business (Håkansson, Johanson, 1993). Both quantitative and qualitative approaches of social networks are needed to better understand conditions and effects of changes and innovations towards sustainable food systems, from emergence to diffusion, as well as to support the dynamics of change. Addressing the dynamics of food systems with a social network perspective, this session is open to all disciplines. Welcome are papers that target these issues with qualitative or quantitative approach. Qualitative proposals have to go beyond incantations to networks and quantitative approaches have to be grounded by empirical work and field knowledge.

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Keywords: food systems, innovation, sustainability, quantitative analysis, qualitative analysis

Network Analysis in Humanities

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Network analysis has provided scholars of different disciplines with new ways to analyse and present their data. Social network analysis (SNA) has established itself in social sciences, however, its advances into the humanities have started only in the very recent years. In case of historical or archival data the methods enable to reveal the communication networks that have long since become inaccessible. The prevalence of social media or the Internet per se in the contemporary world has literally made it visible how networks emerge from interconnections among individuals. It has also intensified the awareness of how social structures are formed, maintained and and restructured. In addition to the social networks (i.e. the communication networks between fictive or real human beings) the network analysis methods are growingly used for any kind of data representable as networks i.e. the data where the items and relationships between them are to be detected and quantified, e.g. word networks based on the collocations of the words showing the most central words in a literary work, or networks of different texts based on the similarity rates of word frequencies (stylometry) for authorship attribution of texts or the peculiarities of a distinct group of texts.

There is an increasing interest from all disciplines towards network analysis, and this growth is suitably supported by advances in technology. Side by side with other more conventional fields where network analysis has already been used for decades, humanities has risen as the new potential user of SNA. The tools made available to researchers in the humanities are becoming more numerous, with programmes like Gephi or NetMiner becoming household names. Vast amounts of data in cultural archives and elsewhere is waiting to be analysed via the methods SNA has to offer. The aim of the proposed session is to offer a discussion forum for humanities scholars using network analysis as one of their research methods.

Keywords: humanities

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Modeling Network Dynamics

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This session will be open to methodological as well as applied presentations about models for network dynamics. Papers can have a mathematical, statistical, theoretical, or empirical subject-matter focus, as long as they are relevant for empirical social science.

Keywords: network dynamics, longitudinal networks, Siena, LERGM, TERGM

Social Influence

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Social networks are important for many kinds of social influence. This session will be open to methodological, theoretical, and empirical studies of influence in social networks. Papers can be mathematical, statistical, theoretical, and/or empirical in their focus, as long as they have a relevance for empirical social science.

Keywords: social influence, contagion, diffusion, selection and influence, co-evolution, socialization, Siena

Social networks, globalization and economic geography

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With all its increased mobility of capital, goods and labor, modern globalization has failed to produce a placeless market economy. Contrary to expectations, local differences between regional economies have more radically emerged creating uneven economic landscapes and increasing varieties of market systems. Regions and localities increasingly compete to attract and hold down resources through innovation, while civil society straggles to fill in the gaps of shrinking national regulating systems. Social and economic networks plays a key role in shaping these local pathways to development. Although social network analysis does offer valuable research techniques to capture and explore regional and global shifts in the spatial economy, there has been only limited cross-fertilization between the fields of network research and economic geography. This session aims to explore and promote the multiple intersections between the connectivity of networks on the one hand and the geographical relations in the economy on the other. Among other potential topics, we particularly invite:

1. Methods and empirical applications to examine the interactions among individual actors, within and between organizations across space, and in global structures within the context of globalization.
2. Empirical illustrations of key concepts in economic geography such as path dependence, local clusters, knowledge spillovers, global city networks, peripheral regions, economic landscapes and global production networks to name but a few.
3. Methods and application to examine the new role and dynamics of social movements in the process of recent globalization.
4. Relational theories and concepts on market systems, local production and innovation networks, and global value chains etc.

Keywords: economic geography, regional cluster, value chain, interorganizational relations, globalization

Large networks

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Very large networks may come from digital databases (online interactions, phone calls records, co-authorship, large affiliation networks, sensor-based co-presence, etc.). Their study

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needs special dedicated methods which change the way network analysis is done. Mainly after 2000, works coming from computer science, physics and applied maths have brought many (sometimes genuinely) new insights on well known questions, but with a focus on the development of new methods and algorithms to handle very large networks.

This session will welcome presentations of new methods as well as field work on large networks.

Keywords: large networks, complex networks, algorithms, big data

Session 1: Social Networks of Entrepreneurs: Causes, Variations and Consequences

The characteristics of the networks of immigrant businesses in terms of economic innovation: Selected Italian case of analysis

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This article refers to the context and individual conditions of entrepreneurs in Brescia, Italy as a case of economic innovation in immigrant businesses. I focus on the introduction of products or services and the use of new marketing strategies. Such innovative practices appear when several conditions are met, among them: a conducive context, a flow of information and a flow of resources (Ramella, 2015). The first one is covered by a description of the institutions and context, such as access to social benefits and legal status of entrepreneurs. The rest are understood from the analysis of the social connections beyond the economic transactions of immigrant business.

The study of immigrant entrepreneurs has mostly focused on the satisfaction of the ethnic market and the support from the community. On top of that, I emphasize in the interaction with the local actors –immigrants or natives- within particular sectors of the economy. Structural holes can be joined by those interactions (Aldrich, 2005; Burt, 2000) and those actors with bridging positions show a higher potential for innovation (Hunt, 2011). Furthermore, immigrants are facing social, economic and political macro-determinants in a similar way to natives (Rath and Swagerman, 2015). Reactions to that environment can be caused, among others, by educational and professional experience, access to information and funding for entrepreneurial ideas and by different composition of social network.

For this study, the networks of immigrants businesses are expressed in two levels: the owner(s) and the business' connections. The methodology currently used for the collection of empirical data is ego-network rosters plus in-depth qualitative interviews. For the first level, social and cultural networks of individual owners of business are collected. For the second level, the ego is each business and the connections concentrate in economic relations of the businesses, searching for replication or innovation in their products, services or marketing strategies. The measures for analysis are: density of ego-networks; repetition of alters (in/out degree); homophily among ego and alters; and, network location nearby bridges or brokers (betweenness and closeness).

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Keywords: immigrant entrepreneurship, economic innovation, ego network analysis

The structure and evolution of academic articles related to social networks and relationships between network actors in the field of entrepreneurship

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Different studies highlight the importance of social networks throughout the entrepreneurial journey. Consequently, in the last twenty years the number of studies conducted in this subfield increased steadily. The present paper studies abstracts of articles published in academic journals (impact factor 1.6 and higher) dealing with research on social networks and network actors in the field of entrepreneurship. The purpose of the paper is to provide an analysis of the structure and evolution of the particular research subfield of entrepreneurship. In order to do that, two methods are applied: namely coding and bibliometrics. In total 768 abstracts are coded according to classifications of entrepreneurship (entrepreneurship in general, corporate and individual entrepreneurship) and network types and actors. The abstracts are allocated across one or more keywords to represent the interrelationships within the subfield. The results of the coding are presented with descriptive statistics by describing the dominant journals and most contributing authors. The results of the bibliometric analysis describe the most influential articles and authors in this field. In conclusion, the paper discusses possibilities of directions for future research.

Keywords: entrepreneurship, network actors, bibliometrics

Changing for the better? Exploring the relationship between entrepreneurial network change and changes in firm performance.

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It has become increasingly recognised that the social networks in which firms are active should also be taken into account in studies focused on firm competitiveness. Through their network contacts entrepreneurs can gain resources they lack and this can be particularly important for small- and medium-sized firms, as these firms often experience a lack of firm resources due to their small firm size (Cooke, 2007). In this paper we focus on a particular type of small-sized entrepreneurial activity, namely firms located in residential neighbourhoods in the Netherlands.

Several studies have found a positive relationship between a firm's network and firm performance (Stam et al. 2014). But much less is known regarding the direction of this relationship and with this paper we hope to take a small step towards solving this question. Several authors have called for additional longitudinal research on the relationship between firm networks and firm performance, as many studies primarily build on cross-sectional data and therefore cannot control for reversed causality issues (Stam et al. 2014). Our paper adds to the existing literature, as we adopt a dynamic perspective with which we try to give additional insights into the relationship between changes in network size and changes in firm performance.

Panel data from two waves of the Survey on the Social Networks of Entrepreneurs (in 2008 and 2013) are used. The panel consists of 180 entrepreneurs for whom we have information in both years on their social networks and firm performance. Network size is defined as network contacts either offering support on business issues or being firms with whom an entrepreneur cooperates on a regular basis. Firm performance is measured using firm turnover (i.e. sales) figures.

In the analyses both multilevel- and fixed effects models are used, with both types of models giving similar results. The results show that firm performance is positively influenced by the size of the entrepreneurial network as well as by a number of other variables. Network size on the other hand is influenced only by firm performance. Although adding a piece to the puzzle, our outcomes still leave us with many unsolved issues for future research regarding the relationship between firm networks and firm performance.

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Keywords: entrepreneurship, firm performance, entrepreneurial networks, longitudinal analysis

Social networks and types of social capital in developing countries: The case of Ugandan entrepreneurs

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Classical network theory states that a social network is a form of capital because it provides access to resources. However, some authors have also highlighted that social networks does not automatically entail (positive) social capital. In contrast, they can have also a dark side, since they entail a series of obligations, exchanges and reciprocal favours that may not be beneficial to business. In other words, the contacts that entrepreneurs have might require more resources than the ones they provide (negative social capital). Despite this, previous research did not generally analyse this topic concerning developing countries.

Based on a survey (N=608) recently carried out on Ugandan entrepreneurs, this presentation aims to contribute to the emerging field of entrepreneurship and social networks in developing countries. In particular, we analyse the effect of social networks addressing both positive (resources provided) and negative (resources requested) social capital.

Since previous literature has stressed that social networks have different effects based on the environment where relations take place (e.g., rural or urban context) and the kind of person who have access to resources through social networks (e.g. migrants or natives), we also compare the effect of social networks regarding different types of people, such as: people living in an urban context and the ones living in a rural area; migrants (namely, people who moved from a rural to an urban area within Uganda).

Keywords: social capital, entrepreneurship, developing countries

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The evolution of Japanese business networks overseas since the 1960s

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The aim of our study is to assess to what extent Japanese business networks overseas replicated structures existing in Japan and evolved in the same manner during the last five decades. Our study relies on micro-data obtained from the Toyo Keizai (TKZ) annual survey for analyzing the characteristics and evolution of network structures among Japanese manufacturing overseas subsidiaries established since the 1960s. The coverage is global and includes all the recipient countries of Japanese foreign direct investment. The TKZ database reports micro-data for several thousands Japanese overseas subsidiaries, either wholly owned companies or joint ventures with local partners. Available information enables identifying Japanese and non-Japanese investors, and the shares owned by each firm. The motivation for comparing Japanese networks in Japan and the rest of the world is related to one of the most hotly disputed issues in postwar Japan business history, namely the strength of postwar linkages between companies that belonged to one of the prewar conglomerates owned by kinship networks (i.e. zaibatsu such as Mitsui, Mitsubishi, Sumitomo, and Yasuda, dissolved in 1946 upon request of the U.S. occupation authorities). The major part of the academic community in the fields of management and industrial organization considers that the links between former zaibatsu companies remain strong in Japan during the postwar period and can be identified through information on main-bank, cross-ownership, and transactions (e.g. Gerlach 1992; Aoki and Saxonhouse 2000). This stream of literature also argues that the reconstitution of zaibatsu as so-called "horizontal keiretsu" (literally, keiretsu means "economic line-ups") in the 1950s and their persistence in the following decades relied on strong non-kinship interpersonal relationships among managers of the companies. Miwa and Ramseyer (Miwa and Ramseyer 2002; Ramseyer 2006) challenge this claim that they describe as an ideological construct devised by Japanese Marxists in the 1950s, later adopted by the Dodwell, a marketing company, and finally by non-Marxist scholars. They argue that the empirical evidence supporting the keiretsu hypothesis is weak. Our study tests the keiretsu hypothesis globally.

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Keywords: Japanese overseas subsidiaries, keiretsu

Social capital of female entrepreneurs - Different from men's?

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Entrepreneurship and being self-employed often go together with flexible working hours and having the working place close to the home. These are conditions, which can be assumed to be attractive for women, in particular when they need to combine work and family life. However, still, men are considerably more likely to be self-employed than women. In this paper we inquire into the differences between male and female self-employed entrepreneurs in the Netherlands. We look at their motivation to start the firm, their professional networks, the surrounding neighbourhood as well as the type of business they have established. In particular, two opposing arguments are explored. First, as in all domains of society, women can be expected to work in lower ranked firms, have more family oriented networks as well as work fewer hours. This argument implies that female entrepreneurs in a lower position compared to men as women in general are in society. Second, we employ the argument that when it comes to entrepreneurship, women actually do men's work: they establish their business, take risks, and hire personnel. Therefore men's and women's position, networks, motivation etc. are not expected to be different. Rich data from panel survey in 2008 and 2014 among entrepreneurs in the Netherlands are used to study these arguments. Results show that men and women differ in the number of contacts to weaker ties. In addition, while women's businesses benefit from a neighbourhood's social cohesion, male entrepreneurs benefit from access to many diverse positions they can access in their neighbourhood.

Keywords: female entrepreneurs, position generator networks, social capital

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Session 2: Typologies of personal networks

Accounting for the quantified quality of researchers by looking at their personal co-authorship networks

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This presentation reports a study that was conducted to determine whether the quantified quality of academic researchers (measured through the use of Hirsch index scores, citation and publication metrics) could be accounted for by the personal networks in which they are embedded in.

The personal co-authorship networks of 493 university researchers, from three academic communities in the field of social sciences (Romania, n=294; Slovenia, n=109 and Poland, n=90) were explored and analyzed. Attribute and relational data concerning the focal nodes and their corresponding alters were collected from electronic scientific platforms.

The analysis employed two stages. At the first, a regression model with several structural and compositional predictors was fit to the data. At the second, collections of different personal co-authorship networks and standardized images were built through the clustered graph visualization technique.

The preliminary results indicate the presence of homophily effects at the level of the personal co-authorship networks (i.e. alters' research profiles have a positive effect on egos' quantified research quality). Also, the individual and aggregated clustered graph visualizations provide evidence for distinct patterning in case of individuals with similar research performance. Building on this observation, different typologies of personal co-authorship networks are advanced for future analysis.

Keywords: personal networks, clustered graphs, research metrics, standardized visualizations

Characterizing personal networks: An empirical and structural approach for building a typology

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One can compute a large number of structural indicators on a network. But these indicators are generally used separately, comparing networks with emphasis on a single dimension. Our aim is rather to provide a systematic comparison of personal networks articulating different perspectives while giving a synthetic view of their structures.

We built a structural typology by seeking combinations of criteria which allow to sort personal networks. Some of these indicators have a fairly intuitive meaning, others are more technical, but in any case those of concern have a sociological implication. We rely on a longitudinal survey of personal networks of young French people. We are using this empirical investigation to elaborate a typology of personal network structures. We present our own progression that has aimed to strip down our technique in order to bring out the fundamental characteristic traits we retain for constructing an inductive typology.

The idea was to start from visual recognition (the network looks like this, differs from that) to establish an initial classification that was entirely empirical. This first intuitive classification led us to adopt six types. Then we defined a limited number of indicators ensuring the best way to arrive at this empirical typology. We reconstructed the typology in the form of a decision tree, which would automate the classification and reach a broader scope of the method. We looked at the distribution of the variable values in different types. We then tested the correlations between these types and two sociological variables (level of education and residential status).

One of our objectives is thus to see if our approach can be reproducible and if our typology can characterize personal networks in general. Only replication on other surveys will provide answers.

Keywords: personal networks, typology, methodology, structural analysis

*Speaker

A typology of personal networks for explaining perceived health status: The case of older adults in Midi-Pyrénées Region, France

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Objectives. The aim of the present paper is to contribute to the discussion on the role of the personal network attributes in the perceived health status of aged population. Both the empirical and methodological questions are being addressed here. While a number of scholars have stressed the importance of social relationships on self-perceived health (and on different health outcomes), most of them have tested explanatory models introducing a number of relational variables separately. With our study we intend to demonstrate that more precision can be gained by bringing in the analysis a typology constructed by combining various network properties.

Data. In this work, we analyzed a survey data of over 60 years old population of the Midi-Pyrénées region (France) collected in 2014. Our representative sample of 470 individuals is focused on ordinary households (population placed in institutions was not considered in our study). The survey consisted of two parts: the first one inquired about several topics including life course trajectories, living conditions and residential mobility, health status and behaviour, sport and culture activities, institutional support, etc. The second one collected information on personal networks using seven name generators through which 6823 alters were obtained.

Method and analysis. A simple typology was developed on the basis of two network composition variables: network size and proportion of the family members in the network. The personal networks in this way were classified into four network profiles (small family-oriented network, small community-oriented network, larger family-oriented network and larger community-oriented network). Then, the typology was related to several socio-demographic and other network characteristics that allowed us to delve into full description and understanding of each type of the network. In order to answer our research question, we constructed different logistic regression models and compared the effect estimates (ORs) and the goodness-of-fit measures (R^2) for perceived health status.

Conclusion. Based on the results of the analyses we can conclude that the personal networks mediate the relationship between individual factors (gender, civil status, income, educational attainment and place of residence) and perceived health status of aged population. Moreover, inclusion of the network typology into the model afforded a more nuanced representation of the

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influence of social ties on perceived health status than running the same model with separate network variables.

Keywords: network typology, perceived health status, elderly population, France

A typology of personal networks of Spanish young adults in Toulouse (France)

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Objectives. The aim of this communication is to contribute to the discussion on the characterization of the structure and composition of personal networks of people having experienced a mobility process. By constructing a typology of personal networks we intend to explore the adaption process in the current intra-European migration context. This process is influenced by the migration project and relational chains present at the arrival and the residence time in the destination place. These relationships persist or become transformed at the post-migratory stage in various areas of sociability and social support, contributing to the construction of personal transnational networks, and are influenced by the social position of individuals (level of education, occupation, gender, age, marital status and family situation).

Data. Snowball in an unrepresentative sample of 57 Spaniards in Toulouse, with an average age of 32 years, men and women with or without children, with different level of studies and working in different sectors of occupation. Biographical interviews were accompanied by the personal networks questionnaire (54 from the whole sample). Data collected from 2012 until 2014, relate to characteristics of the interviewees: 7 - 34 alters (personal network delineation), network composition, network structure.

Method and analysis. The typology was built on the basis of qualitative criteria and the typology was based on the structural variables of personal networks (betweenness, modularity, density, diameter, giant component N nodes, N isolated components). We used different descriptive and analytical tools to assess the characteristics of the networks, and we get a first proposal typology which may be slightly modified by new analysis, enabling greater stability to the model. Five profiles were the most significant and interpretable: very small network and isolated components, small network and 2-3 isolated components, medium-sized network based on two or multiple connected components, medium or big sized central network, medium or big sized central or chained network.

Conclusion. We show that there are five types of personal networks. Although we have also considered the biographical characteristics of the studied people. The network profiles give

valuable information about adaptation to a host country. We conclude that the residence time in the destination contributes moderately to generate differences in patterns of adaptation. We see that the number of alters resident in the country of origin are higher in any network, especially in networks of people who are in Toulouse for less time. We detect differences when profiles are controlled for background characteristics (employment status or education level). The measures of network structure indicate a moderate variability, especially in reference to the density and modularity.

Keywords: personal networks, international migration, transnationalism, youth work

Applying a structural typology on a large dataset of inline personal networks

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The study of ego networks represents a wide field of researches [1] applied by the social sciences, among others, to study both classic and online sociability networks [2]. From 1995 to 2004, Claire Bidart, Alain Degenne and Michel Grossetti worked on a long-time survey [3]. During the process, they build 287 networks to help them following the dynamic evolution of young people's sociability. These networks are quite small since they have an average of 23 nodes. With that material, they constitute an ego networks typology only based on a few structural indicators : betweenness centrality's repartition among the nodes, clustering coefficient, modularity, diameter and density.

Here, we applied this categorization on a second dataset which is from the Algopol project [4]. Algopol is focused on online sociability through the uses of Facebook. The deployment of a Facebook application between 2013 and 2015 enabled 15.000 users to share their Facebook friends, statuses and more with the researchers and we also amassed some socio-demographic indicators. All of this has permit to collect friendship and conversational networks which have up to 5.000 nodes for the largest ones.

The aim is to see how much the categorization is efficient for a dataset made of a different kind of networks than the first study's ones and thus we will present the results from the categorization of Facebook friendship/conversational networks. After applying it to the networks, among the complete collection we have from the 15.000 egos, with size similar to the previous ones, we explore the ways to adapt the classification to larger networks. We also cross-analyze these results with the socio-demographic indicators that we have been provided with.

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Keywords: typology, large dataset, structure, online social networks, personal networks

Complex measurement of tie-strength using the contact diary method

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The paper analyses one of the most important indicators of ego-centric network qualities: the strength of ties. The precise exploration of it is essential to understand the structure and the functioning of egocentric networks. The paper presents a promising method and measurement for the strength of ties.

To understand important network features, researchers have used various generators and other proxies to obtain a subset of actors and ties later used in their analyses. Although most generators are sufficient to collect information about egos and the alters, about the ties between them, as well as about the resources and social supports embedded in ego's network, they share a common defect in their inability to measure the whole spectrum of ties of different strengths.

Contact diary is an alternative way to explore ego-centric networks. This method allows researchers to reconstruct the components of networks that are active in everyday life by requiring respondents to track and record all their interpersonal contacts in a given period. (Fu 2007; Huszti et al. 2013) To date, researches utilizing this method were limited to small and special sampling designs. In 2015 our research team had the exceptional opportunity, to our best knowledge in sociology for the first time, to apply the contact diary method on a national representative sample.

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One of our main goals was to measure the continuum between weak and strong ties. Therefore, we constructed a Strength of Ties (SoT) index. Improving our previously used measurement (Dávid et. al. 2016), we expanded the dimensions defined earlier. We specified the four dimensions of tie strength according to Granovetter (1973), namely the amount of time spent together, the emotional intensity and the intimacy of the relationship, as well as the reciprocal services offered to each other.

In the papers, on the one hand, we present the methodology of constructing such composite measure as the SoT index using the dimensions mentioned above. On the other hand, we describe the Hungarian society according to the separate indicators, as well as to the complex Strength of Ties (SoT) index.

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Keywords: contact diary method, ego centric networks, strength of ties, Hungary

Changes in personal networks: Life events, new spheres and social inequality

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Peru has undergone a sustained economic growth last ten years. Yet educational inequalities at the higher education level persist. Against this backdrop, using longitudinal network qualitative data (N=100) collected in three waves (2011, 2013 and 2014), this research investigates how and why students' personal networks change over time. Also, this project studies the consequences this phenomenon has for educational inequality at the college level. My key hypothesis is that new life events (for instance, finishing high school) lead the actor to encounter new

spheres (for example, college as organization), which in turn opens the door for having access to new connections (friendship ties) from different social class backgrounds, which in turn, may reduce and/or amplify social inequality between low-income and middle class Peruvian college students. For example, in Latin America the extended family can provide an array of informational, emotional and material resources to its members, which can attenuate educational inequality in the transition from high school to college. However, at the same time middle-class parents can provide crucial "brokering" (for instance, information and access to connections in higher education) to their children. And this mechanism may amplify educational inequalities vis-à-vis low-income college students.

Keywords: longitudinal personal networks, social inequality, life events, institutions, higher education

Transitions and third-place

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Third-places, as collaborative spaces to experiment personal projects, are increasing in France since the 2010s (Burret, 2015). We propose, in this communication, to focus on actors' personal network that frequent those places. Our methodology is based on qualitative interviews around project narratives. By making use of name generators during the interview, we can identify people with whom they worked during the project. This approach allows very different profiles' comparison, often involved within a professional bifurcation process. The typology of personal networks can in this way qualify the process at work. A first wave of interviews took place in autumn 2014 and a second wave is in progress. The first results will be presented here.

Keywords: third place, bifurcation, personal network

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How artists mobilize their contacts for success: The case study of Barcelona

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We propose a social network analysis of the personal networks of a community of contemporary artists in Barcelona. Three analytical questions put together the attributes of our sample with the structure and composition of the networks. First, how do attributes such as age, gender, socio-economic status and educational level factor in as a relevant in the composition of the artists networks? How can we describe them in terms of strong/weak ties and homophily? And third, how can the measures of density, centrality and cliques contribute to the understanding of the artists' trajectories? Our objective is to collect and analyze the artists' personal networks and explain how they mobilized their relationships to move forward in their professional career. We claim that the shape and structure of the artists' networks, and more specifically, the patterns of mobilization of contacts and their compositional features, intensifies the inequalities that come with social structure. We know from the literature that two processes link networks to inequality: Access to social capital via family and friends (Bourdieu, 1998; Savage et al, 2014; Bradley, 2014) and the mobilization of weak contacts at work (Lin, 1999). Higher economic and cultural capital comes with more efficient use of the network (Duncan, 2005, Chauvac, 2013, Portes, 2013). Moreover, a double bet within the artistic community (Moulin, 1967) makes trust, the base of social capital, a conflictive element in the mobilization of contacts. In addition, promotion and other labor trajectories are defined by glass ceilings and sticky floors. Our case study included 21 interviews to the artists of the community EART in Barcelona from September- November 2014. This is part of a larger international project that aims at comparing longitudinally the boundaries and behavior of five European communities of artists (St Petersburg, Madrid, Barcelona, London and Hamburg). Our mixed methods approach included, as part of an ethnography, asking artists to reconstruct their trajectories with EGONET. We found evidence of the existence of differences within the trajectories and networks of the contemporary artist despite clear homophily: the artists had an homogeneous class background with few variations: middle class & middlebrow cultural capital (70% of artists have a university degree). Still, there were differences in the composition of Ego networks and also in the mobilization of contacts in and out the community. While cultural capital defines a common trajectory in the social space for artists, what seems to make a difference in terms of centrality is an intermediary figure that is an expert in the art field. Finally, the composition of personal networks in terms of gender and community points towards two typologies of mobilization: that of investing in weak ties from work within the art community for female artists, and that of mobilizing strong contacts among male artists.

Keywords: personal networks, artistic trajectories, egonet, inequalities, intermediation, homophily

**Session 3: From international to
global networks? Investigating social
dynamics of globalization**

Connecting global cities by maritime network: An empirical study (1890 - 2010)

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Global cities are still in many ways maritime cities (Dogan, 1988) or locate near seaports or sea-river ports (Vance, 1970). Port cities have also been vital centers of successive world systems throughout history (Braudel, 1979), from Tyr and Sidon in the Phoenician world to New York and Shanghai nowadays.

This communication aims to apply for the first time network analytical methods to maritime flows connecting cities of the world, over the long term (1890-2010). More likely were analyses of interurban connectivity through telecommunications, roads, highways, railways, which was extended later in the 1990s and after to airlines, multinational firms' linkages, and the world-wide web. A global matrix of interurban vessel flows was elaborated for about 5,000 ports, 400,000 inter-port calls and 5,000 cities using data from the Geopolis, Populstats, World Gazetteer and Lloyd's Shipping Index databases and the rigorous assignment of ports to both coastal and inland urban areas.

Preliminary results show that despite the observed decrease in the correlation between maritime flows and the urban hierarchy (10% loss between 1950 and 1990), the largest cities remain dominant in the network. These large cities (over 630) catch nearly 70% and 60% of worldwide flows and population, respectively. This dominance is also reflected in their higher network centrality, traffic share, and average (kilometric) length of flow linkages. Mapping largest maritime flows among world cities helps discovering hidden groups based on geographic or other proximities, with a shift over time from a core-periphery to a more polycentric pattern. A typology of cities is also provided based on the evolution of their relative concentration index of population and traffic.

This research thus contributes to question the ineluctable separation between ports and cities which dominated the literature, while offering new empirical evidence about the structure and dynamics of city-systems and spatial networks in general. All in all, this long-term historical perspective is a new empirical and methodological contribution to the theoretical debates on the intermingled evolution of cities, flows, networks, regionalisation, and globalisation.

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Keywords: city systems, maritime networks, globalization

Beyond Ricardo: The structural patterns of international trade networks

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Following Ricardo's theory of comparative advantage it has frequently been suggested that any two countries will engage in bilateral international trade even when one of the partners is more efficient in producing every single good than the other. While comparative cost advantages may explain the emergence of dyadic trade relationships between pairs of countries, the theory fails to offer an explanation for the structure of the entire trade system as being represented by the collectivity of all trade relationships between countries. Based on network theory it can be argued that the individual trade relationships do not emerge independently from each other. Instead, it is legitimate to assume that a specific trade relationship between any two countries i and j will potentially depend on all other trade relationships the two partners possess. It has been previously shown that tie interdependence is likely to result in structural patterns characterizing the network. Because some of these patterns can be observed more or less frequently than one would expect in a random network, the collectivity of structural patterns can be referred to as a network's structural logic. In this paper, I examine the structural logic of the global trade network in 2014. Applying a class of exponential random graph models (ERGMs) I investigate to what extent interdependencies between individual trade relationships result in the emergence of stable trade patterns that characterize the network. The results reveal a number of interesting findings: (1) The trade network is characterized by strong tendencies for mutual trade (reciprocity), in which in line with Ricardo's argument two countries mutually export goods to the partner. (2) There are strong tendencies for both in- and outward centralization suggesting that there are countries that export goods to several partners while others import from multiple partners. (3) Tendencies for transitivity and simultaneously against structural paths emphasize the local aspect of international trade thereby reflecting the increasing importance of regional trading blocks at this time.

*Speaker

Keywords: international trade, ERGM, network patterns

Networks of scientific cooperation between cities: A multiscalar analysis

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The scientific enterprise is viewed as globalized but little research has been done to track the world geography of scientific activities. In particular, the growth of scientific collaborations is perceived as one of the main feature of science globalization. From the 1970s, bibliometric data retrieved from the Science Citation Index (SCI) are used to measure this growth. Usually those data are only processed at the country level which does not allow to quantify the share of interurban collaborations. Other research only rely on limited perimeters : the top cited cities or European cities. The spatial scientometrics method developed in Toulouse University aims at filling this void in the literature. Using this method, we have been able to process all the publications data retrieved in the SCI from 1999 to 2008 at the urban area level. After a short presentation of the geocoding and the counting method, I will focus on the world network of interurban collaboration. In the first part of my talk, I will show that the growth of international collaborations is part of the overall growth of inter and intra-city collaborations, whether or not they are in the same country. I will notably explain why for most countries, and particularly for emerging countries, this growth is even more pronounced within countries than between them. Then, I will focus on preferential channels of collaboration showing that scientists tend to seek partners, first, in their own countries, second, in the macro-regional area they belong to. In particular, I will show how Community Detection algorithms have been used to identify those perimeters and characterize them.

Keywords: community detection, internationalization, macro regions, scientific collaborations, spatial scientometrics

From bilateral to multilateral economic treaties (1957-2014)? A network analysis

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Since the 80's, financial flows have considerably grown; a major part of those being captured by Foreign Direct Investments (FDI). The globalization process promotes a liberalization of FDI that reduces barriers for multinationals companies and investors to operate overseas (UNCTAD, 1999). International Investment Agreements (IIA) have been concluded at an exponential pace in order to enhance FDI. They aim to protect and promote investments between two (Bilateral Investment Treaties - BIT) or more countries. Our study re-emphasizes recent economist studies (Neumayer & Spess, 2005; Cho and al., 2016) which demonstrate how IIA remains key instruments to secure the legal environment of FDI.

We examined the evolution of IIA in order to test two main hypothesis. First, we consider the number of agreements signed as a reflection of the economic power of a given state or regional group. Then we expect that the regionalization of the financial sphere since the 80s impacts the development of multilateral (state-regional or inter-regional groups) agreements. We gathered nearly 7 000 bilateral trade agreements and multilateral ones from 1959 until 2014 (UNCTAD, 2016). If bilateral agreements always involve two different states, and can be considered as one-mode valued network, two different kinds of links are mixed on multilateral agreements: links joining a state and a regional group, links joining two regional groups.

Two approaches were used on both networks: a global one aiming to characterize the general pattern and a local one aiming to test different properties (nodes hierarchy, transitivity of links, ego-network evolution). Different time slicing were tested in order to insure the robustness of results. First results indicate that the main pattern of bilateral agreements changed after the collapse of the socialist bloc: the structure evolving from a star-based network to a center-periphery structure. Regarding multilateral agreements, they remain highly marginal, even if it is possible to notice a slight rising of group-group agreements the last decade.

Keywords: international investments agreements, regionalization, world networks, globalization

Multidimensional and multilevel analysis of media flows: Classification of newspapers and regionalisation of the world

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The organisation of the world is increasingly shaped by flows of people, money and information that determine to a large extent the particular location of states or cities within the world-system. However, these flows can also reveal intermediate organisational levels based on

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territorial proximity (e.g., world regions) or on network topology (e.g., global cities). In this context, international media flows – defined as news published by a media about a country – offer an original perspective on soft power (which countries are the most often mentioned in news) and on the mental divisions of the world from two complementary points of view: (1) Which medias are talking about the same countries? And (2) which countries are over- or under-represented by the same media.

News regarding foreign events are – in most cases – intentionally reported by mass media at the international level: they take place or involve one or several countries.

However, one can wonder if some macroscopic regional patterns might actually arise from an analysis of international news at higher-levels. In this communication, we present such an approach to understand media flows from the international to the worldwide scale. This approach first relies on the concept of international geomedia agenda that we introduced in a recent work [1] and according to which mass media behave as information gatekeepers deciding "which countries make the news". In this context, countries are hence "competing" for media coverage. We showed that the complete international geomedia agenda can be formalised at the microscopic level as a tridimensional object linking medias, countries, and time periods. Here, we hence propose to describe this object from a graph-theoretic perspective as a bipartite temporal network. We also provide two data models to identify empirical irregularities within this network, depending on two complementary analysis objectives: analysing outlying countries relatively to (1) the mean temporal agenda of a given media and (2) the mean media agenda at a given date.

Until now, these concepts and models have only been applied to the analysis of media flows at the international scale, hence identifying outliers within a set of countries. To overcome this limitation, we propose in this communication to apply a multilevel analysis method based on constrained data aggregation to provide consistent mesoscopic representations of the data [2]. As it has only been applied to simple unidimensional data sets, we generalise this approach to bipartite temporal networks [3], thus allowing the study of media flows in much more details. Contrary to classical blockmodeling methods that analyse social relations by aggregating individuals (nodes), our approach is more general and directly allows the aggregation of relations (edges) without any requirement on the nodes. We are hence able to detect many more mesoscopic patterns: different groups of medias uniformly covering different groups of countries on different time periods. We show that, by varying the data model and the information granularity, one can build interesting insights regarding the world-scale organisation and dynamics of media flows. Preliminary empirical results suggest that structural divisions of the world by media flows can be related to various effects: (1) linguistic effects (Latin America), (2) spatial proximities and regional integrations (Asia-Pacific, EuroMed), and (3) leadership effects (USA).

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Keywords: media flows, international agenda, spatiotemporal analysis, bipartite temporal networks, multidimensional data aggregation

A net of moving people. Network analysis of international migration flows between countries

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This paper delves into the determinants of global migration flows by applying a social network methodology. In order to explicitly address the multidimensional aspects of this phenomenon, we employ data on bilateral flows between 169 countries from 1990 through 2010 in combination with information about language and colonial history of each population, and bilateral distance between countries. With respect to traditional approaches, the underlying mechanism characterizing the international migration network (IMN) is described using a data driven approach which takes into account both bilateral and multilateral resistances to migration. To enhance the understanding of the relationships occurring between countries, we analyze contextual effects at different granularity levels and use graph theory to explore the topological properties of the IMN. Overall, complementing existing literature, our results suggest that socioeconomic, geographical, and political factors are more important than local-network properties in shaping the structure of the international migration network. In other words, a gravity-like approach, where dyadic resistance to migration affects all destinations in the same way, is already able to recover most of the structural features of the network. At the same time, when considering the IMN development in time, we find that a dyadic approach is inefficient: migration trends seem to be deeply determined by the functioning of a variety of networks at different levels of aggregation. Therefore complex network models, considering the capacity of the migration architecture and its disruptive risks (i.e. policy constraints), must be considered as a useful tool in predicting the IMN evolution.

Keywords: international migration flows, ERGM

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Session 4: Changes in Personal Networks: Causes, Differences, and Consequences

Changes in personal networks of young Iranians and former Yugoslavians in Sweden

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Research on personal networks of immigrants indicated that immigrants in general have disproportionately more co-ethnics in their network than natives. The prevalence of such ethnic boundaries, however, varies between, e.g., men and women, ethnic groups, and first and second generation immigrants (e.g., McPherson et al. 2001; Van Tubergen 2015). More general network studies showed that the size and composition of people's network of close associates changes considerably over the years (e.g., Shulman 1975; Wellman et al. 1997; Degenne and Lebeaux 2005; McPherson et al. 2006; Mollenhorst et al. 2014). At the intersection of both, we describe changes over four years in the composition of personal networks of young native Swedes, and first and second generation immigrants from Iran and Former Yugoslavia who currently live in Sweden (born in 1990; N=1537; Edling and Rydgren 2010 and 2014). We primarily focus on changes in the share of co-ethnic relationships in the networks of immigrants, and find that – although the share of co-ethnics in their networks remains rather small – it does increase over time. Assessing the causes, developments, and consequences of ethnic boundaries in networks is relevant, because ethnically segregated networks may lead to prejudice, socioeconomic inequality, et cetera, not least if it occurs among young people who are leaving school and entering the labor market. Next, we explain variations in these network changes in terms of respondents' sociodemographic characteristics, ethnic background, length of stay in Sweden, the occurrence of important life events and changes in the social contexts they enter during their daily lives.

Keywords: personal networks, changes, causes, immigrants, interethnic relationships, integration

Associations between males' and females' dieting pattern and peers' weight-control behaviors in late adolescence and early adulthood

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Background: Previous research based on social network approaches demonstrated peer similarity in regard of smoking, overweight but also weight management behaviors, especially for adolescents. However, despite the peer similarity that is commonly recognized as organizing principle in social networks, dissimilarities that prevail as rather non-structuring principles between egos and peers may still arise. Theories on social learning and social comparisons could provide an understanding about potential behavioral dynamics within networks imposed by these discrepancies. Subsequent this notion, the present study explores whether perceived dissimilarities between egos' and peers' weight-control behaviors relate to individuals' dieting propensity.

Methods: The analysis was based on a Swedish two-wave survey sample comprising ego-centric network data. Respondents were 19 years old in the initial wave, and 23 when the follow-up sample was conducted. 10,187 ego-alter dyads were included in the analyses, which corresponds to an average response rate of 44.4 percent. Mixed-effects negative binomial regression models were performed to calculate gender-specific associations between egos' dieting pattern and peers' weight-control behaviors.

Results: Egos' dieting correlated with dieting-related behaviors of peers but the strength and direction of associations notably varied when accounting for gender and body mass index (BMI). Females in the lower BMI segment (with a BMI below median) showed an increased dieting propensity when having underweight or overweight peers in their social network (Reference: peers with same weight). Their frequency of dieting also increased when peers exercised more than themselves. In the higher BMI spectrum, young women demonstrated an increase of dieting when interacting with underweight peers but not with peers perceived as overweight. No significant association was found for peers' training pattern.

Compared to females, males' dieting revealed partly reversed associations with peers' weight-management behaviors. The dieting pattern of males with lower BMI, however, did not reveal any significant associations with peers' behaviors. Males with a higher BMI revealed an increase of dieting when peers' were perceived as underweighted. Peers' training did not show significant associations with males' dieting pattern.

Conclusions: The distinct associations between males and females seem to reflect gender-specific differences in body images and confirm females' concerns about body weight and males' concerns about body shape. Stronger associations between individuals' dieting and peers' dieting-related behaviors in the lower BMI segment compared to those with higher BMI suggest that "cosmetic" dieting is to greater extent determined by peers' weight-control behaviors.

*Speaker

Given these findings, and in line with earlier research, we conclude that social influence and interpersonal comparison plausibly contribute to the identified associations.

Keywords: egocentric networks, dieting, weight, control behavior, adolescence, gender

Impact of university admission on freshmen' egocentric network

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We study two questions about the impact of university admission on egocentric networks of freshmen. Taking the initial "before school" period as a reference, we study the creation and decay of social ties after the ego was placed in a new social environment. Using Jensen-Shannon divergence, we show how the structure and composition of one's egocentric network dynamically change over time. Earlier studies [2] suggest persistent individual patterns in the egocentric network structure, which are invariant of the actual social environment. Second, we are interested in the role of status homophily in the creation of new social ties. In other words, we study whether university helps to build connections between egos from different socioeconomic classes, or new social ties emerge via homophilic effects between students of similar economic status.

Keywords: computational social science, egocentric networks, socioeconomic status

Social networks & school experiences of disadvantaged children going through a collective music education intervention

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The social networks of primary-aged children have not received as much attention as the social networks of adolescents. Yet, children's social networks are important, especially since childhood is an age where individuals learn skills that can make a very large difference to their life chances, such as literacy and basic numeracy. Furthermore, disadvantaged children tend to be at particular risk of not acquiring these key skills. Thus, understanding the factors underlying network change for these children, and the way in which these factors affect these children's life chances, is important.

To further this understanding, the present paper presents preliminary findings from a mixed-methods case study of two French primary schools that exclusively recruit children who are socioeconomically disadvantaged or have academic or behavioural difficulties. The schools are both implementing an intervention using intensive, collective music education to improve their students' social relations, behaviour, and life chances, making them important cases for the study of network change. Thus, the study asks (a) What effect does the intervention have on the personal (in-school) networks of students? (b) How does this effect vary according to school features and to important student characteristics (age, gender...)? And (c) How do the changes in students' networks affect their experiences in school?

To answer these questions, the study measures the friendship & disliking networks of all students in both schools before and 6 months after the beginning of the intervention. It relates these network measures to measures of students' behaviour, Health-Related Quality of Life, and sense of community in school. It also presents ethnographic data collected throughout the school year. This data focuses on students' experiences in school and in the music intervention and how these are affected by students' social networks and the surrounding social structure. Through combining quantitative and ethnographic data, the study brings to light a particular kind of embeddedness: the 'collectivity' of activities in the school and intervention, or the way in which such activities are very often experienced jointly by students. It argues that this 'collectivity' affects children's experiences and the resources and strains present in their networks in crucial ways, and thus is relevant for studies of network change, including for ego-networks.

Keywords: children, students, mixed methods, case study, school, intervention, music, network change

**Session 5: Multilevel Network
Perspectives in and around
Organizations: Theory, Structure
and Dynamics**

Understanding multilevel networks with White's concept of switchings – An application to universities

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The multilevel nature of organizations creates a complex system where individuals, groups, subunits, and whole organizations are dynamically entangled. Additionally, organizations are embedded in diverse, oftentimes fragmented environments. In recent years, network analysis has made some tremendous advances in modeling and formally examining the associations of those interdependent, nested levels of social action. Yet, there is still only little theory to it - the gap between computational possibilities and theoretical models on multilevel logics in organizations remains as apparent as in most other branches of network analysis.

Understanding multilevel networks calls for the identification of types of social action as well as social mechanisms which are both able to explain why actors took a certain action and how that action contributed to a mechanism which brings upon the (re)production of social networks on higher aggregated levels of social organization.

In order to develop a theoretical framework that addresses organizational multilevel-networks in a non-eclectic way, my approach draws heavily on Harrison White's cultural theory on social networks (2008) and combines it with concepts of translation by Barbara Czarniawska (1996) and Bruno Latour (2010) as well as autocatalytic mechanisms recently discussed by John F. Padgett and Walter W. Powell (2012).

In his pivotal swing to theorize social networks, White conceptualizes relations as context spanning, interdependent control projects. Expressed in stories and styles they become durable and at the same time subject to change. Switchings between different network-domains both generate actors and multiple levels of the social. Intra- and inter-organizational ties must be understood likewise: as connected through communication and cultural interpretation systems that are triggered by events of translation, transmission and transformation. Since switchings always rely on acts of transmission or translation they are irrevocably relational and ultimately form different organizational domains. As I will argue, the very forms and texture of these switchings offer a useful tool not only to understand the duality of culture and structure of organizational networks, but also to inform analytic multilevel-network designs.

To illustrate my framework, I will refer to European universities. Drawing on empirical findings on cooperative networks and university boards, I intent to show how actors' switchings constitute different organizational domains and at the same time prevent the organization from disintegrating. As for the superimposing structures these switchings transfer into relational mechanisms which feed back into the structural dynamics of the university.

The presentation concludes with an overview of possible conceptual junctions between network theory and organizational theory.

Keywords: university, multilevel networks, switching, translation, Harrison White

Changing climate governance in the city. A multilevel network perspective on social innovation in extended organizations

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Governing climate issues in a modern city involves a complex organizational eco-system between the cities bureaucracy and political institutions, private businesses, social movements and engaged citizens. The city has to view itself as an "extended organization" (Häußling 2015: 235), which is able to channel multiple processes inside the city to encourage sustainable developments. To model this complex eco-system and achieve a better understanding of the chances and hindrances posed by this situation, we propose an integration of Multi-level Social Network Analysis (Lazega et al 2008) and the Multilevel Perspective on Technology Transitions (Geels 2002) to study social innovations on climate policy on the city level. Geels and others invoke a differentiation of three levels impacting innovations. There is the overall landscape of broad societal trends and discourses, infrastructure and things beyond the influence of the actors involved. Then we have the niches, where individuals with relative shelter from other influences try out innovations. And lastly we got the regime level, where important actors like organizations determine criteria of relevance and worth. Our project aims to follow these different networks and work out how they are related to each other. Such networks can be interpreted as Netdoms (White 1995, White 2008: 7ff), which develop their own styles of talk and styles of networking. A complex ecology of networks in and around the governing bodies of the city can be viewed as a nested order, where niches-netdoms are enveloped by less malleable structures on the regime-level. The aim of this framework is to open transition pathways from niche-level to regime-level netdoms by constructing participatory interfaces to align styles of talk and styles of conduct in the form of open publics (Mische & White 1998). To view extended organizations as a nested constellation of netdoms gives us the opportunity to model the transition pathways between niches innovations and regime implementation.

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Keywords: multilevel networks, social innovation, urban governance, netdoms, nested order, niches, regimes

Emerging communities in multilayers networks: Analysis of a regional policy programme

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To enhance innovation processes in small and medium-sized enterprises (SMEs), in the last decade innovation policies have increasingly supported the creation and strengthening of intermediaries (Howells, 2006; Lazaric et al, 2008; Kauffeld-Monz and Fritsch, 2013; Russo and Rossi, 2009; Caloffi et al, 2015). In general, current approaches do not adopt a network perspective to highlight the multidimensional system created through the activities undertaken by these intermediaries. In this paper we adopt that perspective applied to the analysis of a regional policy supporting the creation of specialized intermediaries, named "innovation poles", in the Italian region of Tuscany. The creation of innovation poles has mobilized a large number of agents that were directly involved with different roles in the creation of the regional system of technology transfer. Through the different activities they perform, the various agents create connections between the poles; the poles, in turn, create links between agents, facilitating the exchange of information and creating opportunities for joint actions to boost innovation. We analyze the intermediaries' infrastructures with a focus on the multidimensional linkages across those infrastructures. This network of networks perspective of analysis asks for identification the pivotal agents embedded in multidimensional interactions and helps in detecting emerging communities of innovators in the regional innovation system. By adopting the analysis of multilayer networks (recently developed by Rosvall & Bergstrom, 2007 and 2008, and De Domenico et al., 2015), we identify and compare the emerging communities in aggregate networks and in the multilayer networks.

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Keywords: innovation policy, multilayer multiplex networks, regional innovation systems, innovation poles, intermediaries, overlapping communities

Investigating organizational identities in multilevel networks with multiple membership, multiple classification models

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A major line of contemporary organizational research links organizational identity to membership in multiple institutionalized categories. One consistent result delivered by empirical research inspired by these theoretical developments is that audiences tend to evaluate more positively organizations with more focused identities, and to discount organizations trying to broaden their appeal by spanning multiple categories. A related result is that the negative effect of category spanning on audience evaluation is stronger when the categories involved are more distant. One working assumption underlying these results is the absence of meaningful network dependencies that may cross cut the boundaries of categorical identities and confound their effect on audience evaluation.

In this paper, we examine possible consequences of the violation of this assumption. We reframe organizational identities as a two-mode network that affiliates organizations to institutionalized categories. We consider individual organizations as explicitly embedded in networks of dependence relations that they actively establish with other organizations.

We search for evidence of interaction between categorical and relational identities in data we have collected on a community of hospital organizations. Detailed information on internal portfolios of activities held by individual hospitals allows us to reconstruct with accuracy organizational identities based on patterns of affiliation to institutionalized clinical categories. We use collaborative interorganizational relations of patient transfer to reconstruct network structures in which hospitals are embedded.

We are interested in studying how audience evaluation varies as a function of: (i) Organizational characteristics of the hospitals; (ii) Structural characteristics of the clinical categories; (iii) Categorical identities of the hospitals, and (vi) Positions that hospitals occupy in the network of collaborative patient transfer relations. Our analysis focuses on the stability of these various effects through time.

We reconstruct audience evaluation in terms of patients' decision to leave the hospital against the advice of the doctors in charge of providing care. We adopt recently derived multilevel net-

*Speaker

work models for multiple membership and multiple classification to examine cross-sectional and temporal variation in audience evaluation. In our specific empirical case, the clinical categories to which hospitals are affiliated represent the higher level in a multilevel system that has interacting hospitals at the lower level. The analytical objective of the model is to apportion the variance in audience evaluation across the different components of the multilevel system.

Keywords: categories, multilevel networks, organizations, time, health, hospitals, patients

Social network, board interlocks and firms' financial decisions

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There is a growing interest in finance to analyse how economically significant corporate connections and board interlocks are. For an investor, understanding the relationships helps weighing up the risk and the likely rewards of different investment options. The research focuses on understanding how corporate interlocks influence a firm's financial decisions. Hypotheses linking network connectivity, financial risk and return are put forward in light of relevant theories and explored in an original dataset. We use data from two different databases, BoardEx and Orbis, to obtain information about listed firms in Italy. Information about the composition of boards of directors are integrated with firm-level financial information and performance ratios. Results from this study are likely to contribute to both academic debate and financial practice.

Keywords: director interlocks, firm performance, network centrality

Multilevel analysis of co-authorship networks: Evaluating the impact of exogenous factors on the conduct of scientific collaborations

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Science studies have shown that a large number of exogenous factors influence the conduct of scientific activities, such as the social, institutional, economical, political, and geographical context of academic research. Hence, the description and explanation of scientific practices cannot go without a clear understanding of the impact of these macroscopic contexts on the individuals. In this communication, we propose a multilevel analysis method to describe co-authorship networks at various scales and thus address these challenging issues.

Our method exploits information-theoretic data aggregation to summarise the information that is contained at the individual level in a given data set and to highlight consistent patterns that arises at higher-levels. Applied to relational data, this method consists in partitioning the adjacency matrix of co-authorship networks into "rectangular tiles". Each such tile represents an "aggregate edge" between two "aggregate nodes", that is the aggregation of several collaboration relations between two groups of researchers. Similarly to blockmodeling methods – introduced for the analysis of social networks – the quality of such an aggregate depends on the homogeneity of the relations it contains, that is the homogeneity of collaborations between the two groups of researchers. We propose to use information-based measures, such as Kullback-Leibler divergence, to quantify and optimise this homogeneity criterion.

Data aggregation thus provides an abstraction method to identify homogeneous macroscopic patterns within the network. However, one can require additional constraints to apply on the set of feasible abstractions depending on the exogenous factors one is interested in. For example, one could only consider as valid abstractions the groups of researchers that are defined at some institutional level: e.g., individuals aggregated as research teams, as research departments, as institutes, and so on. By introducing such constraints within the aggregation process, the network is then macroscopically described on the basis on this exogenous vocabulary, thus leading to general empirical assertions regarding the collaborations within the different institutional levels, as well as the individual level.

To go further, we are currently interested in the combination of several sets of constraints, modelling several exogenous contexts. We hence propose to add some other exogenous classifications in order to allow more abstractions for the aggregation purposes: e.g., geographical categories (cities, countries, regions), epistemic categories (subfields, fields, disciplines), and so on. Our aggregation method should hence allow to identify the categories, and eventually the combinations of categories, that are the most efficient to macroscopically describe co-authorship networks, thus providing different points of view on scientific activities by mixing the individual level to several multiscale exogenous contexts.

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Keywords: coauthorship networks, multilevel graph analysis, from individuals to institutional levels, information theoretic data aggregation

Emergent technologies imaging. Exploring intraorganizational knowledge spaces as tree and network dynamics

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Research and development in large organizations generates complex landscapes of knowledge and expertise, delineating themselves as local playing fields within a continuously evolving global knowledge topology. Public patent databases are a rich source of information, enabling insights into the evolution of these fields for actors in the economy, science, and technology realm [1]. When it comes to the visual analysis of such knowledge spaces, various options to represent their topological structures and dynamics are available, exhibiting different strengths and weaknesses. With regard to patent data, large classifications have been established to organize and file the continuous stream of emergent technologies. Building on these systems of knowledge administration, we present a prototype of combined imaging methods to visually analyze hierarchical and relational aspects of intraorganizational knowledge topologies. By the means of treemaps, networks, and icicle diagrams, we offer three different perspectives or topological projections, tied together by a consistent spatio-temporal framework to visually explore topology dynamics. Against these backgrounds we discuss, how publication trajectories of selected researchers enable insights into past and possible future states of inventor biographies.

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Keywords: emergent technologies, patent data, network dynamics, hierarchy dynamics, visual an-

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Toward a multilevel social exchange theory of advice relations in organizations

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What motivates organizational members to seek and give advice, contributing to informal knowledge transfer and sharing in organizational settings? To answer this question, extant literature proposes two competing views. One view builds on social exchange theory to argue that organizational members try to exchange status recognition for advice. The other view claims that the motivation to release information and exchange knowledge is triggered by the relational dimensions of trust, norms, and obligations. To advance our understanding of the motivations behind advice relations we propose a unified view of social exchange theory. We test the hypothesis that advice seeking and giving is shaped differently by the presence of the formal organizational structure, which embeds advice relations in hierarchical orderings of various strength. Empirical analysis of advice seeking ties among the around 200 members of a multiunit organization provides support to the coexistence between the two perspectives postulated. Results indicate that advice relations between members of the same organizational subunits are shaped by hierarchical ordering. Advice is likely to be exchanged with status recognition, either socially or formally defined, and advice seeking relations are likely to be non mutual. When linking organizational members formally connected across subunits boundaries, advice relations are shaped by interpersonal trust. Advice is likely to be exchanged with advice, and advice seeking relations are likely to be mutual.

Keywords: advice seeking, social exchange theory, status, knowledge transfer, intra organizational network, organizational structure, multilevel networks

Session 6: Social Networks from Interaction Events

Discourse relations from communicative events

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The presentation discusses methods to identify relations in discourse by examining patterns of events. I argue against a purely quantitative approach (as in Big Data) that merely counts events between actors (like message, comments, or turn-taking). In contrast, we need differentiated analyses of the meanings of different types of events, which may relate actors very differently (e.g. criticism vs. support). We can draw on conversation analysis and interactional sociolinguistics to examine the relational underpinnings of communicative events (in-depth interpretation), and to group them in types of relational events (typification; with any one communicative event potentially falling into more than one type). Types of relations in discourse, then, exhibit different patterns of relational events. Any one event follows up on prior interactional dynamics like reciprocity or transitivity, and on relatively stable expectations underlying the relationships between the actors involved. Interactional dynamics will accumulate to incremental change in relationships. These arguments are illustrated by empirical analysis of a political debate.

Keywords: discourse, communication, relational events

Interactions and becoming sad: Relational expectations and social influence

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Relational expectations as social relations among human beings are theorized to originate from interactions and reveal themselves as consequences of interactions. This study investigates relational expectations regarding how one should respond to sad peers. Do students adapt to their sad interaction partners and does it matter whether the interaction partner is considered a close friend?

Daily health reports submitted by residents of a university dorm over a period of four months are related to friendship nominations in a panel survey and real-time data on spatial proximity. The risk of becoming sad was estimated with discrete-time multiple-episode event history models, nesting episodes within students.

Controlling for effects of contextual factors and episode duration, interaction with sad residents partly predicts the risk of becoming sad. The effect is not linear but cubic: few contacts with sad residents decrease the risk of becoming sad but more contacts increases the risk while it decreases again for many contacts. The effect seems to be stronger for contacts with sad friends than contacts with other dorm residents. Interaction with friends who are not sad reduces the risk of sadness (a linear effect) whereas interaction with other non-sad residents increases rather than decreases the risk of becoming sad. If interaction with non-sad persons help against becoming sad, it works for friends, not for other dorm residents.

The moderation of effects on becoming sad by friendship status suggests that friendship entails relational expectations on how to respond to sad and non-sad friends. Having met a sad friend, it seems more appropriate or less forbidden to become sad or say that one is sad. Having met friends who are not sad, we seem less inclined to allow ourselves to be sad. The usual explanation is that friends are emotionally closer or more emphatic. I suspect that these types of explanations are begging the question what makes friends emotionally closer or more emphatic. Within the relational expectations framework, the heightened response to interaction with friends is considered part and parcel of what it means to be friends.

Keywords: relational events, interaction, social influence, sadness, event history models

Double temporality in a permanent organization: Knowledge network formation between internal management consultants

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The increasing complexity of global competition has caused the social division of management labor to grow deeper and become more specialized. While the consulting business has grown extensively since the 1990s in Europe, there has been a remarkable and more recent growth of consulting units within large enterprises reflecting the increasing demand for consultancy expertise in support of corporate strategy planning and decision making. This paper presents a case study of a large internal consultancy unit in a major German corporation. The consulting unit of more than 60 experts does not only offer consultancy services within the firm, but also serves as a repository of management talent and a slingshot for career promotion. Due to high employee turnover, the average consultant stays for only two years before either being promoted to a management position or leaving the firm. This pronounced volatility in staff composition, temporary project organization and the immense mobility and interlacement with the entire organization poses a challenge for the consultants to build inter-personal relations of collegiality, knowledge-sharing and career support. Both, the high volatility in staff composition and the project organization might be seen as a context of double temporality for social interaction. Embedded in that special context and based on a network survey of the entire unit, this paper offers a comparison of the studied knowledge network with previous studies leading to a surprising result of a particularly robust (measured by point connectivity) and endogenously structured order of social interaction (illustrated by results from a MRQAP regression). By doing so, we demonstrate first, the influence of intrafirm activities for structuring informal social relations and second, the effect of intense but timely limited interactions leading to social tie formation and the reproduction of robust structures.

Keywords: knowledge networks, transnational corporation, management consulting

Analysis of content and networks of virtual relationships: promotion of the system of innovation poles in the web space

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In analysing and modelling the Tuscany regional system of innovation "poles"^{||}, we first analyzed the networks of agents in which the poles were engaged in the three years of their start-up phase of activity. By examining systematically all available information on websites we then focused on two objectives: (i) to analyze the variety of language and content that characterize the poles in their online activities; (ii) to examine the extent poles refer to the same institutions, enterprises, organizations, projects, and among these, organizations / or activities directly related to them (such as the companies managing the poles laboratories, incubators, the adherents), what we can call their "virtual network".

This paper offers a linguistic analysis of the websites produced by innovation poles in Tuscany, in order to provide a set of variables for the evaluation of their promotion strategies and to detect which are the agents involved. The focus of the analysis is the evaluation of original vs. reported information, which is here used as indicator of the innovation poles' engagement in the promotion of their activities. The purpose is to quantify the level of engagement in their networks that each single pole has built – on its website – through the publication of texts.

Through Corpus Linguistics methodology, and using both a quantitative and a qualitative approach (similar to the one proposed by the CADS framework), this paper looks at how a set of innovation intermediaries supported by a regional innovation policy have used a set of 24 terms related to the notions of innovation and promotion their core activities (business, businesses, centers, collaboration, knowledge, finance, management, manager, business, business, industrial, innovation, pole, poles, processes, projects, design, research, service, services, development, technology, technologies, territory). By looking at whether these terms appear in original or reported (produced by third-parties) texts, and at how their meanings and connotations are constructed in the former cases, this paper identifies how active have the innovation poles been in promoting their work. In addition to linguistic analysis, text analysis of web pages also allowed to identify main domains (urls) and complete links mentioned on the websites of poles. Adopting a perspective of social network analysis, with information on these virtual networks we analysed two issues relevant in modelling the system of innovation supported by the poles: through the citations of major domains, we highlight the extent to which the web sites have reported the poles connections with each other and with those involved in technology transfer; through the analysis of complete links present on the websites of individual poles we can identify to what extent the poles refer to the same information space. The presentation is structured as follows: section 1 presents the data, tools and methodology used in linguistic analysis; section 2 presents linguistic analysis of the 24 selected terms; in section 3 virtual networks are analysed; section 4 concludes with a comparative perspective on the "virtual" networks and the "real" multilayer networks in which the innovation poles are embedded, and we discuss to which extent the two domains are close for the 12 poles.

Keywords: linguistic analysis, web communication, innovation poles, regional innovation policies

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Networks of interaction events as styles

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Classical network analysis treats ties or edges as durable structures between durable nodes. Relationships such as friendship or kinship create ties that last between the persons involved. This works for a variety of types of tie (White 2008: 27f), but most ties are just shortlived and rely on events happening between the nodes. Even a friendship which seems stable, was built through events and can be dissolved by events. The style concept emphasized by White (White 1992: 166ff and 2008: 112ff) can shed some light on how this duality works and how it can be modeled. Basically, the style concept evolves from insights from the development of core network concepts like structural equivalence (Lorrain & White 1971) and blockmodelling (White, Boorman & Breiger 1976). Style combines these insights with a major role for accounts or stories, following the cultural turn in network theory (Mische 2011). Styles appear as quantifiable patterns as well as signals for identities. They track self-similar structures with attached meaning in time and space. So, on the one hand we can model event cumulation as a style, but on the other hand we are also able to model event sequences as a form of style. Both can produce stable social entities like network nodes and network edges. To demonstrate the advantages of the style perspective on interaction event networks, the presentation will discuss the development of brokerage positions from event networks (Burt 2005) and how the problem of turning points (Abbott 1997) can be tackled with the style approach to interaction event networks. Then these models will be applied to data from Scientists on Twitter to show how the patterns in event interaction networks can be typified by their style (cumulative or sequential). Styles, like networks, are also scale-free and can be conceptualized as a nested order, which enables an analysis of spillover effects and the meshing of patterns.

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Keywords: event networks, style, twitter networks, meaning of networks, brokerage, turning points

Support to entrepreneurs through meaningful ties

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Entrepreneurs rely on the people around them to build their own business. Entrepreneurs' business ideas will only go as far as the advice, moral support, financial support, and access to relevant people will get them. How do the people around an entrepreneur choose the type and amount of help they will give? The answer to this lies in two dimensions of relationships: both within the relationship between the entrepreneur and the supporter, as well as in the relationship of the supporter with the people they know. The supporter is faced with a question: what kind of support can they and are they willing to give?

Although entrepreneurship has been seen as a relational phenomenon ever since social networks were included in the study of entrepreneurship with Aldrich & Zimmer's seminal work (1986), these discussions have revolved more around the patterns of ties, rather than on understanding the contextual dynamics in which ties are established (Jack, 2010). The patterns of relationships, where actors are connected to each other directly and indirectly, are established as these actors pursue their interests by engaging with each other to negotiate their interests and positions (Ibarra et al, 2005; Kossinets & Watts, 2009). Through their repeated interaction, meanings emerge which define their routines of exchange (Nickerson & Zenger, 2004).

This research examines how ties between entrepreneurs and supporters form and develop in the context of the social networks surrounding both the entrepreneur and the supporter. The focus of the present study is on the supporters that sustain entrepreneurs, as well as the entrepreneurs, since the support provided is assumed to be guided by the tie of the entrepreneur with the supporter as well as the supporter to other people. How does the support they give fit in the many relationships the supporters hold?

Meaningful Ties: Specifically in the case of entrepreneurship, the set of relationships organized within a dynamic structure of relationships motivates entrepreneurs' actions as they employ resources in the creation and exploitation of opportunities (Aldrich & Zimmer, 1986). Shared understanding among actors has been posited as a basis for strategic positioning (Nickerson & Zenger, 2004). These are shaped by each actor's self-interest and political position and negotiated through forging of partnerships for knowledge transfer, which builds on the shared language between the actors while they reconcile their divergent beliefs and meanings emerge that they can articulate. This means that throughout the entrepreneur's network, shifts in the

codes and routines are obliged to occur as relationships are added and new situations arise (Mische & White, 1998). White (2008) stresses the importance of disjoint, mismatch, and ambiguity for the emergence of meanings within ties. When people stumble upon such a mismatch in their relationship, they struggle for control over the rising ambiguity, and the meaning of the encounter emerges for the dyad. When entrepreneurs approach a supporter, they are also approaching the supporter's relationships, some of which can have meaning which are incorporated in the emerging stories. It is clear that (potential) supporters' support to entrepreneurs' endeavors is related to the degree to which the story regarding these endeavors reflects the meanings at hand throughout the relationships (White, 2000).

Research Design: Through in-depth interviews with entrepreneurs and their supporters in São Paulo, Brazil, 16 cases of support given and received were described and analyzed. To elicit the names of the supporters, the entrepreneur was invited to reflect on the challenges they currently faced, and then to list the people with whom they have talked about these challenges. From this list, the entrepreneurs were asked to select one supporter and to describe their relationship with him or her in terms of the story of the development of the relationship, the support they received, the things they talk about, the frequency of interaction, and their feelings when interacting with this person. They were then invited to name the type of relationship they had with this supporter. The entrepreneurs were then asked if anyone they knew could give more support than they actually gave. If they were able to list someone, they were asked about their relationship in the same manner as previously described.

The two people whose relationship with the entrepreneur was described in detail were also interviewed. They were first invited to describe their relationship with the entrepreneur in the same terms as in the interview with the entrepreneur. This provided grounds for a comparative analysis of the two sides of the relationship – not to triangulate an objective reality, but rather to understand the context in which support was provided. The supporters were asked to describe the entrepreneur's business, and then list the people with whom they talked about entrepreneurship within the terms of the description they had just provided. Similarly to the interview with the entrepreneur, they were then invited to choose two people on their list and to describe the relationship.

A preliminary analysis reveals the importance of affect to the support the entrepreneur received, where negative feelings were found to provide a base for an experience which was overall described as positive as it guided their learning and strategic decision making. The supporters also, at times, revealed that they had wanted to help the entrepreneur more than the entrepreneur would allow, which suggests that the question for the supporters is less one of legitimacy of the entrepreneur, and more about an experience of a thriving relationship, where helping the entrepreneur would enhance the relationship with the supporter, but where the entrepreneur was hesitant to allow for such engagement.

Keywords: qualitative research, support ties, entrepreneurship

Situated and networked settings: A semantic analysis of distributed knowledge among university students

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This study looks into how university students' discourse gains legitimacy from its semantic structure. The object of this paper is two fold: To assimilate the existence the students' institutional context to that of semantic frame; and to provide a network analysis of students' narratives. We claim that their daily utterances have a particular structure of networked contexts of meaning. We adopt a contemporary take on cognitive science, with contributions from distributed cognition (Hutchins,1995; Lozares, 2007) and situated cognitive semantics (Hardy 1997), semantic frames (Fillmore, 1982), mental spaces and blends (Fauconnier, 1994). Independently of the students' intentions- in terms of direction of fit (Anscombe, 1957)- their narratives have been taken as epistemologically objective indicators of distributed cognition. Methodologically, we interviewed Sociology students from the Universitat Autònoma de Barcelona in 2008-2009. The data corresponded to internalized and objectivated knowledge typically described as intersubjective within sociology of knowledge. Through interview scripts, we collected their accounts on everyday life, including cognitive states and conative states. We analyzed the linguistic data with UCINET and developed a discourse analysis of simplified narratives that describe the situational environment of each student with a simple sentence. We applied Fractions and Cliques measures which distinguished thematically within work and friendship communities of practice. Our results show how students make sense of their everyday experiences by building network settings. Such linguistic blends are conglomerates of meanings. The network settings are made of socially situated mental spaces in which the students take part as actors. Moreover, the apparent universality of their formal structure hides the conditions of production which are necessary social. The process of routinization is a fundamental requirement of everyday knowledge. In all, semantic analysis is an adequate tool but also a theoretical device to develop a comprehensive analysis of everyday discourse.

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Keywords: semantic analysis, cliques, faction, blends, distributed cognition

Session 7: Egocentric networks and social integration processes

The changing structure of core discussion networks – a longitudinal study

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Core discussion networks show the people around us, who we feel the closest, so the change of this intimate network segment is really important in our understanding of the social structure as it reflects changes of it. The GSS core discussion network name generator was administered on nationwide representative samples of the adult Hungarian population in 1999, 2004, 2011 and 2015, so there is opportunity to examine the characteristics of these networks at four time points. Significant changes can be observed over this time period: the thus far dominant role of kin ties (partners, parents, children) is replaced by non-kin ties (especially friends). As earlier researches[1] showed, the pattern of change between men and women seems quite different.

Based on this finding, we will present and compare the changes by time in the different subgroups of the society. Our goal is to understand the effects that influenced the different specifications of the core discussion network (for example the size of the network, the ratio of men, the ratio of kin, the frequency of talks, etc.).[2]In these models we use both socio-demographic and attitude-like explanatory variables. The main part of the presentation focuses on the significant changes in these explanatory models.

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[2] Depending on the measurement level of the network specification, we will use linear-, binary logistic- or Poisson regressions.

Keywords: egocentric network, core discussion network, longitudinal

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Mobilising social network support for childcare: The case of Polish migrant mothers in Dublin

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Mothers experience great pressure trying to balance their lives between childcare and employment. The paper describes the utilization of support networks for the organisation of informal childcare by working Polish migrant mothers in Dublin. Grounded in a support network perspective the study employs a mixed method approach to elucidate how the mothers use transnational relations in their child-minding strategies, but also the obstacles posed by the distant character of these ties. In line with previous research on support networks, we find a strong reliance on strong ties in providing instrumental and emotional support (e.g., Wellman and Wortley, 1990) but also that 'distance' matters (e.g., Mok et al. 2010) and shapes the network mobilisation strategies of the working mothers. Locally based weak ties, shaped by gender and ethnicity, are based on various forms of reciprocity, and are fundamental in providing ad-hoc crisis support that cannot be provided by transnational strong ties. Nonetheless, transnational ties have proven to be crucial in covering expected childcare breaks, positioning 'floating grandmothers' at the forefront of transnational social support.

Keywords: social support network, transnational ties, informal childcare, migrant mothers

Revisi(ti)ng migration itineraries: Social networks and pathways to economic incorporation of ageing non-EU migrants in Brescia

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Demographic changes brought about by improved life expectancies, decreasing fertility rate, and increasing migration to more developed countries happen within the context of growing social inequality. Hence, it becomes important to study the situation of the ageing migrant who must deal with social consequences of relocation, and renewed insecurity and risks accompanying the ageing process.

The research takes a mixed-method approach, combining quantitative data from egocentric network survey and qualitative interviews of 105 non-EU migrants, who are at least 50 years old, and residing in Brescia. It is an important field site since it is one of the Italian cities

with a good number and diversity of migrants, ranking fourth, after Rome, Milan, and Torino. The researcher collected the retrospective longitudinal data from September 2014 to May 2015. Adopting meso-level analysis, the study investigates the extent networks play in enhancing or inhibiting economic incorporation, and seeks to identify network typologies that give rise to certain work trajectories or incorporation paths.

While the formal social network component offers an "outsider view" by capturing compositional and structural features of job-finding networks, the thematic analysis of interviews provides an "insider's view." The analysis also highlights the socio-spatial context of encounters and meanings that respondents attribute to their ties. Through network narratives embedded in migrants' life-stories, the sequential characteristic of network-formation is taken into account, along with the resulting expansion (or contraction) of the horizon of access to potential resources, and the circumstances surrounding the upturns and downturns of work trajectories set amidst ever-changing migration projects as non-EU migrants navigate the Italian labour market and enter old age.

Keywords: egocentric network, mixed method, interview, non EU migrant, ageing, migration, labour market

Defining integration and segregation mechanisms with network structures

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The positive (or negative) influence of networks (and ties) is a widely analysed field of research. On one hand, the losing of network ties could lead to social isolation, on the other hand, a too dense strong tie network could lead to a fragmented society. The theory of social capital also shows a diffuse picture about the role of network ties. We could reach a high amount of social resources through our social capital, which can help us to find jobs or to reach higher social status. But the closed milieu groups (in the sense of network ties) could lead to a dysfunctional society. The varied connectedness of social groups shows the level of integration of the society; and the lack of these ties could sign the appearance of segregation mechanisms. The Hungarian Social Integration study (made by the Hungarian Academy of Sciences) gives a unique chance to examine and compare these above mentioned various network mechanisms. As three different network techniques (name-generator/position-generator/summation method) were administered in the research, a deep and diverse analysis can be made. In our presentation we will introduce a complex "network map", which could grab the broadest aspect of integration and segregation momentums of network ties.

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Keywords: egocentric methods, social integration, methodology, mico, macro structures

Session 8: Political Networks

Measuring party competition with party likability scores: A network modeling approach

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The methodological possibilities opened by computational network science are used here to address one of the ongoing debate of political science: how to measure party competition. We model the data obtained by the likability scores in the Comparative Study of Electoral Systems relative to the UK, the US, The Netherlands and Germany in ten years of time as competition networks in order to provide two indexes of party competition: a country index focusing on the country level and a diversity index measuring the perceived likability between each pair of parties. Our method overcomes the methodological problems posed by the classic measurements based on the ideological placement of parties in a post ideological political context. Moreover, the use of survey data provides a consistent and reliable measurement of the perception of the voters. Our findings are consistent with the literature, so corroborating the soundness of our method. Our findings also suggest that the number of parties in a political system is inversely proportional to the level of party competition in a system.

Keywords: party competition, network modeling, likability scores, competition networks

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The monitoring capacity of civil society networks

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The role of civil society functioning as a watchdog in the implementation process is widely acknowledged. However, little is known about what determines the capacity of civil society organizations monitoring the implementation of EU directives in national context and how it differs across member states. Departing from the literature on the strength and weaknesses of civil societies in Western and CEE member states and linking it to network institutionalism and graph theory, this study sets out to capture the different sources of capital that determine the monitoring capacity of civil society organizations. By applying social network analysis in a comparative case study on the networks of national coordinations of the European Women's Lobby in the Netherlands, Luxembourg, the Czech Republic and Lithuania, differences in the configuration of their monitoring network are demonstrated. The preliminary results show that the national coordinations in the Western member states tend to be better equipped with human, financial and social capital, while the national coordinations compensate for this lack of resources by linking up with influential actors on a European level.

Keywords: civil society, policy process, European union, network structure, information exchange

Network centrality and agenda-setting power of MPs

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MPs are unequally successful when they introduce parliamentary interventions to put a policy issue on the political agenda. A parliamentary intervention is usually sponsored by one MP, and asks parliament or government to address a given issue and to find a solution to a related policy problem. Parliamentary interventions accepted by parliament are fed into the usual policy-making process. Whether a parliamentary intervention is successful or not is thus important both for the political agenda and the overall legislative outputs, as well as for the individual MP, who depends on policy successes and media coverage for re-election.

Both characteristics of the MP (such as party affiliation, seniority and membership in parliamentary committees) and of the intervention (such as the specific policy area, the breadth

*Speaker

of support across parties and the number of supporters) may influence the success of a parliamentary intervention. In addition, MPs are also embedded in a social network with other MPs. This paper innovates by investigating the micro-foundations of parliamentary agenda-setting, and by taking into account the MPs' position within the social network of parliament. The analysis asks to what degree a central position in the social network of parliament influences a MP's agenda-setting power. More specifically, the social network among MPs is re-constructed based on ties of co-sponsorship of parliamentary interventions. Co-sponsorship basically represents similar preferences on policy issues, but is also a way for MPs to send low-cost signals of support to peers.

We study this question in the Swiss context. In comparison with other European countries, the Swiss political system knows no fixed parliamentary coalitions, and MPs may establish a broad range of cross-party connections. Whereas the literature on co-sponsorship is quite developed for the US congress, there is little literature on this phenomenon in European countries.

Our data-set covers all parliamentary interventions (motions and introduced in the National Council, the lower Chamber of the Swiss parliament, during the 49th legislative period (2011-2015). Whenever MP A co-sponsors a parliamentary intervention of MP B, this creates a tie of social support from MP A to MP B. This results in a valued network of support ties between MPs. The MPs' centrality in this network is then used as a (lagged) explanatory variable for the success of given parliamentary interventions. We take into account the MPs' overall centrality, as well as their centrality in the networks within specific policy areas. Analyses are conducted relying on (clustered) regression analyses.

Keywords: political networks, parliament, co sponsorship

Homophily and legislative co-authorship: new evidence from Ukraine

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There is a strong tradition in social science to study collaboration networks with respect to innovations and social capital in business and science (Ahuja, 2000; Newman, 2001). However, an interest in legislative collaboration has grown only recently (Kirkland & Gross, 2014; Lazer, 2011). Classic political science studied dependence of legislators on public, parties, and other groups. However, new scholarship has recognized the importance of codependence, relationships, and mutual interests of legislators (Fowler, 2006a; McClurg & Lazer, 2014; Victor & Ringe, 2009). In this paper we study to what extent homophily affects legislative collaboration. Similar questions were raised recently in political science with respect to other forms of interactions

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such as regional planning (Gerber et al., 2013) or career mobility of politicians (Opper et al., 2015). However, the studies of homophily in shaping legislative collaboration are scarce. We also contribute to the literature by providing the case of Ukraine. Most studies are focused on the US and its specific forms of legislative collaboration (i.e. cosponsorship), therefore omitting alternative institutional contexts. We employ the VoxUkraine legislative co-authorship data for the first and second sessions of the eighth convocation of the Ukrainian Parliament (i.e. the year of 2015). We do establish that the amount of ties is indeed affected by institutional context and individual performance. However, these ties are built not with actors who share the same attributes. Our data suggest as well that measures of centralities are highly correlated between each other. MPs who are better connected with other MPs tend to have many connections and tend to be on the paths between other MPs. This yields a conclusion that an individual position of an MP provide him or her with more opportunities to collaborate in making bills. A person who has more experience, who serves as a head of a union, who is embedded in social circles is more likely to be engaged in collaboration. A target of this collaboration, however, is not important and change frequently. Thus, it is possible that MPs use their positions to pass any legislation of interest in a given situation.

Keywords: political networks, homophily, legislative collaboration

Actors' interactions at the Human Rights Council: A network approach

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Intergovernmental organisations (IGOs) can be considered as relationnal systems involving different types of actors: states, regional groups, non governmental organisations (NGOs), IGOs, experts, etc. This communication examines patterns of interaction at the Human Rights Council (HRC), a United Nations organ created in 2006 and based in Geneva. One of the main objective of the HRC is the Periodic Universal Review where human rights situation is examined for all member states. At least three kinds of interaction can be analysed: bilateral interactions (states send recommendations to each other), NGOs-states relations (NGOs send information at the beginning of the process and can make statement when the examined state presents its final report) and NGOs-NGOs collaborations (possibility to present shared statements). Results presented here come from the first cycle of the UPR (2008-2012), the second cycle being not finished yet.

Studying bilateral recommendations (over 21,000 recommendations of which 15,600 have been accepted by the state under review) can be carried out by combining flow and network analysis. The graph of accepted recommendations is very different from the one of noted ones - noted being a diplomatic word for refused (greater density, lower diameter, less variance for degree centrality). It also seems to have a great number of convenience recommendations (no

impact measures suggested by an ally) for inflating the volume of the accepted recommendations. And there is also an absence of relation between gravity of human rights situation and number of recommendations received.

A bipartite graph States-NGOs allows to explore all the NGO interventions during the presentation of the final report. The number of comments received by States varies from 1 to 10 while the number of comments made by NGOs varies from 1 to 100, the organization taking the floor the more often being Amnesty International. First results allowed to construct a typology into 3 main classes:

- global NGOs present continuously and able to provide an expertise regardless of the country in question, these NGOs being generalist (Amnesty International, Human Rights Watch) or thematic ones (COC Netherlands and ILGA-Europe working on homophobic discrimination for example);
- local and regional NGOs whose expertise is limited to a State or a sub-continent. Less active, they constitute the majority of NGOs present in HRC;
- GONGOs (governmental non-governmental organizations...), that is to say, NGO-led government that appear only once to warmly congratulate the country under review – China, Cuba, and Venezuela appear as specialists in this particular type of NGOs.

When the graph of NGO collaborative statement is examined, several levels of specialisation appear amongst NGOS. Some small components are related to a thematic, a confessional or an ideological approach while the main giant component (80% of the nodes, 85% of the edges) is structured on a thematic and a geographic perspective.

This approach, based only on archive material, reveal key positions for both states and NGOs but fails to highlight some relations (NGO work of lobbying) and some specific actors (regional groups).

Keywords: human rights, NGOs, political networks, international relations

Party competition on issues during election campaigns: A dynamic network model

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Powerful spatial models of political competition have made their way into political science. These models specify strategies that parties may use to maximize their electoral results. An often neglected question that is addressed in the current paper is whether these strategies actually explain and predict the political communication of parties through the media that are used by their voters. Parties are supposed to adjust their issue positions between elections to the positions of other parties and issue preferences of voters. The models assume more or less perfect knowledge on voters' issue preferences. But how does political competition work during election campaigns? Then, parties need to speak out on issues on a daily basis to capture the attention of the electorate. The electorate is more involved in politics during election campaigns and the salience of issues to the electorate as well as their issue preferences may shift. Polls offer information on a party's electoral success but they do not disclose shifting issue salience and preferences among voters. How do parties speak out on issues if they have far from perfect information on issue preferences of voters?

This paper proposes strategies that parties and party representatives use for making statements about issues in the media. It contrasts a strategy based on available knowledge about voter preferences-the party's current standing in the polls-to a strategy of adaptation to issue statements made by other parties in the media. In the absence of detailed information on the electorate, do party representatives adjust their issue statements to those of other parties? Do parties compete on issue statements alone?

The presence and strength of the proposed strategies are tested against data on six national election campaigns (1994-2010) in a multi-party system (The Netherlands). Statements about issues in newspapers and television news were coded on a daily basis. Data about popular support for parties stem from weekly or biweekly panel survey studies during the campaigns. A dynamic network model is used, which allows modelling the adaptation of issue statements to preceding issue statements by other parties.

The results show that available information about voter preferences predict issue statements in the sense that parties that are winning in the polls are less likely to change their issue statements than parties losing in the polls. In addition, however, we find a more substantial predictive effect of preceding issue statements by other parties. Parties tend to make statements on issues that give voters the impression that they align with some parties on almost every issue, and disagree with other parties. Thus, they signal which coalitions they prefer in the multi-party system.

Keywords: election campaigns, issue positions, political parties, networks from content analysis, longitudinal network data

Political elite networks: A decade of transformations in three post-socialist states

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The elites in the states constituting the former Soviet Union followed different ways of socio-political and economic transformations after the USSR collapse in 1991. In some states, the densely connected groups were argued to capture the state power both politics and policy making while in the others democratic elections and the rule of law allowed for new elite members to reach the top positions in the country legislative and executive political power branches.

The paper is focused on three cases – Georgia, Lithuania and Ukraine – two of which (Georgia and Ukraine) experienced protest social movements in 2004-2005 and in 2013-2014, and the other one (Lithuania) joined the European Union in 2004. All the contextual transformations affected the changes of political landscape. Therefore, the central question of this paper is what power groups/clusters were represented within political elite networks in these three countries before 2004/2005, during a decade of 2005-2014 and nowadays. Methodologically, the paper suggests the perspective for the evaluation of the progress of establishing fair and transparent conditions for obtaining positions in the governmental institutions through the elite networks as well as the conditions for keeping the ‘status quo’ for the former Soviet bureaucrats (‘nomenclatura’) and current big business owners.

The empirical study conducted for answering research questions suggests the comparison within three dimensions: 1) the Soviet legacy (Communist Party representation in post-Soviet political elites), 2) big and medium size business representation and the opportunities for lobbying, and 3) women representation as a part of gender-equality policy implementation and women empowerment. Two types of ties are compared for each of three country specific elite networks: biographical ties of the common past vs. legislative ties of joint draft-laws submission. The network dynamic is traced comparing consequent time slots 2004-2007, 2007-2010, 2010-2013, and 2013-2015, with the calculation of basic network measures (including cohesion and centrality measures, and egocentric network measures), and subgroups identification.

Keywords: political elite networks, post socialist states, democratic governance, policy of gender equality and women empowerment

De Gaulle’s nightmare: The steady erosion of party discipline in France - A network based approach

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In France, the 1958 constitutional overhaul was as rapid as it was significant in terms of power shifts. Meant to put an end to what its main advocate Charles de Gaulle demeaningly dubbed a "regime of the political parties", the Fifth constitution gave pride of place to the executive branch in the decision process. In the nascent regime, members of parliaments were supposed to enforce government decisions, not the other way around. This translated, from the start, into markedly high levels of party discipline in the French lower chamber. Although this legacy is still very present nowadays, the iron law of party discipline seems nonetheless to be on the wane, as was recently demonstrated by the recent episodes of socialist "Fronde", a collective and recurrent strife against the government's policy from the majority group.

Drawing upon a comprehensive dataset of roll call votes [scrutins publics] at the French National Assembly over the last three decades, the goal of this paper is to investigate the slow but steady decline of party discipline in contemporary France. In particular, it will document the sharp decrease of voting unity among the members of the Socialist Party. The presentation will also demonstrate the fruitfulness of social network analysis techniques for analyzing party discipline, a classic topic of political history or political science.

We will first show how a network based approach can offer a better picture of indiscipline at the Parliament. Based on shared votes, our approach helps distinguish between various groups of dissenting MPs, showing divisions within political groups which tend to reflect ideological or political stands. We will then show that network metrics offer new insights into dissent. The oft-used Rice index tends to over-represent indiscipline in small groups, and lump together various forms of indiscipline. We present an alternative measure, based on the comparison between detected communities of co-voters and party affiliations, which offers insights into the varying strength of political groups over time.

Keywords: political network, party discipline, dissenting groups

Analyzing policy instrument preferences with two-mode networks

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In democracies, the adoption of environmental policies largely depends on the concerted action of policy actors representing diverse parts of society, economy, and politics. In order to assess the potential for coordinated policy making, the present paper analyzes policy actors'

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potential to develop shared policy instrument preferences in a new policy field of water protection policy, i.e. micropollutants. We employ a network approach to explain the processes guiding policy preference formation by fitting an exponential random graph model (ERGM) to a two-mode network of political actors (the first mode) and their preferred policy instruments (the second mode). With the bipartite ERGM, we test whether actors who display similar problem perceptions (H1), competence levels (H2a), or organizational types (H2b) exhibit shared policy instrument preferences. Moreover, we estimate if actors who cooperate (H3a), or who display equivalent network positions (H3b) have a higher chance to share instrument preferences (H3a). Finally, we control for endogenous network processes like popularity and clustering, and for exogenous ones including geographical proximity and co-memberships in water basin organizations.

In the present paper, shared policy instrument preferences serve as a proxy for coordinated policy making. An agreement about policy instruments indicates that actors work towards a common strategic goal, which promotes the likelihood of concerted policy action. The article employs data from a survey conducted in 2012 with Swiss policy actors who participated in policymaking on micropollutants. Actors representing governmental bodies, science, political parties, water, environmental, and economic associations reported their preferences towards diverse policy instruments for the reduction of micropollutants. Moreover, actors indicated their perception of the severity of the micropollutants problem; their geographical areas, and levels (national, regional, local) of responsibility. Actors also obtained a battery of questions on their collaboration ties and their memberships in international water basin organizations.

Results indicate that actors who similarly perceive the problem also tend to have common instruments preferences. Likewise, actors of similar types tend to share instrument preferences. Findings suggest that in the underlying case, concerted policy action not only depends on actors' linkages, but also on their perceptions and organizational mandate. Who participates in policy networks is thus a decisive factor influencing the outcome of political decisions.

Keywords: policy network, policy instrument preferences, two mode network, perceptions, water protection policy, micropollutants

Building a transnational advocacy network: An ERGM approach to cooperation among climate change NGOs

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Inter-organizational coalitions are the skeletal structure of an advocacy network. But forming a coalition is a risky process that can involve politically fraught negotiations between groups. Our paper asks: how do NGOs choose their partners? We examine the coalition formation process by analyzing an original dataset of civil society groups working on climate change in the

European Union during 2008 and 2009, using event co-sponsorship as an indicator of coalition formation. Building on recent network studies, we employ a two-mode ERGM approach for testing important relational hypotheses while controlling for characteristics of the organization, the event itself, and the overall network structure. Our results suggest that organizations tend to work with similar others and to seek bonding social capital, supporting arguments about the importance of trust in facilitating inter-organizational cooperation and contradicting previous studies that have identified resource-seeking dynamics.

Keywords: social movements, climate change, ERGM, two mode

Multi-level challenges in climate change policy networks: Evidence from Brazil and Indonesia

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This paper investigates the opportunities and the barriers to the integration of policy networks in two subdomains of climate change policy: climate change mitigation and adaptation. The work focuses on the land use sector and draws on evidence from Brazil and Indonesia. There are numerous challenges to cross-level networking in the climate change domain, including problems of institutional interplay, differences in policy and political priorities among policy actors, differences in perceptions of costs and benefits from mitigation and adaptation actions and uneven knowledge, capacity and resources to sustain cross-level interactions (Young 2002, Adger 2005, Klein 2005, Hooghe and Marks 2002). Yet, there is much to be explored about how institutions, policy coalitions and cross-level brokers affect interaction across governance level (Ernstsons 2010, Keskitalo et al. 2014, Young 2002).

This paper draws on social network analysis on natural resource management (Gallemore et al. 2014, Ingold and Fischer 2014, Prell et al. 2010, Crona and Bodin 2010) to investigate communication and collaboration networks in the mitigation and adaptation domain across three governance levels. It aims to answer the following questions:

- To what extent are communication and collaboration networks in the two climate change mitigation and adaptation sub-domains integrated across governance levels in Brazil and Indonesia?
- What is the role of institutions, of policy coalitions and of individual brokers in facilitating or hampering cross-level policy network integration?

*Speaker

To address the first question we assess the extent of overlap of mitigation and adaptation networks, the extent to which actors tend to interact more within compared to across governance levels and we compare these results to other possible homophily features (McPherson 2001). To answer the second question, we first use cluster analysis to identify policy coalitions and assess the extent to which they bridge – or not – governance levels (Carrington et al. 2005, Krackhardt and Stern 1988, Krackhardt 2007, McPherson 2001). We then identify cross-level brokers and assess the role and political motivations of key brokers in supporting integration (Gould and Fernandez 1989, Bellotti 2009, Bizzi 2013).

The paper is based on primary social network survey data collected at 3 levels of governance between 2014 and 2015 in Brazil and Indonesia (over 200 surveys) and it contributes to identify opportunities and barriers to cross-level interaction in environmental policy networks, an underresearched area in social network analysis (Tramner et al. 2014, Stein et al. 2011).

Keywords: policy networks, climate change, climate policy integration, multi level networks, communication, collaboration

Organizing regional marine governance: Implications from a structural analysis of case studies in Brazil and Indonesia

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Concerns about the world's oceans are rapidly growing. Recent studies particularly emphasize the need to integrate larger territorial scales in a multi-level approach to governing marine resources. This is seen to trigger the development of new and more appropriate institutional arrangements in marine governance. A major challenge of organizing such multi-level governance, however, lies in linking a growing number of actors across multiple jurisdictions and functional quasi-autonomous governance units to facilitate sustainable governance outcomes at increasing territorial scales.

To address this challenge, this research uses Social Network Analysis (SNA) to examine the patterns of social interactions emerging from two different regional marine governance approaches in Brazil and Indonesia from a multi-level perspective. The study particularly aims to identify structural characteristics associated with more sustainable outcomes of marine governance at the local level in a multi-level context. Four local study sites in each of the two regions were selected. In two of the sites, the resource users display rather sustainable resource use behavior in that they comply with the existing rules. The local resource users in the other two local study sites are widely known for cheating on the existing rules and for being involved in highly unsustainable resource use practices. Based on face-to-face SNA interviews that were carried out over a one-year field research period, weighted networks were obtained for the frequency and quality of interactions between actor groups in marine governance in the two case

study regions.

Independent from the two different governance approaches, the study finds two network characteristics in all local study sites with more sustainable local outcomes in a multi-level context. First, the results clearly show that in the communities with more sustainable resource use, the integration and activity of local civil society actors in the marine governance network is much higher than in the other communities. The second characteristic relates to the stronger mono-centric in-group organization at the local level in the study sites with less sustainable outcomes. In these sites, certain local actors seem to have become structural bottlenecks as a high number of interactions between governance units are channeled through only few local actors. Further structural characteristics associated with more sustainable governance outcomes at local level are also found for each of the two regions but seem to play only a role in context of the different approaches to regional marine governance.

Keywords: marine resources, fisheries, multi level governance

The funding of political parties and the emergence of elites: The case of Brazil

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Description and analysis of networks of relations among actors involved in main political processes has proven, at least since Knoke's Political Networks (1990), to be a powerful tool for the explanation of fundamental political processes. The process that we intend to examine here is that of elite formation through the interaction of economic and political agents. In order to do so, we will focus on the relationships the economic actors and the political order by means of financing of political parties and candidates. The aim is not to examine the reasons or purposes of donors when making their contributions to the funds of a party; neither is to establish a causal relation between donations to political parties or individual candidates and actual compensations or returns. The idea is that the donation relation defines a network whose structure and features can eventually reveal the existence of a cohesive group of economic and political actors that could emerge as a elite in a longitudinal analysis.

The particular case study that we are going to deal with is Brazil. The network under study is defined by donations to all the candidates participating in the elections at state and national level. The donors are individual citizens, private firms and organizations, as well as parties' directorships and ad hoc electoral committees, whose role as mediators is of relevance. The starting point are 2010 presidential and state elections.

As analytical and theoretical tool we use the concept of duality proposed by Ronald Breiger (1974, 2000). We examine, though, two networks: the network of candidates connected by

common donors and the network of donors connected by the candidates whose campaign they contribute to. The results of the analysis show a highly cohesive group at the top of a hierarchical structure in both networks.

Keywords: political networks, financing of political parties, elites, duality

The corporate elite in the market of policy ideas in France and Portugal

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Policy-planning agencies are non-profit organizations independent from political parties, state bureaucracy and corporations, which perform studies and advocacy about various topics such as social and economic issues or international relations in order to influence the political agenda. They have experienced a significant development in France and in Portugal for two decades and play an important role in the policy-making process by facilitating discussion and consensus among elites, sponsoring research, lobbying government, and serving as a channel of recruitment into ministry cabinets.

In the line of the call for the development of an institutional approach to the study of elites and command posts that informs our understanding of policy making and implementation (Zald & Lounsbury 2010), this study deals with the mobilization of the corporate elite in these organizations.

In this paper we wish to focus on a small minority of corporate directors who are appointed in policy-planning agencies' boards. According to Useem (1984), there is a division of work inside the corporate elite with a small minority of directors who undertake a political role in order to defend the interests of big business at large.. While they benefit from the huge economic, symbolic and social resources from large corporations and represent meanwhile their interests, they stand in a brokerage position with other social circles, in particular political and intellectual spheres.

Previous analysis has confirmed the existence of an inner circle, a small group that is strongly present in corporate boards and in policy planning agencies' boards as well as in other spheres of society such as the boards of trustees of universities and charities as well as in governmental commissions. However we still do not know enough about the political behavior – i.e. intervention in the polis - of corporate leaders. What are their socio-economic profiles? What are

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their typical professional trajectories? How do they differentiate from corporate directors not engaged in policy planning organizations? How do their memberships and careers interrelate top institutions in France and Portugal? To answer these questions, we zero in on the directors who interlock the top 100 corporations in France and of the top 40 corporations in Portugal with policy planning agencies in their respective countries. We examine the profiles and careers of those who belong to the boards of policy organizations and compare them to the other directors. We also analyse the structure of their interlocking directorships and memberships. Finally, we intend to create a typology of these corporate leaders.

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Keywords: corporate elite, interlocking directorates, policy network, policy planning, ideology

Who is really running the show? Uncovering hierarchies using career paths and network measures

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Who really runs a country? Particularly in authoritarian regimes, this answer cannot always be answered by consulting the constitution: Deng Xiaoping did not serve as Chinese president or General Secretary of the Communist Party after 1980, and the second party secretaries in the Soviet Republics were often thought to be more powerful than the first. Observers have tried to guess the hierarchy of official positions by gauging push and pull factors. They assume that individuals who held high positions will usually continue to hold such jobs (push factor), and positions that serve as stepping stones for important positions are themselves important (pull factor). This paper combines these insights using social network analysis by constructing a network of positions, in which directed ties indicate the move of a high-ranking official from one position to the next in the course of his or her career. It presents an intuition for why - if one is willing to accept the assumption that individuals on average tend to advance in the hidden hierarchy during their career – specific network centrality measures should correlate with the position's ranking in the hidden hierarchy. It also explores what happens if the main assumption is relaxed, and careers do not follow step-wise promotions, or contain demotions and appointments to sinecures. The method is applied to the career movements of high-level Chinese bureaucrats between 1978 and 2006. The results correspond to received wisdom about the importance of different top-level positions at the central and provincial level. Three application

sections demonstrate how this method can rank ministries or and provinces, track their changing importance over time, and help analyze the career advancements of individual leaders.

Keywords: centrality measures, hierarchy, China

**Session 9: Network Science and
Agent-Based Models: what
cooperation?**

Opinions and social networks

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Social science analyzes the large-scale behaviour of the society. On the other hand, the interactions among the individuals are studied by social psychology. The main interest of social modeling is to create a bridge between the two levels of description, observing how, starting from the microscopic description of the interactions among the agents, the global phenomena observed in the society can be reproduced. In this framework, in the last decades, many models have been proposed to analyze the evolution of the opinions due to the interactions of individuals in their social environment, where the social environment can be a static or a temporal network structure.

In this seminar I will generally summarize how opinion dynamics models and network models enter in contact and I will present two prototypical examples. At the end I will introduce some preliminary data-oriented results.

Opinions and social networks can interact in different ways: opinion can shape social network structures, giving rise to social groups based on homophily, social networks can be the environment where opinion dynamics processes take place or, finally, opinions and social network structure can co-evolve in a coupled dynamics.

First I will present a network generation model, introduced in [1], allowing to introduce linking preferences based on opinion similarity into a preferential attachment scenario [2]. This procedure allows to create networks with a significant community structures based on homophily. Secondly I will analyze the interplay between opinion dynamics processes and the underlying social network structure. I will mostly concentrate my attention on a very simple opinion dynamics model - the bounded confidence [3] (BC)- showing in a second moment that the same consideration can be extended to other modeling frameworks. According to the BC model two individuals having their opinion less far than a threshold ϵ are going to have closer opinion after the interaction. In the case where no social structure is present (all agents can interact with all the others), this model show the emergence of consensus – all the agents reach the same opinion value – for $\epsilon > 0.5$.

It has been shown in [4] that the complexity of social network cannot influence the model outcome and that the transition from a pluralist pattern (more than one opinion cluster) to consensus always appear at $\epsilon=0.5$. The only way to change the model outcome according to the network structure is to introduce a dynamical network framework, where the network structure continuously co-evolves with the opinions [5]. I will show that, performing opinion dynamics on an evolving, group-based social networks, reduces the transition threshold, leading fast to an homogeneous society (as presented in [6] and [7]). Moreover a rich phenomenology emerges concerning the group structures, with the spontaneous formation of strongly heterogeneous group size, based on homophily.

Finally I will present some preliminary results on the analysis of the data concerning the

elections of the members of the Wikipedia editorial board. This dataset contains the binary votes (with their time ordering) of the previous members of the editorial board concerning a new membership. I show how, the properties of the pre-existing reputation network structure, can be used to build a predictive agent based model able to infer the outcome of the next elections.

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Keywords: opinion dynamics, data based models

Negative word-of-mouth in threshold diffusion processes. An agent-based approach

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It has long been accepted that positive and negative word-of-mouth (WOM) communications play a crucial role in convincing people to adopt innovative behaviors and ideas, or to reject them (Rogers, 2010). Much interest has been devoted to the role that interpersonal communications has in influencing positively or negatively the dissemination of new behaviors and their adoption. It has been argued (Granovetter, 1978), moreover, that diffusion can have the form of threshold-like processes; people’s likelihood of adoption depends on the number of other individuals who already adopted the innovation, net of their individual ”threshold” (an exogenous latent propensity to adopt the innovation). Although there is some evidence showing that negative WOM follows some sort of dissemination process (Leonard-Barton, 1985; Leherer, 2015), limited attention has been paid to the dynamics of negative and positive WOM and how

do they affect each other. In this paper, it will be argued that both the processes might behave in a threshold-like fashion, at the same time. The first part of the study will test, by means of an agent-based model, the theoretical expectations of the argument and will test in which parts of the simulated network, and on which simulated individuals, positive and negative WOM spread. The second part will apply the theoretical structure to a case study, the process of diffusion of the Movimento 5 Stelle in the Italian election campaign of 2013 (Vezzoni and Mancosu, 2015). Starting parameters of the theoretical agent-based model will be thus calibrated with survey data. Preliminary results support our argument. More precisely, far from being accidental, both positive and negative WOM behave according to the expectations of a threshold model of diffusion (the first to be converted are the easiest, and the latest are the most difficult). When calibrated with real data, moreover, the agent-based model predicts well the electoral outcomes of the elections for the Movimento 5 Stelle.

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Keywords: word of mouth, diffusion, agent-based models, network topologies, threshold

Modelling the resilience and disruption propagation in Australian business networks at the firm level

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National economies comprise complex networks of firms exchanging material and non-material resources via physical infrastructure, which can be modelled by agent-based models (ABMs). The network structure of interfirm interactions effects how shocks and fluctuations in one part propagate, disrupt behaviour and affect aggregate outcomes and performance. The critical importance of the structure and behaviour of these networks is being increasingly recognised but, to date, sufficiently realistic models have not been developed of these highly complex systems, due to lack of data (complete interfirm production network data for an entire economy are available only in Japan) and the ability to adequately model the firms’ behaviour. A correct specification of interaction network topologies is of crucial importance in ABM but previous models have been operated mainly on theoretically stylized networks such as lattices, random networks, or generic small-world and scale-free networks. ABMs have been mainly used to illustrate theoretical principles rather than being explicitly calibrated against statistical data from real-world networks.

Exponential Random Graph Models (ERGMs) support statistical inference regarding the processes underlying observed network structures, efficiently capturing complex network ”motifs”, which can represent, for example, the tendencies to form cliques in trade networks or utilizing intermediaries who broker between diverse network cliques. Moreover, multi-level ERGMs, introduced by Wang et al (2013), can be used to explore complex interactions between supply networks and underlying physical infrastructure networks. Importantly, ERGM coefficients can be obtained from adequately sampled network data.

This project develops ABM embedded in empirically estimated multi-level network structures governed by interaction rules identified in Australian business networks. The model is developed by (1) collecting snowball samples of supply networks in diverse regions of Australia and integrating them with underlying physical infrastructure network data; (2) estimating the micro structure of these multilevel network fragments by ERGMs; (3) utilizing 2 million agents with contact structures probabilistically inferred in the previous step; (4) validating and calibrating the process on the existing data of the entire production network in Japan. Such model can simulate fine-grained non-linear diffusion processes and their pathways, which could not be accomplished in the ERGM framework alone. The aim of the model is to be used by policymakers and firms to examine the critical infrastructure for the resilience of the system, the effects of different types of shocks on the system, and to develop strategies to deal with them in effective ways.

Keywords: ABM, ERGM, production networks, disaster resilience

An agent-based model for dynamic social networks generation

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When generating social network dynamics using Agent Based Modelling and Simulation approach, the creation and evolution of the network rely on agents' actions and in particular on their choice to create or remove links with other agents. We propose in this work a very simple agent-based model able to generate generic social networks based on a simple imitation process. Therefore, we are interested in simple but realistic and explicit social behaviours for agents that will provide mechanisms for link evolution between these entities, and thus enable social network formation and evolution.

In this perspective, we modelled both: the application of the actions corresponding to given behaviours; the propagation of a given behaviour on the social network among the agents.

The main source of complexity in such systems lies in the crucial issue that the network shapes the influence undergone by the agents and that the agents' actions shape the network in return [1]. In such systems, influence of local connectivity of an agent within the network is represented by the way people choose to interact with others [2].

A common way to represent this is consists in taking into account the social neighbourhood during the action selection. This method is adapted to agents in possession of various actions available. In our system, following a parsimonious approach[1], in order to be generic and applicable to a broad variety of cases, the agents have only a couple of atomic actions. For making the network connection play a role in the attitude of agents, we choose to spread behaviour among agents following the social network. Indeed, human beings tend to imitate each other, for various reasons, the main one being that social learning is an advantageous evolutionary solution. Some years ago, the memetics field of research was particularly dedicated to imitation [3][4]. We will present specifically tools that offer a good insight into the dynamics of the simulation of such complex artificial systems. In particular the system we work on offers an adaptive way to measure the output network: metrics on the topology or on process-oriented results.

In the first case, the metrics of a target network will be compared to the output. The other way to do this is to run processes and compare their respective results. (i.e. speed of a rumour spreading, formation of a steady state ...). We can then run a genetic algorithm to find the best distribution of behaviours among the agents to match a specific kind of network.

As an example for our system, we choose as an objective to generate network with scale free property, i.e. with a Pareto distribution of the degree distribution of the nodes. We then provide 4 sets of behaviours: 2 rules for adding edges and 2 rules for removing them. Agents can only have one of each. They can add a link to a random entity, or be selective and add a link to a most connected node. Same goes for the removing action, they can remove randomly or remove from a less connected node. An agent can replace his actions set by imitation, copying an action previously applied on him. With those simple rules and depending on the initial distribution of the behaviours, scale free property can be obtained.

[1] ABMs explore the simplest set of behavioral assumptions required to generate a macro pattern of explanatory interest Macy, Michael W, and Robert Willer [1]

Acknowledgments: This work benefited from the support of the project GENSTAR (ANR-13 – MONU – 0006) of the French National Research Agency (ANR).

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Keywords: agent-based modeling, social networks generation

Minority size and ethnic homophily. Preference interpretations and misspecification of ERG models.

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Research using exponential random graph (p^* or ERG) models of ethnic friendship homophily in schools suggests that pupils have stronger preferences for in-group choices in classrooms with a larger ethnic minority. We demonstrate theoretically how this preference interpretation of ERG homophily coefficients could be at odds with an actor-oriented process model explicitly representing homophily preferences. We use agent-based computational modelling to represent theoretically alternative individual-level processes of network formation and derive their emergent consequences for network structure and intergroup relations in particular. This work shows that in classrooms with larger ethnic minorities, stronger segregation may arise as an emergent property from the interdependent network choices of individuals who hold the same preferences than those in classrooms with smaller minorities. We then show how misspecifications of an ERG model of the simulated cross-sectional network data can lead to this discrepancy between the preference assumptions made in the process model and the inferences researchers may draw from the statistical model of the emergent networks. ERG model specifications are presented that better align ERG model and actor-oriented model and implications are discussed for strategies to foster inter-ethnic integration in classrooms.

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Keywords: agent-based computational modelling, ERGM, homophily, inter, ethnic friendships, segregation, school composition

Multi-level agent based simulation for network analysis

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In this work, we propose to use multi-level agent based simulation to visualize and explore weighted networks. The basic principle is to let agents capture their neighbors to create high level agents/nodes. Intermediary agents/nodes try to get out of their host, while low-level nodes stay idle to keep the simulation efficient (only high and intermediary level agents have active behaviors). The agent behavior is used to define the aggregation/disaggregation properties, and thus to allow an easy interpretation and analysis. This methodology, implemented within the GAMA framework, is applied to the analysis of the work market (with one agent/node for one job offer or CV) and scientific teams (one agent/node by team). The network is generated from the distance between the text of the jobs/cvs/articles. While the basic graph is hard to interpret (each node is described by its text), the multi-level aggregation allows both to study and visualize homogeneous groups (high level agents/nodes), to describe them (aggregation function on text descriptors), and to get a manageable network size (with only high and intermediate active agents).

Keywords: multi-level network, agent-based simulation, dimensionality reduction

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Session 10: Doing qualitative network analysis

Narrative methods for the analysis of network ties

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Since the cultural turn in network analysis numerous works have dealt with the co-constitution of culture and networks. I engage with this line of research by bringing together two strands of research: (a) Harrison C. White's network theory and (b) qualitative methods of detailed text analysis. In particular, I draw on recent developments in narrative analysis of identities and show how its linguistic techniques can be used to trace the co-construction of identities and ties in stories on personal networks. I demonstrate my approach empirically using data on professional ties from narrative interviews with nascent entrepreneurs.

Keywords: narrative story, identity, Harrison C. White, qualitative methods, relational sociology, culture

What online curriculum vitae data say about identities? A relational approach about identity construction in online biographies in Academia

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Relevance & Research Question: Biographical research are typically focused on the examination and documentation of lives of individuals retrospectively. With the emergence of the internet the everyday life has changed and people use new technologies for self-promotional purposes to reach a broader audience – especially in the academic field. But how does it look like? Which information are shared, disclosed or withheld? And what can online CV data say about identity construction of individuals on the web in relation to the (social) recruitment strategies in the national higher education system? Are there common paths? With the following network study these questions shall be examined with the view on both perspectives ethnographical and phenomenological. The aim of this study refers to getting new insights about the social phenomenon on identity construction and the impact of the (social) web by a combination of quantitative and qualitative relational research.

Methods & Data: The case study based on the examination of online CV (curriculum vitae) data compared with interview data from 10 popular (male and female) professors in Germany. The test persons were systematically recorded from different universities in Germany and originated from two different disciplines (social science and natural science). The first step includes the extraction of biographical relational data within successful career paths (in relation to the impact of social relations) via narrative interviews. The second step describes the representation of (successful) careers within the online CV data. After analyzing the qualitative and quantitative (relational) data the study compares the results and concludes with implications about self-presentation and self-expression in order to answer the question what (online) CV data say about identity construction on the web.

For analyzing the whole qualitative and quantitative (text) data sets the study based on the multimodal multilevel analyzing concept called Social Academic Analytics by Stuetzer, Breiger, and Koehler (2013) which refers to extracting, exploring, and analyzing multimodal multilevel network data in higher education. The data were systemized by given multimodal Actors-Locations-Organizations-Roles-Time relations and will be analyzed via different network analytics tools (Social Network Analysis, Dynamic Network Analysis, Semantic Network Analysis).

Results: The results and the interpretation of the results is work in progress and will be prepared until the EUSN16 conference. With the focus on the research questions the study ultimately aims to contribute to a better understanding of the relationship between social theories about (social) networks, (online) communication, and human beings.

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Added Value: The results of the study give implications for both social scientists and data experts in the field of biographical (online) research and put the researchers in the position to transfer new (relational) methodologies in the context of biographical research.

Keywords: data mining, online networks, mixed methods, social influence, personal networks, social resources, multilevel networks

Qualitative comparative analysis of international sanctions network

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Contemporary nation-states use sanctions as one of the most explicit forms of economic coercion. The significance and frequency of this foreign policy instrument has increased so dramatically over the last ten years of the twenty century that some scholars have dubbed it, "the sanctions decade." Of the many methodological approaches employed to explain the occurrence of sanctions, the use of social network analysis has proved to be especially well-suited for this problem. Our bimodal network is based on the updated Threat and Imposition of Sanctions (TIES) dataset, which we model to incorporate categorical variables usually omitted in network studies on sanctions. Our prime interest is to explore combinations of different issues, sanctions types and attributes of actors thus we apply qualitative comparative analysis to study international sanctions network.

Keywords: international sanctions, multi method network analysis, qualitative comparative analysis

Pitfalls in the development of qualitative social network analysis

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Qualitative social network analysis is (again) getting more and more discussed in recent past. However the development of qualitative SNA faces pitfalls on the level of theoretical frameworks as well as on the methodological level. On the theoretical level qualitative SNA

studies are often implicitly grounded on a mix of frameworks which causes a logically inconsistent foundation. While the study of "the story behind the ties" (relationalism) is seen as consistent with qualitative approaches, formal analysis (formalism) is considered to be satisfied only via quantitative means. On the methodological level qualitative social network analysis is often developed in reference to methods from the standardized approach instead of (re-)formulating an agenda on its own right (e.g. in methods of data collection or sampling). The paper will discuss the pitfalls of the development of qualitative social network analysis and will explicate them along past and current network studies.

Keywords: qualitative social network analysis, formalism, relationalism, open, ended

The visual sociogram in qualitative and mixed-methods research

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The paper investigates the place of visual tools in mixed-methods research on social networks, arguing that they can not only improve the communicability of results, but also support research at the data gathering and analysis stages. Three examples from the authors' own research experience illustrate how sociograms can be integrated in multiple ways with other analytical tools, both quantitative and qualitative, positioning visualization at the intersection of varied methods and channelling substantive ideas as well as network insight in a coherent way. Visualization also facilitates the participation of a broad range of stakeholders, including among others, study participants and non-specialist researchers. It can support the capacity of mixed-method approaches to research areas of the social that would otherwise be difficult to reach, such as hidden populations and informal organisations. On this basis, visualization appears as a unique opportunity for mixing methods in the study of social networks, emphasizing both structure and process at the same time.

Keywords: sociogram, network visualization, qualitative networks research, mixed methods, graphs

EITHER and OR – On the intricacies of conceptualising digitally mediated social ties

Cornelia Reyes Acosta

*Speaker

Social network analysis as a means to investigate individuals' relationships within their personal social networks, is primarily concerned with the existing dichotomy of strong ties and weak ties in order to identify the quality of those relationships. Online social networking platforms as a means to amplify the scope of social interaction, has given way to a more broadly defined approach to the nature of social interaction. Conceptually, the notion of latent ties is meant to signpost this development by way of describing a set of social ties that "exist technically but have not yet been activated" (Haythornthwaite, 2002). Whereas this definition points to the fact that digitally mediated social interaction bears a strong potential in building new social ties, a clear definition in terms of what latent ties actually are once being activated is still missing. In absence of a neatly defined concept, one may speculate that once activated, latent ties assume the qualities of either strong or weak ties. Even though, this may occasionally be the case, my research shows that latent ties do in fact diverge from these existing conceptualisations of social ties. As such, with this paper, my aim is to highlight that empirically, digitally mediated social ties do take on characteristics of both strong and weak ties at the same time, while technically not fitting either definition. More precisely, drawing on affordances of latent ties, I will show that given the specific context, latent ties often afford outcomes that have hitherto been primarily associated with the existence of strong ties. Researching the creation of trust via digitally mediated social ties, I provide empirical evidence that frames – at least in respect of their affordance – latent ties as strong ties. Nonetheless, at the same time the intrinsic nature of those ties remains markedly weak. In light of these findings, I make a case for a more elaborate definition of latent ties, which is informed by empirical material that showcases individuals' experience of activating latent ties as creating a sense of social relatedness that departs from the predominant strong/weak tie tradition.

Keywords: digitally mediated social ties, online social networking platforms, social ties, trust, latent ties

Qualitative network analysis : A way to understand construction of a collective?

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This communication is about the history of The Third Place called Le Multiple. Located in Toulouse, this collective was founded in 2012 starting from two structures: a FabLab called Artilect and a project called La Serre from the social solidarity economy. The various stages of its

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formation show the key role played by the installation location - sometimes pretext, sometimes driving force, sometimes catalyst - on the occasion of singular events that created bifurcations and irreversibilities, engaging the different participants' ways they had not necessarily planned.

The research work is ongoing since September 2014 and is based on observations, in-depth interviews and data collection coming from the protagonists.

To analyse our corpus, we use classical thematic analysis but also social network analysis, specially relational chains to understand resources mobilization, but also we identify relations between people involved in this place. With qualitative data, we are doing qualitative network analysis, using qualitative analysis software to code the data.

First, we'll present the research lead on this third-place (Azam, Chauvac, Cloutier 2016). In a second time, we'll present the methodology we use to analyse relations between the individuals who are part of the Multiple, but also with their environment, and particularly, the interest of this approach to understand collective action.

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Keywords: qualitative methods, collective projects

Session 11: The Inequality–Social Network Nexus

Socioeconomic segregation of activity spaces in urban neighborhoods: A network approach

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Recent evidence indicates that residential segregation by income and education is increasing alongside trends of slowly but steadily declining Black-White segregation. Levels of segregation in urban neighborhood residents' non-home activity spaces, however, have not been explored. How integrated are the daily routines of people who live in the same neighborhood? Are people with different socioeconomic backgrounds that live near one another less likely to share routine activity locations than those of similar education or income? Do these patterns vary across the socioeconomic continuum? Moreover, research is silent about how patterns of spatial sorting in routine activities by socioeconomic status might vary according to the socioeconomic structure of the neighborhoods where people live. We draw on segregation research and network approaches to examine hypotheses regarding variability in socioeconomic (income and education) sorting in the routine activity locations of urban residents. These questions address longstanding issues in urban sociology and current debates on the effectiveness of mixed-income housing in increasing exposures across SES. The analyses employ unique data from the Los Angeles Family and Neighborhood Survey (L.A.FANS) that identify the location where residents from a representative sample of neighborhoods in Los Angeles county live, work, shop, worship, visit the doctor, and spend other time. We conceptualize the structure of shared routine activity locations as a multilevel network – household pairs (represented by a randomly selected adult) residing in the same neighborhood (census tract) and examine whether the dyads conduct activities in the same location (census block group). Of central interest is whether neighbors with the same education/income levels (homophilous dyads) and/or those with different education/income levels (heterophilous dyads) are more or less likely to conduct activities in the same places. We also examine whether the role of neighbor socioeconomic similarity or dissimilarity in the co-location of routine activities is dependent on the socioeconomic composition and level of trust characterizing the neighborhood as a whole. The analyses control for a host of dyad-level demographic similarity/dissimilarity covariates (as well as geographic distance between residences of the neighbor pairs) and tract-level structural characteristics. We employ multilevel p2 models (Zijlstra et al., 2006) to model the probability of a tie through any routine activity location. The logistic regression framework results in coefficients that capture the change in the log odds of a household dyad tie (shared activity location) associated with a given dyad- or tract-level predictor, while accounting for dependence due to the sampling strategy (individuals are nested within tracts) and definition of dyads (individuals are part of many dyads). Results indicate that, on average, increasing SES diminishes the likelihood of sharing routine activity locations with any SES group. This pattern is most pronounced in neighborhoods characterized by high levels of socioeconomic inequality. Neighborhood trust explains a nontrivial proportion of the inequality effect on the extent of routine activity location sorting by SES. Thus stark, visible neighborhood-level inequality by SES may lead to enhanced effects of distrust on the willingness to share routines across class.

Keywords: spatial networks, two mode networks, multilevel networks, activity space, segregation, neighborhood

”I’m just like anyone else”. A longitudinal study of the effect of homophily on educational performance

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Educational achievement is an important determinant in both educational and occupational success. Many educational policies, such as desegregation, de-tracking and use of special needs education have targeted the composition of students in schools to improve the students’ learning and performance. While much of the research have concentrated on how institutional effects, i.e. the use of tracking, affects performance and educational achievement, only few studies have investigated how the students interact with each other, within these institutional settings and how the student interactions translate into educational performance and social inequality. Although the institutional settings may explicitly create social stratification, through allocation of resources to students, social interactions between students may also create implicit social stratification.

Preferences of friends are very important in that friends provide resources, norms and behaviors for the individual students, which might not be available elsewhere. Preferences of friendships might therefore lead to lower or higher inequality of performance if students segregate themselves based upon their educational achievements. A problem is thus that friendship and achievement are endogenous to each other, giving challenges in separating the effects of peers on the individual student’s educational performance and friendship preferences.

Using a two-step strategy on data of 109 longitudinal social networks in Danish classrooms, I use the Simulation Investigation for Empirical Network Analysis (SIENA) method to separate the influence of friends on educational performance from the selection of friends and model how the students’ social interactions affect educational performance as a dynamic feedback mechanism. I then combine these results in a multilevel meta-analysis to provide evidence of peer influence on educational performance across multiple social networks.

This study finds that students tend to assimilate the performance of students who are similar to themselves. Students tend to associate with friends of similar achievement. The results suggest that students segregate themselves along performance, creating a ”Matthew Effect” in which the high-performing students segregate themselves from the low-performing students, leading to further social inequalities in educational achievement.

Keywords: SIENA, homophily, educational performance, social inequality

Gender gaps in social capital: A theoretical interpretation of the Italian evidence

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In this paper, we show that social capital accumulation along the life cycle is different for men and women, and make the hypothesis that this evidence is compatible with the existence of gendered social networks, where personal characteristics such as age and sex determine dominance. We survey the literature on gender and social capital and use the Italian data of the "Multiscopo" Survey to assess differences in life cycle accumulation of social capital by sex and age. The lifecycle profile of social capital accumulation is gendered, with men accumulating more social capital at all ages, with a different peak and overall profile. We also show that, over 15 years, the gap in social capital by sex narrowed. Finally, we introduce a model of social capital structure compatible with the empirical evidence and with notions of gender as defined in feminist literature.

Keywords: social capital, gender, network formation, relations, life cycle, Italy

How young workers use social networking services to find a job in Spain? A mixed-methods approach

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Online resources in the job market play an ambivalent role that ought to be empirically clarified. How do young Spanish people really use social networking services when looking for a job? And how do structural factors such as class or cultural capital shape this choices? Optimistic views claim that technology and social networking sites will eventually substitute the governmental agencies of employment as well as family, friends and colleagues. Private HHRR departments such as Adecco (2014) reports on the increasing role of social networking services for job seekers. But data is a commodity like anything else that can be traded, assembled, and used as a source of business intelligence (Savage & Burrows, 2009). Our claim is that social networking

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ought to intensify the compositional features of personal networks, widening the inequalities that come with social structure (Bourdieu, 1998; Savage et al, 2013; Brynjolfsson & MacAfee, 2014). The digital gap (Castells, 2002; Castaño, 2008) puts forward the differences in access and use of digital tools. Robinson's (2009), Hargittai (2010) and others have analyzed Internet use as potentially capital-enhancing activity, examining digital literacy as either recreational or as tools for "concerted cultivation" (Lareau, 2011). Still, in societies like Spain, where social networking services are widespread, we claim the digital gap is not only cultural but also social. The heterogeneity in social interactions in the UK bring about an inversion of the digital divide (Mayo & Nairn, 2009). Sennett (2012) comments on this new form of inequality that adds on to income or knowledge inequality. Our study includes face-to-face surveys, with computer-mediated ego networks questionnaires to youth living in Spain, from 20 to 34 years of age, from Barcelona and the metropolitan area that are either working or looking for a job. Our questionnaire asks for the type and effective use of the interviewees' personal network, the media and settings involved, and their degree of success in finding a job. The EGONET name-generator asks for the personal network of the interviewee, limited to 20 contacts to ensure a manageable duration, including a specific request to include former or current colleagues that helped. The interviewee reconstructs her past with the physical aid of a qualitative longitudinal life grid on paper. Finally, a short qualitative interview at the end captures their view on their work-related decisions taken so far. Our quotas followed gender, age, educational level and occupational status. Our methodological stance is to make explicit the bidirectional transfers between qualitative- the interview and the life grid of labor events- and quantitative data- the social network generated with EGONET-. Our methods showcased show that social networking services are not homogeneous. Their use seem to depend, first, on occupation and qualification, and second, on composition of their personal networks. Social networking services might only be effective for a small subset of personal networks with alteri with high educational status. The effectiveness of using social networking services is shaped by the the digital habitus of Spanish youth but also by the composition of their social capital. This presentation spawns from the "Social Networks as a Resource and Mechanism for Spanish Youth in looking and finding a job", a R+D Project for the Spanish Ministry of Economy CSO02012- 36055 2012- 2015.

Keywords: social capital, social networking services, inequality, egonet, digital habitus, interaction

Comparison between alumni in French Grandes Ecoles and Universities: How to network?

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French Grandes Écoles reputation is also maintained by alumni activities which defend network value and boundaries of this favored social class (Chaulet & Bès, 2015 : Bès & Chaulet,

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2016). Based on a long tradition of selection and self-reproduction, each graduate network is performed by the social capital of the group. The main alumni's function is to maintain a useful data base with operational address and contacts. At this other side, the French universities recently build some alumni activities without directories or a strong sense of belonging. In this context, it's interesting to compare how the both alumni offer network actions based on their graduates. We use Brubaker's framework on identity to follow this comparison. Our materials, about alumni, included recent interviews (30), direct observations (10), directories analysis and sites and communication support analysis and the communication will be qualitative oriented.

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Keywords: alumni, higher education, social capital

Session 12: Historical and Archaeological Network Research

Financing the fight: The role of free-French financial intermediaries through their social network

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While advances in computing power and software have helped us to better understand the complexities of a person's social and professional networks[1], the importance of digital humanities to historians is a recent development. In line with this, this paper seeks to apply Network Analysis to the economic history of the Anglo-French cooperation in the Second World War. A study into the social networks of the principal actors has been conducted in order to reveal the role played by the intermediaries of the Bank of England, the Free French, HM Treasury and the commercial banks.

Drawing on documentary evidence from the Archives of the Bank of England, and the National Archive at Kew in London, and using graphical representations generated by UCINET[2], this paper argues that these networks prove to be the foundations of relationships that administered both the Free French colonies in Africa[3] and the financing of the Resistance in France[4]. The analysis of correspondence found shows three members of the Free French coming to the fore; Pierre Denis (Rauzan), André Diethelm and Tony Mayer; and through their letters, we can effectively chart the breakdown of the amicable diplomatic relations between the Free French and the British Government.

This paper looks at the bilateral, multi-levelled organisational interaction formed between the British Government and commercial banks which helped the Free French to develop both militarily as well as monetarily. Stemming from two personnel, Denis and his elderly colleague[5], following the Call of 18th June 1940, the Financial Service of the Free French evolved as the tides of war changed. Initially responsible for simply keeping the Gaullist organisation afloat[6], they oversaw the creation of the Caisse Centrale de la France libre the 2nd December 1941[7] in order to ensure monetary circulation in the rallied colonies. However, political tensions were growing. The departure of General de Gaulle from London marked a turning point for the Caisse Centrale as it became autonomous[8], and free from the constraints of the British Government. It equally represented an end to the symbiotic Anglo-French collaboration.

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Keywords: Caisse Central de la France libre, Bank of England, H.M. Treasury, Pierre Denis, André Diethelm, Tony Mayer, Free French, General Charles de Gaulle, Anglo French Collaboration, World War II

Numerical network modelling: Is machine time historical time?

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Historical networks evolve for endogenous and exogenous reasons whose roles can be difficult to distinguish. This confusion is often present in network modelling, particularly where poor data requires mathematically-based models predicated on particular assumptions about the relevant agency behind the network evolution. Typically, the anticipated network is optimal or, more realistically, approximately so in some regard e.g. it is chosen to make best use of our knowledge (constrained entropy models) or it tends to maximise benefits (cost-benefit models). Inevitably, the complexity of the models means that the identification of ‘good enough’ networks is achieved through iterative computer algorithms designed to hunt for optimal behaviour. It is possible to trace how the computer hunts step by step in machine time through potential networks, searching for increasingly ‘better’ ones.

The question we shall address in this talk is how to understand this hunt. There are two different approaches. At its most extreme, the first adopts initial conditions appropriate to a specific historic past for the society under study and takes a single evolution towards an ‘optimal’ network as a proxy for the historical evolution from that past state to the one of interest. From this viewpoint endogenous algorithmic iteration in machine time is history in the making [1]; machine time is historical time! In this picture the exogenous evolution of system parameters plays a subordinate role.

The second, more epistemic, approach says that the computer is doing no more than show-

*Speaker

ing the relaxation in machine time from an arbitrarily chosen (non-optimal) initial condition towards the ‘optimal’ (or ‘good enough’) required answer. The assumption is that different initial conditions would give essentially the same outcome and nothing societal is to be attributed either to them or the nature of the path of relaxation, only the final ‘optimal’ state [2]; machine time and historical time are unrelated!

From this viewpoint network evolution is driven by the largely exogenous evolution of system parameters in historical time (e.g. the changing ‘benefits’ of exploiting local resources), defining a sequence of ‘optimal’ outcomes which mimic history. That is, history is an attempt to maintain ‘optimal’ (or ‘good enough’) functionality as the global parameters change whereas, from the previous viewpoint, history is an attempt to achieve ‘optimal’ functionality from a non-optimal beginning. We explore these different narratives with examples from the (constrained entropy) ‘retail’ archaeology of Iron Age Greek [3] and Celtic city-state formation and (cost-benefit) modelling of Bronze Age Aegean maritime exchange [2]. While there is merit in it, the dichotomy presented above will be shown to be too simple once the stochastic nature of the modelling has been taken fully into account.

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Keywords: networks optimisation, entropy, cost benefit

The geopolitical landscape of early England: Anglo-Saxon ‘Great-hall complexes’ and their wider networks, AD 400-800

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The royal villas or ‘great-hall complexes’ of early England are described in contemporary documents as administrative centres and places of regional power. They are depicted as offering a range of services to their dependent territories, such as protection and legal dispensation, and were involved in the collection of food rents in return.

That they operated as important nodes within regional networks has previously been argued on theoretical grounds – using Central-Place Theory, for example – but has never been tested archaeologically. It therefore falls upon network analysts to consider the topic in formal network terms and characterise the nature and extent of these relationships.

This study, the first of its kind, considers six of these ‘great-hall complexes’ and situates them within their wider regional networks using a GIS and network-based approach. This is undertaken using the ArcGIS and Visone programs to identify, analyse and visualise spatiotemporal networks from several regions of fifth- to eighth-century Anglo-Saxon England.

The results of the empirical analysis are related to broader concepts of early medieval power, place and governance, and are compared with similar studies of contemporary north-western Europe. The concluding remarks consider interpretative issues such as the identification of nodes and ties and explore possible avenues for further research.

Keywords: Anglo Saxon, Visone, ArcGIS, royal vill, early medieval, power, place, governance, administration

Exploring dependence assumptions for visibility networks in archaeology: tackling issues of missing data and long-term change

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In a visibility network a line of sight from an observation location to an observed location is represented as an arc and a pair of nodes. Visibility networks are used in archaeological research to study a variety of past phenomena. They can serve as representations of past communication networks using visible smoke or fire signals to communicate a message between two places that were visible from one another. Visibility networks are also often used to represent resource extraction sites or other settlements the access to which could be visually controlled from a given settlement. What most archaeological studies of visibility networks have in common, however, are assumptions about the network data patterns one expects to see if specific phenomena occurred in the past. For example, a non-trivial signalling network consists of at least three locations with at least two lines of sight between them. In this paper I will discuss the dependence assumptions for visibility networks that are most commonly used in archaeological research. I will argue that their formal representation as network data allows for hypotheses about the structure, role and change of past phenomena that concern visibility to be represented and falsified. However, the study of visibility networks through the lens of dependence assumptions and formal network science is still in its infancy. I will therefore conclude the paper with an overview of the archaeological and methodological challenges that emerge from this discussion of dependence assumptions. Particular emphasis will be placed on the issues of missing data

and long-term change: complete knowledge of contemporary settlement locations that could have acted as a communication network, for example, and how a settlement pattern changed throughout the centuries is rarely possible in archaeology. This issue is shared by historians and archaeologists who have developed a range of approaches to study long-term change in social phenomena using incomplete data. I will illustrate how total viewsheds, where visibility patterns are calculated for entire landscapes rather than only for known settlement locations, show particular promise for tackling these issues.

Keywords: archaeology, visibility network, spatial networks

Interlocking directorates and social networks in French Financial System (1880-1939): first results from DFIH project

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This paper analyzes the interlocking directorates in French financial system from 1880 to 1939, presenting the first results of a research part of the larger project "Data for Financial History". This project is setting up a financial database gathering both the assets listed on the French stock markets from 1796 to 1977 and all the information available about the issuers. Among the several interdisciplinary applications made possible by this database, the study of interlocking directorates allows a comprehensive understanding of the connections among financial corporations in the long run, conveying important information not only on the overlapping corporations' management, but also on the ties among the members of the directorates.

Data used for this research come from the Yearbooks published each year by the Chambre Syndicale of the Compagnie des Agents de Change (i.e. the governing body of the exchange). Given the large amount of information contained in this source (not only companies' directorates, but also their juridical status, purpose location, and so on), we applied a semi-automatic process of data mining and validation, by developing a specific OCR software able to capt the information from the source and organize them into the database. Through this process, we collected information on the directorates of all the companies recorded in the Yearbooks, from 1880 to 1939. For the purpose of this paper, we will focus on the financial companies listed on French official market.

Our analysis proceeded as follows: we first built an a bi-mode matrix "companies on directorates members" and then we split this matrix into two one-mode adjacency matrix. In this way,

*Speaker

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we observed two kinds of connections. On one side, the ties among companies sharing at least one member of the administration board; on the other side the ties among the administrators sharing at least one company.

As far as the network of ties among the companies is concerned, we studied the evolution of the interlocking directorates of financial companies over time. Statistical measures such as the density of the ties and the centrality of the nodes and clusters measures have been applied to uncover the structure of the network and its evolution. At the same time, the main attributes of companies (location, sector of activity, juridical status) have been enlightened in order to understand how the interlocking directorates is dislocated among different kinds of companies. This network analytical description conveys important elements to study companies behaviour as well as to understand the relationship between interlocking directorates and market regulation. Moreover, it allows inferring the connections between the financial companies directorates and the industrial ones.

Beside the analysis of the interlocking directorates, we applied social network analysis to the members of the directorates, establishing that there is a tie among two individuals if the are members of the same company directorate. This analysis shows the connections among the managers leading financial companies over time. It not only uncovers the ties among these individuals in specific turning point in the history of the companies, but it allows also to follow the changing position of specific managers among the directorates they were part of. The analysis of the ties among members of companies' directorates will be completed thanks to other kinds of prosopographical information gathered about these individuals, in order to get a picture of the people composing these directorates.

The study of interlocking directorates has various important applications in historical analysis of French financial system, concerning the study of companies management, the flux of information and its transparency as well as the study of the behaviour of firms. This paper aims at contributing to these studies providing an insightful analytical pattern of both the interlocking directorates and the social networks about the French financial companies on the long run.

Keywords: interlocking directorates, financial history, French Stock exchange markets

Extending transportation network of the Roman Empire by means of demographic and economic proxies

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In a premodern period, diffusion of innovations through a cultural system was more than today limited by spatial constraints and, because of its political unity and economic connectivity, the Roman Empire represents an ideal context to study impact of them. Recently, the modelling platform ORBIS: The Stanford Geospatial Network Model of the Roman World [3] has been created, based on digitalized Roman road network [1] and following the debate on maritime travelling in ancient Mediterranean [2]. In this paper, we extend ORBIS-based network with demographic and economic factors, so it is possible to build on it when constructing more realistic diffusion models.

First, we parse the empire into micro-regions respective to individual nodes from ORBIS based on several geographical factors. Second, we use archaeological data as proxies to estimate proportional population size and economic importance of each region. Currently, we are working with subsets from datasets [4,5,6], which we use to count density of each type of evidence for every micro-region (Map 1a-c). To minimize biases in our data, we check them for consistency by mutual comparison and we further validate them for a subset of localities where reliable estimates on population sizes are available [7]. Third, we create a gravity model describing the travel probabilities between pairs of localities based on our demo-economic estimates and mutual distance on the travel network [8,9]. Finally, we analyze the transport network with the help of measures using random walks respecting the trip distribution given by the gravity model, and compare the results to the standard measures using purely random walks [8].

As future work, we intend to apply our extended transport network model when analyzing the spread of religious innovations through the Roman Empire, namely early Christianity and the cult of Mithra, where the model results can be compared to external empirical evidence (Map 2a-b).

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Keywords: Roman Empire, travelling in the Roman Empire, Roman demography, archaeological proxies, diffusion of innovations, ancient religions

Social network and spatial diffusion of obsidian in the Near-Eastern Neolithic: Raw material and technology networks

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Throughout the history of Archaeology, obsidian holds a particular place. Since the 1960s, researchers have highlighted the potential of this raw material to help identify long term interaction between a geological source and a volcano. The success story of this raw material can be explained both by its success with prehistoric groups as a material both visually attractive and technically efficient (very good clastic properties), and a practical proxy for archaeologist as it is relatively easy to match the geochemical signature of an archaeological artefact to the specific volcanic eruption. Consequently, thousands of artifacts have been characterized over the past 50 year in the Near East only, thus allowing to reconstruct maps of short to long-scale distribution across the region [1].

However, if the precision and accessibility of characterization techniques have been largely improved over the past 50 years [2], comparatively very little improvement have been made on the theoretical approach inherently related to the use of this proxy material, and several issues remain. First is a large uncertainty about the origin of the data, its direct geologic and geomorphologic context (primary or secondary deposits; available or not during prehistoric times, etc.). Second is the relatively low number of artifact chemically characterized, not statistically representing of the total assemblage.

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In this paper, we show that a strict focus on the chemical aspect of an obsidian artifact, as a raw material, is not only limiting our understanding of its potential, it is also biasing our understanding of the networks that we are reconstructing through its analysis. After presenting how an obsidian artefact can be studied as an object of technology, and the production of human knowledge, we present two models of distribution network. One solely including depicting raw material distribution, and one including dispersion of technology associated to the manufacture of these obsidian artefacts. We then propose a case study looking into the superposition of raw material and technology networks in the context of the Neolithization of the Near East. Indeed, considering the importance of knowledge transfer at this period[3], this approach would allow us to look directly at diffusion of innovation rather than inferring such process from a binary "presence-absence of contact" approach provided by the analysis of raw material distribution alone.

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Keywords: obsidian, neolithic, near east, technology, geochemistry

A network contribution to intervisibility analysis

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The objective of this article is to propose a methodological approach able to generate endogenous models of site distribution (i.e. models that emerge from existing data without imposing a priori assumptions on site distribution, architecture or economic behaviour) based on network theory and visibility data. The approach was applied to a sample of Roman sites located in the Marches of the Welsh borders. As expected, an endogenous model of site distribution emerged from the proposed approach, and this model was interpreted using a mix of standard and post-processual approaches. The results revealed that Romans organised the landscape in subareas according to functional as well as symbolic considerations.

Keywords: archaeological networks, intervisibility networks, endogenous models of site distribution

**Session 13: Personal networks and
the development of individual
vulnerability or strength in the life
course**

Personal social network as a shelter in situations of vulnerability

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In the last decades, individuals became more independent socially and economically from the family and community in comparison to previous times (Beck, Beck-Gernsheim, 2002). Even so, familial network still appears as a shelter protecting individuals from the external forces (Robila, 2004). Pahl and Spencer found that friends and other society members can replace some familial functions like closeness, time for leisure activities, support, and other (Spencer, Pahl, 2006), though, in the situations of periods of vulnerability, individuals give priority to family members (Pahl, Spencer, 2004; Park, Roberts, 2002).

The purpose of our research is to explore the interrelation between the structure and size of the personal social network and life satisfaction in the face of critical events. We hypothesize that individuals with larger personal social networks with dominated family members it its are more satisfied with their life even they experience some situations of vulnerability.

The analysis is based on representative quantitative survey data collected within the project "Trajectories of family models and social networks: intergenerational perspective" (code No. VP1-3.1-ŠMM-07-K-01-106). Fieldwork carried out between November, 2011 and February, 2012. Sample size of 2000 respondents represent four birth cohorts of Lithuanian habitants: 1950-1955, 1960-1965, 1970-1975 and 1980-1985. The following situations of vulnerability experienced by the respondents personally or by their family members were explored: unemployment of family members, long-term illness, caring for a sick family member, abortion, death, suicide, encounters with legislation, addiction, depression, domestic violence, family conflict, divorce, infidelity of spouse or partner, poor housing, financial difficulties, emigration.

The research results revealed that individuals in partnership (in marriage or cohabitation) and those with children at age of 7–18 years are more satisfied with their life even they experience difficulties in the life course in comparison to the respondents with other configuration of personal social networks.

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Keywords: personal social network, life course, vulnerability, life satisfaction

The impact of multidimensional life trajectories on personal networks in the transition to adulthood: A comparative perspective

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The aim of this presentation is to investigate the impact of co-residence and occupational trajectories on the composition of personal networks of two birth cohorts (1950-55 and 1970-75).

Over the life course, individuals develop personal networks which provide essential resources - sporadically or on a daily basis - such as instrumental, emotional, and informational support. Those personal networks are composed of family (primary and extended kin) and non-family ties (friends, colleagues, acquaintances) (Pahl & Spencer, 2004). The prominence of specific ties varies across the life course depending on life stages, transitions and events. Following the linked lives principles (Elder et al., 2003), these transitions trigger changes in household composition and labor market participation, promoting different types of relational interdependency. Thus various life trajectories will differentially influence the composition of personal networks.

Based on a configurational perspective, multichannel sequence analysis (Abbott, 1990 ; Gauthier et al., 2008) and network analysis (Widmer et al., 2013) are applied to longitudinal survey data collected in Switzerland, Portugal, and Lithuania using a commonly designed questionnaire.

Results show that individuals born in the 50s and individuals born in the 70s in either countries have entered adulthood and developed their personal networks within contrasted historical and social contexts. Social, demographic and gender inequalities, economic and political stability, better or worse living and work conditions, are all likely to influence young adults' autonomy, transitions and resources.

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Keywords: sequence analysis, life course, cohort, international comparison

Investigating the potential use of social networks to aid smoking cessation in pregnant smokers (SCIPS): A development study

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Background: Smoking is a major preventable cause of premature maternal mortality and subsequent ill-health for babies born to smokers. Only a very small percent of pregnant smokers engage with established smoking cessation services or manage to stop smoking. Existing evidence demonstrates that our embeddedness in social networks affect our health and behavioural choices. This is highly relevant to smoking with its social context which influences smoking behaviour. However, there is lack of evidence looking at how this link could be 'engineered' to help smoking cessation attempts in pregnancy.

Objective: To explore how the social networks of pregnant women could be used to aid their smoking cessation attempt and translated into a complex intervention.

*Speaker

Design: A rapid literature review was undertaken to identify any existing health behaviour change interventions that targeted pregnant women's social networks. Qualitative engagement with a range of stakeholders which included experts from academia and practice (n=23) to discuss the application of social network theory to help pregnant women stop smoking using support from their social network. Face to face interviews with pregnant smokers (n=7) and members of their social network (n=8) to explore the ability of the target population to describe their social network and understand how these networks might be used in a future intervention. A workshop with representation from practice, policy and commissioning (n=25) to discuss key findings from the study and potential intervention approaches.

Findings: A total of 4,740 citations were screened independently by two reviewers using titles and abstracts, from which 6 papers were retrieved for full text screening. Of the theoretical approaches we reviewed the ones we drew on were enhancing existing networks ties and alteration. Consultation with stakeholders generated important learning around the composition of pregnant women's networks and highlighted the importance of social media for younger women. A pen and paper mapping tool (based on egocentric sociograms, using concentric circles and a name generation question) was created to enable pregnant smokers (ego) to describe and consider their social network (alters). The use of the tool was piloted with the seven pregnant women who contributed to qualitative research phase. The tool enabled participants to visualise the structure of their social group and identify strong and weak sources of support. The stakeholder conference (N=25) generated feedback on our findings, including the utility of the mapping tool and their understanding of how this approach would relate to practice.

Conclusion: This development study has created the learning and understanding to design an intervention drawing on social networks to help pregnant women stop smoking. Further testing is required to assess its utility and incorporation into existing practice.

Keywords: sociograms, concentric circles, personal networks, ego, alter, smoking, pregnancy

Resources or strains? Patterns of supportive and upsetting interdependencies in family networks of individuals with mental illness

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Despite substantial attention given to family support for individuals with mental illness, the resources provided by the complex web of family interdependencies in the larger family network, particularly social capital from a structural perspective, have seldom been considered empirically. In addition, supportive ties often come with stressful and interfering relationships that should be taken into account when researching the link between family-based social cap-

ital and psychological health. Rather than considering negative and positive relationships as alternatives, this study hypothesizes that distinct patterns of positive and negative interdependencies characterize the family networks of individuals with serious mental illness. Throughout a five-wave assessment of 60 outpatients of a private practice, it examines the structural features of supportive together with upsetting relationships in the family networks of individuals with severe mental illness. Based on an empirically derived typology, this paper shows that individuals are embedded in four distinct patterns of relationships. Bonding social capital and bridging social capital correspond to two of them. One pattern is characterized by overload, and another one by ego-centered conflict. Compared to individuals within a bonding or bridging social capital pattern, those experiencing overload and ego-centered conflict patterns face higher levels of distress. These findings present evidence that family networks provide resources to some individuals when dealing with mental illness; however, for a significant number of them, they rather disclose stressful or demanding situations.

Keywords: family networks, patterns of interdependencies, support, conflict, psychological distress

Personal networks' effects on individuals' psychological and conjugal vulnerability: a longitudinal approach

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In the light of individualization and pluralization trends, personal networks are said to be paramount in ensuring individuals' psychological well-being and conjugal quality, since they provide a sense of belonging, as well as expressive and instrumental resources. For instance, perceived social support enhances individuals' subjective well-being as it facilitates coping with and adaptation to critical life events and transitions, therefore assuming a buffering effect. However, feelings of being controlled by relatives can also jeopardize individuals' autonomy and mental health, potentiating a psychological vulnerability increasing. On the other hand, conjugal quality is as well affected by the characteristics of personal networks. Thus, the conjugal dyads are better understood if we take into account the relational context in which the couple is embedded, i.e. the networks of close relationships. Several features of personal networks have been empirically proved to have an impact on conjugal quality, such as the density and transitivity of support, the ties' overlap between partners, and the degree of family interference. However, little is known about the longitudinal effects of those features. Therefore, the main aim of this paper is to investigate the role of personal networks on both psychological and conjugal vulnerability by taking a longitudinal approach. For this purpose, we draw on data from the Swiss longitudinal survey "Cohesion et conflict dans les familles contemporaines", composed of three waves (1998, 2004 and 2011). In this paper, we focus only on data from wave 1 and wave 3 and we selected only those couples who remained together between the two waves (N=721). In

*Speaker

order to explore the network effects, we focus on both functional and structural indicators. As functional indicators, we considered the emotional and financial support perceived, as well as the level of family interference in conjugal life. As structural indicators, we stress the level of friends' overlap in the networks of both partners, and the level of transitivity between friends, siblings and parents. Psychological vulnerability was measured through a 6-item scale of depressive symptoms (fatigue, inquietude, sadness, loneliness, anger, and pain). In order to assess conjugal vulnerability, we relied on four indicators: conjugal satisfaction, separation thoughts, intensity and frequency of conjugal conflict. The findings show a significant effect of personal networks' indicators on individuals' psychological vulnerability, as those individuals who perceive a weaker provision of emotional and financial support report a higher level of depressive symptoms. Also, the perception of family interference in conjugal life is likely to be positively associated with higher psychological vulnerability, particularly among men. On the other hand, the functional and structural features of couples' networks were also found to be strongly associated with conjugal vulnerability.

Keywords: personal networks, psychological vulnerability, conjugal quality, lifecourse, longitudinal design

The role of personal network in the construction of identity at the entrance into adulthood

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Researches on personal networks allow us to observe concretely how individuals are shaped, in contact of which relations, along which socialization instances, evolving within what kind of network and with which flexibility in the social worlds. This level of analysis also allows us to grasp the relational dimension of reality, revealing how dispositions and aptitudes are developed through contact with others and how they then need to be activated and maintained through relationships, feeding different facets of the personality of a plural actor. A sociology of relational dynamics finally allows us to conceive relationships not as static links but as processes at work in life trajectories. As part of my PhD, my study aims to better understand the interdependencies between the individual and its social environment, both in the resources and the limits that the personal network embodies. In the end of youth, by focusing on transition steps to adult life, we're seeking to grasp the transformations that drive the personal network and the supports it provides to the individual, at the time when one enroll in major social roles which will participate to define him (professional, conjugal and parental roles). For this, a series of private interviews is conducted among young adults from Montpellier with contrasted social backgrounds, to rebuild with them their personal network and reconstruct their recent biographical route. There, the different types of personal network observed can be correlated to the social background of individuals. The networks of popular classes are more often dense, homogeneous and smaller. The networks of upper classes are more likely to increase, to be dissociated and heterogeneous. However, these opportunities and limits that the personal network

allows are often experienced at an individual scale, in an injunction to produce oneself, denying all the force of social determinisms. As part of this identity ordeal, which is more a relation to oneself, the personal network will even participate in the production of a particular link of a person to its own individuality. This individuality will be experienced by excess or by default, depending on the self-images that are reflected and the relational supports (like relational skills and network organization) provided by the personal network.

Keywords: personal network, youth, identity, relational supports

**Session 14: The role of social
networks in the transition towards
sustainable food systems**

Social networks and food transition: exploration of new drivers in food studies

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Food and food consumption are privileged objects of research in social sciences. Nevertheless, in a pressured context of climate change, food waste, and environmental damages due to food production, researchers and policy-makers are circumspect regarding the way to make food practices evolve towards more sustainable food practices. While economists highlight the limited role of taxes, education campaigns or labels to favor changes, food sociologists and anthropologists explain the inertia in relation with low income, low level of diploma or familial heritage, then difficult to modify (Esnouf et al., 2013). However, in a society in which the role of institutions appears as weakened and the opportunity to develop social relations is higher, another perspective emerges as relevant: considering that practices and innovating practices may be explained by the position in social networks, rather than by social categories (Burt, 1987), network sociology may give new ideas to face this issue. Short food supply chains, renewing in Northern countries for the last twenty years, appear as exemplary cases to test this approach: promoting a re-embeddedness of economy in human, interpersonal networks (Hinrichs, 2000), they allow a crossed and dynamic analysis of practices and networks. Moreover, they now concern "ordinary" consumers, no or little aware about the sustainability issue, beyond the activists who contributed to their renewing. From a study case of an open-air market located in the South of France, we highlight four positions among ordinary consumers, each position corresponding to a specific relational trajectory, both before and after they entered the market, as well as to a set of people with similar food practices (purchasing, cooking). While each position is diverse in matter of age, sex, income, etc., three of them show little to major changes towards more sustainable food practices. More than the trajectory before, the analysis highlights the importance of the diverse relations favored by the market (advice, mutual help...) and of their impacts (learning, self-esteem...), as well as of specific resources of mediation (Grossetti, 2008) linked with the short chain. Giving first new tracks to policy-makers, this analysis calls for further research on the role of social networks in food transition.

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Keywords: food practices, changes in practices, relational trajectory, resource of mediation, sustainability, short food chain

Social network analysis for evaluating impacts of science based research and innovation program: The example of the farmers' conversion to organic crop production in Camargue

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The conversion to organic farming can be expressed as a paradigm shift and typically implies developing various innovations. This production system is faced with numerous potential barriers including the influence exerted by the routines. Research institutions may partly balance this. We ex-post evaluate the role played by research institutions since 2000 to developing organic farming in the French Camargue, by performing a Social Network Analysis (SNA). In more specific terms we ex-post evaluate "Impacts of Science Based Research and Innovation Program" or "ISRIP" (Quiédeville et al. 2016). This approach is based on the impact pathway analysis and aims at assessing the role of the research through reconstructing the innovation story in a retrospective way. This paper specifically attempts to demonstrate why and how a SNA can be suitable for evaluating ISRIP.

We interviewed 20 stakeholders comprising 2 research institutes, 4 traders, and 11 organic farmers, for reconstructing the organic actor network at 6 time periods. Intensities of relationships (information flows, collaboration and financial links) were rated from 0 to 3. We calculated indicators of centrality (betweenness, clustering coefficient) and proximity (degrees, density and distance). We used the software UCINET.

We have been able to evaluate effects of the foundation of the organic trader BIOSUD (scaling-up) in 2003 on relationships and related significances: this has fostered the transition to organic agriculture. Additionally the SNA has confirmed the growing influence of INRA in the network while discerning the main underlying mechanism: enhanced relationships with farmers. The scope of the INRA's results was relatively limited, the farmers reported. In fact the SNA shows that the CFR (French Centre of Rice) has played a minor intermediary role, and very few peer-to-peer exchanges occurred between farmers. With respect to impacts on the organic actor network, we observe an increase of 44% and 50% (since 2000) of the clustering coefficient and the density, respectively. Furthermore, the Camargue organic network presents a better survival

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capacity (e.g. robustness) than the conventional one (Quiédeville 2013). Thus, the SNA allows concluding that research on Camargue organic crop production somewhat implies the actor network to be both more resilient and likely to support development of further innovations towards sustainable food systems.

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Keywords: impact pathway analysis, organic farming, innovation, science based research

Governance of food systems. The key role of the gatekeepers

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Many countries promote territorial governance arrangements to improve their public policies. It is a way to support local dynamics of development. However, the efficiency of these institutional arrangements depends mostly on the actors' capacity to interact at various levels of governance. In Brazil, the federal government adopted many public policies to tackle hunger and rural poverty but the implementation of these policies in the concerned municipalities faced difficulties. To overcome the hurdles identified at the municipal scale, new governance arrangements in the inter-municipal scale (Colleges of territorial development - Codeter) was encouraged within the framework of a national program of territorial development. This program is supposed to impulse territorial development dynamics and strengthen territorial food system through the dialogue between civil society and public institutions, building capacities and social learning to family producers (Renting et al., 2012). However, in vast regions with low density of population such as Amazonia, the consolidation of actors' coordination turns out to be particularly uneasy. Therefore, to strengthen it, the Codeters of Pará state favored Local Productive Arrangements (LPA).

We analyze interactions in both categories of institutional arrangement (local and territorial) with primary relational data that we collected from 140 interviews of actors significantly

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involved in 6 arrangements in the two territories (2 Codeter and 4 LPA). The interviews were organized in two parts. During the first part, we used semi-structured questions about the implication trajectories of the actors in collective actions (Grossetti et al., 2011). During the second part, we used longitudinal sociometric questions (Carrington et al., 2005) about the relationship characteristics (frequency of communication, temporary geographical proximity, friendship, policy, collaborations). In this paper, for each territory, we carry out social network analysis of the joined Codeter and LPA networks of communication to study the positions of the gatekeepers and explain their logic of action related to their embeddedness in the social network structure (Graf, 2010). We pointed out the various postures adopted by the gatekeepers who control links between actors' groups. We deduced gatekeepers' strategies, which could facilitate the internal governance of territories and ease the implementation of public policies related to territorial food systems.

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Keywords: territorial governance, food systems, gatekeepers, quantitative analysis

Networks of agroecological knowledge exchange in Spain

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Globalization has brought changes in the relations between cities and the countryside due to

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technologies for new forms of communication and knowledge exchange. In this context, place-based strategies have been developed. Such strategies embody multifunctional agriculture and the construction of new identities around rural goods and services. Connected to this, a range of motivations arise for people to migrate from cities towards rural areas. Initiatives mostly set up by groups of young urban dwellers aiming at the revitalization of abandoned lands and largely depopulated small towns develop all over Spain following agroecology principles, i.e. they re-establish a model of agriculture for the generation of social, cultural, economic and ecological richness for sustainability. A central concept in Agroecology is that of integrating local/traditional ecological knowledge with scientific/technical knowledge for the adaptation of farming practices to current challenges. The need to bridge diverse types of knowledge has been indicated as an important aspect for the successful governance and management of social-ecological systems. The central questions that guide this study are, how do new dwellers from the cities learn to cultivate, to raise livestock or make use of common resources such as firewood? What information do locals and newcomers (not) exchange? In how far does knowledge co-generation between long-term residents and newcomers take place, and how does this influence the sustainability of food systems? In this work we explore the social networks associated to ecological knowledge exchange between locals and newcomers in a mountain area of Madrid (Spain). Through a mixed-methods approach that integrates qualitative (interviews) and quantitative data collection and analyses (socio-centric network metrics), we explore differences in (agro)ecological networks according to: 1) knowledge holders' characteristics (sex, age and years living in the countryside, schooling, occupation), 2) relationships between knowledge holders (e.g. kinship, friendship), 3) domains of knowledge (agricultural, livestock, and forest management/uses), and 4) sources of knowledge (e.g. family, friends, courses, internet, books). Results might be useful to identify key stakeholders in ecological knowledge exchange that could play a relevant role in rural agroecological dynamization as well as gaps in knowledge transmission that might be hindering the adaptation of natural resource management to local contexts and current challenges.

Keywords: agroecology, neorural, local, rural

Professional dialogue networks and changes in herbicide use among wine grape growers in the south of France

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This presentation is based on a research project looking at water pollution from agricultural practices within a catchment area known as the Rieutort, located near the city of Béziers in the

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south of France. Our goal was to analyze the relationship between the structure of the professional dialogue network among wine grape growers within the catchment area and the dynamics of change for norms governing herbicide use. Thirty-one out of a total of approximately 80 farmers growing wine grapes within the catchment area were interviewed. Our central hypothesis was that farmers' ability to research, understand, and implement alternative practices would be linked to their ability to access relevant cognitive and social resources via their insertion within local professional dialogue networks.

Our analysis of the network found that the majority of links exist among wine grape growers within the catchment area, with fewer links existing between growers within the catchment area and growers outside the catchment area. The catchment area thus appears to be a meaningful geographic delimitation for understanding social connections among wine grape growers. The catchment area is small enough that most of the growers are acquainted with one another even if they do not maintain active professional or social connections.

The network has an overall core-periphery structure in which the core is made up of strongly interconnected growers and two peripheral groups are made up of growers less strongly connected with the core. Growers' agricultural practices ranged from conventional (heavy herbicide use), to integrated (reduced herbicide use), to organic (no herbicide use). In analyzing the relationship between individuals' agricultural practices and their position within the network, we found that individuals at the center of network tended to be conventional growers with high rates of herbicide use. This suggests that the local norm for viticultural practice is still strongly centered on the use of herbicides.

Nevertheless, two growers near the center of the network make little or no use of herbicides, suggesting that the dominant norm with regard to soil cultivation is being challenged by the alternative practices used by other growers in the network. We are thus confronted with a norm that admits of variation, perhaps one in the process of modification. Examining the professional dialogue networks among wine grape growers within this catchment area enables us to assess the structure of the network and the position of growers within that network as a function of their agricultural practices. It helps us understand the dynamics of change in operation and highlights the role of growers in an intermediate position between cliques within the network, capable of spreading new ideas from clique to another.

Keywords: dialogue networks, ERGM, viticulture practices, dynamics of change, water pollution

Haggling on values: Towards consensus or trouble

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The "AMAP" Movement in France: In the last 15 years, a large alternative food movement has grown in France and gave birth to AMAP (= "CSA"), association in which a group of consumers share the risk of production hazard with a farmer, paying in advance and accepting variation in the supply [1] against quality and good practices in production. This chain involves consumers much more than a usual vegetable market [2], and participants usually hold and share strong values related to what food and agriculture should be. These associations have gathered as networks, which evolved in time due to ideological choices in the type of food and practices that are implemented. Indeed, even when individuals agree on values, they often differ in attitudes (the way the value should be implemented) to be adopted in their AMAP and/or network. The discussions in the board of networks about how to enact the shared principles and values, taking place on an everyday basis or in assembly, sometimes even led networks to split. We are interested in understanding the link between interaction patterns among agents, which imply the establishment of norms, and the structures of AMAP networks that can emerge.

Building a Multi-dimensional Model of Opinion: We build a model to show the role of agents characteristics and the organisation structure (open-mindedness of agents, number of values, size of the board, organisation of the board) on the stability and representativeness of networks. Our model is made of "basic" agents (AMAP) which hold vectors of opinions which represent the ideal attitudes (norms) they want to see implemented in the "structure" agent (AMAP networks called here Metastructures) they belong to. Some AMAP are taken to be members of the board of their Metastructures and can influence each other on their vectors of opinions through the Social Judgement Theory model [3], discuss which norms to implement in their Metastructures through haggling (taking the arithmetic mean of opinion vectors), and compute the utility they retrieve from the haggled norms. Depending on this utility AMAP can decide to stay in, leave, or split their MetaStructures.

Results: At the steady state reached by the model, we are interested in the number of Metastructures, indicator of the stability of the system, and the fraction of AMAP involved in MetaStructures, indicator of the representativeness of all MetaStructures. We find that the dimension of the vector of opinions (the total number of norms that can be discussed) have a negative effect on both the stability (increase the number of MetaStructures) and the representativeness. We also show that the more democratic processes are involved (large number of AMAP, large size of boards, and allowing influence in board), the less stable the system but the more representative it is.

Conclusion: We have put forward the elements that influence the appearance of two main regimes of organisations : few big AMAP networks versus numerous small networks but able to reach more AMAP in the population thanks to their diversity.

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Keywords: agent based modeling, sustainable food system, social influence, opinion dynamics, democratic organisations

Session 15: Network Analysis in Humanities

Symbolic networks: How museum exhibitions signal artists for historical commemoration

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Modern history is conceived as a progression narrative. Movement through time is established relationally, with each generation building on the advancements of the prior and, in turn, contributing to those of the subsequent. Since history's narrative is established relationally, understanding how connections build the reputation of historical personages is essential to understanding history's construction. Focusing on relational importance for historic reputation, this research examines how contextualization of artists within art historical networks affects the commemoration of those artists. Using a population of 236 artists who first exhibited between 1946-1955 in three of the largest museums in the Netherlands (Boijmans, Stedelijk, and Van Abbemuseum), we examine the connections curators create for artists through in-common exhibition and their effect on commemoration. Employing network analysis, we examine exhibition connections established for artists with from prior (1930-1945), concurrent (1946-1955), and subsequent cohorts (1956-1989)-altogether examining connections across 540 exhibitions. Our findings indicate artists who exhibit with previous cohorts are significantly more likely to achieve historical commemoration, even when controlling for the artist's individual recognition (solo museum exhibition). These results suggest the "symbolic network" created through museum exhibition matter for historical reputation, but only when artists are connected to those from the past, rather than future or own cohorts. This finding contradicts assumptions that artist continued relevancy is reliant on connections with the avant-garde, but rather indicates that strong connections to prior/established artists serves to signal which artists receive commemoration. Overall, the research provides insight on how symbolic networks and historical contextualization serve reputational development.

Keywords: symbolic networks, artistic careers, network analysis in humanities, visual art

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Network analysis and typological classification of folklore texts

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Classification of folklore texts according to their content has been for a long time one of the basic methods in folkloristics. The best known are international folk tale typologies, first compiled by Antti Aarne (1910), then enlarged by Stith Thompson (1928 and 1961), and most lately by Hans-Jörg Uther (2004), but the method has been used to classify the other kinds of folklore texts as well: songs, legends, proverbs, riddles, even the tunes. At the same time, it has been also a cornerstone for historic-geographic research method, which aimed to find out the original form and home as well as later additions for any plot. Although the aims of the historic-geographic method have mostly fallen into oblivion by now, the typologic classification has retained its function as an useful tool in order to get an overview of the large number of records, it enables us to examine the geographical spread of a folkloric type, to observe its variability which in turn reveals us the characteristics of the folkloric communication. When observing the voluminous folklore collections and archives it is evident that the folklore texts tend to group according to their similarities, and the folkloric types are not a construct of the researchers, but a reality typical to the folkloric communication. The typological classification in itself is a method to cope with the big data, it would require a reasonable amount of texts to find out what is typical and what is exceptional. Nowadays the typological classifications can be used as a source data for network analysis, combined with other dimensions of folklore texts, e.g their geographical spread, their linguistic properties, their performers. The proposed paper will observe the possibilities network analysis has to offer to folkloristics when combined with classical (or old-fashioned) typological classification.

Keywords: oral tradition, folklore, typologies

A dynamic network visualization framework for sociological theory teaching and training

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The use of node-link diagrams has significantly expanded the visual-analytical capabilities of the social sciences by supporting the visual exploration and communication of empirical data as

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graphic representations. Still, when it comes to teaching and training of social-scientific theories, scholars still overwhelmingly rely on text books, where abstract terminology or formal notation take up all the space. To bridge this structural hole between theories and diagrams and tap into possible synergies, the presentation points out possible conceptual transactions. By the means of a simple network notation, basic tenets of sociological theory could be reconstructed as a visual-theoretical pattern language. To do so, elements of network and process visualization will be combined: While multiple types of nodes and ties allow the representation of all sorts of relational structures, their temporal trajectories can illustrate predicted dynamics within an extended space-time-environment [1]. The theoretical input for this endeavor comes from a textbook, which reconstructs major sociological theories as distinct perspectives on the evolution of modern society [2]. Along four macro-evolutionary threads (i.e. domestication, rationalization, differentiation, and individualization), three phases are delineated, distinguishing early, developed and late modernity. This unfolds a developmental matrix, staging a dozen major contributions of sociological theory. After looking at their molecular patterns, the presentation will reflect upon how to reassemble them within a comparatistic framework. Related discussions could benefit both sides: As a recent research field, SNA could reconnect to an extended stock of social-scientific theories, whose tenets are reconstructed in an interoperable visual notation. On the other side, major sociological theories are introduced to the representational toolkit of SNA, which allows them to become more accessible and visible again. By doing so, a new branch of visual didactics in the social sciences could emerge, offering new ways to reduce theoretical complexity.

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Keywords: network visualization, information visualization, sociological theory, visual syntax, cognition support, communication support, methods development

Session 16: Social influence

Cool guys or naked emperors? Status attribution, status perception, and gossip in the classroom

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Individuals respect or look down on others in any social context. These evaluations are not necessarily in line with the perception of who is considered as having high or low status in the group. In this study, we differentiate between positive and negative direct and indirect status attributions (valued perceptions about peers vs. perceptions about the status of peers). We consider friendship and gossip ties as channels of social influence that shape direct and indirect status attributions. We determine structural conditions in which direct and indirect status orders could be congruent or incongruent with each other theoretically. We highlight how status attributions modify balance-related processes. This way, we contribute to integrating valuable ideas of the original version of structural balance theory to sociological and social psychological theories of social influence and of status attributions. We use a longitudinal social network panel from Hungarian secondary schools to examine our basic assertions about social influence via friendship and gossip ties on status attributions employing R-Siena.

Keywords: status, adolescents, network dynamics, social influence, structural balance

*Speaker

Coevolution of anti-school attitudes and friendship in vocational schools

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In psychology and sociology of education there is a long history of studying anti-school attitudes and anti-school culture. Negative effects of anti-school attitudes on academic outcomes and wellbeing of adolescents are confirmed in many researches. We continue to study this topics using social network approach. Our empirical base is vocational schools offering basic vocational education. Students come after the 9th grade from academic schools, and usually they have low GPA, low academic motivation and high level of antisocial and risk behavior. Our aim is to analyze coevolution of anti-school attitudes and friendship relations during 3 years, from admission to graduation.

The study is based on the 5-waves survey of 300 students from 4 vocational schools of St. Petersburg. Data was collected during 3 academic years (mean age 16 years old at the first wave). We selected schools with different gender composition: (1) all-female school - 95% girls, (2) all-male school- 3% girls, (3) mixed gender school- 24% girls. Friendship relations were measured with a single name generator item - "with whom you socialize most of all?" (maximum 10 friendship nominations). Anti-school attitudes were measured using 9-items scale. The study uses SIENA software for modeling the processes of friendship selection and friendship influence.

Our preliminary analysis by means of multilevel p2 modeling revealed statistically significant homophily effect for anti-school attitudes among students. It should be noted that dyadic p2 models do not take into account dependences beyond dyads, such as transitivity, cyclic closure, multiple two-paths etc. Thus, we cannot exclude the possibility that the apparent homophily for anti-school attitudes is a result of higher-level network interdependences. The current research addresses the problem of maintaining and spreading anti-school attitudes in friendship networks accounting for network structure.

Keywords: antischool attitudes, friendship, schools, longitudinal network data, SIENA

Dynamics of political attitudes and social networks development

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Political attitudes may change in critical and unstable times, especially among young minds. Social environment of individuals, mostly presented by their social networks, has significant impact on their evaluations. The relationship between political views and social affiliations is difficult to analyze: do people influence each other's opinions so that they shift over time, or do their political attitudes act as a ground for attraction of individuals to each other?

In this research, we use longitudinal attitudinal and network data on a sample of sixty-three first-year students, collected twice during two study years. Social network analysis methods, logistic regression and structural equation modeling were used to investigate the nature of social influence and social selection processes. Significant tendencies to conformity in regards to political attitudes were found, driven by friendship more so than study relationships. We discovered that social selection based on political attitudes' similarity has almost no impact for friendship formations, but affects the development of study social network. Also, we accessed retrospective evaluations of previous political attitudes to examine the congruency between actual and recalled attitudinal data.

Keywords: social influence, political attitudes, social selection, homophily, libertarianism, totalitarianism

Media use in social structures – A longitudinal multi-network approach on adolescents' TV and youtube use

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Media use of adolescents and the social structures they are embedded in are highly inter-related. They often use mass media together with friends, refer to media content in everyday interactions and receive information about new media content from their friends. The social processes underlying mass media use have been of interest in communication research for decades. Two competing perspectives can be distinguished: While some scholars focused on the influence that social structures have on media preferences of individuals (cf. research on opinion leadership and diffusion), others stressed the importance of individual preferences for the selection of significant alters in social structures (cf. research on homophily).

Despite its suitability, to date, only a handful of existing studies on use of mass media in social context use a social network approach to disentangle social influence from selection processes. Depending on the population and type of media under study, evidence for selection as well as influence have been found. Media types studied so far have usually been the so-called 'old media' like music or TV. However, with the advent of the internet their status as predominant media has been seriously challenged. Among adolescents webbased video sharing

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websites like YouTube have already replaced TV as favorite medium. Furthermore, there are important differences between TV and YouTube that may lead to different network dynamics as well. While TV programs are usually received at the time they are broadcasted, on YouTube more than a billion videos can be accessed at any time and hours of new content are uploaded at any moment. Therefore, our research question addresses the interactions of TV and YouTube use with social structures: What are the network dynamics in adolescent friendship networks regarding media content on TV and YouTube? We hypothesize to find evidence for social influence regarding preferences of media content as well as for social selection for both media.

To answer our research question we apply Stochastic Actor Oriented Modeling (SAOM) with RSiena. In the first half of 2015 we surveyed a whole grade of students from a German secondary school ($n = 89$, mean age = 16.7) with a panel design at three points in time at intervals of 8 weeks each. We gathered sociometric data about friendships on the one hand and data about frequency of use of the most popular TV shows and YouTube channels among these students on the other hand. The collected data are analyzed as one unimodal friendship network that is coevolving with two bimodal networks of media content preferences. Results show significant effects for social influence with respect to both TV and YouTube content. However, a slight tendency for social selection can only be stated for YouTube channels. This may be attributed to the oversupply of different content on the video sharing platform. Further potential of dynamic network modeling for research on media use will be discussed.

Keywords: adolescent friendship networks, media use, tv, youtube, SAOM, SIENA

The role of outdegree in knowledge creation

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Social Networks literature has addressed how the nature of the ties between individuals influence knowledge sharing behaviours (Alavi and Kane, 2008) and how it affects knowledge creation and adoption (Phelps, Heidl & Wadhwa, 2012).

While researchers seem to agree that innovations are adopted to a greater degree when innovators hold a central position, there are some discrepancies in the results about the type of relationship between knowledge creation and network position (Phelps et al., 2012). As previous authors point out "some studies suggest more direct ties improve an individual's innovativeness" but other studies propose an inverted U-shaped effect.

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Looking forward to contribute to this open debate the research uses empirical data from a multinational corporation belonging to ICT industry. Data collection follows two strategies: 1) collection of 918 email exchanges in a distribution list in a Virtual Engineering Community of Practice composed by 174 individuals during 5 years which is used to gather knowledge creation and knowledge sharing behaviours and outdegree centrality (OC). OC is measured as the number of outgoing emails to answer other members in the distribution list and it is decoupled in time following Wasko & Faraj, 2005 methodology; 2) monitoring a periodic virtual meeting hold during 3 years, where sharing of new ideas, methods and processes was encouraged; including also the collection of additional information on knowledge creation behaviours.

Among the main results we find that outdegree centrality follows a logarithmic relation with knowledge creation, one that grows sharper when knowledge is more tacit/complex and becomes flatter/linear when knowledge is more explicit/simple. The former seems to suggest that outdegree centrality is decreasingly relevant when knowledge becomes more complex.

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Keywords: knowledge creation, knowledge sharing, innovation, outdegree centrality

Network methods for evaluating the impact of a cross-disciplinary institute on scientific collaboration at a research university

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In the last several years, the interest in the environmental and social factors that facilitate the formation and development of scientific teams has led to a growing adoption of statistical network methods in the emergent field of the Science of Team Science. Along this line of

^{*}Speaker

research, this paper explores the formation and evolution of scientific collaboration networks across all disciplines, departments and colleges of the University of Florida (UF). We study the UF scientific network at the time of the establishment and expansion of the Clinical and Translational Science Institute (CTSI), a large research institute founded in 2008 with the mission of supporting translational research, including the facilitation of scientific collaboration and cross-disciplinary team science. The data covers the whole network of publication co-authorships and co-participation to research grants at UF in 2008-2014 (order between 3,000 and 5,000 nodes, size between 10,000 and 20,000 edges). We analyze the topological properties of these longitudinal networks using constructive stochastic modeling to infer the structure of collaborative interactions in terms of cohesive communities, and to identify key players and diffuser leaders within the network at different granularity levels. We then analyze the interaction of these structural factors with different contextual effects (such as institutional affiliation and disciplinary divides) performing STERG models on the network at different aggregation levels, so to evaluate collaborative mechanisms within single community sub-graphs and between-community clustered networks. This inferential framework allows us to identify the main predictors of team formation processes while accounting for the individual characteristics of the researchers, historical path dependences, the influence of disciplinary divides, and the overall architecture of the UF scientific network. Moreover, all else being equal, we can estimate the specific contribution of CTSI activities on the likelihood of scientific collaboration. Therefore our results provide a general method for assessing the collaborative impact of cross-disciplinary institutes at research universities.

Keywords: science of team science, research collaboration, evolving networks, STERG models

Session 17: Modeling Network Dynamics

The co-evolution of trade and land use: clarifying positive feedbacks in global social-ecological systems

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Increasingly, scholars are being asked to describe and analyze the dynamics of social-ecological systems. In this paper, we explore such feedbacks by examining the 'co-evolution' of countries' international trade patterns and their associated embodied land use over a ten year time period (2000-2010). By 'embodied land' we mean the amount of land associated with the production of all products along global supply chains related to exports and imports of countries. Although past research has considered how differences in countries' embodied land coincide with variances in wealth, none have considered how such differences arise in the context of an evolving network structure. In this paper, we consider trade networks and embodied land as co-evolving phenomena, and study these using a combination of multi-regional input-output (MRIO) analysis with stochastic actor-oriented models (SAOMs). We frame our approach and findings in the context of 'feedback loops', calling special attention to the between-country environmental inequalities arising from such feedback loops.

Keywords: global trade networks, co evolution, feedback loops, social ecological systems, land use change, stochastic actor oriented models, input output analysis

*Speaker

Effects of early exposure on later affiliation processes within an evolving social network

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Background: Laboratory studies previously showed that repeated mere exposure to a picture of a person will make this person appear more likeable. This study investigates the effects of early exposure on later affiliation processes in a field setting, within a naturally evolving network.

Methods: One hundred psychology freshmen gave information on whether they attended a two-day introductory excursion before the start of college, constituting the measure of early exposure. Participants further provided biweekly reports on friendship ties to, and time spent with peers throughout their first semester. Trait neuroticism and extraversion were also assessed.

Findings: RSiena network models revealed that students not taking part in the introductory course were less likely to attract friendships during the first semester ($B = -.47$, $OR = 0.63$, 95% CI OR [0.44 - 0.90], $p = .012$). Moreover, students affiliated more to students that shared their excursion status ($B = 0.96$, $OR = 2.61$, 95% CI OR [1.41 - 4.85], $p = .002$). Likewise, people spending more time in the semester also received more nominations from others ($B = 0.18$, $OR = 1.20$, 95% CI OR [1.08 - 1.33], $p = .001$). These effects were controlled for gender and traits. Most interestingly, they were constant comparing the first and the second half of the semester (all $\chi^2 \leq 1.44$, all $p \geq .230$).

Discussion: Early two-day exposure to people in a network might give them a head start concerning their contacts that at least prevails about half a year.

Keywords: mere exposure, friendship selection, college freshmen

The co-evolution of emotional well-being with weak and strong friendship ties

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*Speaker

Social ties strongly affect individual's well-being (Kawachi & Berkman, 2001). But how exactly? In this study, we aim at understanding the role of three social mechanisms – social integration, social influence, and social selection – in the co-evolution of weak and strong friendships ties with emotional well-being. Emotional well-being refers to the "quality of an individual's everyday experience" such as the experience of joy, happiness, and the absence of sadness (Kahnemann & Deaton, 2010, p. 16489). We hypothesize that socially integrated individuals with extensive and dense friendship networks report higher levels of emotional well-being and that individuals are influenced by their close friends' emotional well-being. We use longitudinal friendship data of 126 individuals from the Friends and Family study (Aharony et al., 2011). The application of ordered Stochastic Actor-Oriented Models (SAOMs; Snijders et al., 2010) allows us to test hypotheses on weak- and strong-tied friendship networks simultaneously. The results do not support our social integration hypotheses but indicate that individuals with higher emotional well-being tend to have more strong-tied friends. We also do not find conclusive evidence for social influence through strong ties but weak evidence for homophily processes regarding emotional well-being in strong-tied networks. In this study, we unfold the two-directional nature of social integration and social influence mechanisms of emotional well-being by combining those with mechanisms of social selection. Furthermore, we emphasize the importance of considering different tie strengths for various social processes.

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Keywords: stochastic actor oriented models, emotional well being, social integration, social influence, social selection

Reciprocity or redistribution of resources? The dynamics of friendship, helping and perceived stress at work

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In this paper, I examine the dynamics of friendship, helping and perceived work pressure among employees in different organizational contexts. What is the relative importance of perceived work pressure and the quality of existing relationships (friendship) on receiving and providing help? And to what extent does helping have an impact on perceived work stress for the recipient and for the helper?

The theoretical framework combines relational and situational perspectives on helping. Existing research on interpersonal helping at work has typically taken a relational perspective. Social exchange theory is the dominant framework here. On the other hand, research on friendship norms suggests that helping is often an expected part of friendship relationships (i.e., based on a generalized reciprocity principle, rather than balanced reciprocity as suggested by social exchange theory). By contrast, experimental studies have adopted a situational perspective, focusing on recipients' need for help and potential helpers' ability to help, as well as considering the effectiveness of the help provided. Here, helping is considered a way of redistributing resources (such as time, knowledge, or equipment) from helpers to recipients.

Drawing on both relational and situational perspectives, in this paper I develop and test competing hypotheses using stochastic actor-based modelling. Data on social networks (helping and friendship) and perceived work pressure come from two waves of employee surveys in seven small and medium-sized private and public sector organizations in Finland.

Keywords: SAOM, interpersonal networks, intra organizational networks, helping, friendship, work stress

Multilevel blockmodeling and blockmodeling of networks in several time points

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In this work, different approaches to blockmodeling of multilevel network data will be presented. Multilevel network data consist of networks that are measured on at least two levels (e.g. between organizations and people) and information on ties between these levels (e.g. information on which people are members of which organizations). Several approaches will be considered: a) separate analysis of the levels; b) transforming all networks to one level and blockmodeling on this level using information from both/all levels; c) truly multilevel approach, where both/all levels and ties between them are modeled at the same time. Most attention will be given to the last approach. In addition, use of the same procedure for blockmodeling networks in several time points will be presented. This procedure is especially useful for blockmodeling networks in

a few time points where we want the groups from different time points to be connected, while not necessary the same. The procedure is also useful when not all units are present in all time points. Advantages and disadvantages of these approaches will be discussed.

Keywords: multilevel networks, multilevel analysis, generalised blockmodelling, blockmodelling, networks in discrete time

Influence, selection and spatial heterogeneity in interorganizational networks: An actor-oriented approach

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When behavioral consequences of network positions affect the formation of network ties, individual behavior and network structures co-evolve. We extend this core insight of contemporary social network research to the analysis of interorganizational networks by showing that co-evolutionary processes linking network structures and the behavior of individual social units are spatially heterogeneous. Specifically, we argue that social influence and social selection processes operate differently on subsets of organizations occupying different geographical locations. The empirical opportunity to establish the merits of our argument is provided by data we have collected on a community of health care organizations connected by meaningful collaborative relations. We specify and estimate Stochastic Actor Oriented Models (SAOMs) that reveal spatial variation in how social influence and social selection processes jointly affect the network structure of the interorganizational community, and the ability of individual organizations to manage their internal operational capacity.

Keywords: interorganizational networks, longitudinal network data, network autocorrelation, stochastic actor oriented models

What happens when we do not look. A critical look at model-based network evolution trajectories in continuous time.

Christian Steglich

*Speaker

Longitudinal sociocentric network studies often display a mismatch between the data collection design (at discrete observation moments) and the data generating process (in unobserved, continuous time). The totality of observed changes then needs to be interpreted as the cumulation of many unobserved small changes. The most prominent stochastic models for analysing such data are continuous-time models, viz., actor-based models of network evolution ('siena models') and tie-based longitudinal exponential random graph models ('lrgm', but not 'tergm' or 'stergm', which are discrete-time models). These continuous-time models are fitted to the observed discrete-time data in an iterative, simulation-based procedure. As such, they can be viewed as models of not just the observed data, but also of the data generating process. In this presentation, model-predicted sequences of small changes that connect the discrete observations of a social network are investigated.

Keywords: network evolution, RSiena, continuous time

Modeling cooperation networks through time: Introducing an actor-oriented model for time-stamped network data

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A central question in organizational and political science concerns when collective actors coordinate and cooperate. In international relations, for example, cooperative institutions through which actors cooperate often take the form of bilateral treaties between states. Data such as this typically have four characteristics: (1) treaties are usually recorded and public; (2) they have a start and, at least theoretically, an end; (3) they are the product of agreement between the parties; and (4) treaties are not established independent of the network of existing treaties. The growing literature identifying this fourth feature has found social network methods useful for modeling the evolution of networks of bilateral treaties. However, current statistical network models were developed for sociological applications that rely on panel network data. While treaty data can and has usually been coerced into such a format, there is no reason why we cannot exploit public information about the start and end of cooperative relationships to gain greater precision for our inferences about dependencies between states' choices. Moreover, political researchers often have questions about the salience of endogenous and exogenous events through time. We propose a novel statistical network method for time-stamped data for the study of such phenomena and demonstrate its precision and a few unique properties on a dataset of states' bilateral treaties in a particular issue area. The method builds upon actor-oriented models for social networks. We conclude by discussing the applicability of this method for

*Speaker

various scientific questions and demonstrate how a new software package can be specified in a flexible way.

Keywords: stochastic actor oriented models, time stamped data, event data, cooperation networks

A dynamic analysis of interethnic relationships in high school

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This paper focuses on inter-ethnic relationships between high school students. We investigate friendships as well as negative (dislike, hate) relationships, defining and analyzing two different aspects of ethnicity: ethnic self-identification, and ethnicity perceived by peers. Friendships and negative ties are modelled using dynamic random-coefficient multilevel stochastic actor-oriented models, that allows for change over time in perceptions about each others ethnicity. Moreover, our models take into account that not only ethnicity affects relationships, but friendships and negative ties can also influence how students categorize each other. For the analysis, we use a two-wave sample of 12 small Hungarian school classes consisting of two ethnic groups: Roma and non-Roma Hungarian. Our theory is based on the social identity approach, and focuses on strategies members of the lower status social group can use in order to improve their self-esteem. While there are not many significant results in the friendship networks, non-Roma students show a tendency to dislike those they perceive as Roma, regardless of these students self-identifications. At the same time, there is growing level of enmity within the Roma group. These results highlight the importance of focusing on negative ties as well as on both aspects of ethnicity.

Keywords: inter ethnic relations, friendship, negative ties, ethnic self, identification, ethnic perception, Siena

A matter of accuracy: Standard errors in stochastic actor-oriented models

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Stochastic actor-oriented models allow for statistical inference on the mechanisms driving the interdependent change of social networks and the behavior of network actors. Peer influence and social selection are examples of such mechanisms. They are in the model often represented by a single parameter. When parameters are estimated by the Method of Moments, hypotheses about social mechanisms are usually tested using t-type tests, by dividing the estimate by its standard error. To draw inference, both parameters and standard errors need to be estimated accurately. In converged stochastic actor-oriented models, parameter estimates have been obtained for which simulated data resembles the observed data on the features that are included in the model. However, convergence criteria for parameter estimates do not guarantee the accurate estimation of standard errors. In fact, standard errors in converged models with a complex model specification can be highly inflated. This phenomenon will be illustrated by an example. Very high standard errors in complex models occur seemingly at random. Rerunning such models several times may result in a wide range of standard errors: some small, some very large. This behavior of the estimation procedure increases the risk of type II errors. Therefore, a criterion for accurately estimated standard errors will be proposed.

Keywords: longitudinal network analysis, stochastic actor oriented model, standard errors

Consideration of edge directionality and network dynamics for structural balance assessment

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The majority of social network theories was developed based on carefully collected small to mid-sized samples. Verifying those theories' scalability to larger groups as well as their applicability to other domains, conditions and at later points in time used to be confined by technical and data-size constraints (Kleinberg, 2008). The availability of larger sets of digital social trace data that represent social interactions coupled with powerful computing have lifted some of these constraints.

We have previously shown how analyzing large volumes of content generated and disseminated by thousands of network members can help to assess the validity of one such theory, namely structural balance (Cartwright & Harary, 1956), in today's context, which often involve socio-technical infrastructures that facilitate remote and asynchronous interaction, and based on a sizable network (Diesner & Evans, 2015).

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Building upon our prior work, in this paper, we first present a theoretical extension to the structural balance theory such that edge directionality is also considered for balance assessment. This matters as particularly in communication networks, ties are often inherently directed (Leskovec, Huttenlocher, & Kleinberg, 2010). This extension eliminates issues with converting directed ties into binary ones. Secondly, we leverage the over-time nature of communication data to identify temporal patterns (Miritello, Lara, & Moro, 2013) in the retention or fluctuation of members in balanced versus unbalanced triads by tracking their identity and connections over time. This steps helps to test for the assumed relationship between dissonance arising from individuals being embedded in unbalanced triads and their consequential behavior. Both innovations are theoretically developed, and empirically tested based on the Enron email data.

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Keywords: directed networks, over, time networks, structural balance theory, natural language processing

A test for heterogeneity and outliers in exponential random graph models

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Key to fitting exponential random graph models (ERGM) to social networks is that the process of link formation is homogenous throughout the network. While the ERGM may account for heterogeneity as an outcome of endogenous processes - such as the rich get richer, attribute-related selection mechanisms, etc – there are cases where some nodes are just different from the others. Using the principle of leave one out, we propose an index of how much each node contributes to the overall network inference. Refitting the ERGM treating the ties of an actor as missing, and comparing the estimates with those of the originally fitted ERGM gives us a measure of how much our inference would differ had the focal node 'been like every other node'. These scores gives us an index for each node that tells us what nodes are outliers or that influence the overall network structure. As refitting the model for each of the nodes is time-consuming, we derive an approximation to these scores that is quick to calculate. For the purposes of allowing for a more detailed inference of scores, we have also implemented a Monte Carlo-based test that provides us with simulated p-values.

Keywords: ERGM, statistics, MPNet

Session 18: Social networks, globalization and economic geography

A relational model of peripheral market integration: The global network of stock visual content

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How does the global expansion of a digital industry lead to the integration of peripheral regions in the global market structure? We draw on recent advances in trade network studies and global value chain theory to develop an original research design that allows to simultaneously analyze the structure and dynamics of inter-firm governance relations and the entire industry network on a global scale. We use the network method of generalized blockmodeling and the concept of regular equivalence to develop a prespecified, conceptually grounded model of positional market structure. Based on a unique global survey of the market of stock photography and a dynamic blockmodel analysis over a period of 12 years, we abstract a model of gradual market integration. In addition, we employ observations from qualitative field work to demonstrate the validity of our model in this industry context.

Keywords: global networks, photography, regular equivalence, blockmodeling, geography

The evolution of innovator social networks under increasing social technology mobility: Uneven scapes of concentrated clusters and dispersed connectedness

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Technologisation and globalisation are widely acknowledged as key drivers of uneven development, compounding social and economic disadvantage at all spatial levels including the sub-regions of a city. This is despite the increased non-spatial nature of social interaction afforded by mobile and social technologies. However, whilst these technologies have facilitated connectivity between markets and access to information, there is limited research examining if such changes are reflected in greater diffusion of innovative activity throughout a city. This paper traces the evolution of innovator connections and clusters over the period of dramatic technological transition to firstly the mobile phone (c.1986), then the Internet (c.1995) and more recently social media (c.2005). It does so through a spatio-temporal social network analysis of 1980-2013 OECD patent application and collaboration data across the local government areas of the Australian capital cities of Sydney, Melbourne and Perth. The analysis produces interesting insights into the evolution of innovator networks through time and space, displaying an increasing dichotomy of spatial concentration and dispersed connectedness across the cities. The paper concludes with a discussion of the contribution of the rising use of mobile and social technologies in the context of path dependent socio-economic and urban processes as well as other policy and strategic changes.

Keywords: innovation, economic geography, clusters, connections, uneven development

Spatial Interaction and proximity dynamics. A way to understand the social construction of public action territories

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Territorial governance arrangements meeting civil society and public institutions have been promoted by many countries in order to build sustainable development strategies in a context of

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globalization. This paper aims to analyze the implementation of territorial development policies in a low demographic density context, characterized by environmental issues. We question the possibility to build collaborations and to set up territorial governance processes by activating various forms of proximity between local development actors.

The effect of spatial interactions on collaboration between the actors of a given economic sector, cluster or innovation project has been analyzed in numerous studies (Boschma et al. 2014). However, their role in the functioning of formal mechanisms of territorial governance promoted through public policies has been little studied thus far.

The benefits of those mechanisms are dependent upon the local actors' ability to collaborate with one another. Using the social network approach, this paper analyzes the impact of two public action mechanisms implemented in the Amazonian region on the dynamics of interaction and on collaboration between the actors of rural development. In these regions, creating organized proximity relations is made difficult by the great distances between the actors concerned.

Our analysis combines social network (Carrington et al., 2005) and proximity frameworks (Torre and Rallet, 2005). The methodology consists in collecting primary relational data from the 25 most implicated actors in each arrangement at three key periods (before, during and after the collective action), regarding the interactions (frequency of face-to-face communication or by the TIC and temporary geographical proximity) and the various types of relationship (friendship, policy, collaborations). We categorize the actors in two groups related their statute: civil society or public institution actors. Finally, we apply a multiple logistic regression of collaboration links with the others variables, in order to evaluate their relative influence.

Our results reveal that distances are not, in any sense, insuperable obstacles to collaboration. Regular communication is maintained, allowing for the construction and reinforcement of organized proximity between the actors of the territories, proximity further fostered by the measures implemented in the framework of territorial governance arrangements.

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Keywords: multiplex relationships, territorial governance, public action

Structural changes of collaboration networks: Critical insights into partaking actors' perspectives

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By adopting a mixed method approach, the present contribution examines systemic changes in the pattern of collaborative behaviors linking the organizations partaking in an Italian technological district. The showcase of IMAST Technological District in Campania region is examined. In its mission, the district explicitly aims at promoting the formation of collaborative connections, selecting contacts, fostering partnerships, providing resources and expertise that support a regional development strategy based on network innovation policies. The members of this district are extremely heterogeneous as they include public and private research centers, firms, and local institutions sharing scientific research and technological interests.

Block modeling analysis has been previously employed to investigate the changes in the configuration of the R&D collaboration network as a whole during the period 2006-2015 (D'Esposito et al., 2014; Prota & Vitale, 2015). In this study, the positions and roles identified by block modeling are interpreted using qualitative information gathered by semi-structured interviews with key informants for each organization.

Partaking actors' perspectives on the observed dynamics of structural change are here in focus. The main purpose is to better understand how the patterns of collaboration are implemented and diffused, which factors favor (or do not favor) collaboration and at which conditions changing dynamics take place.

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Keywords: blockmodeling, mixed methods, content analysis, innovation, collaboration

*Speaker

Rice: commodity or public good? A Polanyian analysis of rice trade in south Vietnam through pre-specified blockmodelling

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Within the context of Vietnam transition from central planning to free markets, this study uses pre-specified blockmodelling to differentiate market from non-market systems of rice trade. Karl Polanyi (1945) identified three principles of non market coordination- redistribution, self-consumption and reciprocity. Furthermore, he associated specific patterns of exchange to each system. In particular, redistribution was associated to the centrality of an allocative authority, reflexivity was associated to self-consumption and cycles were associated to systems based on gifts and reciprocity. This study uses blockmodel pre-specifications to derive theoretical configurations expressing these patterns.

Rice trading data linking producers, intermediaries and buyers in two communes of the Mekong River Delta were traced through snowball sampling. Moreover, qualitative data describing life histories of actors and accounts of local development paths were also gathered to contextualize the analysis. The resulting trading networks are used to fit the theoretical configurations pre-specified, while qualitative data were used to interpret results and identify the dominant principle of coordination within each case examined.

Results demonstrate that different systems of rice trade co-existed within each case study. Furthermore, qualitative interviews situate the origin of each system back to the early 1970s when ideological tensions arose between richer peasants and the socialist State. The study concludes that Polanyi theory can explain the resiliency of redistributive mechanisms of rice trade in today's Vietnam as a mean to safeguard the social value of rice production during periods of radical institutional changes such as transition.

Keywords: blockmodelling, mixed methods, economic geography, trading networks

Building the bridges that matter: A method to examine the effect of interactions on firms performance

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Aim: Regional growth and innovation largely result from the bridging and brokering of unconnected networks or network clusters (Glückler, 2007). Building bridges (connections, ties) within and between regions is essential for improving the economic profitability of regional firms. However, from a firm's utility perspective, a set of connections may yield different returns on the invested relationships. In other words, there are different types of bridges and not all are equally important in every situation. The bridges discussed in this paper connect firms to other firms, education providers, R&D centres, public organisations, capital providers, cluster organisations, and global markets. We develop a methodology to examine their impact on companies' performance by assessing the traffic (intensity of interaction) that they carry. We illustrate the proposed methodology by studying the performance of firms from different industries in three geographical clusters in Sweden.

Methodology: We applied a social network perspective to develop a survey and collect information from firms on the strength and depth of their ties with the seven types of actors mentioned above. The data allows us to measure the traffic over each bridge. We then associate the intensity of interactions with the financial results of the companies. Several dimensions of firm performance are considered (productivity, market share, market share growth, sales growth, technological leadership, customer development, innovation, new product development, product quality). We develop a new method, which combines multidimensional technique and regression analysis to assess the marginal improvement of performance as a consequence of the traffic over each of the discussed bridges.

Empirical application: We surveyed 265 firms over a period of several years. The results show that the traffic and the effect on performance associated to each bridge vary between the three clusters. This implies that different clusters are supported by bridges of different sizes. The main findings are shown in the Cluster Traffic Chart in Appendix where vertical axis represents impact on firm performance.

Contributions: The proposed method can be applied to 1) compare cluster ecologies 2) investigate the effect of different bridges on firm performance 3) evaluate bridge-building efforts 4) improve the results of individual clusters firms. The paper is of interest to broad readership and offers practical implications for development of cluster policy.

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Keywords: interactions, space, clusters, firm performance, bridges

International production networks and world trade

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In this work, we examine bilateral trade data in three industries with different technological characteristics (textiles and apparel, electronics and motor vehicles) in order to detect the presence of international production networks in these sectors and to assess their structures and organization. Moving from the recent stream of literature which underlines the importance of assessing the position of a country within an international production system, we show that the structure of international production linkages can be much more complex than a simple chain, with relevant implications for the position of each country.

We start by applying a particular specification of bilateral trade intensity indices to the matrix of world trade in each sector (from the BACI – CEPII database, re-classified using the BEC classification), distinguishing between intermediate and final goods, in order to highlight trade flows driven by international production networks. We compute indicators for the world trade matrix and its regional partitions, as defined by exogenous geographical criteria, or by the existence of regional integration agreements. The resulting pattern of revealed trade preferences conveys useful information about the actual geographic distribution of the underlying international value chains.

The core of the paper is an application of network analysis to better understand the topology of global and regional value chains. In each industry, we apply community analysis techniques to identify endogenously sub-networks characterized by more intense trade linkages that can be traced back to the existence of international production networks, again by distinguishing between trade flows in intermediate or final goods. We then examine the topological structure of the revealed communities, to assess whether they are formed by a group of countries belonging to the same geographical region, and whether they are built around a central core country.

In conclusion, we compare the results obtained with the two methodologies, as we aim at assessing the heuristic value of different statistical techniques, in order to identify the traces left by international production chains in the structure of the world trade network.

Keywords: international trade, global value chains

*Speaker

The changing role of emerging countries in world trade

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According to the recent literature (e.g. Hanson, 2012), since the early 1990s, low- and middle-income economies more than doubled their total share of world exports: the 15 largest middle-income countries had average annual export growth of 8 percent. In particular, some export giants have emerged: between 1992 and 2008, average annual growth in exports was 18 percent in China and 14 percent in India. But increasing trade shares do not necessarily go hand-in-hand with a central position in the world trade network.

In the analysis by Iapadre and Tajoli (2014) using a network framework, already in 1995, the BRICs appear well connected and central in the system in terms of degree centrality (with the exception of Russia). All the BRICs catch-up considerably in terms of the number of their connections in the past decade, but the situation is very different for other emerging countries. Furthermore, the use of different centrality indicators provide a different picture. With respect to eigenvector centrality, according to the same work, the position of the BRICs is much weaker. Even if China has an export market share higher than USA since 2007, in 2011 its eigenvector centrality was half of USA's, in spite of an impressive growth over time of this indicator. A significant improvement is recorded also for India and Brazil, but both countries are still far from the Chinese position in the global scenario. What about the other emerging countries?

In this paper we make a general assessment of the position of emerging countries in the world trade network using different topological measures, and considering relative changes over time in the past two decades. We also assess the implications for their growth rates of different relative positions.

Keywords: emerging countries, international trade, centrality

Implementing propensity score matching with network data: The effect of GATT on bilateral trade

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Motivated by the evaluation of the effect of the General Agreement on Tariffs and Trade (GATT) on bilateral international trade flows, we investigate the role of network information in propensity score matching. Under the assumption of strong ignorability, propensity score matching (PSM) is a widely used technique in causal inference studies to adjust for bias arising from an unbalanced distribution of observed confounders between a treatment and a control group. Both theoretical and applied works have recently considered the PSM for nested data, but the analysis of interlinked data is still missing. In this paper we consider the implementation of PSM in the context of network data. In our application, together with individual unit characteristics, also features of the social network in which units are embedded are considered as confounders (i.e., variables that impact on both the probability of receiving the treatment and the outcome). We study the sensitivity of causal inference with respect to the presence of characteristics of the network in the set of confounders conditional on which strong ignorability is assumed to hold. We find that estimates of the average causal effect are sensitive to the presence of network information in the set of confounders, therefore we argue that estimates may suffer from omitted variable bias when network data are ignored, at least in our application.

Keywords: centrality, clustering, GATT, matching, trade, unconfoundedness

Session 19: Large networks

Category spanning and social evaluation in Wikipedia

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Featured articles are the best articles in Wikipedia according to Wikipedia editors. Why is the Wikipedia article "Mathematics" a B-class article but the article "0.999..." (the decimal number) is featured? Why is "Social network analysis" rated as a Start-class article while "Reactive attachment disorder" is a featured article? Building on recent research suggesting that objects that span distant categories have less appeal to audiences, we develop multiple indicators of focus of Wikipedia articles based on the article-category network. We consistently find that more focused articles tend to attract higher social evaluations from Wikipedia audiences. We explore the conjecture that characteristics of the teams of contributors mediate the relation between focus and evaluation of Wikipedia articles.

Keywords: online social production communities, category spanning, wikipedia

*Speaker

Socioeconomic correlations in communication networks

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In this work we study the socioeconomic structure of a communication network by combining mobile communication records and bank credit informations of a large number of individuals living in Mexico. We provide empirical evidences about present economic unbalances suggesting not only the distribution of wealth but also the distribution of debts to follow the Pareto principle. Further we study the internal and interconnected structure of socioeconomic groups. Through a weighted core analysis we signal assortative correlations between people regarding their economic capacities, and show the existence of "rich-clubs" indicating present social stratification and spatial segregation in the social structure.

Keywords: social stratification, socioeconomic correlations, mobile communication, Pareto law

Wikipedia as a network: Automatic classification of articles through communities detection techniques

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Wikipedia is one of the best known repositories of knowledge. It is used daily by millions of people of all types in a wide range of languages, it is also developed and refined daily by hundreds of thousands of people. It is interesting to know its contents, their topics and the intensity and the way they are exposed, in the sense that they are a good picture of the interests and concerns of society in general. However, Wikipedia lacks an effective thematic classification; there are categories of articles, but they can be created and freely assigned by the thousands of publishers who continuously enrich wikipedia. In fact, each version of wikipedia in each of the available languages has hundreds of thousands of subject categories. On the other hand, a

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manual analysis of the thematic content of the articles is unaffordable because the high number of such articles. We worked with a snapshot of the Wikipedia in Spanish taken in January, 2015; it has about 1.02 million items distributed in more than 300,000 subject categories.

Since Wikipedia articles contain hyperlinks to other articles in the Wikipedia, it can be represented as a network, in which each article is a node and these hyperlinks are directed arcs. Thus, we can apply techniques of Social Networks Analysis for various purposes. In our case, the detection of communities of articles may be of interest; a community of items is a set of nodes strongly linking between them. Since the existence of links between an article and another denote some relationship between their contents, we can think that, somehow, a community of items is showing a set of thematically related articles. After downloading a snapshot of Wikipedia in Spanish (January 2015) and getting the items and their hyperlinks, the network thus formed was processed by the well known Infomap algorithm for communities detection. Note that this is a large network: 1.02 million nodes and more than 30 million arcs. Infomap is particularly effective with large networks.

Infomap scored more than 1,300 communities, still a large amount to be manually examined. However, only 250 of these communities have more than 20 articles; these 250 communities containing 98% of all articles. 250 is a small number of communities that can be manually examined and thematically classified easily.

Keywords: wikipedia, communities detection, automatic classification

On widespread index

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On January 12, 2016 Clement Levallois posed on the SocNet the following question: I need to have a measure of how widespread is the distribution of a node attribute in a network. In our talk we will propose two indices measuring different aspects of the notion of widespread. Both indices are closely related to the notion of dominating sets in a graph which is well known to be a NP-hard problem. We will present some properties of both indices and illustrate their use by applying them on selected networks.

Keywords: node index, attribute widespread, domination

A new combinatorial curvature for complex networks

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We adapt Forman’s discretization of Ricci curvature [1] to the case of undirected networks, both weighted and unweighted, and investigate it on a variety of complex social networks which include both classical model and real-world networks, such as email communication network. We find that Forman curvature displays high negative correlation with degree and centrality measures in both random and small-world networks. However, Forman curvature is uncorrelated with clustering coefficient, both in model and real networks. Moreover, we show that both model and real networks are vulnerable to targeted deletion of nodes based on increasing order of Forman curvature. In addition, we find that deletion of nodes based on increasing order of Forman curvature leads to faster disintegration of both model and real networks when compared to deletion of nodes based on decreasing order of clustering coefficient.

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Keywords: Forman curvature, robustness, real world networks

A multiplex network based tag recommendation approach

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Social tagging systems, or folksonomies, are popular Web 2.0 tools that allow people to share and organize large sets of resources such as bookmarks, documents, photos, etc. Tag recommendation is a core service in such systems. The goal is to compute the most adequate

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tag set that a user can apply to annotate a given resource. This helps in controlling the tag vocabulary set, enhancing hence its usefulness for resource access and searching while keeping the annotation process user-centred. This problem has attracted much of interests in the last few years with a variety of different approaches being proposed. Graph-based approaches constitute a major trend in this area. These are attractive approaches since they rely only on mining the induced graph structure of the tagging history making them independent from the type of annotated resources. Actually, the tagging activity history can be represented as a 3-uniform hypergraph where all hyperedges involve three nodes of different types: a user, a resource and a tag. Graph-based tag recommendation approaches include node ranking approaches, graph-search based approaches, link-prediction approaches and graph-clustering approaches. While graph-based approaches yield interesting results, they often suffer from high execution times due to the large-scale of handled graphs.

In this work, we propose a graph-coarsening based approach that can overcome this drawback. The proposed approach is decomposed into two steps: an offline step where the folksonomy hypergraph is abstracted by applying a topological clustering approach to the three sets of nodes: users, resources and tags, and an online step during which recommended tags are computed. Upon receiving a query composed of a target user and resource we apply a basic graph-based tag recommendation approach to the abstract graph in order to compute a set of recommended abstract tags. These will be used to construct a new reduced graph, called the contextual graph by unfolding the abstract subgraph composed of the set of recommended abstract tags and nodes representing the cluster of users (resp. resources) to which the target user (resp. resource) belongs to. Again the same basic graph-based tag recommendation approach is applied to this new reduced graph in order to compute the final set of tags to recommend. Thus the approach consists in replacing the execution of a standard graph-based tag recommendation approach on a large-scale graph by two executions of the same approach on two reduced graphs.

In order to compute the abstract hypergraph (offline step) we first project the raw hypergraph on each of the three sets: users, tags and resources. The raw hypergraph is approximated by a tripartite graph connecting users, resources and tags. This tripartite graph is first decomposed into three bipartite graphs: Users-Tags, Users-Resources and Resources-tags. Then each of these bipartite graphs is further projected on each of its components. By the end we get three multiplex networks defined on the three sets: users, tags and resources. Recall that a multiplex network is a multi-layer network defined over the same set of nodes but each layer contains a different set of edges. We apply a community detection algorithm to each multiplex in order to compute clusters of users, resources and tags. Different approaches for community detection in multiplex networks can be applied}, including a) Layer aggregation (denoted LA) approaches where we first combine all layers and then apply community detection algorithm to the resulting unipartite network, b) Ensemble clustering (denoted EC) approaches where we apply a community detection algorithm to each layer then we combine the obtained clusterings, and c) Multi-layer approaches that consist in adapting existing algorithms to the multi-layer nature of multiplex networks.

The abstract hypergraph is then constructed by replacing each community of each type by a single abstract node.

We have applied the proposed approach to a real dataset extracted from the Bibsonomy folksonomy. We experimented the approach using FolkRank as a base-line graph-based tag recommender. Two community detection algorithms are selected, the well known Louvain approach and a seed-centric approach developed in our team, the Licod algorithm. Both algorithms are

used in combination with layer aggregation and ensemble clustering and in their respective generalized versions to multi-layer networks : GenLouvain and MuxLicod. Another two parameters of the approach are the number of abstract tags to recommend and the number of final tags to recommend. We evaluate the results in terms of both precision and execution time.

We have varied the number of abstract tags (denoted k_{cluster}) (resp. tags (denoted k_{tag})) to recommend from 1 to 4 (most of resources in the dataset have up to 4 tags). The proposed approach yields better results than raw FolkRank with different graph-coarsening approaches but the improvement in terms of precision is rather limited. However, obtained execution times show clearly the advantage of the approach, where the execution time drops from 1115 s. to 93 s. when using the Muxlicod algorithm. These executions times are computed for the set of 510 queries composing the test set. This is a promising result that needs to be confirmed on other datasets and for other basic approaches other than FolkRank. The approach can also be used as a framework for benchmarking and comparing different multiplex community detection algorithms.

Keywords: multiplex network, graph coarsening, tag recommendation

Community detection in interval-weighted networks

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The goal of social network analysis is to create, from raw relational data, a useful description of a system of relationships. These data can be described in the form of graphs or networks where nodes (or vertices) represent entities and edges (or links) represent relationships between pairs of entities. In classical graph theory, weights in valued graphs are constants. However, in real world applications, these weights may vary within ranges rather than being constants (Moore et al. 2009). In this paper, to better model such variability of weights in a graph, instead of using constants, we represent weights as intervals (Hu & Hu, 2008). An interval representation of these values (see (Noirhomme-Fraiture & Brito, 2011)) allows taking into account the variability observed in the original network, and thereby minimizing the lost of information.

A common property of networks is their modular structure, namely their organization into modules (also called communities or clusters), in such a way that most of the links are concentrated within the modules, while there are fewer links between vertices belonging to different modules. Community detection algorithms aim at identifying the modules and, possibly, their hierarchical organization, in a graph. The modularity metric proposed by Girvan and Newman (Newman & Girvan, 2004) is one of the most used and best-known functions to quantify community structure in a graph. Empirically, a high modularity value indicates a good partition. In this paper, to optimize modularity, we use the state-of-the-arte greedy method introduced by Blondel et al. (Blondel, et al. 2008) - the Louvain algorithm.

Although several extensions of modularity to weighted networks were proposed, none takes into account the variability of link weights. To fill this gap, we extend both the Newman's modularity and the Louvain method, to the general case of interval-weighted networks. Thus, we introduce a new community mining measure Interval-Weighted Modularity as well as the adaptation of Louvain algorithm to this new metric. An application to a real undirected network, of "Approved projects of the Portuguese Innovation Agency between 1986-2012" illustrates the proposed approach.

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Keywords: interval, weighted networks, community detection, modularity, Louvain algorithm

Connectivity in temporal interactions

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The question of connectivity in networks is well-defined and understood: a network is said to be connected if there exists a path, i.e. a sequence of links, from any node to any other node; if a network is not connected, then each node belongs to one and only one connected component.

*Speaker

In the case where we do not deal with a classical, static network, but with temporal interactions, we are faced with two problems. First, though it is straightforward to extend the classical notion of path to that of a temporal path, this does not imply any straightforward definition of temporal connected components. Indeed, we will show that a node can belong to many overlapping connected sets. Second, we are motivated by the observation that temporal paths may span a small or large fraction of the total duration of the considered data sets. Consequently, the fact that there exist temporal paths from any node to any other node can correspond to vastly different situations.

For instance, all paths could have a duration comparable to the total dataset duration; or all paths could have a small duration and exist at approximately the same time. Other configurations may of course be observed, but one can see from this small example that temporal connectivity does not provide an accurate description of a set of temporal interactions. We therefore introduce the notion of strong Delta-connectivity. A set of nodes is strongly Delta-connected if there exists a temporal path from any node in the set to any other, starting at any time, with duration at most Delta. In other words, any node can be reached from any node, at any time, within a given duration. This notion therefore allows to find sets of nodes that can reach one another in a (relatively) short time, all the time, which provides interesting descriptions of a the temporal interactions. Moreover, varying the duration of Delta allows to observe different interesting groups, from small, tightly knitted groups such that there always exist paths with a very short duration, to larger, lense densely connected groups, within which the paths are longer. Unfortunately, computing strongly Delta-connected components is a very difficult problem (it is NP-complete). We therefore propose a method for finding an estimate for the size of the largest component, as well as a method for highlighting time intervals during which large strongly Δ -connected components appear. We illustrate our findings on two different data sets and show that this leads to insightful observations.

Keywords: dynamic network, temporal network, connectivity

Session 20: Health

Life and death and kinship: Racial disparities in living donor kidney transplantation

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Living donor kidney transplants are the primary site of racial/ethnic disparities in kidney transplantation in recent years –between 2000-2010, African Americans were less than half as likely as whites to obtain a living donor kidney transplant, a difference sufficient to account for the black-white disparity in all transplants. Nearly all living donor kidney transplants are donated by kin or close social contacts of the transplant candidate. Because of this, social network inequalities drive the process of obtaining donations. We report on an innovative ego-centric network study of 70 black and white transplant seekers. We exhaustively mapped the kin and close confidante networks of these candidates, yielding over 1,200 alter nominations. For each candidate, we then selected and attempted to survey up to 4 purposively chosen alters. We also conducted an additional 30 qualitative interviews with transplant seekers and their spouses. These data were collected from June 2014-December 2015. Our paper speaks directly to the differential access hypothesis for racial disparities in living donor kidney transplantation, testing this idea on all transplant seekers, not just those who successfully convince kin and friends to be evaluated. We also evaluate how the quality of ego-alter relationships, alter health, and alter finances affect the life and death chances of transplant seekers.

Keywords: ego centric networks, kinship networks, network inequality, kidney transplantation, organ donation, racial disparities

*Speaker

Perinatal network Lorraine. The user told: In the interest of the story in the networking of health and social actors

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The Research Neoris (Global Support Risk Neonatal) aims to analyze the terms of comprehensive care actually taken at work in the perinatal network Lorraine.

This communication deals specifically anthropological component of Neoris, focused on representations of risks and uncertainties related disability among medical, social and associative.

In perinatlity, the care support must go beyond simple "monitoring" medical. However, the existing devices are primarily focused on medical diagnosis of disorders encountered in children who were hospitalized in a neonatal ward. But real support must be comprehensive and not limited to the medical aspect. He returned it to integrate complementary viewpoints that meet all dimensions of these beings in development and support can only be considered so that under these potentially crippling risks to their future. In this perspective, then it is deemed necessary to determine how and to what extent the own representations of network professionals determine support for the political risk of disabilities.

In this context, the role conferred on the "user" is such an important issue to be analyzed to better understand the relationships that result. How these professionals "negotiate" the effective management of the risk of disability in relation to representations of their "users" (child and parent)?

The methodology consisted of 40 semi-structured interviews conducted with 20 medical professionals, social and associative actors ; all involved directly or indirectly in the network.

The results demonstrate the importance of an evaluation of the network as "culture" from the social and cultural relations of network professionals. These relationships form the cement of a structure made of interpersonal ties and anchored in the singular stories around a "user", whose representation is constructed from narrative forms. These stakeholders are individuals enrolled in a collective story, frame and link a dynamic network whose efficiency is proven. The investment of the trust of the "user" in this or that worker must be preserved, beyond the diversity of the actors. Therefore, it is essential to give back to the "user" its dimension "public" that is to say precisely place it in the context of trade, within the meaning of "public" as "sharing idea , after the experience. " In this perspective, the "user" can not be grasped as an isolated entity - even less in the case of nourrissons-, but rather as an "individual crossed by social relations that is built itself by standing the center of a significant network of relationships "(Faya-Robles, 2014: 17); relationships which are among the professionals.

Keywords: perinatal network, qualitative analysis, culture, interpersonal relationships, uncertain-

An exploratory network analysis of the French governance of bovine spongiform encephalopathy

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This communication focuses on the governance of BSE epidemic in France. Officially, it infected 1028 cattle and 27 persons between 1987 and 2014 (OIE). BSE crisis probably found its source in the practices of the food-processing industry. Pathogenic agent (prion) was found in animal wastes, which were recycled and used as feed-bone meal for the livestock. The disease generated a huge crisis, which entailed representations and actor' interactions that move beyond the health sector alone.

In this paper, we would like to emphasise the BSE governance, understood as a process of coordination between actors [Lascoumes P., Le Galès P., 2007]. BSE crisis involved a set of actors from different spheres (economical, political, sanitary, industrial, agricultural...) who interacted differently in time. In social sciences, BSE governance studies generally paid attention on the composition of experts committees [Granjou C., 2009] or on specific actors like scientists [Soyeux Y., Wolfer B., 1997]. In this paper, we hypothesize that the understanding of the governance requires an analysis of all the actors involved in the crisis management and an exploration of the variations of their relationships in time.

The use of archives as materials to analyze social networks has been developed by Padgett and Ansell (1993). As instruments of public action, legislative texts " organize specific social relationships " and " social networks [...] are formed from them " [Lascoumes P., Le Galès P., 2005, p. 13]. Therefore, legislative archives can be used to trace the conceptions of governance that was defined by the French government between 1989 and 2006 (from the first to the latest measures against BSE).

We collected 135 legislative measures (orders, decrees, laws) from the Legifrance website. From this corpus, we identified 17 key-measures. We aggregated them into five groups which define the types of governmental action over 1989-2006 period: 1) prohibition against animal products from UK 2) sanitary police 3) prohibition of risk products in the French industry 4) changes of industrial processes in feed-bone meal 5) re-authorization of animal products in the food industry. For each group we: 1) list the actors in texts, their roles and interactions 2) define actor functions in the networks 3) test various indicators: connected components, dyad census, centralization and closeness centrality.

The results allow us to identify central actors for each group: minister of agriculture and veterinary services. These results also emphasize the structuration of these networks. However, this quantitative analysis has limits. Only the actors and their relationships defined in the texts were taken into account. It reflects how the French government thought the BSE governance. So,

we do not know how the governance was actually done, especially at the local level. Therefore, we need to mix this quantitative analysis with qualitative interviews. Options will be presented in conclusion of this communication.

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Keywords: governance, actors, legislative archives, BSE crisis

How social networks can supplement health literacy: The case of elderly migrants in Israel

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Elderly migrants are a topic of growing importance, given the fact that, in many developed countries, the populations are both aging and becoming increasingly culturally diverse. This paper focuses on the elderly migrants' health literacy (HL). HL is defined as the ability of an individual to obtain, process, and understand basic health information in order to make appropriate decisions concerning health. Previous research has shown that elderly migrants rely heavily on interpersonal sources to share and receive health information; however, little is known about these lay sources, and how they affect the recipients' HL. In the current study we investigated how the ethnic composition of elderly migrants' social network interplays with their HL. Drawing on research in social networks, we learn that homogeneous social ties are not constructive for distribution of new information, compared with more diverse networks. Thus, we propose that ethnically diverse social ties among elderly migrants, and native born elderly, can expose the elderly migrants to more opinions and information about health issues, and thus

promote their HL.

We used data gathered through a representative sample of the Israeli population (N=1,200). In our analysis we only included elderly participants (cut off age 55) who were born in the FSU (n=73) and Israel (n=172). We found significant support for the effect of the interaction between perceived social support and country of birth (Israel vs. FSU) on health literacy of respondents ($\beta = .21, p < .01$). Simple slope analyses indicated a significant positive relationship between social support and health literacy for elderly born in the FSU ($\beta = .25, p < .01$), and significant positive relationship between social support and health literacy for elderly born in Israel ($\beta = .13, p < .01$)

We then conducted 34 structured interviews with elderly migrants born in the FSU. These interviews were designed to assess more deeply where the interviewees get their health information from, and map their social network using a sociogram. Using grounded theory we identified major themes in participants' interviews. Emerging themes in our analyses highlighted the notion that ethnically diverse social networks serve as an important source for health information.

This study offers an original view on the investigation of interpersonal information channels as an HL source. More specifically, it allows us to empirically test the effect of social network ethnic composition, on HL. By doing so, our work offers a twofold contribution. Firstly, it bridges the theoretical gap in the health communication literature, by addressing lay person information exchange and its effect on HL. Furthermore, the results can directly inform evidence-based, culturally informed healthcare interventions aimed at improving HL among elderly migrants.

Keywords: health literacy, migrants

How do goal structures and close social contacts associate with stress?

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Sometimes individuals face difficulties when trying to reconcile their goals related to distinct life spheres. Such goal conflicts correlate with psychological distress (Kelly, Mansell, & Wood, 2015). A possible explanation for this finding is provided by cognitive dissonance theory (Festinger, 1962) as individuals pursuing incompatible goals seem to face more internal conflicts (Riedinger & Freund, 2008).

Looking at intra-individual processes only, however, might not provide a full explanation for how exactly goal conflicts develop, and how this leads to distress. Since goal achievement

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is a socially embedded process (Fitzsimons & Finkel, 2010), it is also important to consider interpersonal dependencies. Here we suggest three such mechanisms. First, social support experienced in social relations might buffer stress (Cohen & Wills, 1985). Second, in line with balance theory (Heider, 1958), persons might experience stress if their judgment of a goal is negated by the judgment of a person important to them. Third, being part of several distinct groups might reinforce the appearance of goal conflicts as each additional group might constrain an individual's acts a bit more (Krackhardt, 1999).

Accordingly, the present study investigates the relationship between individuals' level of stress, the relational structure of their goals, and of their close social contacts based on these mechanisms. The data of the present study consist of the responses of 67 Bachelor students at a Swiss university. For our analysis, we combine results of individual level measures, an ego-network questionnaire, a goal-network questionnaire, and a questionnaire on relations between the participants' close social contacts and goals (e.g., support and desirability of goals). The association of stress with structural features of individuals' goal- and ego-networks is tested in a linear regression model.

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Keywords: goals, egonetworks, stress

Session 21: Migration

An integrated network approach to kinship, residence and mobility

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Kinship, residence and mobility are intimately intertwined. Kin often live and move together, and relations created through migration (as between strangers and natives) often durably structure residential space. This interconnection reflects the fact that kinship, residence and mobility actually just constitute different aspects of the same basic reality: residential networks are the cumulate result of previous mobility events, and the events resulting in kinship ties – births and marriages – can be interpreted as mobility events of a particular sort.

In this paper, we shall present an integrated network model of kinship, residence and mobility. We start from a bimodal network of dated mobility events and individuals linked to them as "migrants" or "hosts". Each mobility event severs the residential links between the "migrants" and the rest of the network, and creates new links between the "hosts" and the "migrants" disconnected from their former "hosts". The series of mobility events results in a continuously transforming network of residential links, the connected subgraphs of which are the local groups. This is basically a development of Fischer's (1958) analysis of residential structures as networks of "sponsor" relationships. To integrate kinship into this model, we consider "birth" (as many societies actually do) as the first in the series of mobility events that make up a person's residential trajectory. Networks of parent-child links (i.e. of "primary" host-migrant-links) are virtual social spaces whose only transformation is growth.

Kinship networks, residential networks and migration trajectories can thus all be regarded as subnetworks of social space-time. The morphology of this social space-time can be studied by examining the circuits that emerge within it as new host-migrant links combine with chains of previous or primary links. The study of kinship relations between members of a household or between a person and his or her subsequent hosts is just a particular aspect of this general study of spatiotemporal social circuits.

In this paper, we shall explore the potential of this integrated view, drawing on data from three subsequent censuses of the Togolese village of Afagnan-Gbléta, completed by individual migration biographies. Proceeding from the special (kinship) to the general (social space-time) perspective, we shall study the structure of residential groups both through a census of kinship relations and through a census of residential "sponsor" chains, and we shall examine migration biographies both as sequences of kinship positions and as sequences of host-migrant chains resulting from previous migration events. All methods presented in the paper are implemented in the open-source software Puck (www.kintip.net).

Keywords: kinship networks, migration networks, residence networks

Social support networks and social integration processes for immigrants

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In recent years many scholars have been more and more interested in exploring the association between personal networks and social integration processes for immigrants. As widely known, the availability of social support networks for immigrants in the country of destination is crucial to modulate the impact of first settlement (Gurak and Caces 1992; Massey, Arango et al. 1993; Palloni, Massey et al. 2001) and to foster social integration. Of course, the effects of social support on social integration depend on the different relational patterns on which personal networks are based and on the type and amount of resources that networks can provide (Ryan et al. 2008; de Miguel & Tranmer 2010). From this angle, networks characteristics in terms of structure and composition could have powerful implications for the type of support that immigrants receive, the self identification in the country of destination they form, and the interactions they experience (McPherson et al. 2001; Lubers et al. 2008). Here, our particular interest is to explore the association between ego-networks characteristics and social and economic integration processes for immigrants. We focus on two ethnic groups, Sri Lankan and Ukrainian, by using data from a more comprehensive survey on living conditions for immigrants living in a Southern Italian city (Naples). We adopt an ego-centric network approach in order to address three main issues. First, we aim to describe and explore the structure of social relationships that immigrants activate in order to obtain different kind of supports. Second, we investigate the main factors that affect the amount and variety of resources embedded in the immigrants' support networks. Third, we analyse the relationship between the social support patterns embedded in the ego networks and the degree of social and economic immigrants' integration.

Keywords: ego centric networks, immigrants, support, social integration, multidimensional data analysis

Determinants of migration across Italian provinces: A spatial network analysis

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Migration is an intrinsically spatial phenomenon, entailing a change of place of residence, and a relational one, any change involving a place of origin and a destination. We exploit these properties by conceptualizing and representing migration as a network, where the nodes are geographical areas and the ties are flows of people moving from one area to another. The network approach facilitates an understanding of underlying spatial, social and economic mechanisms, and reveals patterns in the data that would be difficult to see otherwise. Specifically, we analyze migration within Italy, using administrative data from the Italian population registers for the period 2002-2012. Italy is a particularly interesting case, historically characterized by the intertwining dynamics of long distance flows from the poorer south to the richer north, and shorter distance relocation patterns between geographically close areas. Taking 103 Italian provinces as our main unit of analysis (the "nodes" in the network), we are able to observe spatial interdependencies at a high level of disaggregation, rarely attempted in the literature before. Our goal is to uncover the characteristics of provinces that affect people's location decisions, whether it means inciting residents to leave, attracting newcomers, or discouraging mobility altogether. In line with today's growing literature on migration, we use a modified gravity model, estimating the magnitude of the mobility flow between any two provinces as a function of the existing population in each of them and of measures of proximity, both geographical (physical distance) and administrative (such as being part of the same region), as well as similarities and differences in quality of life based on location-specific amenities. Our extended version of the gravity model innovates with respect to existing research in that it also includes measures of local and global dependencies between the network ties connecting provinces, at both dyadic and extra-dyadic levels: for example the existence of hubs or attractors, as well as patterns of clustering and transitivity. More precisely, we estimate a count variable model exploiting the panel structure of the data, and augmented with instruments to control for potential endogeneity issues. Our results show that a combination of proximity and quality of life indicators contributes to explaining the global properties of the flows of mobility observed, and that their effects are differentially affected by local dependencies between network ties.

Keywords: migration, spatial networks, gravity model

The effect of network segregation on wage formation: The case of the Sri Lankan immigrant community in Milan, Italy

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The aim of this paper is to delve into well-known results on the positive effects of social networks on job search and job match in immigrant communities. Following Granovetter's

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argument on the strength of weak ties, we explore the informational content provided by social networks of acquaintances and its effects on the economic performances of Sri Lankan immigrants in Milan, Italy. To this purpose, we collect information about personal networks and daily activities of 107 Sri Lankan immigrants in Milan. Analyzing co-location and intersection of activity spaces, we reconstruct the socio-centric acquaintance network of interviewed immigrants. Then looking at the national composition of immigrants' personal network, we derive a measure of the extent to which each person in our sample is exposed to the Italian community via Sri Lankan acquaintances. Finally, we estimate the impact of this measure (i.e. segregation index) on wage formation using a human capital model derived from existing literature on self-selection phenomena among immigrants. Our results confirm that being in contact with diverse social circuits (i.e. brokerage) has a positive and statistically significant effect on wage. At the same time, we find that this effect is less significant when information in each social circuit is more heterogeneous. In other words, the highest benefits are associated with either high levels of social network integration in the Italian society or high levels of network segregation within the Sri Lankan community. Thus, consistently with existing theories of social capital, economic performances increase with network integration within a national community. At the same time, integration within a single national community reduces the chances to benefit from the information provided by members of different community. A number of innovative robustness checks using both structural and Bayesian approaches are provided to assess the consistency of our econometric results.

Keywords: ego networks, migration, social segregation, spatial analysis, wage formation, self selection

Session 22: Science networks

Network positions and success. The case of physics

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It is well known that in science exist "Matthew effects" on many levels – be it institutions, awards or publications. The allocation of resources in the academic field is structured by the (im)possibilities that arise from the system of self-reinforcing rewards. These type of mechanisms is also well-known in social network analysis, where it is mostly addressed as "preferential attachment" and which was initially found in scientific collaboration networks. In respect to social relations in general, the effect yields that actors try to connect with those that have already many relations. For this reason, new relations emerge with central nodes and mostly not at the periphery of a network. Researchers found many examples where such self-sustaining processes play a crucial role. However, there exist very few attempts to link the network positions and structures (on which the Matthew effects depend on) to major outcomes being produced by the networks.

Elaborating these interplay of positions and consequences is the main aim of this paper. Specifically, "success" in academia is taken as an important case of network outcomes. One reason is the rather clear (if not exclusive) definition of individual scientific success as the publication of papers. This is especially true in Physics, where other publication forms (e.g. books) play no role at all in current research efforts. Moreover, collaborations are almost always necessary in Physics due to the high degree of specialization and division of labor.

As an empirical basis we utilize the ArXiv library. Most of the papers in Physics are made available there before they get published in peer-reviewed journals (comparable to working papers in social sciences). Fortunately, this information is incorporated in the rather open ArXiv API where we downloaded the data from 2004 to 2014. On this basis we derive a global collaboration network and the individual position therein of (approximately) every physicist. Due to the information whether the paper was finally published it contains also the information of scientific success. Methodically, both sides are brought together by a longitudinal network analysis and positional measures on the one hand, and an event history analysis on the other hand.

Preliminary results confirm the existence of "Matthew effects" in science. However, it is not only important that your collaboration partner has many relations, but important one's in the sense of a high social capital of the partner. Even more decisive in order to increase the success considerably is to create stable and long-lasting relationships. The empirical evidence also indicates that changes occur mostly in the periphery, thus really helpful relations have to be created in the center. Finally, the often proposed (sub-)interdisciplinarity does significantly enhance the probability of scientific success.

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Keywords: large network, survival analysis, Matthew effect, preferential attachment, physics, ArXiv

How do scholars collaborate with each other? Comparative study on co-authorship networks of scholars worldwide using big data

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Are there any similarities and/or differences regarding how scholars collaborate with their colleagues in different universities worldwide? The aim of this research is to investigate the trends, differences, similarities and changes over time in the co-authorship networks of individual scholars. To do so, we have gathered big data from Google scholar profiles of 5000 scholars including information about all their papers and publications, their affiliation, keywords they have used to introduce their research interests on their profile. These scholars are selected from higher ranked universities like Oxford and Harvard to be compared with lower ranked universities like the university of Milan and Tehran university in Iran.

The goal is to see how authors' collaborations change over time throughout their scientific career: are there drastic changes in the recent years compared to the early years of their careers? To elicit the networks, the researcher used "scholar" and "igraph" packages in R to build a recursive crawling function to reach out to the authors' Google scholar profiles and publications as reference of collaborations. Each paper and the names of authors was seen as a single adjacency list to extract the relationships. These adjacency lists represent the tie between ego (first author of this paper) and alters (each of co-authors). If the relationship is reciprocated, it was added to the network as well. It means if one of the co-authors appeared to be the first author of another paper, the relationship changes from a one-way directed one to a two-way undirected one, showing the reciprocity of collaboration. If there was more than one collaboration between two or more authors, this was taken into account through multiple relationships. And lastly, if a paper is written by a single author, it was represented with a loop (tie to oneself). The year of publication of each paper was used and in an aggregate of papers in a year, the evolution of collaborations is compared through years in scientific career.

The focus of the study is the structure of egocentric networks. Data on composition of egocentric networks is not available, although that could be another interesting research question to see if there are compositional differences of scientific networks among scholars worldwide or not? One of the main ideas here is to see how scholars are building and developing their collaboration networks. Are there differences among higher ranked scholars and universities behaviors in terms of the change in their scientific career collaborations over time with lower ranked universities' scholars? Are there differences between earlier years of scientific career, with the subsequent or later years? Are there differences among scientific fields (extracted based on research interests keywords) in the co-authorship patterns, as an example between hard sciences and social sciences? Are there statistically significant relationships among the authors' h-index and i10-index and their egocentric network properties? Are authors building

distant relationships in shape of unique dyads and triads to work with multiple and more scholars to maximize their scientific proliferation or not? What about publishing in more unique journals and/or trying to publish in some particular journals repeatedly? Can we find any significant trends in the variation of number of journals papers are published in, between scholars in different universities?

The study is still a work-in-progress, so far the researcher has finished the data gathering process and this abstract mostly included the network extraction procedures, and the ideas and questions that the researcher is going to answer to them based on analysis of data. The prospects of getting interesting results and the trends of how scientific collaborations develop, change and grow or shrink over time, are promising. This enables us to see how scientific collaboration among universities worldwide evolve over time.

Keywords: personal networks, egocentric networks, scientific collaboration, co authorship, comparative study, Google scholar, big data, temporal networks

Conference co-participation as a factor of new knowledge creation: network analysis

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Scientific and professional conferences represent unique opportunities to search for new knowledge: representatives from leading universities, high-tech firms and other organizations from all over the world come together to discuss topical issues and exchange latest findings. However, prior studies on knowledge- and innovation-related effects of conferences consider such events as if they were isolated entities, whereas in reality the value of a conference depends on what other events its participants attended before and whom they had met previously. Our study aims to relax this assumption and account for the interconnected nature of conferences and its implications for knowledge outcomes of participating firms. We build on the propositions that knowledge processes are embedded in the structure of co-participation networks and investigate how different positions of firms in such networks relate to subsequent new knowledge creation of these firms.

The study relies on archival data gathered from multiple sources (e.g. Web of Science's CPCI, Derwent Innovation Index, LexisNexis, Amadeus, SDC Platinum). The sample is represented by 470 small firms operating in electronic industry during the period from 1991 to 2012 and actively participating at industry conferences. Estimations of different models for dynamic

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panel data show significant links between different positions in conferences co-participation network and knowledge creation outcomes (measured using patent data).

Our findings suggest that some positions in conference co-participation networks are more beneficial for knowledge creation, while the other are less beneficial for that. In particular, we found that having a central position in such a network as well as being well-connected to other highly central firms have negative relationship with subsequent knowledge creation. At the same time, being a broker in the co-participation network has a positive relationship with subsequent knowledge creation.

Keywords: conferences, knowledge networks, knowledge creation

Exchange networks in science – what do scholars exchange and how do they do it?

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The main aim of the paper is discussing the exchange processes in collaboration ego-networks among scientists. On some fundamental level, we can think of scholars as actors possessing, or controlling, various types of resources. These resources can be roughly grouped into the following categories: human capital resources including skills and knowledge; social capital resources including social status and social connections to other researchers; financial capital resources including access to and control of research funds. Desirability and uneven distribution of these resources between different scholars create opportunities for collaboration that take the form of exchange. Previous research has developed general rules for exchange: behaviour is motivated by the desire to increase gain and to avoid loss, exchange relations develop in structures of mutual dependence, actors engage in recurrent, mutually contingent exchanges with specific partners over time, valued outcomes obey the economic law of diminishing marginal utility. However, it does not take into consideration types of resources, which are substantial for understanding scientific collaboration networks. Based on 30 IDI conducted with Polish scholars we show what resources are a subject of exchange; what are the motivation to initiate and engage in exchange; what are the norms regulating the exchange of different types of resources?

Keywords: exchange networks, ego networks, scientific networks

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Typifying researches by using networks of citations: The weight of scientific social circles

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Because citations are more and more used as indicators for research evaluation, taking into account their relational nature is a necessary approach to better understand their social origin and formation. The objective of RESOCIT (ANR project) is to examine scientific publications by using their cited references as a source of information to analyze the social relations of the paper's author with the authors of her/his references.

This study is similar to ego-network analysis, which emphasizes the social support of a single actor. It is also an analysis of social resources for a specific activity (the publication of an article) like other social network analysis (for example, whom do you need to know to get a job?). Using bibliographical references of an article is a good way to generate the names of alters who are mobilized to realize the publication. In short, we use bibliographic references as a names generator to understand the relationships involved in a publication.

The analysis presented here highlights the social depth of the scientific reference by examining the relationships underlying it from a qualitative standpoint, while increasing the number of cases studied to provide the means of revealing more general trends. Because the nature of the relationships is known, the social circles of the scientific world (institutional to more informal) can be discussed.

The study is based on an analysis of 147 publications comprising a total of 5,218 bibliographic references. All of the papers appeared in selective journals (listed in the Thomson Reuters' Web of Science), specialized in chemistry, biology, mathematics, economy or sociology. The method consisted of interviewing the publication author who was responsible for the publication (95 corresponding author). Semi-structured interviews addressed the scientist's trajectory and the history of the paper: its origin, its preparation, collaborations, funding, evaluation, links to previous or succeeding papers. In the course of the interview, the researcher answered the following question regarding each name cited in the bibliography: "Can you characterize the type of relationship you have with this person whose reference is cited, and if you do not know him/her personally, what do you know about him/her?" This question generated information about the nature of the relationship, the degree of mutual acquaintanceship and the origin of the encounter, and made it possible to obtain the characteristics of the people cited: who they are, where they work, in what field, and so on.

What is the nature of the relationships with these authors? Do the researchers always know the authors they cite? First result, citation relationships do not always involve underlying personal exchanges. Moreover, unknown references are an essential component, revealing segmentations in scientific groups. The relationships implied by references are of various strengths and origins. Several social circles and acquaintanceship are identified: co-authors, close acquaintances (team), colleagues (former or future), invisible colleges (discussions), peers (identification), and strangers (socially unknown). These circles are more or less related to researchers'

social characteristics: age, sex, position, discipline.

The social network mobilized by an author in his/her publication through bibliographic references gathers different relationships: both social and intellectual, personal and professional, individual and collective... The case study of the 147 articles (and their 5218 references) highlights four principal types of networks of citations. These networks are underlain by four types of scientific sociability: reading and surveillance; discussion and confrontation; collaboration and claim; competition and rivalry. Each of them refers to specific practices and dynamics, related to scientific stakes: teamwork, international context of research, emergence or transformation of a thematic, etc.

Keywords: academic networks, science, publications, citations, references, social circles, sociability

Session 23: Modelling networks

Social influence networks

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Our aim is to tackle formally a simple version of the Friedkin-Johnsen approach to social influence networks, by following the methodology of discrete analysis on graphs, the way it is motivated by the mathematical theory of linear parabolic and elliptic partial differential equations (heat/diffusion and Laplace equations). This analysis may shed some light on the dynamics of opinion propagation inside a social network, which, in this way, can be examined formally under the angle of how structure responds to opinion stimulations triggered at the network boundary in the presence of differentiated intrinsic proclivities and susceptibilities for opinion change or perseverance. Since, in this formal guise, social influence network problems are linear, their solutions can be easily computed in matrix (or linear operator) form. Moreover, one may define a number of matrix or vector measures of network influenceability that attune to known measures of adjacency and degree-closeness centrality in social network analysis. Examples of computation of these measures are given here with regards to artificially generated random networks possessing randomly assigned or fixed (across layers) influence susceptibilities.

Keywords: social influence networks, centrality

Knowledge and experience in 2-mode temporal networks

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We consider two mode temporal data in which a group of actors attend a series of time stamped events. Actors benefit from the events they attend in two distinct ways. Firstly they learn from the experience of attending multiple events. Secondly they learn from interacting with other actors attending the same events who bring different experience from other events. We propose a measure and a resultant algorithm that tries to capture these features and measure the extent to which actors benefit from both of these. Examples in which this may be useful would be in career trajectories, learning in educational environments or partaking in criminal or terrorist events. The result is a type of centrality measure but one that is very different from other measures and is linked closely to the type of data. The basic representation of the data is an extension of the Moody representation of a temporal line graph to a bi-dynamic line graph. In addition we try and establish which events provide the most benefit to the network as a whole by implementing an induced measure to capture the importance of the events.

Keywords: centrality, two mode, time stamped data

Specification of homophily in actor-oriented network models

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Homophily is a basic feature of social networks. For numerical actor variables, its specification in statistical network models is usually done by means of the absolute difference between ego and alter on the variable under consideration; sometimes, as an alternative, by the ego-alter interaction. It is argued that such specifications are incomplete for continuous actor variables and for ordinal numerical variables with three or more categories. The reason is that ego is not necessarily attracted mostly to others with the same value as ego; often the attraction is to some value between ego's value and the 'social norm'. (Attraction here is to be understood not necessarily as a preference, but rather as an empirical tendency.) Therefore, the usual representation will often amount to a misspecification. This is elaborated in an extension of the usual specification of effects of actor variables in stochastic actor-oriented models for network

*Speaker

dynamics. This new specification may have consequences for results of studies of social selection. An example is given.

Keywords: meta analysis, multilevel network analysis, combination of p values, Bayesian multilevel analysis

Models for distribution networks

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We propose a statistical model for the analysis of distribution networks. In distribution networks each node has an exogenously determined number of resources it can distribute between itself and all other nodes, spanning a network of resource allocation. Distribution networks are a special case of weighted networks where tie strength indicates resource count. Further, distribution networks frequently include loops that are of direct interest to the researcher, rather than being a nuisance. The statistical model for this type of network is based on ERGMs, but takes a rather different approach than other models for weighted ERGMs. By making use of the restriction that the outdegree of each node is fixed, the model is considerably simpler and has a more straight forward parameter interpretation than comparable models. The model is applied to two distinct datasets. The first dataset comes from a lab experiment, in which each pupil of one school class could distribute a fixed number of chocolates freely between itself and all class mates, constituting a network of weighted distribution decisions, in which loops (keeping chocolate) are very common. The second dataset contains patient transfers between hospitals in one Italian region. The structure of this patient transfer network allows insight into hierarchy, collaboration and specialisation among the hospitals.

Keywords: statistical network models, weighted networks

On dynamic stability of equilibrium in network game with production and externalities

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*Speaker

*Speaker

We consider a network game with production and externalities, which describes a situation typical for many social, economic, and political systems. In the first period of time each of the agents in a network receives endowment and distributes it between consumption and investment. In the second period the agent's consumption depends on her own investment as well as on investments of her neighbors in the network. The agent's payoff is determined by her consumption in the two periods. We introduce adjustment dynamics into the model and study the problem of stability of the game equilibrium.

The concept of equilibrium is specified as Nash equilibrium with externalities. Under this concept the player, when makes decision is more "tied" to the situation than as under usual Nash equilibrium. The existence and the structure of the equilibrium depend on the structure of the network. Three ways of agent's behavior in equilibrium are identified: passive (the agent does not invest), active (a part of endowment is invested), and hyperactive (the whole endowment is invested). Correspondingly, inner equilibria (in which all agents are active) and corner equilibria (in which at least one agent is passive or hyperactive) are possible. It is proved that if the inner equilibrium exists, then it is unique. Conditions of existence of the inner equilibrium are specified for different types of networks and combinations of parameters. We propose a definition of the dynamics which starts after a disturbance of the inner equilibrium. We find instability of the inner equilibrium and study convergence to a new corner equilibrium and stability of the latter. The pattern of the dynamics and the nature of the resulting equilibrium depend on the parameters of the model and on the character of the initial disturbance. An important fact which we find in our research is a special role of conditions, which are referred here as the presence and the absence of productivity, both in the static and in the dynamic frameworks. In particular, we prove that in any connected network, if initially the game is in the inner equilibrium and an agent overinvests (underinvests) comparatively to her inner-equilibrium investment, then under presence of productivity the game converges to the corner equilibrium in which all agents are hyperactive (passive, correspondingly). Under absence of productivity this is true if initially the agent underinvests, but if initially the agent overinvests this fact is true only under some additional conditions.

The specifics of the dynamics and the nature of the resulting equilibrium depend on parameters of the model and on the character of the initial disturbance. We find instability of the inner equilibrium and study convergence to a new corner equilibrium and, correspondingly, stability of the latter. The instability of the inner equilibria seems to be a property typical for social and economic systems. The presence of many social institutions can be explained by the will of the members of the society to preserve the existent equilibria under the dynamic instability which would take place without such stabilizing institutions.

Keywords: network game, equilibrium, externality, production, dynamic stability of equilibrium

Factors changing blockmodels' type in time

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”The aim of a blockmodeling is to reduce a large potentially incoherent network to smaller and less complex network (Doreian et al. 2005)”. In comparison with community detection methods, blockmodeling allows not only to detect highly connected groups of units, but also the relations between the obtained groups of units (de Nooy et al. 2011). Therefore, blockmodeling is seen as appropriate method to describe the structure of a certain network. The most known structures of blockmodels are center-periphery, hierarchy, cohesion and others (Doreian et al. 2005). Studies done on empirical networks show that the network’s structure can move from one to another blockmodel type in time under the influence of some factors (e.g. the blockmodel of center-periphery type can move to a complete network, where all nodes are linked) (Bettencourt et al 2009, Kronegger et al 2015). The presentation addresses the factors that affect the transition from one type of a blockmodel to another type of a blockmodel.

Keywords: simulations, blockmodeling, blockmodels' types, dynamics, changes in time

How stable are centrality measures in valued networks regarding different actor non-response treatments and network’s macro structure?

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Valued networks have greater potential for representing well network relations among units than simplified binary networks: more than the presence or absence of relations is recorded. Yet, all collected network data are prone to measurement errors regardless of the of data collection source. If all outgoing ties of actor are missing, the error is known as actor non-response. Yet incoming ties are available and can be used. Actor non-response treatments for binary networks can be extended to valued networks. We consider eight actor non-response treatments

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via simulations. The first treatment is the complete-case approach where both the row of absent ties the corresponding column is deleted resulting in a smaller network. A null tie imputation procedure replaces all absent ties by zeroes. If the modal value of incoming ties for a non-respondent is used instead of the absent tie the procedure is called imputations based on modal values. Similarly, using the mean value of incoming ties is another imputation method (imputations based on mean values). In the reconstruction procedure, an absent outgoing tie from actor i to actor j is replaced by the incoming tie from actor j to actor i . Reconstruction of ties between two non-respondents is not possible, therefore in the simplest case the null tie imputations are used, while the second option uses imputations based on modal values for ties between non-respondents. The seventh procedure is imputation of a total mean where the valued density of the network is imputed instead of absent ties. The k -nearest neighbors approach searches for k closest actors according to their incoming ties and then calculates the outgoing ties of the non-respondent as a median of outgoing ties of selected nearest neighbors.

The impact of all of the mentioned treatments for several centrality measures is examined: weighted betweenness centrality; weighted closeness centrality with different alpha parameter varying importance of tie strength and number of ties; eigenvector centrality; and diffusion centrality which measures an actor's ability to disseminate information within random process such as word-to-word gossip.

The simulated networks in the study were based on three well known blockmodel structures: a core-periphery model, a cohesive subgroups model, and a hierarchy model. Therefore, the macro structure of a network will be taken into account when evaluating the stability of centrality measures. The imputation treatments vary in their effects with some being much superior. Recommendations for best practices are provided.

Keywords: actor non response treatment, centrality measures

Centrality in multiplex networks

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In a multiplex network, several different relations are considered together. The dimensions that make up a tie may be unrelated but are more likely to be interacting, for example mutually reinforcing or inhibiting. Centrality and other indices summarizing the position of actors in a multiplex network are commonly determined either (i) by first aggregating the relationships into one and then performing the analysis on the resulting uniform network, or (ii) by first analyzing the networks of each relation separately and then aggregating the results. Either way, cross-relational dependencies are not taken into account in the analysis itself, because indices are generally defined in terms of a single relation. The observation that centrality indices necessarily preserve positional dominance suggests to turn things around and use more complex notions of

positional dominance as a basis for the definition of centrality in multiplex networks. Examples show that this approach is not only more expressive in terms of possible interactions but may even be easier to argue for.

Keywords: multiplex networks, valued networks, network centrality, positional network analysis

Session 24: Business networks

Social collateral and credit market access: Evidence from a large panel of Italian firms

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In this paper we provided a novel contribution to the empirical literature on the relevance of business networks in promoting credit market access. Building on some recent methodological advancements, we based our analysis on a novel measure of the strength of social relations in agents networks that is related to what Karlan et al. (2009) refer to as social collateral.

Italian firm networks identified by interlocking directorates were analysed from this methodological standpoint, in order to test the hypothesis that higher firm-level endowments of network-based reputational capital facilitate credit provision in loan contracts that do not imply the posting of standard collateral assets. The core assumption is that, upon default on its loan obligations, a firm would incur social sanctions within its business network which, in their turn, should promote credit contract enforcement.

Our empirical strategy mainly hinged on a panel fixed effects (FE) specification, with controls for possibly differentiated credit demand and supply trends at the sector, area and bank size levels. We collected panel data for a large sample of Italian firms, which essentially amounts to the entire population on Italian firms different from sole proprietorships. By comparing OLS and panel FE estimation results, it was shown how controlling for unobserved firm characteristics – namely the quality of the managerial staff – plays a crucial role in order to identify the effect of social collateral on credit provision. In fact, firm linkages within business network are clearly not randomly assigned but reflect the endogenous choices of corporate managers and shareholders.

According to our baseline FE estimates, the marginal effect of social collateral is found out to be positive, significant and economically sizeable, implying about a 10 percent increase of the amount of short term uncollateralized credit granted when moving from the absence of social collateral to the median endowment observed on networked firms. Extended model specifications showed how, in line with the predictions of the literature on banking, the effect of social collateral on credit provision is larger for smaller and younger firms, i.e. for the firms facing more severe restrictions on credit market access due to greater opaqueness and the lack of a consolidated own reputation. Some evidence was also collected showing how tight (direct) network linkages have a stronger impact on credit access compared to less stringent (indirect) ties. As a final research question, the interaction effects between firms participation in business networks and aggregate social capital was investigated.

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Keywords: networks firms

Barriers to the commercialisation of public research

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Technological innovation is defined as commercialising an invention, inventing a product and taking it to market. While having a "great idea" is essential and important, alone it is not sufficient to result in commercialisation. Innovation is a social process that depends upon the building of relationships resulting from substantial search endeavours. Networks are fundamental to innovation. However, there are inherent tensions and difficulties in the innovation process which may render some networks ineffective and constrain the process of innovation, particularly when the commercialisation is of public research. For example, a major impediment is that commercialisation of public research requires the coming together of two very different communities of practice – public research organisations and private firms – each with their own values, measures of worth, language and hierarchy. This makes forming and maintaining network ties for the purposes of innovation a complex enterprise.

Using the latest advances in statistical models for multilevel social networks, the project will detail the important substructures of collaboration networks which lead to commercialisation success and failure, providing insights to the barriers of the commercialisation process. As its empirical focus, this project examines innovation projects at multiple sites around the world that involve the use of controlled radical polymerisation which is a platform technology that, in contrast to a single use technology, has a much larger potential innovation and economic impact because it can be applied in multiple ways in multiple domains.

Keywords: multilevel, ERGM, scientific networks, commercialisation, international comparison

Beyond emerging market: Ties and institutionalization. The case of french SRI

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There is an increasing interest for the role of social positions to understand evolutions and changes within organizational fields. This paper advances a new approach to understand how actors manage their connections within an organizational field and how this influences their ability to shape the field and its specific institutions. Precisely, we want to explain how institutions (formal and informal) of the field come to support more the interests of some players than others. To do so we focus on the positions of actors in the field and their strategies of relational brokerage. We define two different types of brokerage: a structural one, in the social network analysis tradition; and an attributive one, which relies on the relational structure of actors but also takes into account their social characteristics.

We focus on a structuring organizational field – i.e. a field which already emerged but which formal and informal institutions are not stabilized yet. Structuration of such fields goes through the creation of professional associations, standards, etc. More specifically, we focus on the French field of Socially Responsible Investment (SRI) in the early 2000s. While it emerged in the 1990s in France, SRI remained controversial and a niche market during this decade and only structured in 2000s with laws being passed that support its development and a clear structure of the field emerging.

We consider brokerage strategies in this field when it is structuring, that is after its initial emergence as relations and norms become stabilized. A structuring field is different from an emerging one in two regards. First, the network structure is more stable, which makes it easier to study than in an emerging field where relations are constantly building, which makes the network harder to grasp as it is still in formation and instable and no structure has emerged yet. Second, relations are richer as field members had time to develop multiplex links - when two or more different types of relationships occur together among two actors. This allows to explore the complex plurality of relations that take place within an organizational field while making possible to observe and describe brokerage across those multiple relations. We analyze relational structures, and explore their consequences on the structuration of the organizational field.

To conduct this analysis we rely on a mixed methodology combining formal social network analysis and qualitative analysis to uncover the brokerage structures whereby some field members tried to maintain the existing institutional arrangement and the related field domination structure while others challenged it. Analyses presented in this communication are based on a fieldwork conducted between 2003 and 2006 on the French SRI market. This fieldwork relies on three tools: first on a participant observation of a year and a half in a SRI lobby group; Second, around 30 semi-structured interviews with SRI key players in France, whether they are analysts, fund managers, consultants, clients or associated with CSR initiatives and environmental protection; and third, a face-to-face sociometric questionnaire addressed to 78 individuals working in SRI in France (extra-financial rating agencies, boards, management companies, brokerage houses, NGOs, press, etc.) These 78 respondents represent almost all the people in this professional environment, which remains very small (about a hundred). The questionnaire includes a complete social network analysis of SRI: name generators for complete co-work, professional association and friendship networks. Finally, since the field exists, close links have been maintained with key players, particularly during restitutions or some new interviews.

Central to the understanding of organizational fields as arenas of power relations are the

forms of work developed by field members in order to impose their views and eventually secure power. However, little is known about dimensions of relational structures (e.g. types of brokerage), despite the acknowledgment that networks are crucial to account for the evolution of organizational fields. When fields are analysed as networks they are approached as given structure that enable or constrain actions-depending on actors' position within the field the effort devoted by the actors to establish their position and shape those networks are not examined. This approach overlooks the work whereby actors actively shape the connections that constitute the network structure within which they are embedded. We argue that some actors are more likely than others to assert their interests in the constitution of a field by imposing standards that serve them. Why? In the French SRI case, because they are embedded in association networks and there they knit formal and informal heterophilious ties. As a consequence, it shapes SRI in a very specific way in France, withdrawing extra-financial agencies the ability to define ESG criteria and offering financial actor more capacity in this regulation. To sum up, we examine who are the actors and what are the institutional pressures shaping SRI.

Keywords: organizational field, brokerage, market institutionalization

Corporate acquisitions and social integration

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In this presentation we study the process of integration of two firms after the acquisition of one firm by the other, by focusing on dynamics of inter-individual relationships. In that configuration, existing networks have to coalesce -i.e. networks of firm A have to combine, at least to some extent, with networks of firm B. We consider this process as a multilevel one: indeed, by looking at this process of social integration, we study the effects of inter-organizational ties on inter-individual relationships and the process of synchronization between levels. More precisely we try to follow how common rules for work are defined. While before the acquisition, each firm's ways of working, practices and norms were different, in the course of post-acquisition integration companies' members have to adapt and adjust their practices to each other. We address corporate acquisitions here as driving to a situation of forced collaboration which implies social costs to adapt to this new context.

Keywords: corporate acquisition, networks dynamics, advice, friendship, collaboration, synchronization costs, agency

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Global trends in private water contracts

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The private water companies' involvement in providing water and waste water services has varied throughout the years in different parts of the world. There are many studies focusing on cases of a particular company's activities in a specific country but the literature does not provide a holistic view of the changing patterns of the activities of private companies in general on a global level. The involvement of multinational private water companies is of importance when investigating their presence on a global level and it is expected to see networks formed by multinational companies and countries where they provide such services. This paper aims to fill this gap with an organizational networks approach. A new dataset of contracting country-contacted company has been compiled with the aim of investigating the global trend of awarding contracts to private companies as well as predicting the future trends. The main source are the Water Year Books (from 2003-2004 edition to 2012-2013 one), documenting the water contracts being awarded to companies around the globe in the period of 1991-2012. The data includes information on start date, expected end date, actual end date, awarding country, contracted company, location of the contract, type of contract, and the population served. A dyadic analysis of the relationships between countries and companies is coupled by a network evolution model which looks at the collaboration between private water companies while considering the contracts being awarded to more than one company. In the dyadic analysis the different properties of the contracts such as type and location are taken into consideration so the results show a more comprehensive picture of private water companies' presence in different parts and the dynamic nature of their operations throughout the years. The network evolution model sheds light on how different companies have been working together or against each other in different parts of the world; this usefully complements and puts in perspective insight from earlier literature which was based on individual case studies.

Keywords: network evolution models, dyadic analysis, private water sector, multinational water companies

Dynamics of collective learning: A longitudinal study of biotech entrepreneurs

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Learning as an entrepreneurial process: In this study, we look at the milieu of Biotech entrepreneurs as a social collective identity where different epistemic communities coexist, whose members share normative interests. These communities are struggling to promote the position of their coalition by claiming the relevance of certain knowledge or practices rather than others. From an organizational perspective, being part of a community allows actors to control access to knowledge and resources that circulate within the milieu. From a learning perspective, the construction of an epistemic community allows them also to solve the problems related to the creation of a hierarchy between different bodies of appropriate knowledge (Lazega, 1992; 2001).

Advice networks and collective learning: We build on studies of collective learning through advice ties at the intra-organizational level (see for instance: Krackhardt, 1987, Von Hippel, 1987; Ibarra, 1992; Lazega and Van Duijn, 1997; Cross, Borgatti and Parker, 2001; Krackhardt and Kilduff, 2002; McDonald and Westphal, 2003; Lazega, Lemerrier and Mounier, 2006) to formulate hypotheses about the way in which entrepreneurs find a consensus about appropriate knowledge and legitimate epistemic authorities at the inter-organizational level. Our previous work about the milieu of Biotech entrepreneurs in France (Pina-Stranger, 2011; Pina-Stranger and Lazega, 2010; 2011) shows that the exchange of knowledge is characterized by the emergence of different, segmented epistemic communities in which most members align themselves on local opinion leaders that have different knowledge claims: scientific, economic or industrial. Contrary to what happens at the intra-organizational level, homophily effects at the inter-organizational level create a polarized exchange system along the 'science vs. economics' divide. The coexistence of several epistemic communities in this milieu may be associated with the risk of inefficiencies in learning and a subsequent lack of coordination. This epistemic conflict poses a problem for entrepreneurs because, independent from their professional affiliations and knowledge claims, they must combine, in their work, knowledge from different fields.

A dynamic approach on advice networks at the inter-organizational level: These results are based on an empirical cross-sectional network study conducted in 2008. During 2012, we carried out a second wave of interviews following the same population of scientific entrepreneurs. We also collected data on their interpersonal relationships of knowledge exchange. Using this unique data set, we explore the way in which scientific entrepreneurs manage over time the epistemic conflicts they face when attempting to evaluate and select the appropriate knowledge.

Data and methods: The population of the first wave of interviews counts 164 entrepreneurs who work in 88 Biotech firms in France. The second wave of interviews will be finished in a few weeks. It will count at least 180 entrepreneurs who work in 105 Biotech firms. The recovery rate between the two waves is 60%. This recovery rate will allow us to study the evolution of social networks within this population using stochastic actor-based models (Snijders, Van De Bunt and Steglich, 2010). These models help to understand network change by estimating different sources of influence. In particular, these models distinguish the probability of ties changes by taking into account the endogenous effects associated with the network structure, and the exogenous effects associated with the attributes of nodes and the characteristics of ties (dyadic covariates). The dataset collected and these statistics tool enables us to formulate hypothesis about the relationship between dynamics of networks and behaviour in the context of an entrepreneurial social process of learning.

Working hypothesis about the dynamics of collective learning. Dynamics of collective learning can be examined in two ways: either the network is an exogenous variable or it is endogenous.

1st hypothesis: Our first hypothesis explores the effect of past professional affiliation of

entrepreneurs on the evolution of knowledge exchange. We suggest that, as an identity criterion, not all past affiliations have the same consistency over time to explain homophily patterns. In particular, we argue that financial and industrial affiliates will show a stronger consistence in explaining social exchange than scientific affiliation.

2nd hypothesis: Our second hypothesis is about the way in which epistemic authorities preserve their informal status over time. The Biotech industry is experiencing rapid institutionalization. Epistemic authorities can progressively rely on collective and organized forms of social control to secure their position. They do not need to be very active advice seekers to safeguard their position. They can rely on rules that are more established, they can rely on a more rigid structure of authority relationships. Accordingly, we should observe a network evolution where the positive correlation between in degree and out degree centralities became negative over time.

3rd hypothesis: Finally, our longitudinal survey allows us to take into account the way in which professional careers affects knowledge exchange, and perhaps the other way around. In particular, we are interested in the role played by entrepreneurs who became professional consultants in the last four years. These professional consultants have greater formal freedom to choose the epistemic communities in which they participate. We expect that the professional consultants who benefit from high status will be the leaders of new communities.

Keywords: inter organizational networks, collective learning, innovation process, entrepreneurial process

A dynamic view of alliance portfolios: The case of airlines

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The study of interorganizational relations is increasingly centred on the consideration of the set of alliances of the focal company or its EgoNet, which constitutes the Alliance portfolio of the company (Wassmer, 2010). Previous literature on Alliance portfolios has paid special attention to the configuration (portfolio size, structural dimension of Ego Net and relational dimension) and management (generation capacity Alliance and tools for its management) of the portfolio, but has not studied the emergence and the dynamic dimension of Alliance portfolios deeply (Hoffmann, 2007).

The generation and evolution of an alliance portfolio is determined by the decision to establish partnerships over time with other companies, and in this decision the choice of partner is a

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central issue for forming the network structure and determines its management. The choice of partner can come marked by the structure of the network, following a path dependent approach, or the strategic intent of the company (Ozcan and Eisenhardt, 2009), establishing a clear link between business strategy and the alliance portfolio.

However, there are currently many industries where competition is between groups or constellations of companies (Gomez-Casseres, 1994), returning to some extent to the classical idea of collective strategies of Astley and Fombrun. Membership of these groups or constellations, mainly derived from formal alliances, can decisively influence the political alliances of a company and the structure of its EgoNet. This paper attempts to understand the decision of the choice of partners in such contexts considering at least two levels of analysis: the individual company and the group or constellation of allies that competes with others in an industry. Unlike previous studies, on the one hand, the unit of analysis is not the individual alliance (dyad) (Gulati, 1995), but the ego network or alliance portfolio; and secondly, the formation of the alliance portfolio depends not only on the strategy of the company (Ozcan and Eisenhardt, 2009), but also on the group or constellation to which it belongs.

Following a similar methodology to Ozcan and Eisenhardt (2009), a multicase study of the international airline industry has been carried out, which allowed us to analyze the process of evolution and change of alliance portfolios of companies.

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Keywords: airlines, alliance portfolio, egonet, constellations

Session 25: Social support

How social network analysis allows a multilevel approach to study animal societies

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Group-living is a social condition that arose independently many times in evolutionary history with variable degrees of specialization and complexity. Although living in group brings many advantages, it requires mechanisms to maintain the homeostasis between individuals (trade-off between individual costs and benefits). This induces the establishment of complex, non-random, multi-behavioral, polyadic, and dynamic interactions between individuals. These interactions form social relationships that play several roles: tolerance behaviors enable individuals to gather, affiliative behaviors allow the formation of a perennial society, and agonistic behaviors allow the management of conflicts. Understanding how a society emerges, maintains itself, and adapts is a fundamental evolutionary question. Analyzing these aspects requires the investigation of the organization and structure of a society and its different components; in other words, its individuals and the way they interact. Yet individual variation leads to heterogeneity in interactions. These facts lead to complex, heterogeneous, polyadic, multi-behavioral, multilevel, and dynamic animal societies.

Affiliative behaviours (allogrooming, playing, etc.) contribute to the maintenance of social cohesion that is the basis of ecological and evolutionary balance in animal societies. The study of cohesion and resilience of artificial and biological systems (including human societies) is a major issue of the 21st century in which the interdependency of political, economic, terrorist, telematic, social and other systems is a characteristic and fundamental phenomenon. The same applies to trophic, ecological and social systems in animals that may suffer major disruptions due to future global ecological changes (climatic, destruction and exploitation of habitats and populations, etc.). The study of systems that have proved their ability to maintain over geological times could be determinant to understand the mechanisms, the structures and the resilience properties.

The nature of social structure (complex, heterogeneous, polyadic, multi-behavioral, multi-level, and dynamic) and the will to reach a holistic approach of this type of system require the use of adapted analytical tools. The Social Network Analysis (SNA) allows an approach of such complex biological system. Thus, the use of several tools from this statistical field enables to identify the position and the role of individuals within a group, to understand how sub-groups structure themselves and how these mechanisms improve group stability. Understand the rules under which individuals find their position within the group and interact is a crucial element as these mechanisms would finally establish a specific social structure with intrinsic ecological and evolutionary properties.

Keywords: animal societies, multilevel approach

Keep calm and multiplex? The role of multiplexity for career and psychosocial support in developmental networks with two time points

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Developmental networks were found to be positively associated with career outcomes like promotions, salary increases and career satisfaction (Kram, 1985; Whitley et al., 1991). In order to elicit these positive outcomes, more knowledge on the structure of relationships in developmental networks is required. Relationship structure refers to patterns of how relationships are lived. Research on relationship structure has shown that the types of relationship such as friend, ally, or mentor relate to the amount of support received (Dobrow, Chandler, Murphy, & Kram, 2012; Thomas & Kram, 1988). Related to the blurring line between work and non-work spheres, this study will focus on the relation of various roles in one ego-alter relationship (i.e., multiplexity) with the amount of career and psychosocial support received by the ego of the network. We divided multiplexity according to work and non-work context, or a combination of both, and expect multiplex relationships to be positively associated with the amount of career and psychosocial support received. Consequently, this study's added value is the integration of a multiple role related network parameter into research on support within developmental networks.

By means of multilevel analysis in Mplus, 3110 at T1 and 1772 at T2 relationships of developmental networks nested in $N = 539$ (T1) and $N = 341$ (T2) persons were analyzed. Results revealed that multiplex relationships solely from the work context (i.e., supervisor and colleague), and multiplex relationships from the work and non-work context (i.e., colleague and friend) are positively associated with career support. Concerning psychosocial support, a positive association with multiplex relationships from the non-work context (i.e., relative and friend), and the work and non-work context could be observed. To conclude, multiplexity in developmental networks is positively related to support in these networks, and might more broadly relate to variables like career success. Moreover, findings might help individuals to strategically manage their relationships in their developmental networks. Further implications will be discussed in the context of career support for employees and employers.

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Keywords: egocentric networks, multiple role management, developmental networks, multiplexity, career and psychosocial support, career development, two time points

From collaboration to solidarity among peers. A multivariate ERGM of support and trust between collaborating freelance workers

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This work aims at understanding how support ties form from economic exchanges. We studied a multiplex network of instrumental and expressive relationships in a group of independent workers who collaborate for business purposes. We tested (i) the effect of collaborations on the formation of support ties; (ii) the role of business-related trust as a mechanism underlying this relationship; (iii) the endogenous effects of reciprocity and closure on the formation of a support network.

We collected network and attribute data by personally administering a questionnaire to 29 freelancers who share a coworking space in Brescia, Italy. This group was selected because the coworking space did not have any formal organizational structure providing incentives to professional collaboration between its members. This was an ideal context for disentangling the spontaneous formation of social ties from economic interactions. The data collection followed a 3-month ethnographic pre-study. Support was measured by asking subjects whom they would turn to in case of need of material and emotional help for non work-related issues. A collaboration matrix resulted from the integration of data on incoming and outgoing flows of transactions, weighted by the related satisfaction level. In order to measure business-related trust, subjects were asked to cite trustworthy people as potential business partners. Covariate networks were surveyed as control factors: Advice-seeking within the previous 12 months, friendship, and previous acquaintance. We also gathered data about sociodemographic and business-related characteristics of the actors.

*Speaker

We modeled support together with trust by applying a class of multivariate ERGMs, controlling for actor-relation effects and covariate networks.

We found that reciprocity was not relevant for the formation of support ties. Conversely, we found a positive effect of path closure and a non-significant effect of cyclic closure. This suggests the emergence of local clusters where coworkers provide support by following transitive paths. Together with a strong negative effect of indegree centralization, our results show a globally decentralized flow of support which clusters locally around emergent hierarchies. With regards to multivariate effects, collaborating with another freelancer seems to increase the likelihood of developing expectations of support, regardless of the level of satisfaction with the business partner. Trusting another freelancer for business purposes tends to foster expectations of support in everyday life, even controlling for the other covariate networks.

Our work suggests that when peers collaborate without a formal hierarchy, non-instrumental support might align with trust in economic exchanges, while the outcome of a collaboration seems to be less relevant. Moreover, our study provides an interesting insight on the way informal hierarchical structures emerge among peers.

Keywords: support, trust, solidarity, collaboration, coworking, economic network, social exchange, ERGM, multiplexity

Session 26: Cultural networks

The application of networked coincidences analysis to represent the history of Western culture

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The vast amounts of data available on the Web coupled with the increasing processing data capabilities make possible the analysis and visualization of information in entire new ways. This presentation attempts to show a particular representation, provided by Networked Coincidences Analysis (NCA), of the history of Western culture from the medieval to the contemporary era through a set of maps representing main authors connected through their coincidence in time, movement or genre. The preparation of these maps is based on two-mode network analysis with cultural figures and their different classifications. The main conclusion that can be drawn from these networked representations is that artistic movements make more similar cohesive subgroups than time does. In addition to this, genres creates very isolated and different communities from those generated with the previous characteristics. The talk will also introduce the application of NCA to other types of data to generate structural maps of relationships. A variety of examples of this type of analysis and its results will be presented.

Keywords: networked coincidences analysis, cultural history

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Subnetworks and music scenes: An application of generalized two-mode cores

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Recent methodological advances have enabled researchers to directly identify important subnetworks within two-mode networks using local properties. These advances most notably include the introduction of generalized two-mode cores, which synthesizes the concepts of (p-q)-cores and generalized cores in a one-mode network context (Cerinšek and Batagelj 2015). Despite the widespread utility in using local properties to directly infer significant two-mode subnetworks, few empirical studies have applied this technique. For the study at hand, we use this method to examine the emergence of significant subnetworks within the context of large-scale, music collaboration networks. We identify the emergence of such influential subnetworks over time by analyzing different combinatorial pairings of local properties as applied to each of the two node subsets. We evaluate the findings from these analyses against those influential individuals, projects, and collectives identified from narrative historical accounts. Beyond an empirical demonstration of the method, implications from our study highlight the local mechanisms by which particular subnetworks acquire influential positions within their global networks.

Keywords: two mode networks, bipartite networks, collaboration, generalized cores, longitudinal networks, music, local properties

*Speaker

Session 27: Social media

Construction of post-Soviet identities and decomposition of the post-Soviet order in social media: Case of the annexation of the Crimea

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Our study focuses on the analysis of the role of social media during the events known as the Crimean crisis. After Euromaidan that began on the night of 21 November 2013 with public protests in Maidan Nezalezhnosti ("Independence Square") in Kiev, the Ukrainian territory of Crimea was annexed by Russian Federation on 18 March 2014. This paper looks for better understanding of the contribution of those events to the reconfiguration of post-Soviet media and political spheres. We are interested in studying the place of new information and communication practices, social networks and others social media (Kaplan, Haenlein, 2010) in post-Soviet politics at the intersection of public sphere (Habermas, 1997) and private sphere. We stand that the events of March 2014 have contributed to the division of the post-Soviet political and digital space. According to our hypothesis, the creation of national Ukrainian social networks and migration of Ukrainian users to transnational social and digital platforms as Facebook and Twitter is a part of this process of the decomposition of the Soviet order.

In 2013-2014, television remains the major dominant media and primary source of information for Ukrainian and Russian audience. At the same time, early 2010s were marked by a strong use of digital social media. The number of regular Internet users reached 18.8 million in the Ukraine and 68.7 million in Russia, 80% of them had an account in one or more social networks. In 2014, Russia and Ukraine shared many spaces of exchange and communication, including social and digital spaces. Russian and Ukrainian citizens have been main users of Russian social networks Odnoklassniki, VKontakte and Moj Mir since their creation in the mid-2000s and until the events we study.

The subject of our research is Twitter, an online social networking service that enables users to send and read short 140-character messages called "tweets". This choice is explained by a significant coverage of the events on this platform and the constant growth of its audience in Russia and Ukraine. Recently, the "Slavonic" segment of Twitter has been the subject of two important researches (Berkman Centre for Internet and Society at Harvard University, 2012; Research Centre on Internet and Society of the New Economic School in Moscow, 2012). These researches have confirmed that this digital space was a place of individuals and organizations interact beyond formal and traditionally hierarchical political procedures. For this research, we crossed qualitative and quantitative methods with a method of data visualization. I articulate two methods of analysis for this study. More exactly, we used quantitative method of visualization and mapping data and qualitative content analysis. First of all, we used Twitter Search API services to extract contents of tweets marked with hashtags #Крым Russian, Ukrainian and #Крим #Crimea English. Over 17,600 tweets were collected. I removed tweets that did not concern the events of my study and duplications in order to build a corpus of 1,000 messages.

Then, we used Gephy, free software of analysis and network visualization, and I built graphical visualization of links between the actors in Twitter.

We stay that debates and mobilization on Internet in the post-Soviet context do not contribute to empowerment and social changes. Those digital media are "introduced in the fields of local and national forces" (Tristan Mattelart, 2011), and can ensure democratization and domination at the same time. In the post-Soviet context, digital technologies contribute to decline of political mobilisation and engagement; they strengthen isolation of political actors excluded from the public sphere and enhance social control, which benefits for current Russian authorities (Kiriya, 2012). So, digital space of social networks becomes an extension of the official political public space of domination. It allows state propaganda speech to enter the private sphere and alternative public sphere. Our analysis shows that post-Soviet citizens don't use social networks to produce critical comments on political power. Twitter intertwines with traditional actors of politics and media and becomes a part of the balance of power of the actors in the chain of production of information (Koltsova, 2001). We suggest to consider digital space of social networks as a semi-private area, semi-public, which is partly within the post-Soviet system of public spaces, Russian and Ukrainian, increasingly fragmented. Digital space became an extension of the post-Soviet political sphere. Social and digital space contributes only marginally to debates, standards development and new sociability. However, it is fully involved in the reproduction of inequalities, domination and isolation of social actors. The arrival of digital technology and social networks has not really had an impact on how the post-Soviet citizens consult the information. In the choice of forms of political action, they use the ways "rooted" in the post-Soviet society

Keywords: social media, Post Soviet Politics and Society, twitter, political action, political engagement

Network diversity, and tweets credibility assessment

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Credibility assessment plays a central role in people's attitude towards, and acceptance of information. The tremendous amount of information available online has resulted in considerable research on information and source credibility. Yet, the majority of research is focused on individuals as making credibility judgments in isolation from one another, thereby ignoring more social means and tools of credibility evaluation. More specifically, despite the central role social networking sites play in users' information consumption, the credibility assessment mechanisms utilized within these platforms are understudied.

*Speaker

This study is drawn from theories of online information assessment, specifically the Prominence-Interpretation theory and the Elaboration Likelihood Model. Guided by these theories, we explored the social dimension of content credibility assessment. Specifically, we wished to explore how the level of diversity within people who shared a given piece of information (e.g. family, friends, colleagues. etc.) on twitter, effect the recipient credibility assessment regarding that piece of information.

We utilized a between subjects design, our participants (N=88 undergraduate students) were divided into control and experiment groups. The twitter network of each participant was collected and analyzed in advance, in order to identify (1) people to whom our participants are actively connected to on twitter (i.e. they have re-tweeted their tweets at least once); and (2) social clusters among these active connections (i.e. people who are tightly connected with one another, and less connected to other people). Based on this analysis, participants in both the experimental and control groups were shown the same fictitious tweet that was presumably re-tweeted by people they have active ties with. In the experimental group, three people from different social clusters were presented as re-tweeting the content; in the control group three people from the same social cluster were presented as re-tweeting the content.

The participants were then asked to rank the fictitious tweet credibility and to explain the score they gave. In the condition where the tweet was re-tweeted by people from diverse social clusters, the tweet was perceived as statistically significantly more credible, when compared with the credibility scored given in the condition where the tweet was re-tweeted by people from the same social cluster. These results highlight the role interpersonal ties plays in the process of credibility assessment. More specifically, these findings emphasize the relevancy of ties diversity within the credibility assessment process. While this insights offer a deeper understanding of credibility assessment mechanisms within twitter; they can also guide researchers interested in gaining a more exhaustive understanding of these processes within other social networking sites.

Keywords: twitter, credibility, diversity

Leadership for the New Millennium: Modeling Members' Roles in Online Communities

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With the increasing popularity of social networking websites, the need for deep understanding of human behavior in online spaces arises. People use online communities for social interactions, leaving textual traces such as forum postings, which can help understand members' behavior. Online forums deal with a specific area of knowledge, thus can be seen as online

*Speaker

communities (Valenzuela, Park, & Kee, 2009). Social network analysis (SNA) enables the study of complex patterns and phenomena that are reinforced in online social networks. For example, the Arab Spring was reinforced with ideas propagated via interest groups founded in Facebook. However, the mechanisms through which social influence occurs are poorly understood. A main challenge in detecting social influence is identifying members who play an opinion leader role. Members having more influence on others are known as opinion leaders or influential members. A member is considered influential if her activity level is high (Yang, Wei, Ackerman, & Adamic, 2010). We show that members may be distinguished by their emergence roles (roles), having different levels of participation in a community. Participation (activity) was calculated as a function of SNA's centrality measures. Differences in members' centrality measures, such as closeness, betweenness, eigenvector centrality, in-degree, and out-degree, indicate the level of members' activity, reflected by roles patterns. The sequence of roles a member held is represented as a matrix which summarizes the activity of a member across the longitudinal networks. Aiming to find members with similar activity-levels, we clustered the data in the matrix into groups, using K-means algorithm.

Results suggest that roles frequently change over time and are much more dynamic than formal roles. We propose a model, which contributes to understanding members' interactions by identifying roles in an online environment. This process is demonstrated on a variety of 320 forums. Members holding identical roles were found to act in similar patterns, regardless of community's type, supporting the following hypotheses. (i) There is a positive activity level correlation between members' formal role and emergence role; (ii) Members' behavior is dynamic and can be represented by a sequence of roles; (iii) Influential members can be spotted by similar social behavior that is expressed by similar transitions between roles.

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Keywords: virtual communities, emergence role

Social media interaction techniques of UK charities: The case of twitter

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*Speaker

Charitable non-government government organisations are making increasing use of social media to promote their activities and engage potential and existing supporters. Charities in the UK differ in terms of the extent and sophistication of their use of social media. In this paper we survey Twitter interactions involving major UK charities to distinguish distinctive interaction techniques. We captured all 6304 tweets involving the Twitter accounts of 56 major UK charities over a week-long period, mapping these as a directed social network. We analysed the characteristics of the network and the principal nodes and then employed a relational event model (Butts 2008) to investigate the interactions as event patterns. We find UK charities are characterised by distinctive triadic structures in the network of Twitter interactions, which relational event modelling finds to involve distinctive participation shifts, suggesting these are specialised interaction techniques.

Keywords: twitter, relational event model, charities, NGO

Teacherpreneurial behaviors in social media

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In an information age, social media allows one to observe interactions and examine differences within a social network. Many classroom teachers, taking initiative to find, share, and sell materials or ideas related to their teaching practice may be considered entrepreneurs. Given risks in wasting time, effort, and investment in resources of unknown quality, these teacherpreneurs continue to pursue supplemental materials and practices outside those provided within their local districts or social networks.

Teacherpreneurial behaviors often occur as individuals form virtual social networks and develop trust with one another. Using a prevailing social media platform, Pinterest, as a way to manage their enterprise, teachers facilitate the acquisition and promotion of teaching practices and ideology with virtual network members. Early career teachers, ECTs, develop trust in one another and often seek advice regarding teaching practice; trusting peers more than experts or publishers (Education Week Research Center, 2014). This study examines the entrepreneurial behavior of ECTs and their experienced counterparts. Using a sample of ECTs and the nominations of their closest colleagues, we observe entrepreneurial behaviors on Pinterest, identifying differences in compositional and structural characteristics.

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Analysis includes an iterative coding process to identify ECTs' resource "pins," categorizing by primary source function as patterns emerge. Pins fall within three categories, teacher-to-teacher markets (TTMs), teacher blogs, and organizations. TTMs define online platforms where teachers share and sell classroom resources; comparing products directly across vendors. Teacher blogs include independent websites created by individuals or groups of teachers who openly reflect and share their professional values. Finally, organizations refer to companies or other groups of experts diffusing knowledge under an organizational enterprise.

Preliminary findings suggest ECTs pin more resources from teacher blogs and TTMs, both manifestations of teacher-to-teacher trust (see attached file for a table of preliminary results). Within TTMs, teacherspayteachers.com is the predominant enterprise teacherpreneurs procure resources. Future analysis, will examine entrepreneurial behaviors of experienced teachers many of whom may be startuppreneurs, those invested in promoting, sharing, and diffusing information and resources across their network. We will compare compositional characteristics across groups and triangulate entrepreneurial behaviors with teacher performance and knowledge measures.

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Keywords: social media, teaching, entrepreneurs

Session 28: Covert networks

Covert and overt networks in Counterfeit Alcohol Distribution: A Criminological Network Analysis

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Counterfeit alcohol production and distribution is a high priority concern for EU and domestic authorities. A report from Europol and the Office for Harmonization in the Internal Market (OHIM) (2015) argues that despite the worrying growth in counterfeiting, the rise of domestic production in several EU countries, its links to organised crime and the damage it does to businesses and consumers, there is no comprehensive picture of its criminal dimension in the EU.

The paper integrates a criminological and social network analytical theoretical approach to understand the organisation of the distribution of counterfeit alcohols. We aim to analyse the dynamics between the ‘scripts’ through which offenders must go in order to accomplish their counterfeit alcohol enterprise and how these scripts shape and are shaped by the multi-mode, multi-link networks of cooperating actors at various stages of the crime commission process. Our data cover two subsequent and connected investigations by a domestic European regulator on the network of distribution of counterfeit vodka and wine across three European jurisdictions.

We first perform script analysis of the two cases to identify the crime scenes, the actors and their resources; the sequence of actions and decisions before, during and after criminal activity at all stages of crime commission; the tasks that need to be performed to commit these activities; and the range of places where they are performed. We subsequently organise these information in a multi-mode, multi-link network where nodes can represent various entities (people, organizations, resources, locations) involved in the scene, and the ties the type of performed actions. We then collate the two analytical steps to observe the variety of facets that each scene offers, and their possible permutations.

We then identify the key players that brokers within and across the scripts: together with individuals, we also want to identify resources, organizations and locations that may serve the purpose of connecting facets and scenes of a script. Our hypothesis is that one of the two cases represents a substitutive script for the previous one which was disrupted by the FSAI investigation, and we want to focus on the actors and facets that survive and connect the two cases.

We discuss our findings in regards to the covert and overt aspects of the distribution scripts and network, as it is our contention that non-legitimate networks are hidden behind otherwise legitimate actors and business practices and that the concealment of illicit conduct in relation

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to the distribution and supply of counterfeit alcohol can be defined as a habitual and frequent practice within this market.

When knowledge and experience matter. Measuring centrality in 2-mode temporal covert networks

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How do individuals belonging to covert groups acquire enough knowledge and experience for carrying out activities and undertaking their covert intents? They need to learn. The practical knowledge they need not only requires to be transferred to new members but it also must be absorbed and adapted. By doing activities and interacting with others during an event, individuals learn how to independently use this knowledge effectively. First, we start by using the Bi-Dynamic Line-Graph to represent our covert networks. Next, we apply a specific measure of centrality which quantifies the amount of practical knowledge and experience individuals gather through hands-on experience and interactions with others. In doing so, we demonstrate its applicability on temporal covert networks as an example. In particular, we discuss the usability of this centrality measure for empirically capturing knowledge and experience transfer dynamics by considering past relationships and past attendance in events. We also seek to demonstrate that this measure gives us an idea of which people mostly benefit from these transfers and mainly contribute to the diffusion of the knowledge. Finally, we suggest that by applying this measure of centrality it seems possible to identify how and to what extent the flow of knowledge and experience evolves and grows over time in covert networks.

Keywords: covert networks, temporal networks, bi dynamic networks, temporal centrality

Signaling trustworthiness in dark web marketplaces: Investments to network embeddedness and market outcomes

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Recent years have seen the rise of major illegal online marketplaces in a hidden layer of the Internet - the Dark Web (Christin, 2012). Anonymity provided by the Dark Web and digital currencies enable users to run illegal business in relative safety from being shut down by law enforcement. However, anonymity also creates a trust dilemma between buyers and sellers (Raub, Buskens and Corten, 2014). Cooperative partners cannot easily be identified, contracts are not secured by law, and buyers risk fines or jail time if sellers operate unprofessionally. Analysis of how criminals build trust under such risky conditions could provide a better understanding of conditions necessary to sustain human cooperation in uncertain environments.

Previous research has argued that trust in online marketplaces is sustained primarily by sellers' reputation effects resulting from rating systems built into marketplace infrastructures (e.g. Diekmann et al., 2014). However, recent research on Dark Web marketplaces suggests that vendors' reputation might not be solely created by such rating systems, as many vendors also actively try to signal their trustworthiness in marketplace discussion forums (Yip et al., 2013; Lusthaus, 2012). Based on signaling theory (Gambetta, 2009), high network centrality in forum networks could be a good signal of vendor's professionalism, while forum member recommendations could be used to signal trustworthiness.

This article aims to analyze under what conditions drug vendors on the Dark Web marketplaces invest in discussion network embeddedness to signal their trustworthiness and whether these investments have a positive effect on their market outcomes. We use longitudinal data from the "Silk Road" marketplace and link vendors' market data with discussion network data to investigate what market conditions provide incentives for vendors to actively participate in the discussion forums and whether this network embeddedness pays off in the marketplace.

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Keywords: dark web, trust, signaling

The efficiency / security trade-off and beyond

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The efficiency / security trade-off hypothesis has become prominent in the field of covert and criminal network analysis, although it has been empirically tested in only a small number of studies. First, I review the idea and its history, which dates back to early 90's with studies pointing out the crucial need for concealment in covert networks. This hypothesis states that covert networks and actors involved in them generally manoeuvre between Scylla and Charybdis of immediate profit from its activities (efficiency) and working slowly towards long-term goals while remaining undetected (security). Then, I review the network characteristics related closely to this thesis – density and centralization. Sparse and decentralized networks are theorized to be secure yet inefficient, while dense and centralized should be efficient though insecure. I also relate certain types of criminal activities (e. g. terrorism, drug trafficking, corruption etc.) to these assumptions. The main part of my paper is based on possibilities for empirical testing of this hypothesis. I discuss different criteria for considering a network sparse or dense and centralised or decentralised based on previous research as well as on network theory. Upon this discussion, I make note of potential pitfalls of these criteria. In conclusion, I am proposing further research questions and theoretical extensions for the efficiency / security trade-off, paying attention to multiplexity of ties, which is important for greater theoretical and empirical specificity.

Keywords: covert networks, criminal networks, efficiency/security trade off, density, centralization

Session 29: Intra organizational networks

The impact of research design and choice of methodology on social network structures – The case of studying hospital environments

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Constructing a research design and establishing a proper methodology for a SNA study involves a variety of issues related to data collection techniques, type of questions that should be asked, respondent sensitivities, ethics considerations and so on. Researchers have discussed matters that needs to be considered when gathering SNA data referring to various studies conducted in the field and have provided general advice and guidance (Borgatti et al, 2013; Crossley et al, 2015). The issues and techniques under consideration are applicable to a wide range of disciplines however when it comes to more sensitive environments e.g. hospitals, establishing a good methodology for collecting quantitative network data can be challenging because of the urgency of the workplace. Moreover, the adoption of SNA in healthcare studies has been limited (Cunningham, 2011; Chambers et al, 2012) hence there is very little advice on SNA application in hospitals.

This paper critically reflects on issues of research design and methodology for SNA studies in hospitals. It compares results of network structures collected through a variety of different approaches, which were tested in a trial and error approach in a pilot case study of two inpatient departments in a public hospital in the UK. The paper discusses: 1) the methods used for collecting SNA data – interviews, surveys and direct observations and the associated biases that the different methods produced; 2) the stages that helped to test and polish the methods in collaboration with doctors and nurses; 3) techniques for interviewee engagement and data visualisation 4) the ethical considerations taken into account; 5) the effects of missing data on measures. Results of the analysis suggest that size, shape and structure of the network change based on the respective data collection method, the questions asked and sampling techniques. It is also argued that an iterative approach of pre-testing methods and co-developing them together with participants can be beneficial. In addition, the paper shares insights on practicalities of collecting data in very dynamic and stressful environments, where participants have little time to spare, thus suggesting ways in which the burden for caregivers and problems such as recalling names could be minimised.

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Keywords: research design, methodology, hospitals

Organisation and network analytics – Exploring the role of the workplace

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Organisations can be seen as complex interplays of people, processes, structures and cultures. One way to understand organisations better has been offered by network research, which over the last decades has established strong patterns of insight into how businesses are structured, how teams perform and which types of ties between individuals lead to meaningful socioeconomic outcomes. To name a few important research insights, it was shown that strong ties facilitate the transfer of complex knowledge, whereas weak ties enable searching for new knowledge; brokers bridging across structural holes were found more likely to detect and communicate good ideas; high performance was associated with ‘serial closure’, i.e. a history of shifting between open and closed network positions; and team performance was argued to peak for strongest ties. It was also argued that bridging only brings about innovation if it occurs through so called ‘simmelian ties’, i.e. mutual connections in a triad.

An important variable in this context has often been overlooked: the physical design of the workplace in which organisations operate. In particular, the layout and spatial configuration of an office building has been established as an important factor in bringing people together or keeping them apart. One of the most prominent theories in this respect is the propinquity effect, suggesting that people placed in closer proximity inside an organisation (for instance through adjacent desks, or in shared areas of an office) will interact more frequently and form stronger ties.

This paper proposes to bring those two streams of research together: the study of organisations in the shape of networks of ties between people, and the study of the physical workplace. It

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will explore important network concepts and metrics, such as brokerage, clustering and component analysis, and Simmelian ties and search for underlying spatialised patterns and rationales.

Using network data of interaction and collaboration ties of one knowledge-intensive business, collected via a self-reported survey and bringing this together with a detailed study of the floor plans of the organisational office space with 'Space Syntax' (a method to analyse spatial configuration in the shape of a spatial network), this paper aims to identify a list of the possible ways in which the spatial reality of organisational life creates affordances for organisational structures, cultures and processes. It will also explain how each of these can be further researched and validated.

Keywords: interaction patterns, intra organisational networks, Simmelian ties, office buildings, workplace, space syntax

Applying social network analysis to the mobilisation of quality improvement: Structural features of a paediatric palliative care network

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Background: Network forms of organisation are increasingly seen as a way of overcoming some of the barriers to quality improvement in healthcare by promoting communication, co-operation and co-ordination of services. They range from large, complex, managed networks which have been the subject of research, to social movement type organisations that are informal, peer-to-peer, voluntary groups about which little is known. This study focuses on a network of the latter type—a paediatric palliative care network which aims to improve the care of young people with life-limiting illnesses in the West Midlands of England.

Aims of the study were to: 1) to gather information about advice, leadership and influence networks in the group; 2) to describe structural features of the group; 3) to investigate the application of this information to the mobilisation of quality improvement.

Data: relational data were gathered by telephone interviews with 22 members of the West Midlands Paediatric Palliative Care Network, who were asked: 1) who they would go to for advice about a work-related problem; 2) who occupies leadership roles within the group and 3) who is seen to be influential externally. Simulated networks of the same size were then generated to assess whether the observed patterns of relationships deviated significantly from what we be

*Speaker

expected if network ties formed at random.

Methods: Social network analysis tools for detecting hierarchy, homophily and brokerage, including exponential random graph models.

Results: There was no evidence of hierarchy in this network, although there is some indication of status ordering and of the existence of a "core" and "periphery". There was a tendency towards homophily with doctors preferring to obtain advice from other doctors whereas nurses showed a preference for members of other professional groups. Both leadership and external influence were distributed across the network. Three people occupied brokerage roles which suggests that they may play an important role in maintaining the network and as conduits for the diffusion of information and influence. This paper will develop a number of hypotheses about why these people in particular came to occupy brokerage roles.

Conclusions: Social network analysis shows that this group demonstrates some of the key features of social movement organisations as described in the literature. Despite the fact that the group is long standing, a hierarchical structure does not seem to have evolved. One of the most interesting structural features of the network is the small number of brokerage roles. Further comparative case studies may also illuminate the extent to which the predominantly female gender composition of the network is related to its structural characteristics.

Keywords: hierarchy, brokerage, homophily, ERGM

Session 30: Policy networks

Building, understanding and influencing an informal network: The case of Deal Island

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The Deal Island Peninsula, located in the Chesapeake Bay, is facing a number of imminent social and ecological changes due to global climate change and sea level rises. Local stakeholders are in the process of understanding (and potentially adapting to) these changes via intermittent participation in an informal network called the The Deal Island Marsh and Community Project. The stakeholders are diverse, consisting of i) watermen, many whose families have resided on the Island for generations, who harvest oysters and crabs for their (and their families) livelihoods; ii) ‘come heres’, such as retirees who have chosen to live and build homes on the Peninsula post-retirement; and iii) government and non-government employees whose work directly pertains to resources and ecosystem services found and/or managed on Deal Island. For the past decade or so, ethnographic research has been conducted at Deal Island, examining locals’ understandings and cultural views regarding environmental change, and consequent vulnerabilities inherent to the Deal Island landscape. This long-term ethnographic research lead to a NOAA Collaborative Science project, which in turn led to the emergence of an informal network consisting of residents, scholars, government and non-government actors, all of whom share an interest in better understanding the environmental changes affecting the island. Recently, network analysts and geographers have joined this research effort, and funding has been granted to hold a number of participatory workshops aimed at i) expanding and solidifying the diverse network of actors; ii) encouraging social learning through dialogue and knowledge exchanges among scientists and residents; iii) developing potential adaptation strategies in view of the rising sea levels and other environmental changes arising from climate change; and iv) gathering data on stakeholders’ relations to one another, their cultural views of climate change, and the ecological and social impacts of such change. In this paper, we discuss how this network ‘grew’ overtime, the structural features and actor attributes (which include stakeholders’ cultural views regarding climate change) of this network (using a combination of descriptive network measures and ERG models), the intended topics for our participatory workshops, and our next steps in this two year project.

Keywords: climate change, stakeholder networks, network intervention, cultural consensus

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Governance resilience

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Relations between agents (i.e. networks) act as conduits to their political power. And power is channeled to the attainment of governance outcomes. Traditional social science makes the simplifying assumption that actor preferences (their perceived utility) can be employed to predict their behaviour. By comparison an analysis of networks makes actor interdependence the point of departure to an understanding of their constraints and opportunities. In that respect actors can impact outcomes not only through their own discrete interventions, but also mediated by the pattern of interaction among others.

Governance as the product of political exchange is therefore affected by the quality of the interaction between political agents, what Jones et al. (1997) and Robins et al. (2011) have termed governance embeddedness. For instance, the degree to which political agents reciprocate relations equitably, whether there is transitivity, and whether relations are predominantly hierarchical. Governance as a process is affected by the pattern of exchange between political actors. For instance, the degree to which there is a strong core-periphery, the multiplicity of clusters, prevalence of brokers or the skewness in the distribution of ties can affect the way politics is exercised and policies are created. Resilience can be defined as the capacity of a system to survive drastic change, and is linked to its robustness.

I employ a range of case studies of policy making, policy implementation and cross-border policy in Europe, to demonstrate how governance process and governance outcomes are affected by the networks of political agents. This often happens in ways that can only be comprehended by analyzing the pattern of actor relations. I also use examples that draw from cases of environmental policy and the recent debates on sustainability to hypothesize on the nature of governance resilience. This analysis is coached within the literature of leadership, political entrepreneurship and brokerage or what some have termed exceptional agency. I will conclude with a typology of governance resilience.

Keywords: governance, resilience, policy networks, research design

Networks of influence. NGOs in the international decision-making process

Rachel Polaud

The purpose of our research was to identify the parameters that explain why and how a network of NGOs can be influent [i]. The secondary purpose was to determine which NGOs were powerful and why. The first difficulty was to decide which organizations were part of the network. We had to determine the density of their links. Finally we identified central actors. We used interviews, archival data (press releases, websites). We studied 10 years of negotiations and NGOs advocacy activities. We tried to explain victories and statu quo by crossing qualitative analysis and social network analysis. Interviews and press releases allowed us to identify weak links (quoting another NGOs) and strong links (campaign organized together). We successively used decisional method (Knoke, 1998), relational and reputational method (Laumann and Pappi 1978 ; Melbeck, 1998). We crossed results to know which actors were influent (König and Braüninger 1998). Social network analysis helped us understanding why some NGOs succeeded in some enterprises and failed in others, considering they used the same répertoires d'action.

We managed to establish the conditions under which a subgroup can be influent. It must share the same strong beliefs, has different ressources (expertise, capacity to work with medias). The majority of subgroups must be able to keep on existing within the decision-making process, waiting for periods of crisis and uncertainty when they will be more likely to be heard by decision-takers. Going back and forth between qualitative analysis and social network analysis helped us understanding phenomena at work. We would have been unable to explain some of them just by interviewing actors or reading presse releases and websites.

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[i] Studying the part of NGOs in international organizations decision process, we assumed that " being influent " means " being able to push a decision successfully ".

Keywords: networks, NGOs, advocacy coalition, international decision making

The "turning point" of austerity in France in 1982-1983 through the prism of social network analysis: Anatomy of an economic controversy

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This communication presents the first results of an exploratory research concerning a group of persons composed of French Left government members and of members of their staff, who have contributed to the austerity policy debate in France in 1982-1983. Our aim was, first, to identify namely these people who have more or less actively participated to this controversy: they are around thirty five; second, to highlight their opinions on different economic policy subjects at several crucial moments; third, to reconstitute the networks they form when they cooperate and when they give advices on economic policy decisions.

The "turning point" of austerity in France in 1982-1983 is an interesting case study of a regulation process of a State's economic policy. Indeed, beyond its historic importance, this episode has been very well explained and documented, from a lot of points of views, from journalists, biographers, researchers and actors themselves. Thus, the numerous debriefings and interviews make us available a rich ethnography, with indirectly collected data on this 'milieu'. To complete these information, we use on the one hand the Bottin Administratif, a book which, each year, makes the inventory all the people who compose the French State (executive and administrative staffs), and on the other hand, the Who's who which gives all the information on education and professional career of famous people in France: luckily, all the people identified in this study appear in these two sources.

Our analyses are based on the multiple relations between these different kind of prosopographic, biographic, network and opinion data, and aim at understand the regulatory process of economic policy. In our study, we highlight on the way the actors share information and exchange points of views within an uncertainty context. We show the influence of social structures of the French education system ("Grandes Ecoles") and of the French State ("Grands Corps") on politics. We focus on individuals, and we analyze their changes of opinions when they face of other opinions. We insist on the importance of their relational interdependencies to understand their strategies. We thus aim at contribute to the understanding of the transformation of the social and economic relations within the French society by focusing, especially, on the "turning point" of austerity in France in 1982-1983, which prefigures the period of the financial markets reform in 1984-1986.

Keywords: French economic policy, regulatory process, social resources, advice network, cowork network, dynamic network

Session 31: Geography and networks

Geographic versus psychological proximity as antecedents of collaboration

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The literature on collaboration among co-workers in organizations has emphasized two central types of drivers: Geographic proximity and homophily with respect to actors' characteristics and attitudes. The first position centers around the argument that the closer colleagues are co-located the more likely they are to interact by exchanging valuable resources. Similarly, it has been argued that the more similar co-workers are with respect to their characteristics as well as their attitudes the more likely they are to establish collaborative relationships. In this paper I contrast and compare the effects of geographic proximity on the one hand and similarity of attitudes on the other with respect to their effects on the likelihood that co-workers establish collaborative ties. Moreover, I control for a number of actor level characteristics that can also be expected to influence collaboration. Data has been gathered among 218 top and senior sales executives in a large global German high-tech company. Specifically, data comprise information on two dimensions of knowledge sharing (i.e., information and advice networks) among these employees, their geographic location, and several psychological attitudes such as their values, their general attitude towards knowledge sharing, as well as role clarity and role conflict. In order to disentangle the effects of geographic proximity and psychological homophily, I estimate a class of exponential random graph models (ERGMs) including several control variables such as organizational tenure and gender. Analyses have not yet been finished but preliminary results reveal that geographic proximity and psychological homophily have distinct effects on the patterns of the company-wide collaboration network.

Keywords: collaborative networks, ERGM, drivers of collaboration

Spatial and social proximity in inter-organizational networks: A longitudinal study

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According to extant literature, spatial proximity is one of the most important factors affecting inter-organizational resource transfer. The main idea underlying this argument is that risks and costs associated with resource transfers make collaboration more likely to occur between physically proximate organizations. Building on the theoretical distinction between physical and social spaces, in this paper we test the conjecture that the effect of geographical distance (i.e., distance in a physical space) on inter-organizational collaboration is mediated by the effect of social distance (i.e., distance between positions that organizations occupy in a relational space). Specifically, we seek evidence of an effect of social proximity on the strength of collaboration that increases as geographical distance among organizations increases.

To test this conjecture we use longitudinal data on patient transfers that we have collected within a regional community of hospital organizations over a period of four years. We use the aggregate number of patient transfer events to measure the intensity of inter-hospital collaboration. We use distance in kilometers to measure spatial distance between pairs of hospitals in our sample. Finally, we use co-membership in cliques and similarity in network positions as alternative measures of proximity in social spaces. We employ a dyadic dynamic panel design to model inter-organizational collaboration as a function of geographical distance, social proximity, and of a number of organizational and institutional variables that we use to control for additional factors affecting inter-organizational collaboration.

Preliminary results show that the negative effect of geographical distance on inter-organizational collaboration is mediated by different measures of social proximity, suggesting that the effects of physical and social distance need to be understood jointly.

Keywords: interorganisational networks, proximity, collaboration

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Another one rides the bus? Social determinants of diffusion in infrastructure networks

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Social networks play an important role in the study of the diffusion and transmission of diseases. These models often use empirical networks (e.g. air plane routes) to study and predict the spread of disease. While they often incorporate some of the basic principles behind agent-based models, they do so mostly with regards to the contagion travelling through the network. Yet, this approach neglects the multitude of social mechanisms being influenced by and in turn influencing the diffusion process. We seek to address this issue by exploring simulation models which account for social mechanisms like solidarity, stigmatization and group processes. By running these simulation on real world networks we try to answer the question how social mechanisms shape and change in accordance with topological constraints. We think this approach is an important extension of many contagion models, since it is considering network structures and, at the same time, implementing behavioral alternatives that influence the network properties and thus represent the interdependency of structure and action.

We use a comprehensive network of the current German infrastructure for passenger transport as the topology of our simulation. It consists of the German highway, domestic flight and long distance train routes. Combined, the streets, routes and tracks represent the major lines of mobility within Germany. Using Python, we run simulations in which we test the interaction between three different layers: the diffusion of a unspecified contagion, quarantine strategies enacted by a central authority and the flow of passengers influenced by preferences as well as social reactions to the contagion. Because of the focus on social mechanisms we explore a very simplified disease model (SI) and only the most rudimentary quarantine procedures.

Keywords: simulations, topological modeling, diffusion processes

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Session 32: Personal networks

The story behind the network graph: A mixed-method study on problem-centered interviews about the impact of social relations on career paths

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As part of a current research project we are examining the impact of social relations on career paths. In the past it was considered that social networks or embeddedness act as a catalyst for scientific careers. However, there are no studies that have examined the effects of networking on career paths. Hence this project focuses on the determinants for and, in particular, the effect of networking on scientific careers. The study is based on problem-centered interview data relating to ten professors (male and female) from different disciplines (social science and natural science) working at different universities in Germany which were collected in 2015. To facilitate the examination of their interactions during the different phases of the qualification process and the resulting networks, the interviews focus retrospectively on the professors' immediate environment during these phases. To determine the ego-centered networks we developed a method for collecting social relations for different qualification phases and the associated relational and interaction histories in narrative interviews. This gave us indications as to which kinds of relations were helpful in which contexts (family, friends, working relations, scientific community, institutional relations). The initial results show that information- exchange-, advice-, care- and conflict- relations are mostly supportive. The stories about these relations provide information on the ways in which they are helpful. To illustrate the procedure we draw the network graph for the narrative interviews and provide some examples of the stories behind this graph.

Keywords: ego centric networks, narrative interviews, mixed methods

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How do people represent their relations? Collecting network data with an affective name generator

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Using a name generator and asking people for their alters addresses complex cognitive dimensions of an interviewee. Respondents have to comprehend the interviewer's stimulus, retrieve memories, and, at the same time, select, edit and report their answers. While doing this people stick to certain cognitive schemata to give appropriate, consistent or acceptable answers. We explore how people represent their affective networks. Our main research questions are: What kind of affective networks do people represent? How do people process with a name generator stimulus? What cognitive patterns refer our participants to?

The analysis is based on 73 affective ego networks. The data was collected by using a name generator asking for close alters. The data collection was combined with a visual stimulus (i.e. network map) that comprises the opportunity to differentiate the degree of closeness. To get access to cognitive processes of the interviewees, the network data collection was embedded in guided interviews. Participants were asked to verbalize their associations and thoughts during and after the process of network data collection (i.e. Thinking Aloud Method). Using a purposeful sampling gender, age and socioeconomic status were varied systematically. Based on these verbal and visual data we describe affective ties and extrapolate the data collection process by revealing cognitive schemes of the participants.

The paper presents major results concerning on a) the sequence of recalling alters, b) the configuration of the affective networks (i.e. who is how close?), c) the comprehension of the stimulus, d) the relevance of cues and prompts as activators, and e) used figures to justify answers (e.g. social norms). With our findings we can draw implications to better understand and to improve the process of network data collection.

Keywords: ego networks, data collection, cognitive schemata, name generator, affective networks

*Speaker

Poster

Remote working entrepreneurs and their worldwide embeddedness in social networks

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Nowadays people have become increasingly mobile – especially through the developments of new transportation- and communication technologies, mobility becomes (for a wide range of people) more and more affordable and new ways of communication, forms of collaborative work and meeting-types (for example through "skypecalls") arise. It is not necessary anymore to be in a conventional office during a usual workday. Especially in creative-sectors, like "app-development", graphic design, online consulting, architecture, etc., projects can be realized in cooperation with different project partners, who are located all around the world. Based on this circumstances, a quite new "type" of a remote working entrepreneur develops. This type of entrepreneur combines work with the possibility of being mobile all over the world, but they are not forced too. Most of them call themselves as "Digital Nomads". They are highly skilled persons, who can live and work basically everywhere in the world – as long as they have access to a good internet connection. In this poster will be presented, how the social network embeddedness of worldwide mobile remote working entrepreneurs respective "Digital Nomads" looks like. On the one hand, what are the structural characteristics of the social relations and on the other hand, what are the meanings behind the structures from the perspective of ego in the context of a highly mobile lifestyle. The analysis therefore is based on narrative interviews in combination with computer-assisted ego-centered networkcards with remote working entrepreneurs, which were collected around southeast asia.

Keywords: qualitative social network analysis, egocentered networkcards, computer assisted data collection, remote working entrepreneurs, digital nomads

Impact of European integration on regional social movements and economic disparities in the EU

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In order to achieve the goal of an "ever closer Union", as defined in the founding EU Treaties, the European Union has established several policies which aim to increase the levels of European integration amongst the member states. Cohesion Policy is one of its key regional policies, which has been consuming ever larger shares of the EU budget since the 1980s. It aims to improve the standard of living in the poorest EU regions, strengthen social networks and avoid large scale emigration, reduce unemployment and to decrease regional disparities amongst and across the member states. This study examines the effectiveness of the EU Cohesion Policy in achieving these social and economic goals by looking into the impact of this Policy on social movements and relative economic development across and within EU countries and regions. We hypothesize that the payments countries received from the EU Cohesion Fund have resulted in reduced social and economic disparities between member states on a national level, but are failing significantly in achieving the goal of decreasing regional inequalities within EU member states. The literature that studies various effects of the Cohesion Policy on member states, has not reached a consensus on the significance and robustness of its impact on economic disparities and social structures. This study tries to additionally explore this topic specifically for the so-called cohesion countries by conducting the panel analysis. The research is conducted on 16 EU countries in the period from 2001 to 2014. Based on correlations between received cohesion funds and the measures of regional social movements and economic cohesiveness, the estimation of the random effects panel model and Granger causality tests, results imply that the Cohesion Policy has had a positive impact on decreasing economic disparities and fostered social cohesiveness between countries on a national scale. However, the results show that the cohesion funds failed to decrease regional economic disparities amongst regions within member states. On the contrary, the empirical evidence suggests that the Cohesion Policy even helped increase the economic and social centralization within member states as the richer regions had higher absorptive capacity to attract cohesion funds due to better educated and trained human capital. This resulted in higher unemployment and higher emigrations from poorer to richer regions, acting devastatingly towards social network creation in poorer regions.

Keywords: economic disparities, regional cohesiveness, cohesion policy, European union, European integration

How SNA allows a multilevel approach to study animal societies

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Group-living is a social condition that arose independently many times in evolutionary history with variable degrees of specialization and complexity. Although living in group brings many advantages, it requires mechanisms to maintain the homeostasis between individuals (trade-off between individual costs and benefits). This induces the establishment of complex, non-random, multi-behavioral, polyadic, and dynamic interactions between individuals. These interactions form social relationships that play several roles: tolerance behaviors enable individuals to gather, affiliative behaviors allow the formation of a perennial society, and agonistic behaviors allow the management of conflicts. Understanding how a society emerges, maintains itself, and adapts is a fundamental evolutionary question. Analyzing these aspects requires the investigation of the organization and structure of a society and its different components; in other words, its individuals and the way they interact. Yet individual variation leads to heterogeneity in interactions. These facts lead to complex, heterogeneous, polyadic, multi-behavioral, multilevel, and dynamic animal societies.

Affiliative behaviours (allogrooming, playing, etc.) contribute to the maintenance of social cohesion that is the basis of ecological and evolutionary balance in animal societies. The study of cohesion and resilience of artificial and biological systems (including human societies) is a major issue of the 21st century in which the interdependency of political, economic, terrorist, telematic, social and other systems is a characteristic and fundamental phenomenon. The same applies to trophic, ecological and social systems in animals that may suffer major disruptions due to future global ecological changes (climatic, destruction and exploitation of habitats and populations, etc.). The study of systems that have proved their ability to maintain over geological times could be determinant to understand the mechanisms, the structures and the resilience properties.

The nature of social structure (complex, heterogeneous, polyadic, multi-behavioral, multi-level, and dynamic) and the will to reach a holistic approach of this type of system require the use of adapted analytical tools. The Social Network Analysis (SNA) allows an approach of such complex biological system. Thus, the use of several tools from this statistical field enables to identify the position and the role of individuals within a group, to understand how sub-groups structure themselves and how these mechanisms improve group stability. Understand the rules under which individuals find their position within the group and interact is a crucial element as these mechanisms would finally establish a specific social structure with intrinsic ecological and evolutionary properties.

Keywords: animal societies, multilevel approach

Networks and mobilization in Russian social movements

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Russian political processes are characterized by activation of civil engagement. Civil movements are actively formed in Russia. Russian civil activism characterized among other by two features. The first one is the expansion of interaction and communication on the Internet. The second is the development of network forms of its organization. 10 representatives of NGOs from different Russian regions were interviewed to identify characteristics of mechanisms to mobilize citizens, activists and other partners in social movements and NGOs and initiative groups. The survey allowed determining mechanisms of citizen mobilization in social movements through 6 thematic blocks: 1. The legal form of organization; 2. Mechanisms of interaction and communication; 3. Digital technologies; 4. Integration with other social movements, authorities; 5. Promotion of image of the organization, branding; 6. Projects implementation.

The research allowed analyzing the interaction of subjects of political processes in social movements, and got following data: Construction of the interaction within the movement between team members; Instruments to engage participants to social movements; Mechanisms of cohesion and retention of activists; Communication with partners, NGOs, authorities, expert community.

The paper will also include the analysis of researches conducted by a survey of experts in Russian regions: the first one in 2014 (from 21 Russian regions, total sample of 233 experts) and the second in 2015 (from 14 Russian regions, total sample of 165 experts). Experts were employees of regional and local authorities, scientists, business people, members of NGO and others. 10-15 experts were interviewed in each region. Conducting of these studies provided new data on the current trends and patterns of networks and mobilization in Russian social movements. This allowed identifying: the reasons for advancing using of civil networks' forms and mechanisms; specific forms of civil network; the principles of the organization and construction of civil coalitions; trends and characteristics of formation and evolution of organization of civic network and civic coalitions; new channels of communication and tools that promote civil network; the efficiency of civil network in solving of social problems.

The researches allowed identifying the main problems in the formation and development of the network social movements which hinder their development. An important objective of the paper will to analysis the nature of the authority's reaction on network social movements.

Keywords: mobilization, Russia, social movements

Social network analysis of hope and well-being of adolescents

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There is a growing literature on social networks of adolescents documenting the influence of

*Speaker

friendship groups on mental health outcomes such as depression and burnout. However, there is a dearth of research on similar social network influences on positive psychological variables such as hope and well-being, and larger contextual moderators such as socioeconomic status. In this poster presentation, we will present data from research that considers whether the degree of hope of an adolescent's friendship group predicts well-being over the individual's level of hope. Data were collected from a sample of 15-year-olds ($N = 1,972$; 62% Caucasian; 46% identified as Catholic; 25% had professional parents) from the East Coast of Australia. Results suggest that individuals from the same friendship group were similar to each other in hope and well-being. Furthermore, group hope significantly predicted psychological and social well-being over and above individual-level hope. We will also explore the selection and influence processes in the social network of hope and well-being. The study can help identify influential agents of change, and thus has implications for informing network-based interventions for enhancing hope and well-being among young people.

Keywords: hope, psychological well being, social well-being, adolescents

Simplifying ego-centric network analysis in R with egonetR

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In ego-centric network analysis you commonly have n +many networks which you want to analyse simultaneously. However, the majority of ego network analysis is still done via software which are either not designed for relational data thus allowing only a specific set of network analysis or are designed for the analysis of a single case. The software project R – due to its modular structure – allows the analysis of n +many networks independent of input data formats. Yet the use of R for ego-centric network analysis is not as straight-forward, because a standardized solution for the data storage or analysis and the link between existing network packages in R and ego-centric network analysis was missing. To facilitate the use of ego-centric network analysis in R, we introduce a package for the import, storage and analysis of ego-centric network data, called egonetR (<http://github.net/tilltnet/egonetR>). egonetR helps with the restructuring of the collected data on ego-centric networks, and makes it available in different formats that allow to conduct the analysis using the facilities of packages like igraph and statnet. In addition egonetR provides a growing number of functions serving the computational realizations of concepts that are specific for egocentric network analysis. The poster presentation introduces egonetR along an exemplary analysis of network data. We show the import of differently structured raw data (e.g. long, broad format), go over to the calculation of network measures (e.g. size, isolates, subgraphs) and the visual analysis for n +many networks. We would like to use the chance, to publicize the existence of egonetR to the community of social network analysts and at the same time invite the audience to collaborate on the development of the package.

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Keywords: ego centered network analysis, R

Kinsources – Open data and open tools for kinship network analysis

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Kinsources (www.kinsources.net) is an open and interactive platform dedicated to archive, share, analyze, and compare, kinship data used in scientific research. Kinsources offers an opportunity to be part of in the open access turn of social sciences, which aims to assure the reproducibility and comparability of scientific analysis through open data sharing.

The platform provides:

- a sustainable and secure data repository ;
- many functions for management and control of data sharing ;
- a simple way to publish datasets (with permanent link and documentation), in accordance to scientific and legal rules, valorizing the authors' work and protecting their rights.
- tools for searching and browsing among published kinsources' datasets.
- a toolbox advanced software and various data format for analyzing kinship and relational data.

The software Puck (Program for the Use and Computation of Kinship data), available at kintip.net, is integrated in the statistical package and the search engine of the Kinsources website.

Kinsource's dataset can also be downloaded et locally analysed with Puck's large functionalities or common networks and genealogical tools like Pajek (<http://mrvar.fdv.uni-lj.si/pajek/>) and Kinoath (<http://tla.mpi.nl/tools/tla-tools/kinoath/>). Datasets can be stored and downloaded in various open format files from which the puc format: an XML data model which allows managing and representing biographic data, genealogies, kinship terminologies, residential and relational data. Other formats available on Kinsources include all usual open files formats like simple text or tabular format (ods), Pajek Network format, Gedcom. . .

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The poster will demonstrate the main functionalities and the general use of the website Kinsources, inviting researchers to share data and analyze kinship datasets.

Keywords: open data, open tools, kinship, data sharing

Social capital in Start-ups foundation: individual's resources and local governance impact on entrepreneurship in marginal and urban areas.

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Where do entrepreneurial ideas come from, what are social basis of entrepreneurial attitude, what resources are a key for the success? In this research social capital, as analytic concept, helps to explain entrepreneurship phenomenon, together with political and economical measures, founding on new economic sociology approach to entrepreneurship which includes relational aspects (embeddedness, context) as well as agent's interests in the analysis (Swedberg 2003). Scholars from different disciplines are focused on defining which are the core elements of achieving entrepreneurial success in twenty-first century, they converged on the importance of the following premise: success in all social systems is interrelated and co-dependent on establishing and fostering relationships. The stock of accumulated resources that can be accessed via these relationships is what we define as social capital: "These resources include information, ideas, leads, business opportunities, financial capital, power, emotional support, goodwill, trust, and cooperation" (Baker 2000:25).

In facts, entrepreneurs bring to their job more than the human capital they have accumulated through years of education and experience. They also bring social capital, resources and support they can procure through their network of relationships (Gargiulo, Benassi 2000). These resources may have a specific effect on start-up entrepreneurship, highlighting its difference from general business venture. While many new small firms may remain small businesses for their organizational lifetimes, entrepreneurial firms may begin at any size level, but key on growth over time (Carland 1984) and characterized by innovative strategic practices.

Aim of the study is to analyze how entrepreneurs' social network is shaped and changes over time, in order to provide more efficiently resources needed for the success of the company. Research tool is a questionnaire submitted to a sample of Italian start-uppers. Analysis will also take into account territorial variables and geographical constrains, comparing different performances in northern and southern Italy, and marginal and central areas.

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Keywords: social capital, start up, innovation, districts

Networking of methadone users and its temporal evolution

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Background: In Hong Kong, substitution treatment is offered to heroin users through the territory's 20 methadone clinics to achieve the goal of harm reduction in minimizing HIV transmission. Frequent and simultaneous visits at the same clinic may facilitate methadone users to network, the pattern of which could vary over time. We piloted a multigraph social network analysis approach to characterize the networking patterns of methadone users, the results of which may inform public health interventions.

Methods: Archived anonymous clinical records of methadone users between 2008 and 2013 were retrieved following institutional approval. Demographics including HIV test results, admission history, methadone dose, date, time and clinic of each visit were accessed. As methadone users are required to re-apply for admission after an absence of > 28 days, these breaks were also examined. From a networking perspective, 2 users were deemed to have met each other if they attended the same clinic within 15 minutes. The F-score of each pair was given by the harmonic mean of the proportion of visits they met among each of their total number of visits in a particular year. Connections between methadone users were assumed to have been made if F-score ≥ 0.1 and having met for at least 5 times.

Results: Of 16,570 methadone users who ever visited the methadone clinic during the 6-year observation period, 3,410 had at least one connection with another user. There were 2,868 pairs

*Speaker

of users constituting 5,030 multi-edges. Six out of 99 HIV positive users were in the network. They had connections with at most two other users. Three large connected components (LCCs) could be delineated. Comparing between users in dyads and those in the three LCCs, there were significantly more female, non-Chinese, young, and recently admitted persons in the former. Dyadic users had longer and more frequent breaks after similar lengths of observations. The 3 LCCs, namely CC1, CC2 and CC3, consisted of 424 (15%) nodes and 1609 (32%) multi-edges. Proportions of ethnic identities and genders in these components were similar. Users in CC3 were admitted more recently ($p < 0.01$) and were younger ($p < 0.01$). Their longest breaks were also longer than those in CC1 and CC2. Fitting the correlation between the year of first admission and the number of users in the three LCCs with an exponential curve ($R\text{-squared}=0.87$), the half-life of the components was 6 years. Temporally, the degree of CC3 followed power law distribution every year. Its average heterogeneity (tendency to contain hub nodes) and density was the highest (0.72).

Conclusions: Connectivity of methadone users was stronger among local Chinese male who had joined the programme over extended periods. Large clusters could evolve each composing of users with different characteristics. Against the background of a low HIV prevalence in the drug-taking community in Hong Kong, the impacts of networking could not be established in this study within 6 years.

Keywords: drug users, methadone, harm reduction, HIV, multigraph

Multiple imputation for network analyses

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Missing data on network ties is a fundamental problem for network analyses. The biases induced by missing edge data, even when missing completely at random (MCAR), are widely acknowledged and problematic for network analyses (Kossinets, 2006; Huisman & Steglich, 2008; Huisman, 2009). Although model-based techniques for handling missing network data are quite promising, they are not available for all analyses (Koskinen, Robins & Pattison, 2010; Koskinen, Robins Wang, & Pattison, 2013). Multiple imputation for network data is able to overcome this problem. This study expands on recent work on imputation of missing data in networks (Wang et al. 2016). In the current simulation study, different models for treating missing data are compared on different simulated networks varying in size, density and clustering. The compared models range from simple models (available case analyses, reconstruction (Stork & Richards, 1992), imputation of no-ties) to multiple imputation using exponential random graph models. The effects of different missing data mechanisms (MCAR, MAR, MNAR), different percentages of missingness (10-40%), and different types of missing data (actor non-response,

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boundary misspecification) are investigated . The performance of the imputation techniques is examined by comparing parameter estimates of ERGMs estimated on both the complete and imputed network data.

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Keywords: missing data, multiple imputation, ERGM, simulation

How is the mutual sibling relationship affected by sibling-mother relationships? A small-scale family network study into enforcement, compensation and loyalty conflict mechanisms.

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Studying triads between two siblings and their mother, makes it possible to 1) test enforcement and compensation mechanisms, and 2) a loyalty conflict hypothesis based on balance theory (Heider, 1958).

In 1) it is investigated whether higher intergenerational relationship quality and more contact or conflict between sibling and mother enforces relationship quality, contact or conflict between siblings and/or whether a lack of these three relational aspects is compensated by the sibling relationship. To study 2) a discrepant intergenerational relationship is defined as the presence of one positive and one negative sibling-mother relationship. This imbalance is expected to negatively affect the sibling relationship.

Multilevel analyses of sibling-mother-sibling triads from the Netherlands Kinship Panel Study show that perceived intergenerational relationship quality and contact with mothers enforce relationship quality and contact between siblings. Discrepant intergenerational relationships, indeed decreases perceived relationship quality and contact between siblings, no similar pattern was found for conflict.

Future research should investigate more precisely how these patterns develop over time, and should involve more family members. An interesting possible extension is to study how intergenerational and/or intragenerational loyalty conflicts affect the well-being of family members, especially after the family experienced negative events such as loss or divorce.

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Keywords: small scale family networks, siblings, loyalty conflicts, balance

The role of non-providers of support in social support networks: The case of chronic pain

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Introduction: The social environment is a priority in the care of people living with a chronic illness to the extent that guarantees the continuation of care and needs of the disease outside

of the healthcare institutions. Thus, is necessary to know the content of social support that personal relationships contain as well as the factors that modulate and condition it.

Aim: The aim of this research is to study the structural and compositional measures of social support networks received by people affected by chronic pain, as well as the factors that explain the no provision of support.

Methodology: The research has been carried out with patients treated in the Unit of Pain of a public hospital in Santander (Spain). We collected personal network data from 30 individuals (15 men and 15 women) using the software EgoNet with a single name generator, obtaining data from 600 relationships (20 alteri for each ego). Other structural measures were obtained with UCInet6 software. In addition we obtained qualitative data through semi-structured interviews with the aim to obtaining information related to the contextual variables that explain, among others, the no provision of social support.

Results: A 33.17% of the 600 studied relationships, are not providers of social support (N = 199). The average of non-providers of social support in personal networks is about 7 alteri while providers is around 13. These relations are at a slightly higher proportion in the networks of men than women (36% vs. 31%). In relation to the position in the network, these alteri have centrality measures lower than global average: degree centrality (7.25 vs 8.6) and betweenness centrality (2.10 vs. 3.98). Other features of non-providers include that most of them are men (57.79% N = 115), maintain a weak tie with ego (50.75% N = 101), they are found in all social roles except parents including spouses, children and siblings and have been declining in support over time (8.04%) or have remained the same (91.96%). Some of the reasons explaining the no provision of social support are: the impact of chronic pain to the social life of the individual and thus the reduction and weakening of social ties, age of alteri (elderly and children), the disease of alteri, negative or conflicting relationships as well as the geographical distance conditioning the provision of instrumental social support.

Conclusions: The study of social support from the perspective of personal network, allows one hand to measure the social environment from structure and composition measures of the personal network and the other hand, capture both providers and non-providers of social support. From an interventionist point of view, is necessary to know the social contexts in which social support is insufficient or inadequate as well as its complementarity with other formal social support resources at the community level in order to ensure coverage of needs caused by the chronic disease.

Keywords: personal networks, social support, non providers, chronic pain

Similarity-based ranking of user influence in bipartite social networks

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Today with the growth of spreading information, the question of "how to measure a user's influence on others in social networks?" becomes increasingly challenging and interesting. Because, influential users are more likely to be infected and to infect a large number of users. Indeed, influence is the ability to popularize a particular content in the social networks. Various measures of influence have been proposed over the years to rank the nodes of a network according to their topological and structural importance.

On the other hand, many real-world social networks actually have a two-mode nature that can be modeled as bipartite graphs. In a bipartite network, there exist two types of nodes and links only connect nodes of different types. The common influence measures were just defined for one-mode networks with an acceptable performance but they do not work well for bipartite networks. To this end, projection methods have been introduced to convert bipartite networks to one-mode. Although the projected one-mode network is always less informative than its bipartite representation, some of the measures for one-mode networks have been extended to bipartite mode. Therefore, to retain the original information in bipartite networks, the need for proposing an efficient measure in such networks seems essential.

In this research, we address the problem of identifying influential users in bipartite social networks. To this end, it is so important to understand the characteristics of bipartite social networking sites and develop a mechanism to compute the similarity distance and influence possibilities in the affiliation structure. Our proposed method is based on a type of F-divergence, called Hellinger distance of users.

This metric is used to quantify the statistical distance between neighborhood degree distributions for every pair of nodes in users' partition in a bipartite network. Since similarity measures are in some sense the inverse of distance metrics, we can construct a new similarity matrix between users. Hence, we detect the influential users using common interests in large social networks efficiently and effectively. Our method convert users' similarity matrix to users' score vector, then we use an aggregation method to combine scores of each user. Finally, we rank nodes according to their computed scores from the previous step.

We experimentally evaluate the performance of the proposed method on real datasets of Davis' Southern Women Club and Cond-mat Collaboration networks. The simulation results demonstrate that our method can rank nodes better than the state-of-the-art centrality metrics such as degree, betweenness, closeness, and PageRank centralities. For a closer look, we obtain the similarity of the orderings when ranked by each of the quantities via Kendall and Spearman rank correlation coefficient. Indeed, we make relevance between the proposed metrics and the popular centrality measures in bipartite social networks.

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Keywords: bipartite networks, influential users, similarity matrix, Hellinger distance

Influence-based community detection in social recommender systems

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Massive Increases in the volume and availability of data on the Internet will certainly result in difficulty of finding interesting choices among various options in a reasonable amount of time. Hence, Recommender Systems (RS) have emerged to solve this problem by helping people to find their preferences effortlessly. Classical RSs are not usable in some domains and applications when the recommendation process involves more than a person. Because, prediction of the recommendations list for each individual user is usually difficult, costly, and sometimes impossible. To this end, Group Recommender Systems (GRS) have been presented to satisfy a prodigious amount of group members about recommended items. Moreover, GRSs provide recommendations for a group of users to overcome the problem of cold start and data sparsity in conventional RSs. However, many researches have taken into account the limited number of users as a group and only a list of recommendations is given to all the members.

Today, with the growth of users in social networks and their various interests, the idea of finding different communities of users with similar preferences seems essential. This idea aims to provide the lists of appropriate recommendations for a large number of users for maximizing users' satisfaction without full knowledge of network topological structure. All the previous studies have restricted to the assumption that the number of groups and hence the lists of recommendations should be predetermined. Although the number of groups in many applications (e.g. digital marketing) is unknown, the main objective is to find the number of optimal groups with the highest level of users' satisfaction. There is no alternative to find the optimal groups consisting of people with similar preferences in the literature of GRSs.

In this research, we propose a new approach for identifying optimal users' communities while the only input is a ratings matrix including items' score evaluated by users, without full knowledge of network topological structure. In this method, formation the groups of similar users is based on detection of influential users in the networks using only the ratings matrix.

Influential measure indicates how important a user is in the users' similarity graph. After groups formation based on the top-k influential users, we investigate the effect of recommending each item to each group for finding the best recommendation list to maximize the users' satisfactory of each group based on a new weighted strategy.

Performance of the proposed method has been evaluated for four different types of GRSs and six common strategies in a real dataset. The simulation results demonstrate that the proposed

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approach has the most accurate recommendations list in comparison with all the related works in the area of GRSs.

Keywords: community detection, influential users, group recommender systems

Mobility networks and spatial communities to identify spatial organisation

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This study intends to apply social network analysis to identify spatial communities in Portugal, based on commuting patterns. Commuter flows at national level are also mapped using GIS. The results of applying different methods to detect spatial communities are then discussed. Finally, contributions from the network analysis to identify spatial organisation are presented.

In recent years, social network analysis (SNA) has attracted much attention in a wide range of fields, due mainly to its ability to identify and support the analysis of relationships and interactions between nodes in networks and, hence, examine how they are structured. This methodology has the potential to explain spatial phenomena, such as in the case of commuting flows.

The daily trips people are required to make, for work or study purposes, have implications on transport planning and management, the management of labour market areas and on identifying the areas of influence of certain facilities. Thus, these flows should be analysed as factors in territorial structuring that are, as such, essential to public policy-making at several geographical scales.

This research has employed a national statistical database, provided by the National Statistics Institute (2011), which covers all the municipalities in Portugal. The main goal consists in detecting the fundamental structure underlying the organisation of Portuguese commuting flows. Given the scale of analysis (national), only flows involving ≥ 500 individuals were analysed.

The SNA methodology was applied using the NodeXL software, to understand the relational structure and patterns among the municipalities in the network, as well as identify the structuring nodes (municipalities) that shape the network and influence relational behaviour. Two methods were employed to detect the communities, the Girvan and Newman (1) and the

Clauset-Newman-Moore (2) algorithms. A comparison of the results show that the Girvan and Newman method is more robust in explaining the iterations ($Q=0.5$). This method uses a divisive hierarchical algorithm to cluster groups based on the shortest paths and always seeks optimal modularity. The groups created structure the Portuguese territory into several geographic communities (dense, cohesive regional subnetworks, showing weak intergroup relations), polarised by several nodes, revealing a model of geographical organisation that is extremely useful to spatial planning.

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Keywords: community detection, mobility, territory

Social network analysis and ancient letters: Potential and limitations working with papyrological source material

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Written communications make up a particularly interesting and promising category of evidence for reconstructing social history. Compared to most other categories of evidence, letters offers relatively personal, sincere and informative glimpses into specific micro-histories, thereby allowing us to get closer to individuals of the past, as well as the relational ties connecting individuals and groups. A general lack of theoretical and methodological approaches welcoming (or even comprehending) the diversity they present, has though led to letters often having been deemed too individualistic and multifaceted to represent an attractive evidence-type. In this respect, Social Networks Analysis (SNA) offers a range of analytical tools enabling quantitative, yet systematic, examinations of larger and more complex data-sets than has hitherto been possible.

Despite theoretical compatibility, the practical execution of ancient network studies is complicated by the fragmentary state of the evidence at hand. For the most part, ancient letters were written on highly perishable material such as papyri. Adding to the obvious difficulties presented by lacunae and missing text, is the fact that relevant information, such as specification of time and space, was often excluded altogether. For SNA's true value for ancient studies to become widely acknowledged, such limitations must be faced and attempted dealt with.

By means of presenting a case study of preserved military correspondences of Pathyrite soldiers on campaign in the North during the Judean-Syrian-Egyptian conflict of 103-101 BCE, my poster will exemplify the problem of missing data while arguing that, despite certain limitations, a distinct network approach have the potential to challenge, compliment and add valuable information to more traditional methodologies.

Keywords: historical network research, letters, papyri, Ptolemaic Egypt

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Program



EUSN PARIS 2016

2nd European Conference on Social Networks (EUSN)

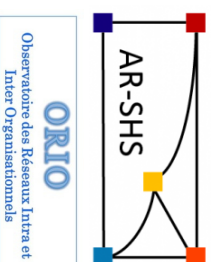
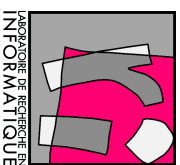
June 14-17, 2016 – Sciences Po, PARIS

13 rue de l'Université, 75006 Paris (métro Saint-Germain-des-Prés)

Program Overview & Useful Informations

Organizing Committee

Laurent Beauquitte (CNRS, UMR IDEES & GDR AR-SHS), Marion Coville (Université Paris 1), Stéphanie Dubois (CSO/CNRS), Emmanuel Lazega (SciencesPo, Centre de Sociologie des Organisations), Yannick Le Gressus (Centre de Sociologie des Organisations), Edith Martine (Centre de Sociologie des Organisations), Olga Mwana Mbulakani (Laboratoire de Recherche en Informatique), Christophe Prieur (Télécom ParisTech), Paola Tubaro (Laboratoire de Recherche en Informatique).



Useful informations

Entrance

When you'll first arrive to EUSN Conference, a personal badge will be provided. Beware not to lose it : due to security mesures, this badge will be necessary to enter Sciences Po building.

WiFi (SciencesPo)

Login : guesteusrn

Password : Paris2016

Best Poster Award

On June 16th, you can vote for the Best Poster Award between 2.30 PM and 4.00 PM.

Fill in the ballot paper « Best Poster Award » (provided in your envelope) and put it in the ballot box in the entrance hall before 4.00 PM.

Room S13 : Coworking space and exhibition

From June 15th to June 17th, Room S13 is dedicated to coworking. In this room, you will also find a posters exhibition by Claire Bidart (LEST - UMR 7317, Aix-Marseille University, CNRS). These posters present a qualitative longitudinal panel "Socialization and social integration", that focuses on the evolution of social networks at the beginning of adulthood.

Lunch bags

If you ordered a lunch bag when you registered, you can collect it every day during lunch time in the « caf  teria » space located in the entrance hall by presenting the "lunch ticket", provided in your envelope.

Hospitality suite

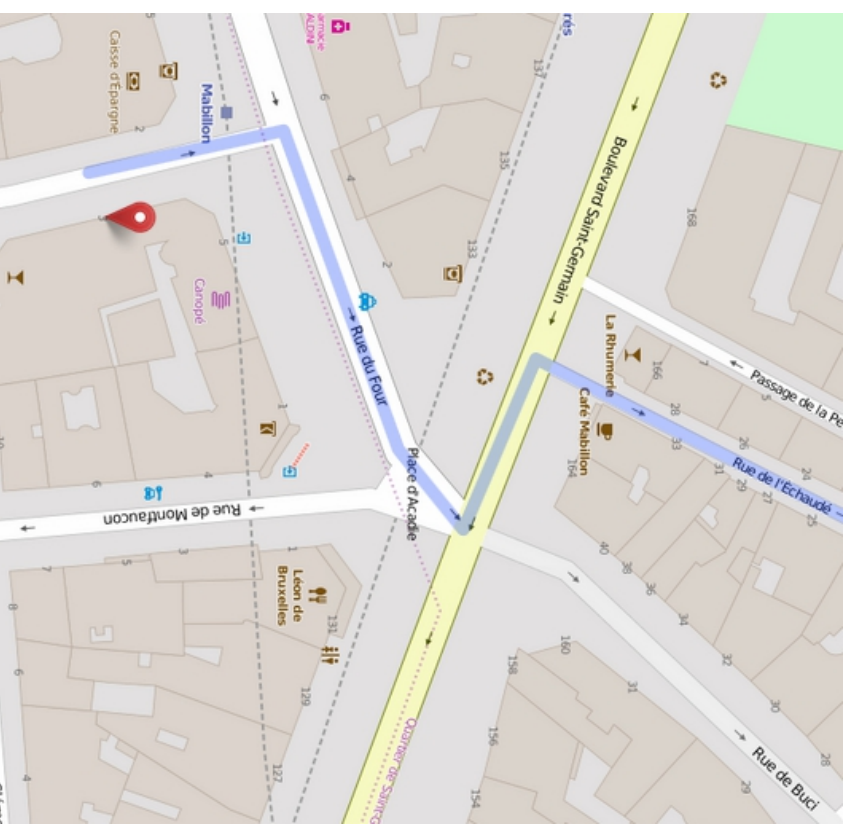
Located 3 rue Mabilion – 75006 Paris

From 7.00 PM, on June 15th and 16th, you can have a drink at the hospitality suite at a place called CROUS Mabilion. The first drink is offered in exchange for the «Hospitality suite ticket» provided in your envelope.

Admission at the hospitality suite : present your EUSN personal badge.

How to get to the hospitality suite ?

From SciencesPo, it is a 10min walk : When exiting the 13 rue de l'Université building, take the rue de l'Université on your right, then continue straight ahead on rue Jacob. Turn right on rue de l'Echaudé, then left on Boulevard Saint Germain. Cross the boulevard and turn right on rue du Four, then turn left on rue Mabilion.



The Organizing Committee would like to thank the members of the Scientific Committee :

Avner **Bar-Hen**, Université de Paris 5 René-Descartes, France
Elisa **Bellotti**, University of Manchester, United Kingdom
Marie-Pierre **Bès**, Université de Toulouse 2 Jean-Jaurès, France
Claire **Bidart**, Aix Marseille Université, France
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Antoine **Vion**, Aix Marseille Université, France
Beate **Volker**, University of Amsterdam, The Netherlands
Eric **Widmer**, Université de Genève, Switzerland

JUNE 14, TUESDAY, 2016 : WORKSHOPS

	Room	Room	Room	Room	Room	Room
9h00 – 12h00	S07	S08	S09	S10	S11	S12
12h – 13h						
13h – 16h						
16h – 16h30						
16h30 – 19h30						

1. Introduction to ego-network analysis with R (part 1)

9. Simplifying ego-centered network analysis in R with egoneR (part 1)

2. Using R and igraph for Social Network Analysis (part 1)

11. Mining (together with a bit of web scraping) of large social networks from Twitter using Python (and Ruby)

13. The Analysis of Longitudinal Social Network Data using RSIENA

15. Mixed Methods Research in Social Networks (part 1)

LUNCH

2. Introduction to ego-network analysis with R (part 2)

9. Simplifying ego-centered network analysis in R with egoneR (part 2)

2. Using R and igraph for Social Network Analysis (part 2)

6. Exponential Random Graph Models (ERGM) using Statnet

14. Advanced RSIENA users' workshop

15. Mixed Methods Research in Social Networks (part 2)

3. Introduction to NetLogo and agent-based models of networks (part 1)

COFFEE BREAK

8. Using Net-Map for co-producing SNA knowledge and co-designing networks

10. Network visualization based on JSON and D3.js

12. Extracting Social Networks from Literary Text

7. Temporal Exponential Random Graph Model (TERGM)

5. The Positional Approach to Network Analysis

3. Introduction to NetLogo and agent-based models of networks (part 2)

List of proposed Workshops (see website for details)

1. Introduction to ego-network analysis with R (Raffaele Vacca)
2. Using R and igraph for Social Network Analysis (Michał Bojanowski)
3. Introduction to NetLogo and agent-based models of networks (Paola Tubaro, Yasaman Sarabi)
5. The Positional Approach to Network Analysis (Ulrik Brandes)
6. Exponential Random Graph Models (ERGM) using Statnet (Lorien Jasny, Michal Bojanowski)
7. Temporal Exponential Random Graph Model (TERGM) (Lorien Jasny, Michal Bojanowski)
8. Using Net-Map for co-producing SNA knowledge and co-designing networks (Jennifer Hauck, Thomas Watkin)
9. Simplifying ego-centered network analysis in R with egonetR (Till Krenz, Andreas Herz)
10. Network visualization based on JSON and D3.js (Vladimir Batagej)
11. Mining (together with a bit of web scraping) of large social networks from Twitter using Python (and Ruby) (Moses Boudourides)
12. Extracting Social Networks from Literary Text (Moses Boudourides)
13. The Analysis of Longitudinal Social Network Data using RSIENA (Tom Snijders, Christian Steglich)
14. Advanced RSiena users' workshop (Tom Snijders, Christian Steglich)
15. Mixed Methods Research in Social Networks (Elisa Bellotti, Betina Hollstein)

JUNE 15, WEDNESDAY, 2016

	Room	Room	Room	Room	Room	Room	Room	Room		
	S07	S08	S09	J208	J210	J211	S10	Erignac		
9h-10h40	9h-9h25	S10 - Qualitative	S12 - History and Archeology	S13 - Vulnerability	S23 - Modeling Networks	S17 - Network Dynamics	S8 - Political Networks	S9 - Agent-Based Models		
	9h25-9h50									
	9h50-10h15									
10h15-10h40										
10h40 - 11h00	COFFEE BREAK									
	BREAK									
	11h00-11h25									
11h00-13h05	11h25-11h50	S10 - Qualitative	S12 - History and Archeology	S13 - Vulnerability	S23 - Modeling Networks	S17 - Network Dynamics	S8 - Political Networks	S9 - Agent-Based Models		
	11h50-12h15									
	12h15-12h40									
	12h40-13h05									
	LUNCH									
13h05-14h30	LUNCH									
	14h30-14h55									
	14h55-15h20									
14h30-16h10	15h20-15h45	S1 - Entrepreneurs		S4 - Change Personal Networks	S6 - Interaction events	S17 - Network Dynamics	S8 - Political Networks	S14 - Sustainable food systems		
	15h45-16h10									
	COFFEE BREAK									
16h10-16h30	COFFEE BREAK									
	16h30-16h55	S1 - Entrepreneurs		S32 - Personal Networks	S6 - Interaction events		S8 - Political Networks	S14 - Sustainable food systems		
	16h55-17h20									
17h20-17h45										
16h30-18h10	17h45-18h10									
	Hospitality Suite (Jazz concert : 21h - 22h)									
19h - 23h00										
Authors meet critique										

JUNE 16 THURSDAY, 2016

	Room	Room	Room	Room	Room	Room	Room	
	S07	J208	S08	J210	S09	S10	Amphi Jean Moulin	Entrance Hall
9h-10h40	9h-9h25	S7 - Integration egocentrics networks	S3 - Globalization	S15 - Humanities	S16 - Social influence	S20 - Health	S28 - Covert networks	
	9h25-9h50							
	9h50-10h15							
	10h15-10h40							
10h40 - 11h00	COFFEE BREAK							
	BREAK							
11h00-13h05	11h00-11h25	S3 - Globalization		S16 - Social influence	S20 - Health			
	11h25-11h50							
	11h50-12h15							
	12h15-12h40							
	12h40-13h05							
13h05-14h30	LUNCH							
	LUNCH							
14h30-16h10	14h30-14h55							Poster Presentations and vote for Best Poster Award
	14h55-15h20							
	15h20-15h45							
	15h45-16h10							
16h10-16h30	COFFEE BREAK							
	BREAK							
16h30-18h00	16h30-16h55							
	16h55-17h00							
	17h00-18h00							
19h00 - 23h00	Hospitality Suite (19h -21h) + Banquet (20h30 - 23h)							
							Welcome Message Best Poster Award Keynote speech (Miranda Lubbers and José Luis Molina)	

JUNE 17, FRIDAY, 2016

	Room	Room	Room	Room	Room	Room	Room	
	S07	S08	J208	J210	J211	S09	S10	S11
9h-10h40	9h-9h25	S31 - Geography and networks	S2 - Typologies personal networks		S5 - Multilevel	S24- Business networks	S18 - Economic geography	S30 - Policy networks
	9h25-9h50							
	9h50-10h15							
	10h15-10h40							
10h40 - 11h00	BREAK	COFFEE BREAK						
	11h00-11h25	S11 - Inequality	S21 - Migration	S2 - Typologies personal networks	S19 - Large networks	S5 - Multilevel	S24- Business networks	S18 - Economic geography
	11h25-11h50							
	11h50-12h15							
12h15-12h40								
	12h40-13h05							
13h05-14h30	LUNCH	LUNCH						
	14h30-14h55	S22 - Science networks	S26 - Cultural		S27 - Social media	S29 - Intra-Organizational	S18 - Economic geography	S25 - Social support
	14h55-15h20							
	15h20-15h45							
15h45-16h10								
	BREAK	COFFEE BREAK						
16h10-16h30	16h30-16h55	S22 - Science networks			S27 - Social media			
	16h55-17h20							
	17h20-17h45							
	17h45-18h10							
16h30-18h30								

SPEECHES AND KEYNOTES

Authors meet critique (June 15, Wednesday)

Multilevel network analysis for the social sciences: Theory, methods and applications

Selected presentations followed by Ronald Breiger's critique

Challenges in Social Network Visualization: Bigger, Dynamic, Multivariate (June 16, Thursday)

Speaker : Jean-Daniel Fekete (Aviz, INRIA)

Welcome message (June 16, Thursday)

Speaker : Christine Musselin, Vice-President for Research, Sciences Po

Ethnography and multilevel networks in the study of migration and transnationalism (June 16, Thursday)

Speakers : Miranda Lubbers and José Luis Molina (Universitat Autònoma de Barcelona)

SESSIONS, COMMUNICATIONS AND SPEAKERS

Oral presentations are to start and stop at the stated program times to allow attendees to move between sessions. If you are presenting a talk, please load your presentation slides on the dedicated computer 10 minutes before the session starts

Session 20 to 32 : Where there is no named session chair, the last presenter in a given time slot chairs the session under the assumption that he or she will have an incentive to keep other session presenters on time. If the named chair is not present, those presenting should select one of their own to keep time.

Session 1: Social Networks of Entrepreneurs: Causes (June 15, 14h30 – 17h20)

Veronique Schutjens, Giacomo Solano

14:30 – 14:55. The characteristics of the networks of immigrant businesses in terms of economic innovation: Selected Italian case of analysis

Juan Alvarado, MASP / University of Milan and Brescia

14:55 – 15:20. Social networks and types of social capital in developing countries: The case of Ugandan entrepreneurs

Giacomo Solano, School of Innovation Sciences, Eindhoven University of Technology - Gerrit Rooks, School of Innovation Sciences, Eindhoven University of Technology

15:20 – 15:45. Social capital of female entrepreneurs - Different from men's?

Veronique Schutjens, Utrecht University

15:45 – 16:10. Changing for the better? Exploring the relationship between entrepreneurial network change and changes in firm performance

Marianne De Beer, Utrecht University

16:30 – 16:55. The evolution of Japanese business networks overseas since the 1960s

Jean-Pascal Bassino, École normale supérieure de Lyon, Institut d'Asie Orientale

16:55 – 17:20. The structure and evolution of academic articles related to social networks and relationships between network actors in the field of entrepreneurship

Karina Zittel, TU Berlin

Session 2: Typologies of personal networks (June 17, 9h00 – 13h05)

Claire Bidart, Michel Grossetti

09:00 - 09:25. How artists mobilize their contacts for success: The case study of Barcelona

Dafne Muntanyola-Saura, Universitat Autònoma de Barcelona

09:25 - 09:50. Characterizing personal networks: An empirical and structural approach for building a typology

Claire Bidart, Laboratoire d'économie et de sociologie du travail - Michel Grossetti, Laboratoire Interdisciplinaire Solidarités, Sociétés, Territoires

09:50 - 10:15. Applying a structural typology on a large dataset of inline personal networks

Raphaël Charbey, Telecom ParisTech - département Sciences Economiques et Sociales

10:15 - 10:40. Transitions and third-place

Nathalie Chauvac, Laboratoire Interdisciplinaire Solidarités, Sociétés, Territoires, Scool, coopérative de

recherches en sciences humaines et sociales - Martine Azam, Laboratoire Interdisciplinaire Solidarités, Sociétés, Territoires

11:00 - 11:25. Accounting for the quantified quality of researchers by looking at their personal co-authorship networks

Marian-Gabriel Hancean, University of Bucharest, Department of Sociology

- 11:25 – 11:50. A typology of personal networks for explaining perceived health status: The case of older adults in Midi-Pyrénées Region, France
Renáta Hosnedlová, Labex Structuration des mondes sociaux
- 11:50 – 12:15. Complex measurement of tie-strength using the contact diary method
Ildikó Barna, Eötvös Loránd University, Faculty of Social Sciences
- 12:15 – 12:40. Changes in personal networks: Life events, new spheres and social inequality
Martin Santos, Pontificia Universidad Católica del Perú
- 12:40 – 13:05. A typology of personal networks of Spanish young adults in Toulouse (France)
Caterina Thomas-Vanelli, Université îles Baléares – EIC, Laboratoire Interdisciplinaire Solidarités, Sociétés, Territoires

Session 3: From international to global networks? Investigating social dynamics of globalization (June 16, 9h00 – 11h50)

Marion Maissonobe, Laurent Beauquitte

- 09:00 – 09:25. From bilateral to multilateral economic treaties (1957–2014)? A network analysis
Laurent Beauquitte, UMR 6266 IDEES – Emilie Bonnet, Identité et différenciation des espaces, de l'environnement et des sociétés
- 09:25 – 09:50. A net of moving people. Network analysis of international migration flows between countries
Luca De Benedictis, University of Macerata
- 09:50 – 10:15. Connecting global cities by maritime network: An empirical study (1890 – 2010)
César Ducruet, Géographie-Cités – Sylvain Cuyala, Géographie-Cités – Ali El Hosni, Géographie-Cités
- 10:15 – 10:40. Multidimensional and multilevel analysis of media flows: Classification of newspapers and regionalisation of the world
Robin Lamarche-Perrin, Laboratoire d'Informatique de Paris 6
- 11:00 – 11:25. Networks of scientific cooperation between cities: A multiscalar analysis
Marion Maissonobe, Laboratoire Interdisciplinaire Solidarités, Sociétés, Territoires
- 11:25 – 11:50. Beyond Ricardo: The structural patterns of international trade networks
Olaf Rank, University of Freiburg

Session 4: Changes in Personal Networks: Causes, Differences, and Consequences (June 15, 14h30 – 16h10)

Gerald Mollenhorst

- 14:30 – 14:55. Impact of university admission on freshmen' egocentric network
Sami Jouaber, DANTE – Yannick Léa, ENS de Lyon, DANTE
- 14:55 – 15:20. Associations between males' and females' dieting pattern and peers' weight-control behaviors in late adolescence and early adulthood
Alexander Miething, Department of Sociology, Stockholm University
- 15:20 – 15:45. Changes in personal networks of young Iranians and former Yugoslavians in Sweden
Gerald Mollenhorst, Stockholm University, Utrecht University – UU (NETHERLANDS)
- 15:45 – 16:10. Social networks & school experiences of disadvantaged children going through a collective music education intervention
Marc Sarazin, Department of Education, University of Oxford (UK)

Session 5: Multilevel Network Perspectives in and around Organizations: Theory, Structure and Dynamics (June 17, 9h25 – 13h05)

Spyros Angelopoulos, Emmanuel Lazega, Francesca Pallotti, Paola Zappa

09:25 – 09:50. Understanding multilevel networks with White's concept of switchings – An application to universities

Daniel Houben

09:50 – 10:15. Multilevel analysis of co-authorship networks: Evaluating the impact of exogenous factors on the conduct of scientific collaborations

Robin Lamarche-Perrin, Laboratoire d'Informatique de Paris 6

10:15 – 10:40. Toward a multilevel social exchange theory of advice relations in organization

Paola Zappa, University of Italian Switzerland

11:00 – 11:25. Emergent technologies imaging: Exploring intraorganizational knowledge spaces as tree and network dynamics

Florian Windhager, Danube University Krems, Austria

11:25 – 11:50. Emerging communities in multilayers networks: Analysis of a regional policy programme

Margherita Russo, Dipartimento di Economia Marco Biagi, Università di Modena e Reggio Emilia

11:50 – 12:15. Changing climate governance in the city: A multilevel network perspective on social innovation in extended organizations

Marco Schmitt, RWTH Aachen University

12:15 – 12:40. Investigating organizational identities in multilevel networks with multiple membership, multiple classification models

Mark Trammer, University of Glasgow, The University of Manchester

12:40 – 13:05. Social network, board interlocks and firms' financial decisions

Srinidhi Vasudevan and Riccardo De Vita, University of Greenwich

Session 6: Social Networks from Interaction Events (June 15, 14h30 – 17h45)

Jan Fuhse, Wouter De Nooy

14:30 – 14:55. Discourse relations from communicative events

Jan Fuhse, Humboldt University of Berlin

14:55 – 15:20. Situated and networked settings: A semantic analysis of distributed knowledge among university students

Carlos Lozares and Dafne Muntanyola-Saura, Universitat Autònoma de Barcelona

15:20 – 15:45. Interactions and becoming sad: Relational expectations and social influence

Wouter de Nooy, University of Amsterdam

15:45 – 16:10. Double temporality in a permanent organization: Knowledge network formation between internal management consultants

Robert Panitz, Heidelberg University

16:30 – 16:55. Analysis of content and networks of virtual relationships: promotion of the system of innovation poles in the web space

Margherita Russo, Dipartimento di Economia Marco Biagi, Università di Modena e Reggio Emilia, Italy

16:55 – 17:20. Networks of interaction events as styles

Marco Schmitt, RWTH Aachen University

17:20 – 17:45. Support to entrepreneurs through meaningful ties

Sean R White, Grenoble Ecole de Management

Session 7: Egocentric networks and social integration processes (June 16, 9h00 – 10h40)

Fruzsina Albert, Beata David

09:00 – 09:25. Revisi(t)ing migration itineraries: Social networks and pathways to economic incorporation of ageing non-EU migrants in Brescia

Jonnabelle Asis, University of Brescia

09:25 – 09:50. Mobilising social network support for childcare: The case of Polish migrant mothers in Dublin

Sara Bojarczuk, Trinity College Dublin

09:50 – 10:15. Defining integration and segregation mechanisms with network structures

Julia Koltai, Centre for Social Sciences Hungarian Academy of Sciences

10:15 – 10:40. The changing structure of core discussion networks – a longitudinal study

Julia Koltai, Centre for Social Sciences Hungarian Academy of Sciences

Session 8: Political Networks (June 15, 9h25 – 17h45)

Manuel Fischer

09:25 – 09:50. Homophily and legislative co-authorship: new evidence from Ukraine

Tymofii Brik, Universidad Carlos III de Madrid – Dmytro Ostapchuk, VoxUkraine

09:50 – 10:15. The corporate elite in the market of policy ideas in France and Portugal

Catherine Comet, Centre Jililois détudes et de recherches sociologiques et économiques, Marta Varanda, ISEG – Pedro Neves, ISEG

10:15 – 10:40. Actors' interactions at the Human Rights Council: A network approach

Laurent Beauquitte, UMR 6266 IDEES

11:00 – 11:25. Party competition on issues during election campaigns: A dynamic network model

Wouter de Nooy, University of Amsterdam

11:25 – 11:50. Organizing regional marine governance: Implications from a structural analysis of case studies in Brazil and Indonesia

Philipp Gorris, Institute of Environmental Systems Research (IUSF), University of Osnabrueck

11:50 – 12:15. Multi-level challenges in climate change policy networks: Evidence from Brazil and Indonesia

Monica Di Gregorio, School of Earth and Environment [Leeds]

12:15 – 12:40. The funding of political parties and the emergence of elites: The case of Brazil

Reyes Herrero, Universidad Complutense de Madrid

12:40 – 13:05. Building a transnational advocacy network: An ERGM approach to cooperation among climate change NGOs

Lorien Jasnay, University of Exeter

14:30 – 14:55. Who is really running the show? Uncovering hierarchies using career paths and network measures

Franziska Keller, Columbia University, Harriman Institute

14:55 – 15:20. Political elite networks: A decade of transformations in three post-socialist states

Tetiana Kostuchenko, National University of "Kyiv-Mohyla Academy"

15:20 – 15:45. Measuring party competition with party likability scores: A network modeling approach

Claudia Zucca, University of Exeter

15:45 – 16:10. Network centrality and agenda-setting power of MPs

Manuel Fischer, Eawag

16:30 – 16:55. Analyzing policy instrument preferences with two-mode networks

Florence Metz, Universität Bern (Switzerland)

16:55 – 17:20. De Gaulle's nightmare: The steady erosion of party discipline in France – A network based approach

Etienne Ollion, Sociétés, Acteurs, Gouvernement en Europe

17:20 – 17:45. The monitoring capacity of civil society networks

Reini Schrama, ETH Zurich

Session 9: Network Science and Agent-Based Models: what cooperation? (June 15, 9h25 – 12h15)

Gianluca Manzo, Paola Tubaro

09:25 – 09:50. An agent-based model for dynamic social networks generation

Audren Bouadio Boulic, Institut de recherche en informatique de Toulouse

09:50 – 10:15. Multi-level agent based simulation for network analysis

Philippe Cailloü, TAO

10:15 – 10:40. Minority size and ethnic homophily. Preference interpretations and misspecification of ERG models

Andreas Flahe, University of Groningen, Department of Sociology / ICS

11:00 – 11:25. Opinions and social networks

Floriana Gargiulo, University of Namur

11:25 – 11:50. Negative word-of-mouth in threshold diffusion processes. An agent-based approach

Moreno Mancosu, Collegio Carlo Alberto

11:50 – 12:15. Modelling the resilience and disruption propagation in Australian business networks at the firm level

Petr Matous, University of Sydney

Session 10: Doing qualitative network analysis (June 15, 9h00 – 12h15)

Stefan Bernhard and Andreas Herz

09:00 – 09:25. Narrative methods for the analysis of network ties

Stefan Bernhard, Institute for employment research

09:25 – 09:50. Qualitative network analysis : A way to understand construction of a collective ?

Nathalie Chauvac, SCODL, coopérative de recherche en sciences humaines et sociales, Laboratoire Interdisciplinaire Solidarités, Sociétés, Territoires

09:50 – 10:15. Pitfalls in the development of qualitative social network analysis

Andreas Herz, University of Hildesheim

10:15 – 10:40. What online curriculum vitae data say about identities? A relational approach about identity construction in online biographies in Academia

Cathleen Stuetzer, Johannes Gutenberg University Mainz, Institute for Sociology

11:00 – 11:25. EITHER and OR – On the intricacies of conceptualising digitally mediated social ties

Cornelia Reyes Acosta, London School of Economics

11:25 – 11:50. Qualitative comparative analysis of international sanctions network
Alina Vladimirova, National Research University Higher School of Economics
11:50 – 12:15. The visual sociogram in qualitative and mixed-methods research
Louise Ryan, Middlesex University
Paola Tubaro, Laboratoire de Recherche en Informatique

Session 11 : The Inequality–Social Network Nexus (June 17, 11h00 – 13h05)

Basak Bilecen

11:00 – 11:25. Gender gaps in social capital: A theoretical interpretation of the Italian evidence
Elisabetta Addis, Libera Università Internazionale degli Studi Sociali, Università di Sassari
11:25 – 11:50. Socioeconomic segregation of activity spaces in urban neighborhoods: A network approach
Christopher Browning, The Ohio State University
11:50 – 12:15. Comparison between alumni in French Grandes Ecoles and Universities: How to network ?
Marie-Pierre Bes, Institut Supérieur de l'Aéronautique et de l'Espace, Laboratoire Interdisciplinaire Solidarités, Sociétés, Territoires
12:15 – 12:40. "I'm just like anyone else". A longitudinal study of the effect of homophily on educational performance
Peter Rohde Skov, SFI - The Danish National Centre of Social Research
12:40 – 13:05. How young workers use social networking services to find a job in Spain? A mixed-methods approach
Dafne Muntanyola-Saura, Universitat Autònoma de Barcelona

Session 12: Historical and Archaeological Network Research (June 15, 9h50 – 12h40)

Claire Lemerrier, Tom Brughmans, Pierre Gervais, Marten Düring and Zacarias Moutoukias

09:50 – 10:15. Financing the fight: The role of free-French financial intermediaries through their social network
David Foulk, Centre d'Etude des Mondes Moderne et Contemporain
10:15– 10:40. Interlocking directorates and social networks in French Financial System (1880–1939): first results from DFH project
Elisa Grandi, Université Paris Diderot - CESSMA, Equipex DFH
11:00 – 11:25. Extending transportation network of the Roman Empire by means of demographic and economic proxies
Vojtěch Kašé, REECR: Ritual and Early Christianity, University of Helsinki, GEHIR: A Generative Historiography of the Ancient Mediterranean & Department for the Study of Religions, Faculty of Arts, Masaryk University
11:25 – 11:50. A network contribution to intervisibility analysis
Daniel May, Kellogg College, University of Oxford, Harper-Adams University
11:50 – 12:15 Numerical network modelling: Is machine time historical time?
Ray Rivers, Imperial College London
12:15 – 12:40. Social network and spatial diffusion of obsidian in the Near-Eastern Neolithic: Raw material and technology networks
Bastien Varoutsikos, Archéologies et Sciences de l'Antiquité

Session 13: Personal networks and the development of individual vulnerability or strength in the life course (June 15, 9h25 – 12h15)

Marlène Sapin and Eric Widmer

09:25 – 09:50. The role of personal network in the construction of identity at the entrance into adulthood

Jeremy Alfonsi, Laboratoire d'économie et de sociologie du travail

09:50 – 10:15. Personal social network as a shelter in situations of vulnerability

Vida Cesnuitte, Sociological Research Laboratory of Mykolas Romeris University

10:15 – 10:40. Investigating the potential use of social networks to aid smoking cessation in pregnant smokers (SCIPS): A development study

Fiona Dobbie, University of Stirling, Scotland, UK, University of Stirling

11:00 – 11:25. The impact of multidimensional life trajectories on personal networks in the transition to adulthood: a comparative perspective

Jacques-Antoine Gauthier, Life Course and Inequality Research Centre – Gaëlle Aebly, Morgan Centre for Research into Everyday Lives

11:25 – 11:50. Personal networks' effects on individuals' psychological and conjugal vulnerability: a longitudinal approach

Rita Gouveia, Swiss National Centre of Competence in Research LIVES, Overcoming Vulnerability: Life Course Perspectives

11:50 – 12:15. Resources or strains? Patterns of supportive and upsetting interdependencies in family networks of individuals with mental illness

Marlène Sapin, University of Lausanne, Swiss center of expertise in social sciences

FORS, Swiss National Centre of Competence in Research LIVES, Overcoming Vulnerability: Life Course Perspectives

Session 14: The role of social networks in the transition towards sustainable food systems (June 15, 14h30 – 17h20)

Yuna Chiffolleau, Marc Barbier

14:30 – 14:55. Hagglng on values: Towards consensus or trouble

Victorien Barbet, Aix-Marseille Univ. (Aix-Marseille School of Economics), CNRS & EHESS (Aix Marseille University)

14:55 – 15:20. Social networks and food transition: exploration of new drivers in food studies

Yuna Chiffolleau, UMR Innovation

15:20 – 15:45. Networks of agroecological knowledge exchange in Spain

Elisa Oteros-Rozas, Universidad Pablo de Olavide, University of Copenhagen

Isabel Diaz-Reviriego, Institut de Ciència i Tecnologia Ambiental, Universidad Autònoma de Barcelona

15:45 – 16:10. Governance of food systems. The key role of the gatekeepers

Etienne Polge, INRA SADAPT – Proximity team

16:30 – 16:55. Social network analysis for evaluating impacts of science based research and innovation program:

The example of the farmers' conversion to organic crop production in Camargue

Sylvain Quédéville, Research Institute of Organic Agriculture

16:55 – 17:20. Professional dialogue networks and changes in herbicide use among wine grape growers in the south of France

Pierre Wavresky, INRA, UMR1041 CESABER, Université Bourgogne Franche-Comté, AgroSup Dijon, F-21000 Dijon, France

Session 15: Network Analysis in Humanities (June 16, 9h25 – 10h40)

Mari Sarv

09:25 – 09:50. A dynamic network visualization framework for sociological theory teaching and training
Florian Windhager, Danube University Krems, Austria
09:50 – 10:15. Network analysis and typological classification of folklore texts
Mari Sarv, Estonian Literary Museum – Risto Järv, Estonian Literary Museum
10:15 – 10:40. Symbolic networks: How museum exhibitions signal artists for historical commemoration
Thomas Teekens, Matthijs Punt and Laura Braden, Erasmus School of History, Culture and Communication

Session 16: Social influence (June 16, 9h00 – 11h50)

Tom Snijders, Christian Steglich

09:00 – 09:25. *The role of outdegree in knowledge creation*
Gloria Alvarez-Hernández, Universidad Complutense de Madrid, dubitare
09:25 – 09:50. Media use in social structures – A longitudinal multi-network approach on adolescents' TV and youtube use
Matthias Bixler, University of Bremen
09:50 – 10:15. Dynamics of political attitudes and social networks development
Yana Maria Priestley, National Research University Higher School of Economics
10:15 – 10:40. Cool guys or naked emperors? Status attribution, status perception, and gossip in the classroom
Károly Takács, MTA TK "Lendület" Research Center for Educational and Network Studies (REGENS), Hungarian Academy of Sciences
11:00 – 11:25. Coevolution of anti-school attitudes and friendship in vocational schools
Vera Titkova, National Research University Higher School of Economics – St.Petersburg
11:25 – 11:50. Network methods for evaluating the impact of a cross-disciplinary institute on scientific collaboration at a research university
Valerio Leone Sciabolazza, University of Florida

Session 17: Modeling Network Dynamics (June 15, 9h00 – 16h10)

Tom Snijders and Christian Steglich

- 09:25 – 09:50. Multilevel blockmodeling and blockmodeling of networks in several time points
Aleš Žiberna, University of Ljubljana, Faculty of Social Sciences
- 09:50 – 10:15. Consideration of edge directionality and network dynamics for structural balance assessment
Jana Diesner, University of Illinois at Urbana Champaign
- 10:15 – 10:40. The co-evolution of emotional well-being with weak and strong friendship ties
Timon Elmer, Chair of Social Networks, ETH Zürich
- 11:00 – 11:25. Effects of early exposure on later affiliation processes within an evolving social network
Helge Giese, University of Konstanz
- 11:25 – 11:50. A test for heterogeneity and outliers in exponential random graph models
Johan Koskinen, University of Manchester
- 11:50 – 12:15. Influence, selection and spatial heterogeneity in interorganizational networks: An actor-oriented approach
Viviana Amati, University of Konstanz
- 12:15 – 12:40. A matter of accuracy: Standard errors in stochastic actor-oriented models
Mynke Niezink, University of Groningen
- 12:40 – 13:05. Reciprocity or redistribution of resources? The dynamics of friendship, helping and perceived stress at work
Birgit Paukaszat, University of Greenwich
- 14:30 – 14:55. The co-evolution of trade and land use: clarifying positive feedbacks in global social-ecological systems
Christina Prell, University of Maryland
- 14:55 – 15:20. A dynamic analysis of interethnic relationships in high school
Neray Balint, Università della Svizzera italiana
- 15:20 – 15:45. Modeling cooperation networks through time: Introducing an actor-oriented model for time-stamped network data
Christoph Stadtfeld, Swiss Federal Institute of Technology in Zurich – ETHZ (SWITZERLAND)
- 15:45 – 16:10. What happens when we do not look: A critical look at model-based network evolution trajectories in continuous time
Christian Steglich, Rijksuniversiteit Groningen

Session 18: Social networks, globalization and economic geography (17, 9h50 – 15h20)

Laura Protta, Johannes Glückler

- 09:50 – 10:15. Implementing propensity score matching with network data: The effect of GATT on bilateral trade
Luca De Benedictis, Rossi-Doria Center, University of Macerata – Bruno Arpino, Universitat Pompeu Fabra
- 10:15 – 10:40. A relational model of peripheral market integration: The global network of stock visual content
Johannes Glückler, Heidelberg University – Robert Paritz, Heidelberg University
- 11:00 – 11:25. Structural changes of collaboration networks: Critical insights into partaking actors' perspectives
Rosaria Lumino, University of Naples Federico II
- 11:25 – 11:50. The evolution of innovator social networks under increasing social technology mobility:
Uneven scapes of concentrated clusters and dispersed connectedness
Kirsten Martinus, The University of Western Australia
- 11:50 – 12:15. *Building the bridges that matter: A method to examine the effect of interactions on firms performance*
Sergey Morgulis–Yakushev, Stockholm School of Economics – Assia Viachka, Stockholm School of Economics
- 12:15 – 12:40. Spatial Interaction and proximity dynamics. A way to understand the social construction of public action territories
Etienne Pojge, INRA SADAPT – Proximity team
- 12:40 – 13:05. Rice: commodity or public good? A Polanyian analysis of rice trade in south Vietnam through pre-specified blockmodelling
Laura Protta, University of Salerno
- 14:30 – 14:55. International production networks and world trade
Lucia Tajoli, Politecnico of Milan
- 14:55 – 15:20. The changing role of emerging countries in world trade
Lucia Tajoli, Politecnico of Milan

Session 19: Large networks (June 17, 9h25 – 13h05)

Christophe Prieur, Lionel Tabourier

- 09:25 – 09:50. Community detection in interval-weighted networks
Helder Alves, FEP & IAAD INESC TEC, University of Porto
- 09:50 – 10:15. On widespread index
Vladimir Batagelj, Institute of Mathematics, Physics and Mechanics
- 10:15 – 10:40. Wikipedia as a network: Automatic classification of articles through communities detection techniques
Carlos G. Figueroa, Institute of Studies on Science & Technology, Univ. of Salamanca
- 11:00 – 11:25. A multiplex network based tag recommendation approach
Manel Himimida and Rushed Kanawati, Laboratoire d'Informatique de Paris-Nord
- 11:25 – 11:50. Socioeconomic correlations in communication networks
Yannick LEO, DANTE, ENS de Lyon
- 11:50 – 12:15. Category spanning and social evaluation in Wikipedia
Juergen Lerner, University of Konstanz, Università della Svizzera italiana

12:15 – 12:40. Connectivity in temporal interactions

Clémence Magnien, Laboratoire d'Informatique de Paris 6

12:40 – 13:05. A new combinatorial curvature for complex networks

Emil Saucan and Juergen Jost, Max Planck Institute for Mathematics in the Sciences – Arejitt Samal, The Institute of Mathematical Sciences, Chennai

Session 20: Health (June 16, 9h00 – 11h25)

09:00 – 09:25. Perinatal network Lorrain. The user told: in the interest of the story in the networking of health and social actors

Sophie Arboiro, Université de Lorraine – Centre de recherche sur les médiations

09:25 – 09:50. How do goal structures and close social contacts associate with stress?

Veronique Charlotte Corrodi, Chair of Social Networks, ETH Zurich

09:50 – 10:15. An exploratory network analysis of the French governance of bovine spongiform encephalopathy

Alexandre Getfroy, Identité et différenciation des espaces, de l'environnement et des sociétés

10:15 – 10:40. How social networks can supplement health literacy: The case of elderly migrants in Israel

Zack Hayat, Interdisciplinary Center, Israël

11:00 – 11:25. Life and death and kinship: Racial disparities in living donor kidney transplantation

Ashton Verdery, The Pennsylvania State University

Session 21: Migration (June 17, 11h00 – 12h40)

11:00 – 11:25. An integrated network approach to kinship, residence and mobility

Klaus Hamberger, Laboratoire d'anthropologie sociale

11:25 – 11:50. Social support networks and social integration processes for immigrants

Rosaria Lumino, University of Naples Federico II

11:50 – 12:15. The effect of network segregation on wage formation: The case of the Sri Lankan immigrant community in Milan, Italy

Valerio Leone Sciabolazza, Università degli Studi di Roma

12:15 – 12:40. Determinants of migration across Italian provinces: A spatial network analysis

Paola Tubaro, Laboratoire de Recherche en Informatique

Session 22: Science networks (June 17, 14h55 – 17h20)

- 14:55 – 15:20. Typifying researches by using networks of citations: The weight of scientific social circles
Beatrice Milard, University of Toulouse
- 15:20 – 15:45. Exchange networks in science – what do scholars exchange and how do they do it?
Dominika Czerniawska, University of Warsaw
- 15:45 – 16:00. Conference co-participation as a factor of new knowledge creation: network analysis
Stanislav Vlasov, Tilburg University, School of Social and Behavioral Sciences
- 16:30 – 16:55. How do scholars collaborate with each other? Comparative study on co-authorship networks of scholars worldwide using big data
Aliakbar Akbaritabar, Department of Economic Sociology of University of Milan
- 16:55 – 17:20. Network positions and success. The case of physics
Oliver Wieczorek, University of Bamberg – Raphael Heiberger, University of Bremen

Session 23: Modelling networks (June 15, 9h25 – 13h05)

- 09:25 – 09:50. Social influence networks
Moses Boudourides, University of Patras – Sergios Lenis, University of Patras
- 09:50 – 10:15. Centrality in multiplex networks
Ulrik Brandes, University of Konstanz
- 10:15 – 10:40. Factors changing blockmodels' type in time
Majjan Cugmas, Faculty of Social Sciences, University of Ljubljana
- 11:00 – 11:25. Knowledge and experience in 2-mode temporal networks
Martin Everett, The University of Manchester
- 11:25 – 11:50. Models for distribution networks
Per Block, ETH Zurich
- 11:50 – 12:15. On dynamic stability of equilibrium in network game with production and externalities
Vladimir Matveenko, University Higher School of Economics at St. Petersburg
- 12:15 – 12:40. Specification of Homophily in Actor-oriented Network Models
Tom Snijders, Rijksuniversiteit Groningen, University of Oxford
- 12:40 – 13:05. How stable are centrality measures in valued networks regarding different actor non-response treatments and network's macro structure?
Anja Žnidaršič, University of Maribor, Faculty of Organizational Sciences

Session 24: Business networks (June 17, 9h25 – 12h40)

09:25 – 09:50. Dynamics of collective learning: A longitudinal study of biotech entrepreneurs

Alvaro Pina Stranger, Centre de recherche en économie et management

09:50 – 10:15. A dynamic view of alliance portfolios: The case of airlines

Ignacio Castro, Universidad de Sevilla

10:15 – 10:40. Corporate acquisitions and social integration

Guillaume Favre, Laboratoire Interdisciplinaire Solidarités, Sociétés, Territoires

11:00 – 11:25. Social collateral and credit market access: Evidence from a large panel of Italian firms

Giorgio Nuzzo, Bank of Italy

11:25 – 11:50. Beyond emerging market: Ties and institutionalization. The case of french SRI

Elise Penakva Icher, Institut de Recherche Interdisciplinaire en Sciences Sociales

11:50 – 12:15. Barriers to the commercialisation of public research

Julien Brailly, Swinburne University of Technology

12:15 – 12:40. Global trends in private water contracts

Yasaman Sarabi, University of Greenwich

Session 25: Social support (June 17, 14h30 – 15h45)

14:30 – 14:55. Keep calm and multiplex? The role of multiplexity for career and psychosocial support in developmental networks with two time points

Luisa Barthauer, TU Braunschweig

14:55 – 15:20. From collaboration to solidarity among peers: A multivariate ERGM of support and trust between collaborating freelance workers

Federico Bianchi, University of Brescia / University of Milan

15:20 – 15:45. How social network analysis allows a multilevel approach to study animal societies

Sebastian Sosa, Adaptive Behavior and Interaction

Session 26: Cultural networks (June 17, 14h30 – 15h20)

14:30 – 14:55. The application of networked coincidences analysis to represent the history of Western culture

Modesto Escobar, University of Salamanca – Luis Martínez-Urbe, Fundación Juan March

14:55 – 15:20. Subnetworks and music scenes: An application of generalized two-mode cores

Benjamin Lind, National Research University – Higher School of Economics

Session 27: Social media (June 17, 14h55 – 17h20)

14:55 – 15:20. Network diversity, and tweets credibility assessment

Zack Hayat, Interdisciplinary Center, Israël

15:20 – 15:45. Construction of post-Soviet identities and decomposition of the post-Soviet order in social media: case of the annexation of the Crimea
Alexander Kondratov, Groupe de Recherche sur les Enjeux de la Communication

Valentyna Dymytrova, Equipe de recherche de Lyon en sciences de l'information et de la communication

15:45 – 16:10. Leadership for the New Millennium: Modeling Members' Roles in Online Communities

Gilad Ravid, Ben Gurion University of the Negev

16:30 – 16:55. Social media interaction techniques of UK charities: The case of twitter

Bruce Cronin, University of Greenwich

16:55 – 17:20. Teacherpreneurial behaviors in social media

Kaitlin Torphy, Michigan State University (USA)

Session 28: Covert networks (June 16, 9h00 – 10h15)

09:00 – 09:25. When knowledge and experience matter. Measuring centrality in 2-mode temporal covert networks

Chiara Broccatelli, The University of Manchester

09:25 – 09:50. The efficiency / security trade-off and beyond

Tomaš Diviák, Department of Sociology, Charles University in Prague

09:50 – 10:15. Signaling trustworthiness in dark web marketplaces: Investments to network embeddedness and market outcomes

Lukas Norbutas, The Netherlands Institute for the Study of Crime and Law Enforcement, Utrecht University

10:15 – 10:40. Covert and overt networks in Counterfeit Alcohol Distribution: a Criminological Network Analysis

Elisa Bellotti, Mitchell Centre for Social Network Analysis, School of Social Sciences, University of Manchester

Session 29: Intra organizational networks (June 17, 14h30 – 15h45)

14:30 – 14:55. The impact of research design and choice of methodology on social network structures – The case of studying hospital environments

Rosica Pachilova, University College London – London's Global University

14:55 – 15:20. Organisation and network analytics – Exploring the role of the workplace

Kerstin Sailer, Bartlett School of Architecture, University College London

15:20 – 15:45. Applying social network analysis to the mobilisation of quality improvement: Structural features of a paediatric palliative care network

Elizabeth West, University of Greenwich

Session 30: Policy networks (June 17, 9h00 – 10h40)

09:00 – 09:25. Building, understanding and influencing an informal network: The case of Deal Island

Christina Prell, University of Maryland

09:25 – 09:50. Governance resilience

Dimitrios Christopoulos, LISEF, MODUL University Vienna

09:50 – 10:15. The "turning point" of austerity in France in 1982–1983 through the prism of social network analysis: Anatomy of an economic controversy

Fabien Eloire, Centre Jillois d'études et de recherches sociologiques et économiques

10:15 – 10:40. Networks of influence: NGOs in the international decision-making process

Rachel Polaud, Institut d'Etudes Politiques de Grenoble

Session 31 : Geography and networks (June 17, 9h25 – 10h40)

09:25 – 09:50. Spatial and social proximity in inter-organizational networks: A longitudinal study

Anna Piazza and Francesca Pallotti, University of Greenwich – Paola Tubaro, Centre National de la Recherche Scientifique – Alessandro Lomi, Università della Svizzera italiana

09:50 – 10:15. Geographic versus psychological proximity as antecedents of collaboration

Olaf Bank, University of Freiburg

10:15 – 10:40. Another one rides the bus? Social determinants of diffusion in infrastructure networks

Jan Riebling, University of Bamberg – Raphael Heiberger, University of Bremen

Session 32: Personal networks (June 15, 16h30 – 17h20)

16:30 – 16:55 How do people represent their relations? Collecting network data with an affective name generator

Tom Toepfer, University of Bremen

16:55 – 17:20. The story behind the network graph: A mixed-method study on problem-centered interviews about the impact of social relations on career paths

Marina Hennig, Johannes Gutenberg University of Mainz