5th European Conference on Social Networks

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Book of Abstracts

5th European Conference on Social Networks

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University of Naples Federico II

Session Overview
Tuesday September 07, 2021
Central European Summer Time

Room / Time	Castel dell'Ovo	Duomo	Lungomare Caracciolo	Maschio Angioino	Piazza del Plebiscito	Teatro San Carlo
9:00-9:30	**Virtual Opening (Room: Palazzo Reale)**					
S1 9:40-11:00	Statistical analysis of populations of networks	Network analysis in sports	Policy networks: efficiency and impact evaluation	Advances in multilayer network analysis: methods and applications	Words speaking in networks of connecting worlds	Structures and agency in social networks
11:00-11:30	*Virtual Break*					
11:30-12:30	**Keynote Session: Beate Volker (Room: Palazzo Reale)**					
12:30-13:30	*Virtual Lunch Break*					
S2 13:30-15:30	Political networks: Legal Networks	Comparing and validating networks, methods and applications	Modeling social influence	Networks and the labour market	Words speaking in networks of connecting worlds	Community detection on attributed networks
15:30-16:00	*Virtual Break*					
S3 16:00-17:00	Qualitative network research	Structures and agency in social networks	Modeling social influence	Agent-based models of social networks		Insight of mobility in higher education using social network analysis methodologies
17:00-17:10	*Virtual Break*					
S4 17:10-18:30	Qualitative network research	Networks and the study of the human past	Signed networks and graph embedding	Agent-based models of social networks	Doing SNA in ethnography: a mixed - methods session	Multiplex networks and individual outcomes in school

Session Overview
Wednesday September 08, 2021
Central European Summer Time

Room / Time	Castel dell'Ovo	Duomo	Lungomare Caracciolo	Maschio Angioino	Piazza del Plebiscito	Teatro San Carlo
S5 9:00-11:00	Political networks: Environmental Governance Networks	Networks and the study of the human past	Family networks and personal networks through the life-course: Focus on social capital and migration	Social networks and fandom	YoungARS session	SNA and geometric data analysis to design fields and uncover relational processes
11:00-11:30	*Virtual Break*					
11:30-12:30	**KeynoteSession: Jürgen Pfeffer (Room: Palazzo Reale)**					
12:30-13:30	*Virtual Lunch Break*					
S6 13:30-15:30	Networks, social resources and subjective well-being	Networks and the study of the human past	Family networks and personal networks through the life-course: Focus on health	Gender and networks	YoungARS session	SNA and geometric data analysis to design fields and uncover relational processes
15:30-16:00	*Virtual Break*					
S7 16:00-17:00	Networks, social resources and subjective well-being	Health, wellbeing, and rural networks	Blockmodeling dynamic or temporal, multilevel and linked networks	Recent ethical challenges in social network analysis	Social media analysis and network analytics	
17:00-17:10	*Virtual Break*					
S8 17:10-18:30	Political networks: Online Political Networks	Data gathering for policy networks: different approaches, different challenges	Blockmodeling dynamic or temporal, multilevel and linked networks	Recent ethical challenges in social network analysis	Social media analysis and network analytics	Erasmus mobility flows and project cooperation in Network Perspectives

Session Overview
Thursday September 09, 2021
Central European Summer Time

Room / Time	Castel dell'Ovo	Duomo	Lungomare Caracciolo	Maschio Angioino	Piazza del Plebiscito	Teatro San Carlo
S9 9:00-11:00	Political networks: International Relations Networks	Modeling network dynamics	Family networks and personal networks through the life-course: Focus on relational processes	Collaboration networks	Organizational networks	Territorial studies from a social network analysis perspective
11:00-11:30	*Virtual Break*					
11:30-12:30	**Keynote Session: Paola Tubaro (Room: Palazzo Reale)**					
12:30-13:30	*Virtual Lunch Break*					
S10 13:30-15:30	REDES panel: promoting collaboration and new studies in the community	Modeling network dynamics	Value co-creation in networks	Collaboration networks	Organizational networks	Territorial studies from a social network analysis perspective
15:30-16:00	*Virtual Break*					
S11 16:00-17:00	REDES panel: promoting collaboration and new studies in the community	Statistical analysis and synthesis of ego-networks: methods and applications	Value co-creation in networks	Avoiding and handling missing and sampled network data	Organizational networks	Criminal networks
17:00-17:10	*Virtual Break*					
S12 17:10-18:30	**Poster Session (Host: Gather Town)**					
S13 18:30-19:00	**Award Ceremony and Virtual Farewell (Room: Palazzo Reale)**					

Session detailed program
Tuesday September 07, 2021
Central European Summer Time

9:00-9:30	**Virtual Opening - Institutional greetings** **Room: Palazzo Reale**	
S1 9:40-11:00	**Statistical analysis of populations of networks** *Simone Vantini and Anna Calissano (chair)* **Room: Castel dell'Ovo**	
9:40-10:00	Extended Stochastic Block Models with Application to Criminal Networks	Daniele Durante, Sirio Legramanti, Tommaso Rigon and David Dunson
10:00-10:20	Prediction Sets for Labelled and Unlabelled Networks using Conformal Prediction	Anna Calissano, Matteo Fontana, Gianluca Zeni and Simone Vantini
10:20-10:40	Global and local inference for network-valued data	Ilenia Lovato, Alessia Pini, Aymeric Stamm and Simone Vantini
10:40-11:00	The network structure of cultural distances	Luca De Benedictis, Roberto Rondinelli and Veronica Vinciotti
S1 9:40-11:00	**Network analysis in sports** *Riccardo Ievoli, Filipe Manuel Clemente (chair) and Lucio Palazzo* **Room: Duomo**	
9:40-10:00	Like Father, Like Son. Influential actors in the lineage network of coaches in Australian Rules Football	Gordana Marmulla, Hagen Wäsche, Geoff Dickson and Ulrik Brandes
10:00-10:20	Process-driven network analysis of passing in professional football	Carolina Mattsson and Frank Takes
10:20-10:40	Spatio-temporal Network Analysis of Formation Characteristics in Soccer	Ulrik Brandes, Robin Chan and M. Eren Akbiyik
10:40-11:00	The use of passing network indicators to predict football outcomes	Lucio Palazzo, Riccardo Ievoli and Giancarlo Ragozini
S1 9:40-11:00	**Policy networks: efficiency and impact evaluation** *Grigoriy Khvatskiy, Dmitry Zaytsev, Valentina Kuskova and Anna Sokol* **Room: Lungomare Caracciolo**	
9:40-10:00	Assessing the impact of social movements on environmental policy change with social network analysis methodology	Anna Sokol, Valentina Kuskova and Dmitry Zaytsev
10:00-10:20	Towards a synthetic theory of policy efficiency: application of network analysis to the science, technology and innovation policy efficiency studies	Gregory Khvatsky, Anna Sokol, Dmitry Zaytsev and Valentina Kuskova
10:20-10:40	Theoretical and Methodological Approaches to Assessing the Influence of Experts on Decision-Making in Education	Rustam Kamalov, Valentina Kuskova and Dmitry Zaytsev
10:40-11:00		
S1 9:40-11:00	**Advances in multilayer network analysis: methods and applications** *Matteo Magnani and Luca Rossi (chair)* **Room: Maschio Angioino**	
9:40-10:00	Mapping specialisations in the international trade of automotive components and parts: a multilayer network analysis	Margherita Russo, Fabrizio Alboni, Jorge Carreto Sanginés, Manlio De Domenico, Giuseppe Mangioni, Simone Righi and Annamaria Simonazzi
10:00-10:20	Multiplexity Analysis of Networks using Multigraph Representations	Termeh Shafie and David Schoch
10:20-10:40	Multilayer Network-based Approach for the Analysis of Media Data: an Application on LexisNexis News Database	Carla Galluccio and Alessandra Petrucci
10:40-11:00		

S1 9:40-11:00	**Words speaking in networks of connecting worlds** *Michelangelo Misuraca (chair) and Giuseppe Giordano* **Room: Piazza del Plebiscito**	
9:40-10:00	The media discourse about Female Genital Mutilation (FGM) as an example of niche building patterns in complex networks	Tanja Preböck and Alexander Brand
10:00-10:20	Using semantic importance analysis to evaluate energy storage awareness and acceptance	Andrea Fronzetti Colladon, Anna Laura Pisello, Ludovica Segneri and Claudia Fabiani
10:20-10:40	Statistically Validated Networks for assessing topic quality in LDA models	Alessandro Albano and Andrea Simonetti
10:40-11:00	Networks of keywords for the bibliometric analysis	Carlos G. Figuerola and Modesto Escobar Mercado
S1 9:40-11:00	**Structures and agency in social networks** *Ingrid Salvatore and Roberto Rossi (chair)* **Room: Teatro San Carlo**	
9:40-10:00	Concepts and practices. A pragmatist reading of Haslanger	Matteo Santarelli
10:00-10:20	Nobility, Poverty and Stigma, an empirical case of Social Network Analysis: The Pio Monte della Misericordia of Naples in the 17th and 18th century	Roberto Rossi
10:20-10:40	Documediality, post-truth and conspiracy theories	Adriano Vinale
10:40-11:00	On the Constitution of the Public Interest	Daniele Santoro
11:00-11:30	*Virtual Break*	
11:30-12:30	**Keynote Session** *Chair: Bruce Cronin* **Room: Palazzo Reale**	
11:30-12:30	Did we close the gap? Networks, social capital, and new opportunities for answering old research questions	Beate Volker
12:30-13:30	*Virtual Lunch Break*	
S2 13:30-15:30	**Political networks: Legal Networks** *Manuel Fischer (chair), Mario Diani, Christina Prell, James Hollway and Petr Ocelík* **Room: Castel dell'Ovo**	
13:30-13:50	Political debates on Social Innovation in Japan: a Discourse Network Analysis	Stefano Ghinoi and Miki Omori
13:50-14:10	The Network of Parliamentarian Committees and Stakeholders in Ukraine during 2020	Tetiana Kostiuchenko and Tetiana Khutor
14:10-14:30	Identifying splinter coalitions in the US House of Representatives by optimally partitioning signed networks based on generalized balance	Samin Aref and Zachary Neal
14:30-14:50	Abstentions and Social Networks in Congress	Marco Battaglini, Valerio Leone Sciabolazza and Eleonora Patacchini
14:50-15:10	Dyadic Treatment Effect on Network Formation using Multi-valued Propensity Score Matching: Lobbying Activities and Legislative Collaborations	Costanza Tortù, Valerio Leone Sciabolazza and Laura Forastiere
15:10-15:30		
S2 13:30-15:30	**Comparing and validating networks, methods and applications** *Valeria Policastro (chair), Luisa Cutillo and Annamaria Carissimo* **Room: Duomo**	
13:30-13:50	The network of international trade in services	Lucia Tajoli, Carlo Piccardi and Federico Airoldi
13:50-14:10	ROBustness In Network (robin): for Comparison and Validation of Communities	Valeria Policastro, Dario Righelli, Annamaria Carissimo, Luisa Cutillo and Italia De Feis

14:10-14:30	Correlation and Topological Analyses of Classical and Community-aware Centrality Measures in Complex Networks	Stephany Rajeh, Marinette Savonnet, Eric Leclercq and Hocine Cherifi
14:30-14:50	Attributes Embedding in Networks Clustering	Luisa Cutillo, Pasqua D'Ambra, Clara De Santis and Panayot Vassilevski
14:50-15:10	Discovering Commonality Between Observed Networks through Two-Sample Graph Kernel Inference Procedures	Ragnar Gudmundarson, Dimitris Christopoulos and Gareth Peters
15:10-15:30		
S2 13:30-15:30	**Modeling social influence** *Viviana Amati (chair), Robert Krause, Tom A.B. Snijders and Christian E.G. Steglich* **Room: Lungomare Caracciolo**	
13:30-13:50	What is an opinion? The problem of weakly-defined measurements in agent-based modeling	Dino Carpentras and Michael Quayle
13:50-14:10	Developing an opinion dynamics model from real-world data	Dino Carpentras, Paul Maher and Michael Quayle
14:10-14:30	Implications of social structure for resource fever mechanisms	Rodrigo Martinez-Peña and Srebrenka Letina
14:30-14:50	Skill, Status and the Matthew Effect	Mikael Bask
14:50-15:10	Modeling Social Influence with Violations of DeGroot Model Assumptions using a Genetic Algorithm	Kara Johnson, Jennifer L. Walsh, Yuri A. Amirkhanian and Nicole Carnegie
15:10-15:30		
S2 13:30-15:30	**Networks and the labour market** *Stefan Bernhard and Joan Miquel Verd (chair)* **Room: Maschio Angioino**	
13:30-13:50	Knowledge spillovers through skilled-workers migration network: evidence from OECD countries	Saverio Barabuffi, Valeria Costantini, Valerio Leone Sciabolazza and Elena Paglialunga
13:50-14:10	Social Networks and Labor Market Mobility: Evidence from Danish Population Registers	Lasse Folke Henriksen, Thomas Lyttelton and Emil Begtrup-Bright
14:10-14:30	Bonding, bridging and linking social capital in the access of young people with unstable labour market trajectories to employment	Alejandro González-Heras and Joan Miquel Verd
14:30-14:50	Changes in professional networks in times of crisis	Deniza Alieva, Sherzod Aktamov, Gulnoza Usmonova and Shukhrat Shadmanov
14:50-15:10	The higher, the better? Testing the relative impact of social capital on high- and low-skilled immigrants' labour market integration	Julia Rüdel
15:10-15:30		
S2 13:30-15:30	**Words speaking in networks of connecting worlds** *Michelangelo Misuraca and Giuseppe Giordano (chair)* **Room: Piazza del Plebiscito**	
13:30-13:50	Educational crisis survey during COVID-19 in Italy: Open-ended question automatic coding	Stefania Capogna and Francesca Greco
13:50-14:10	Measuring the communication power of social media users	Francesca Greco and Alessandro Polli
14:10-14:30	A Social Network Approach of Visions of the Future: before and during the COVID-19 pandemic	Jose Antonio Rodriguez Diaz
14:30-14:50	Topics in the electric vehicles A-I-A space	Margherita Russo, Fabrizio Alboni, Giovanni Bonifati and Pasquale Pavone
14:50-15:10	Thematic evolution as a new Culturomics tool: The case of tweets on Covid-19	Corrado Cuccurullo, Luca D'Aniello, Michelangelo Misuraca and Maria Spano
15:10-15:30	Bibliometric Analysis of the Crowd Myths: from "Madness" to "Creativity"	Stanislav Moiseev and Daria Maltseva

S2 13:30-15:30	**Community detection on attributed networks** *Roberto Rondinelli, Martin Atzmueller and Francesco Santelli (chair)* **Room: Teatro San Carlo**	
13:30-13:50	Community detection with node attributes in multilayer networks	Martina Contisciani, Eleanor A. Power and Caterina De Bacco
13:50-14:10	Label propagation-based item classification with attribute and consumption information	John Pougué-Biyong, Renaud Lambiotte
14:10-14:30	A Supervised Clustering Algorithm for Network Data	Bárbara Santos and Pedro Campos
14:30-14:50	Community detection in the real world: do communities really exist?	Riccardo Righi, Alessia Pedrazzoli, Simone Righi and Valeria Venturelli
14:50-15:10	Mustering Squads in a Police Academy	Julian Müller, Norman Conti, Patrick Doreian and Ulrik Brandes
15:10-15:30		
15:30-16:00	*Virtual Break*	
S3 16:00-17:00	**Qualitative network research** *Tom Töpfer (chair), Andreas Herz and Theresa Manderscheid* **Room: Castel dell'Ovo**	
16:00-16:20	Using Grounded Theory Methods to develop networking in welfare communities	Irene Psaroudakis
16:20-16:40	Ambivalence, surprise and role-switching in narrative networks: a case study using James Bond films	Pete Jones and Dorottya Hoor
16:40-17:00	Analyzing social networks of “Praxiszentren” as learning environments for school-based teacher education	Marco Galle, Liana Pirovino, Jennifer Shepherd and Annelies Kreis
S3 16:00-17:00	**Structures and agency in social networks** *Ingrid Salvatore (chair) and Roberto Rossi* **Room: Duomo**	
16:00-16:20	Social Poverty and Embedded Agency – A Theoretical Approach	André Knabe
16:20-16:40	Intellectual in Displacement: the role of cultural mediation in early modern and modern periods	Aurea Mota
16:40-17:00	Structural explanations and mechanistic constraints in network analysis and policy design	Matteo Bianchin and Ingrid Salvatore
S3 16:00-17:00	**Modeling social influence** *Viviana Amati, Robert Krause (chair), Tom A.B. Snijders and Christian E.G. Steglich* **Room: Lungomare Caracciolo**	
16:00-16:20	The effect of policies on the diffusion centrality of a risky behaviour: School tobacco policies and adolescent smoking in 38 schools from 6 countries	Nora Mélard, Liesbeth Mercken and Vincent Lorant
16:20-16:40	Continuous-time modeling of social influence on static networks	Nynke Niezink
16:40-17:00	Radical positioning on social networking sites about migratory crisis at frontier between Spain and Morocco	Paula Méndez Domínguez, Joaquín Castillo de Mesa and Luis Gómez Jacinto
S3 16:00-17:00	**Agent-based models of social networks** *Filip Agneessens, Federico Bianchi (chair), Andreas Flache and Károly Takács* **Room: Maschio Angioino**	
16:00-16:20	Local Reputation, Local Selection, and the Leading Eight Norms	Simone Righi, Shirsendu Podder and Karoly Takacs
16:20-16:40	How do they integrate? Social exchange and reciprocal integration among migrants and locals	Minna Paunova
16:40-17:00	Individual strategies for knowledge gains and knowledge problems	Christina Prell, Yi-Jung Lo and Karoly Takas

S3 16:00-17:00	**Insight of mobility in higher education using social network analysis methodologies** *Giovanni Boscaino (chair) and Isabella Sulis* **Room: Teatro San Carlo**	
16:00-16:20	Assessing the mobility patterns of outgoing Southern Italian students	Ilaria Primerano, Francesco Santelli and Cristian Usala
16:20-16:40	Simplifying multimode networks. Insight from student mobility flow in higher education	Vincenzo Giuseppe Genova, Giuseppe Giordano, Maria Prosperina Vitale and Giancarlo Ragozini
16:40-17:00	Insights on the effect of network and individual characteristics on students' mobility choices	Silvia Columbu, Mariano Porcu, Ilaria Primerano, Isabella Sulis and Maria Prosperina Vitale
17:00-17:10	*Virtual Break*	
S4 17:10-18:30	**Qualitative network research** *Tom Töpfer (chair), Andreas Herz and Theresa Manderscheid* **Room: Castel dell'Ovo**	
17:10-17:30	Qualitative social network analysis in the strategy of mixing methods in the social sciences: systematic literature review	Aryuna Radnaeva
17:30-17:50	Social network analysis with the Net-Map tool - A systematic review	Christine Bosch, Lilli Scheiterle, Santiago Morales, Regina Birner, Athena Birkenberg and Eva Schiffer
17:50-18:10	Ambivalent and consistent relationships: the role of response networks in cases of domestic violence	Elisa Bellotti, Susanne Boethius, Malin Åkerström and Margareta Hydén
18:10-18:30		
S4 17:10-18:30	**Networks and the study of the human past** *Martin Stark, Maria Carmela Schisani, Aline Deicke and Paolo Cimadomo (chair)* **Room: Duomo**	
17:10-17:30	Social Network Analysis, Mobilities, and the Communities of Classical Potters and Painters in Athens and South Italy	Eleni Hasaki and Marco Serino
17:30-17:50	Mythic Networks and Real-World Ethnicity in Ancient Greece	Benjamin Winnick
17:50-18:10	Augustus and the Transformation of Roman Spatial and Social Network	Brendan McCarthy
18:10-18:30		
S4 17:10-18:30	**Signed networks and graph embedding** *Maria Rosaria D'Esposito, Giuseppe Giordano and Giancarlo Ragozini (chair)* **Room: Lungomare Caracciolo**	
17:10-17:30	Projecting Signed Two-Mode Networks	David Schoch
17:30-17:50	Ranking in signed networks	Dmitry Gromov and Elizaveta Evmenova
17:50-18:10	Topological Characterization of Social Networks using Distributional Data Analysis	Giuseppe Giordano and Antonio Irpino
18:10-18:30	Factorial Embedding of Network Statistics Distributions for Anomaly Detection	Giuseppe Giordano and Raffaele Miele
S4 17:10-18:30	**Agent-based models of social networks** *Filip Agneessens, Federico Bianchi, Andreas Flache (chair) and Károly Takács* **Room: Maschio Angioino**	
17:10-17:30	Stopping network diffusion - agent-based models for simulating strategies of containing complex contagions in cases of sexual harassment	Jan Majewski
17:30-17:50	Targeted immunization strategies: Comparing the efficacy of traditional versus alternative centrality measures through agent-based modeling	Andrea Fronzetti Colladon, Cristina Ponsiglione, Simonetta Primario and Giuseppe Zollo
17:50-18:10	Prioritizing high-contact professions raises effectiveness of vaccination campaigns	Hendrik Nunner, Vincent Buskens and Arnout van de Rijt

18:10-18:30	Empirically calibrated simulations with RSiena: The case of bilingual education and language group status	Christian Steglich and Lysann Zander
S4 17:10-18:30	**Doing SNA in ethnography: a mixed - methods session** *Dafne Muntanyola-Saura (chair)* **Room: Piazza del Plebiscito**	
17:10-17:30	Network Oriented Ethnography: A Case of Interstitial Research in Transnationalism, Migration and Mobility	Ignacio Fradejas-García, Renáta Hosnedlová, José Luis Molina and Miranda J. Lubbers
17:30-17:50	Unveiling network referents: Filter figures in an Haute-Cuisine Restaurant	Guillem Perez Sanchez
17:50-18:10	A way to study transnational identities	Luciana Taddei and Paolo Diana
18:10-18:30		
S4 17:10-18:30	**Multiplex networks and individual outcomes in school** *András Vörös (chair), Zsófia Boda and Elisa Bellotti* **Room: Teatro San Carlo**	
17:10-17:30	Who do you hang out with? Proximity-based social networks as a method to understand situated behaviour in a secondary school playground	Kerstin Sailer
17:30-17:50	Friends and the development of adolescents' educational aspirations - accumulation of advantages?	Eszter Vit, Sven Lenkewitz and Robert Krause
17:50-18:10		
18:10-18:30		

Session detailed program
Wednesday September 08, 2021
Central European Summer Time

S5 9:00-11:00	**Political networks: Environmental Governance Networks** *Manuel Fischer, Mario Diani, Christina Prell (chair), James Hollway and Petr Ocelík* **Room: Castel dell'Ovo**	
9:00-9:20	Consensus and Fragmentation in the Dutch Climate Debate: A Discourse Network Analysis	Marit Meijerink, Dongsun Suh, Jeonghan Lee, Christina Prell and Christian Steglich
9:20-9:40	Forests in Conflict	Laura Roldan
9:40-10:00	How the quality of ecological dependencies influences actor collaboration	Martin Huber
10:00-10:20	Institutionalized Public Participation in Local Environmental Governance in Ireland	Paul Wagner
10:20-10:40		
10:40-11:00		
S5 9:00-11:00	**Networks and the study of the human past** *Martin Stark (chair), Maria Carmela Schisani, Aline Deicke and Paolo Cimadomo* **Room: Duomo**	
9:00-9:20	Bound by belts: Modelling social networks in the early medieval Carpathian Basin, 7th to 9th centuries AD	Bence Soós and Gergely Szenthe
9:20-9:40	When the Black Death knocked on San Marco's doors: the persistence of political power in the Venetian Republic in the aftermath of the plague of 1348	Adelaide Baronchelli, Roberto Ricciuti and Mattia Viale
9:40-10:00	Searching for explanations of polarization during the European Reformation	Ramona Roller and Frank Schweitzer
10:00-10:20	Kinship ties, family altruism and collective action: a network analysis of the 1691 revolt attempt in the city of Basel, Switzerland	Niccolò Giorgio Armandola, Malte Doehne and Katja Rost
10:20-10:40	From Emperor to God. Statistical methods to analyse the spread of Roman Imperial Cult in the Eastern Mediterranean	Paolo Cimadomo, Carla Galluccio and Giancarlo Ragozini
10:40-11:00		
S5 9:00-11:00	**Family networks and personal networks through the life-course: Focus on social capital and migration** *Vera de Bel (chair), Marlène Sapin and Eric Widmer* **Room: Lungomare Caracciolo**	
9:00-9:20	A Friend in Need? – Social Support and Integration of Asylum Seekers and Expats in Hungary	Dorottya Hoor
9:20-9:40	Ageing Transnational Mobility Practices and Ego-networks Family Composition	Eva Fernandez G. G. and Mihaela Nedelcu
9:40-10:00	The influence of family and personal networks on migrants' trajectories: two research experiences compared	Carlo De Rose and Luciana Taddei
10:00-10:20	Resilient relationships - Longitudinal analysis of egocentric network of highly educated young immigrants during the pandemic	Dóra Boelens and Éva Huszti
10:20-10:40	Blood is thicker than water: on the role of strong family ties for rental housing opportunities among young adults	Emanuel Wittberg and Martin Arvidsson
10:40-11:00		

S5 9:00-11:00	**Social networks and fandom** *Simona Castellano and Mario Tirino (chair)* **Room: Maschio Angioino**	
9:00-9:20	Sports fandom between social networks and grassroots cultures: the analysis of Inter Milan fan communities on Instagram	Mario Tirino and Simona Castellano
9:20-9:40	Fan ballerino! Evolving trends in contemporary fandom: the case of Dylan Dog	Lorenzo Di Paola and Giorgio Busi Rizzi
9:40-10:00	Sweatpants are a sign of defeat. Fandom, Fashion and Networks	Vincenzo Del Gaudio and Irene Psaroudakis
10:00-10:20	TV fandom between entertainment and politics. The case of The Handmaid's Tale	Antonella Mascio
10:20-10:40	To Build a Home. Vidding Communities and Digital Platforms as Gendered Spaces	Lucia Tralli
10:40-11:00	The other face of the Upside Down. How fandom reinterprets Stranger Things	Anja Boato and Claudio Riva
S5 9:00-11:00	**YoungARS session** *Viviana Amati, Anna Calissano (chair) and Maria Prosperina Vitale* **Room: Piazza del Plebiscito**	
9:00-9:20	A meritocratic network formation model for User-Generated Content based platforms	Nicolo Pagan, Wenjun Mei, Cheng Li and Florian Dorfler
9:20-9:40	The Rise and the Decline of a Market: The case of the electronic Market for Interbank Deposit (e-MID)	Federica Bianchi
9:40-10:00	Accounting for the Regulation of Elite Conflict through Social Network Analysis: Modeling Contending Bureaucratic Networks in Post-Revolutionary Iran's Diplomatic Corps	Guillaume Beaud
10:00-10:20	Social Participation of Children with Intellectual Disabilities in Sports	Fabian Mumenthaler, Alexander Steiger and Siegfried Nagel
10:20-10:40	Stratified stochastic variational inference for random-dot models	Emanuele Aliverti
10:40-11:00	Environmental Migration? A quantitative overview of the literature	Elisa Scibè, Maria Cipollina and Luca De Benedictis
S5 9:00-11:00	**SNA and geometric data analysis to design fields and uncover relational processes** *Fabien Eloire, Elisa Klüger, Thierry Rossier and Marco Serino (chair)* **Room: Teatro San Carlo**	
9:00-9:20	Think tanks as boundary organizations. Uncovering relational logic of the field with network-geometric analysis of prosopographical data	Szymon Talaga, Rafal Mista and Bartosz Slosarski
9:20-9:40	Network features and funding support of scientific topics in the space of disciplines	Radim Hladik and Yann Renisio
9:40-10:00	The configuration of the creative network and its marginalization effects. A case study of the film industry in Italy	Cristiano Felaco and Sabrina Pedrini
10:00-10:20	The networked field of journal board memberships. Studying field positions and network positions in an affiliation network of Italian sociology journal boards through Cluster Correspondence Analysis	Marco Serino, Ilenia Picardi and Maria Carmela Agodi
10:20-10:40		
10:40-11:00		
11:00-11:30	*Virtual Break*	
11:30-12:30	**Keynote Session** *Chair: Marina Henning* **Room: Palazzo Reale**	
11:30-12:30	An Edge is and Edge is an Edge. Is it?	Jürgen Pfeffer

12:30-13:30	*Virtual Lunch Break*	
S6 13:30-15:30	**Networks, social resources and subjective well-being** *Marina Henning and Stefan Hundsdorfer (chair)* **Room: Castel dell'Ovo**	
13:30-13:50	Does the structure of the personal networks of patients with severe mental illness is associated with well-being and mental health outcomes?	Hélène Garin and Vincent Lorant
13:50-14:10	Human after all: on the need for face-to-face interactions alongside our digital lives	Mattia Vacchiano and Riccardo Valente
14:10-14:30	Core discussion and instrumental networks as determinants of socioeconomic inclusion	Verónica de Miguel-Luken and Livia García-Faroldi
14:30-14:50	Local employment services as providers of resources useful for labour market (re)integration in a context of employment scarcity	Joan Miquel Verd and Joan Rodriguez-Soler
14:50-15:10	Social resources and life satisfaction in a cross-country comparison	Marina Hennig and Bastian Laier
15:10-15:30		
S6 13:30-15:30	**Networks and the study of the human past** *Martin Stark, Maria Carmela Schisani, Aline Deicke, (chair) and Paolo Cimadomo* **Room: Duomo**	
13:30-13:50	Networks of confessional affiliation: religious choice during the schism of Utrecht	Jaap Geraerts and Demival Vasques Filho
13:50-14:10	Power across generations. Family dynasties in the South of Italy business network over Unification (1820-1900)	Maria Carmela Schisani and Giancarlo Ragozini
14:10-14:30	The characteristic and spatial mapping of cooperative relationship between foreign firms and banks in the British Concession of Shanghai in modern times (1939,1947)	Ming Yang and Jie He
14:30-14:50	Networked coincidences analysis to represent an interactive and dynamic history of culture and science	Cristina Calvo López and Modesto Escobar Mercado
14:50-15:10	Networks, Mobility and Resources in the Central Mediterranean during the 3rd millennium BC	Maja Gori and Andrea Di Renzoni
15:10-15:30		
S6 13:30-15:30	**Family networks and personal networks through the life-course: Focus on health** *Vera de Bel (chair), Marlène Sapin and Eric Widmer* **Room: Lungomare Caracciolo**	
13:30-13:50	The differentiated effects of the Covid-19 crisis according to life cycles	Michel Grossetti, Claire Bidart, Adrien Defossez, Guillaume Favre, Julien Figeac and Lydie Launay
13:50-14:10	Migrant women's networks and the care sector	Isabella Corvino and Sara Nanetti
14:10-14:30	Egocentric Contact Networks of Older Adults	Fruzsina Albert, Beata David, Eva Huszti and Gábor Hajdu
14:30-14:50	Social Connectedness and Health for Families Served by Integrated Pediatric Care Clinics	Danielle Varda, Rose Hardy and Amanda Beacom
14:50-15:10		
15:10-15:30		
S6 13:30-15:30	**Gender and networks** *Elisa Bellotti (chair)* **Room: Maschio Angioino**	
13:30-13:50	The Contribution of Social Resources to Gender and Class Labor Market Inequalities	Thomas Lyttelton, Lasse Folke Henriksen and Emil Begtrup-Bright
13:50-14:10	Gender differences in the categorisation of tie strength: an empirical analysis	Cecile Plessard
14:10-14:30	Gender inequalities, academic status and social capital in interlocking editorships. A study on an affiliation network of leading Italian sociology journal boards	Marco Serino and Ilenia Picardi

14:30-14:50	Gendered interaction patterns in small R&D teams. A microdynamic approach using hierarchical dynamic actor network models (DyNAM)	Jörg Müller, Álvaro Uzaheta Berdugo and Julián Salas Piñón
14:50-15:10		
15:10-15:30		
S6 13:30-15:30	**YoungARS session** *Viviana Amati, Anna Calissano (chair) and Maria Prosperina Vitale* **Room: Piazza del Plebiscito**	
13:30-13:50	The Role of Preference-Based Selection in Socioeconomic Homophily: Evidence from a Three-Week Summer Camp	Marion Hoffman and Timothée Chabot
13:50-14:10	Student mobility patterns from high school to master's degree. A statistically validated network approach	Vincenzo Giuseppe Genova, Michele Tumminello, Fabio Aiello and Massimo Attanasio
14:10-14:30	Dynamics of the football market transfer: an application to the Italian Serie A teams	Roberto Rondinelli and Lucio Palazzo
14:30-14:50	Balance in economic sanction collaboration: A relational event model with initiative	Sana Lakdawala, Nynke Niezink and Shihan Li
14:50-15:10	Common Knowledge on Facebook Communication Networks: Models and Experimental Findings	Sarah McDonald and Gizem Korkmaz
15:10-15:30		
S6 13:30-15:30	**SNA and geometric data analysis to design fields and uncover relational processes** *Fabien Eloire, Elisa Klüger, Thierry Rossier (chair) and Marco Serino* **Room: Teatro San Carlo**	
13:30-13:50	Who rules the French private equity field?	Fabien Foureault
13:50-14:10	From local champions to global players: A long-term perspective on Swiss companies' connections across territorial scales	Michael A Strebel and André Mach
14:10-14:30	Effective agents in the field of power. How the Swiss elite core evolved between 1910 and 2000?	Thierry Rossier
14:30-14:50	The social foundations of political nomination	Elisa Klüger
14:50-15:10		
15:10-15:30		
15:30-16:00	*Virtual Break*	
S7 16:00-17:00	**Networks, social resources and subjective well-being** *Marina Hennig (chair) and Stefan Hundsdorfer* **Room: Castel dell'Ovo**	
16:00-16:20	Social Resources and Well-Being: The Japanese Urban-Rural Divide	Stefan Hundsdorfer and Dionyssios Askitis
16:20-16:40	Emotional closeness and geographical proximity of confidants in old age: Revisiting the convoy model of personal relationships	Jing-Yi Wang
16:40-17:00		
S7 16:00-17:00	**Health, wellbeing, and rural networks** *Emily Long and Sebastian Stevens (chair)* **Room: Duomo**	
16:00-16:20	Harnessing the Power of Social Networks: Feasibility Trial of a Social Network Intervention to Reduce Risky Drinking among Residential College Students	Lily Davidson and Leanne Hides
16:20-16:40	Social network range, but not size, is longitudinally associated with cardiac biomarkers in Korean older adults	Ekaterina Baldina, Sung-Ha Lee, Hyeon Chang Kim and Yoosik Youm
16:40-17:00	Network topology and smoking norms: an international longitudinal study of adolescents	Vincent Lorant and Mark Tranmer

S7 16:00-17:00	**Blockmodeling dynamic or temporal, multilevel and linked networks** *Aleš Žiberna and Marjan Cugmas (chair)* **Room: Lungomare Caracciolo**	
16:00-16:20	Review of approaches to blockmodeling of dynamic networks	Aleš Žiberna
16:20-16:40	Comparing different approaches to blockmodeling dynamic networks	Marjan Cugmas and Aleš Žiberna
16:40-17:00	Blockmodeling temporal networks described by temporal quantities	Vladimir Batagelj
S7 16:00-17:00	**Recent ethical challenges in social network analysis** *Paola Tubaro, Louise Ryan, Antonio Casilli and Alessio D'Angelo (chair)* **Room: Maschio Angioino**	
16:00-16:20	Studying travel agents: relational capital and organizational factors	Isidro Maya-Jariego, Deniza Alieva and Daniel Holgado
16:20-16:40	The Presentation of the Networked Self: Ethics and Epistemology in Social Network Analysis	Louise Ryan and Alessio D'Angelo
16:40-17:00	Research ethics in the age of digital platforms	José Luis Molina, Paola Tubaro, Antonio Casilli and Antonio Ortega
S7 16:00-17:00	**Social media analysis and network analytics** *Lara Fontanella, Mara Maretti and Maria Prosperina Vitale (chair)* **Room: Piazza del Plebiscito**	
16:00-16:20	Discovering communities of practice in Twitter with active node classification and graph traversal strategies	Michelangelo Puliga, Alessandro Chessa, Vincenzo de Leo, Martina Erba, Filippo Capriotti and Andrea Filetti
16:20-16:40	Assessing the risk of "infodemics" in response to COVID-19 epidemics	Riccardo Gallotti, Francesco Valle, Nicola Castaldo, Pierluigi Sacco and Manlio De Domenico
16:40-17:00	Twitter Networks of Discussions on COVID-19 During Every Hour of the Last Week of 2020	Moses Boudourides
17:00-17:10	*Virtual Break*	
S8 17:10-18:30	**Political networks: Online Political Networks** *Manuel Fischer, Mario Diani, Christina Prell, James Hollway and Petr Ocelík (chair)* **Room: Castel dell'Ovo**	
17:10-17:30	The release of #SilviaRomano: a case of polarized intersectionality	Elena Pavan and Antonio Martella
17:30-17:50	Storylines of Climate Change: A Network Analysis of the EU Agencies' Discourse on Twitter	Kristin Olofsson, Karina Shyrokykh and Sandra Gerda Eckert
17:50-18:10	Together we stand? An analysis of the digital connections developed by LGBTQIA* collective actors	Aurora Perego
18:10-18:30	Trump and Other Dominating Intersection Subgraphs from Wikipedia Pages Associated with Christian Nationalism	Moses Boudourides and Amitabha Palmer
S8 17:10-18:30	**Data gathering for policy networks: different approaches, different challenges** *Marlene Kammerer and Ruth Wiedemann (chair)* **Room: Duomo**	
17:10-17:30	Hyperlink networks between organizations - the next frontier in policy network studies or a hopeless mess? Fresh evidence for an ongoing debate	Mario Angst and Laurence Brandenberger
17:30-17:50	Re-organizing the Babylon – A systematic review of a maturated research field	Ruth Wiedemann and Marlene Kammerer
17:50-18:10	Understanding the role of the state and the internationalisation of voluntary digital standards using an NLP-based co-occurrence network analysis: the case of consumer IoT code of practice guidelines	Saheli Datta Burton, Srinidhi Vasudevan and Madeline Carr

18:10-18:30	Comparing network structure derived from surveys data and website searches: a case study in water resource governance	Karen I Trebitz
S8 17:10-18:30	**Blockmodeling dynamic or temporal, multilevel and linked networks** *Aleš Žiberna (chair) and Marjan Cugmas* **Room: Lungomare Caracciolo**	
17:10-17:30	Stochastic blockmodeling approach to linked networks using weighted likelihood	Damjan Skulj and Ales Ziberna
17:30-17:50	Inclusion of nodal attributes in dynamic Stochastic Block Models	Francesco Bartolucci, Maria Francesca Marino and Silvia Pandolfi
17:50-18:10	A Stochastic Block Model for collection of networks: Do the networks share a common structure?	Saint-Clair Chabert-Liddell, Pierre Barbillon and Sophie Donnet
18:10-18:30		
S8 17:10-18:30	**Recent ethical challenges in social network analysis** *Paola Tubaro, Louise Ryan (chair), Antonio Casilli and Alessio D'Angelo* **Room: Maschio Angioino**	
17:10-17:30	Whose results are these anyway? Reciprocity and the ethics of “giving back” after social network research	Paola Tubaro
17:30-17:50	New ethical approaches through collective reflexivity	Paola Tubaro, Louise Ryan, Antonio Casilli and Alessio D'Angelo
17:50-18:10	Ethical implications of network data in business and management settings	Bruce Cronin
18:10-18:30	Toward a Critical Social Network Analysis	Ronald L. Breiger
S8 17:10-18:30	**Social media analysis and network analytics** *Lara Fontanella, Mara Maretti and Maria Prosperina Vitale (chair)* **Room: Piazza del Plebiscito**	
17:10-17:30	The role of AI in the analysis of fake news and their use as bot detectors	Jessica Camargo Molano, Daniele Battista and Jacopo Cavalaglio Camargo Molano
17:30-17:50	Egg Jarping: The Network of Amicable Resolution in the Customs and Manners of “E-Eggbattle” Cultures	Theodoros Katerinakis and Zisis Kiriakakis
17:50-18:10	Propagation of misleading information in Facebook Like Pages. An agent-based model of virality in an echo chamber	Vanessa Russo, Federico Cecconi, Eugenia Polizzi di Sorrentino, Mario Paolucci, Giulia Andrighetto and Mara Maretti
18:10-18:30	A space filling sampling approach for network analysis	Luigi Ippoliti, Emiliano del Gobbo, Lara Fontanella, Simone Di Zio and Roberto Benedetti
S8 17:10-18:30	**Erasmus mobility flows and project cooperation in Network Perspectives** *Kristijan Breznik, Ilaria Primerano and Marialuisa Restaino (chair)* **Room: Teatro San Carlo**	
17:10-17:30	Inclusive Universities. Evidence from the Erasmus Program	Silvia Leoni and Luca De Benedictis
17:30-17:50	Entertainment or Enrichment? Evaluating the Drivers of Erasmus Mobility Flows Using Social Network Analysis	Micol Morellini
17:50-18:10	A study of the interaction patterns in students mobility flows	Kristijan Breznik, Giancarlo Ragozini, Marialuisa Restaino and Maria Prosperina Vitale
18:10-18:30	Insights on European student mobility and collaboration network through a multiplex approach	Ilaria Primerano, Maria Prosperina Vitale, Kristijan Breznik and Marialuisa Restaino

Session detailed program
Thursday September 09, 2021
Central European Summer Time

S9 9:00-11:00	**Political networks: International Relations Networks** *Manuel Fischer, Mario Diani, Christina Prell, James Hollway (chair) and Petr Ocelík* **Room: Castel dell'Ovo**	
9:00-9:20	Populist Anger vs. Anger about Populists: Discourse Network Analysis of European Election Campaigns 2009 and 2019 in Germany	Monika Verbalyte
9:20-9:40	The Global Network of Social Policy Relations	Sebastian Haunss and Alexander Polte
9:40-10:00	Mass polarization in Europe in the 21 century: studying belief networks in 15 countries	Tymofii Brik and Oleksiy Krimeniuk
10:00-10:20	For all the right reasons: Using network entailment models to examine support for military intervention among UK security elites	Lorien Jasny and Catarina Thomson
10:20-10:40		
10:40-11:00		
S9 9:00-11:00	**Modeling network dynamics** *Per Block, Robert Hellpap (chair), Nynke Niezink, Tom Snijders and Christoph Stadtfeld* **Room: Duomo**	
9:00-9:20	The mismatch of statistical and theoretical models in network analysis	Per Block
9:20-9:40	Assessing the goodness of fit in relational event models	Viviana Amati, Alessandro Lomi, Tom Snijders and Christoph Stadtfeld
9:40-10:00	Modeling Overlapping Groups: Stochastic Actor Oriented approach	Stepan Zaretckii, Christian Steglich, Marijtje van Duijn and Tom Snijders
10:00-10:20	Does co-citation lead to intercitation? Exploring multiplex networks through dynamic network actor models	Alejandro Espinosa-Rada
10:20-10:40		
10:40-11:00		
S9 9:00-11:00	**Family networks and personal networks through the life-course: Focus on relational processes** *Vera de Bel, Marlène Sapin and Eric Widmer (chair)* **Room: Lungomare Caracciolo**	
9:00-9:20	No Evidence for Structural Balance in the Family	Jonas Stein, Jornt Mandemakers and Arnout van de Rijt
9:20-9:40	Typologies of Duocentered Networks among Low-Income Newlywed Couples and Associations with Relationship Quality	David Kennedy, Benjamin Karney and Thomas Bradbury
9:40-10:00	Personal networks in various family formation stages: evidences on the role of family practices	Vida Cesnuityte and Eric D. Widmer
10:00-10:20	Population-scale social network analysis	Frank Takes
10:20-10:40	"Fault lines" in the family network: Contact and substitution between children, parents, and paternal and maternal grandparents in divorced and non-divorced families	Vera de Bel, Gina Potarca and Marijtje van Duijn
10:40-11:00		
S9 9:00-11:00	**Collaboration networks** *Maria Prosperina Vitale, Giuseppe Giordano and Giancarlo Ragozini (chair)* **Room: Maschio Angioino**	
9:00-9:20	Peer recognition and publishing strategies of Russian sociologists	Angelika Tsivinskaya
9:20-9:40	The co-authorship network of Italian academic statisticians: new evidences?	Silvia Bacci, Bruno Bertaccini and Alessandra Petrucci

9:40-10:00	Do R&D diversification policies change the cognitive structure of knowledge networks? Evidence from France using a meso-structural approach	Delio Lucena
10:00-10:20	Citizenship Regimes: Dynamics of Scientific Polarisation or Consensus in the Field	Lukáš Lehotský, Eva Fernández G. G. and Manlio Cinalli
10:20-10:40	An Agent-Based Model to Investigate the Impact of Responsible Research and Innovation on Collaborative Innovation Networks	Enrico Cozzoni, Carmine Passavanti, Cristina Ponsiglione, Simonetta Primario and Pierluigi Rippa
10:40-11:00	The Effects of Network Position in Open Innovation Communities	Bruce Cronin, Mu Yang and Chunjia Han
S9 9:00-11:00	**Organizational networks** *Spyros Angelopoulos, Paola Zappa, Francesca Pallotti (chair) and Emmanuel Lazega* **Room: Piazza del Plebiscito**	
9:00-9:20	Concept, implementation and first results of a social network analysis to support cross-company workplace health management	Gabriele Fohr, Bert Droste-Franke, Carina Hoffmann and Andrea Schaller
9:20-9:40	Who steps up after a merger? The effects of boundary-spanning on post-merger taking charge behavior	Stefan Breet, Lotte Glaser and Justin Jansen
9:40-10:00	Organizational change and social network resilience among scientists over 20 years: A multilevel approach	Emmanuel Lazega, Avner Bar-Hen, Béatrice Milard and Antoine Descoubet
10:00-10:20	Establishing publication profiles of Russian universities: bipartite institution/journal network co-clustering approach	Angelika Tsivinskaya
10:20-10:40		
10:40-11:00		
S9 9:00-11:00	**Territorial studies from a social network analysis perspective** *Ilaria Marotta (chair), Anna Maria Zaccaria, Mariacamilla Fraudatario and Riccardo Zaccaria* **Room: Teatro San Carlo**	
9:00-9:20	When spatial dimension matters: comparing personal network characteristics in different segregated areas	Éva Huszti, Fruzsina Albert, Adrienne Csizmady, Ilona Nagy and Beáta Dávid
9:20-9:40	The network of the cultural and creative system in the City of Cagliari	Antonello Podda, Marco Zurru and Clementina Casula
9:40-10:00	The process of setting up local development networks. Evidence from the National Strategy for Inner Areas (SNAI) in southern Italy	Carlo De Rose and Antonio Samà
10:00-10:20	Social network approach to the analysis of urban segregation	Tamara Shcheglova
10:20-10:40	Embracing Serendipity in Times of Disruption: Simulation of A Place Prosperity Agenda to chart Practical Improvement in Slum community	Aisha Abubakar
10:40-11:00	Analysing foreign entrepreneurship in urban contexts. Ego-network of support in setting up enterprise	Maria Camilla Fraudatario and Anna Maria Zaccaria
11:00-11:30	*Virtual Break*	
11:30-12:30	**Keynote Session** *Chair: Dimitris Christopoulos* **Room: Palazzo Reale**	
11:30-12:30	Networks in the digital organization	Paola Tubaro
12:30-13:30	*Virtual Lunch Break*	

S10 13:30-15:30	**REDES panel: promoting collaboration and new studies in the community** *Francisca Ortiz (chair), Isidro Maya-Jariego and José Luis Molina* **Room: Castel dell'Ovo**	
13:30-13:50	Cuando los abuelos no pueden: Estrategias de conciliación y redes de apoyo de cuidados de menores durante la pandemia de Covid-19	Livia García-Faroldi
13:50-14:10	Bank substitutability and financial network resilience: insights from the first globalization	Olivier Accominotti, Delio Lucena and Stefano Ugolini
14:10-14:30	The future of personal networks: notes for a research agenda	Isidro Maya-Jariego, Deniza Alieva, Romina Cachia, Elena González-Tinoco, Sergio Granados-Chahín, Daniel Holgado, Esperanza Márquez, Andrés Muñoz-Alvis and Francisco J. Santolaya
14:30-14:50	Women characters on Pixar animation movies over time: A research using a mixed method approach for SNA	Francisca Ortiz and Pete Jones
14:50-15:10	The conditioning of social networking sites in the formation of migratory chains of young unaccompanied minors	Joaquín Castillo de Mesa, Paula Méndez Domínguez, Luis Gómez Jacinto and Antonio López Peláez
15:10-15:30	The academic inclusion of students with Special Educational Needs in Chile: Integrating two SNA approaches	Rosario Escribano, Diego Palacios, Lorena Ortega, Ernesto Treviño and Cristóbal Villalobos
S10 13:30-15:30	**Modeling network dynamics** *Per Block, Robert Hellpap, Nynke Niezink (chair), Tom Snijders and Christoph Stadtfeld* **Room: Duomo**	
13:30-13:50	Descriptive questions and Statistical Network Models	Tom Snijders
13:50-14:10	Regime Switching in Dynamic Network Actor Models	Alvaro Uzaheta, Viviana Amati and Christoph Stadtfeld
14:10-14:30	Change Point Detection in Relational Event Models	Mahdi Shafiee Kamalabad, Roger Th A.J. Leenders and Joris Mulder
14:30-14:50	Extraversion, Neuroticism, and the Evolution of Friendship and Conflict Networks	Evgenia Dolgova, Ajay Mehra and Olga Kornienko
14:50-15:10	On the analysis of a sample of exponential random graph model estimates	Jan-Willem Simons and Marijtje van Duijn
15:10-15:30		
S10 13:30-15:30	**Value co-creation in networks** *Marcella De Martino, Alfonso Morvillo and Fevzi Okumus (chair)* **Room: Lungomare Caracciolo**	
13:30-13:50	Collaborations and social networks for the adaptive reuse of religious cultural heritage: the case of the oratories in the historic center of Naples	Marcella De Martino, Valentina Apicerni, Stefania Oppido, Stefania Ragozino, Lusia Fatigati, Rosa Maria Giusto, Giuseppe Giordano, Alfonso Morvillo and Fevzi Okumus
13:50-14:10	Redistribution of advertising revenue between news websites and social media platforms	Luca Sandrini and Robert Somogyi
14:10-14:30	Collaborative networks for innovation and resilience of cultural destinations: the case of the Venice hospitality system	Anna Moretti and Veronica Leoni
14:30-14:50	A dynamic perspective on destination governance success: The case of an emerging network in the Dolomites	Maria Martini Barzolai
14:50-15:10	Travel bloggers and multi-actor engagement in social media platform for collaborative network management: a model of value co-creation	Letizia Lo Presti and Giulio Maggiore
15:10-15:30	Start-ups and incubators: a two-mode network of Italian emerging firms	Lucio Palazzo, Domenico Boris Salvati, Francesco Santelli and Riccardo Ievoli

S10 13:30-15:30	**Collaboration networks** *Maria Prosperina Vitale (chair), Giuseppe Giordano and Giancarlo Ragozini* **Room: Maschio Angioino**	
13:30-13:50	The collaborative efforts of survivors and newcomers in the Ukrainian Parliament: tracing the legislative network	Tetiana Kostiuchenko and Alina Samoylenko
13:50-14:10	Is collaboration a luxury? Interorganisational collaboration approach within the Higher Education	Anna Piazza, Srinidhi Vasudevan and Madeline Carr
14:10-14:30	The Biomes of the Innovation Ecosystem: an analysis of co-authorship in the scientific production of Web of Science and Scopus	Cristiane Ferreira de Souza Araújo, Paulo Vanderlei Cassanego Júnior and Carla Schwengber ten Caten
14:30-14:50	Reviewing energy justice literature: A co-authorship network analysis	Yutong Si
14:50-15:10	Detecting communities in agricultural innovation networks	Juan S. Jimenez-Carrasco, Roberto Rendon-Medel, Julio Diaz-Jose and J.Reyes Altamirano-Cardenas
15:10-15:30		
S10 13:30-15:30	**Organizational networks** *Spyros Angelopoulos, Paola Zappa (chair), Francesca Pallotti and Emmanuel Lazega* **Room: Piazza del Plebiscito**	
13:30-13:50	Interrogating the Organizational Complexity of Digital Transformation Through a Multi-Level Network Perspective	Mylène Struijk, Spyros Angelopoulos and Carol Ou
13:50-14:10	“How do I do it?” Working Across Boundaries in Social Work Interorganisational Practice	Antonio Sama and Francesca Falcone
14:10-14:30	Technological Trajectories and Organizational Change: The Case of the Textile Industry	Jakob Hoffmann and Johannes Glückler
14:30-14:50	Research project on the evolution and affiliation to multipartner alliances in the airline industry	Marco Castiglioni and Jennifer Medina-Zamora
14:50-15:10		
15:10-15:30		
S10 13:30-15:30	**Territorial studies from a social network analysis perspective** *Ilaria Marotta, Anna Maria Zaccaria, Mariacamilla Fraudatario and Riccardo Zaccaria (chair)* **Room: Teatro San Carlo**	
13:30-13:50	Does the Social Network Analysis recognize the development in a territory?	Vincenzo Mini
13:50-14:10	Horizontal governance networks of poverty: the case of Milan and Turin	Marco Ferracci, Germana Scepi, Maria Spano and Michelangelo Misuraca
14:10-14:30	Predictive Analytics in Urban Studies: Indices of Social Stress and Well-Being	Maria Pilgun
14:30-14:50	Decentering the center-periphery approach to the global art field	Julia Perczel and Balazs Vedres
14:50-15:10	Complementary ties and different meanings in interregional co-patenting and co-publishing	Lin Zou and Robert Panitz
15:10-15:30	Relational assessment of urban landscape. The case study of Bogotá Centre	Dolly Cristina Palacio Tamayo and Amparo De Urbina Gonzalez
15:30-16:00	*Virtual Break*	
S11 16:00-17:00	**REDES panel: promoting collaboration and new studies in the community** *Francisca Ortiz (chair), Isidro Maya-Jariego and José Luis Molina* **Room: Castel dell'Ovo**	
16:00-16:20	Redes comunitarias del agua en bordes urbano-rurales. El caso de Bogotá	Dolly Cristina Palacio Tamayo and Rafael Germán Hurtado Heredia
16:20-16:40	Siempre conectados: interacciones y formas de inclusión social y digital de los jóvenes en el contexto del confinamiento por la pandemia de COVID-19	Alejandro García-Macías, Paulina Guzmán and Ana Laura Flores

16:40-17:00	Redes personales de apoyo social en cuidadores de personas con demencia durante la pandemia por Covid-19: un proyecto con EgoWeb	Rosario Fernández, Abraham Delgado Diego, Aroa Delgado Uría, Alejandro García-Macías, Carmen Ortego-Maté and Carmen Sarabia-Cobo
S11 16:00-17:00	**Statistical analysis and synthesis of ego-networks: methods and applications** *Domenico De Stefano (chair) and Susanna Zaccarin* **Room: Duomo**	
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16:20-16:40	The social support of older adults during the first wave of coronavirus epidemic in Slovenia	Marjan Cugmas, Anuška Ferligoj, Tina Kogovšek and Zenel Batagelj
16:40-17:00	Analyzing ego networks through a hierarchical clustering approach for mixed data	Elvira Pelle and Roberta Pappadà
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S11 *16:00-17:00*	**Organizational networks** *Spyros Angelopoulos (chair), Paola Zappa, Francesca Pallotti and Emmanuel Lazega* **Room: Piazza del Plebiscito**	
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S13 18:30-19:00	**Award Ceremony and Virtual Farewell** **Room: Palazzo Reale**	

CONTENTS

Networks in the digital organization

Paola Tubaro

Abstract

A rich tradition of organizational network studies has molded our understanding of how social ties and structures drive collective action and shape its outcomes. However, contemporary computing technologies breed novel sociabilities and organizational forms that disrupt established practices and knowledge. In particular, the emergence of digital platforms as market intermediaries loosens individual-organization links, fragments production processes, individualizes sub-contracting, extends competition beyond the local level, and threatens jobs with AI-fueled automation. In these environments where isolation dominates and collaboration fades, how do social networks operate, if at all? And how can we, as researchers, apprehend them? In this talk, I discuss how digital platforms, and the transformations of labor they trigger, challenge some of the key tenets of organizational network analysis. Yet there is still much to learn from this tradition, and the (currently very limited) overlaps with the nascent literature on platforms reveal facets that neither of them, alone, could capture. This analysis also confirms that overall, technology-enabled platform intermediation restrains sociability and limits interactions, but specific cases where networking has been possible highlight the fundamental advantages it brings to workers. On this basis, I outline directions for future research and policy action.

Does the pandemic help us to understand social networks and social capital? A probing

Beate Volker

Abstract

It is no surprise that the pandemic influenced our personal networks and relationships. Importantly, the lockdowns made it difficult to maintain weaker ties, let alone to start new relationships. So far, however, how networks changed and how they helped us to cope with this crisis is not completely clear. In this talk, I compare networks of younger (<35 years of age) and older people (65+ years of age) gathered at three points in time, i.e., before the corona pandemic in May 2019, during the first lockdown in the Netherlands in May 2020, and during the start of the vaccinations in May 2021, when many measures to combat the virus still applied. I inquire into network changes on the level of aggregated networks and on the alter level and ask who is not mentioned anymore in the second (third) interview as well as whether certain alters are mentioned again in the last measurement, while skipped in the second one. Findings are compared with network dynamics in 'normal' times, and I draw some conclusions on what the crisis might teach us on network functioning and on the value of social resources.

Extended Stochastic Block Models with Application to Criminal Networks

Daniele Durante, Sirio Legramanti, Tommaso Rigon and David Dunson

Abstract

Reliably learning group structures among nodes in network data is challenging in modern applications. This talk aims at presenting the contribution in the article "Legramanti, S., Rigon, T., Durante, D., & Dunson, D.B. (2021). Extended Stochastic Block Models with Application to Criminal Networks. arXiv preprint arXiv:2007.08569" which is motivated by covert networks encoding relationships among criminals, possibly varying with time or different types of interactions. These data are subject to measurement errors and exhibit a complex combination of an unknown number of core-periphery, assortative and disassortative structures that may unveil the internal architecture of the criminal organization. The coexistence of such noisy block structures limits the reliability of community detection algorithms routinely applied to criminal networks, and requires extensions of model-based solutions to realistically characterize the node partition process, incorporate information from node attributes, and provide improved strategies for estimation, uncertainty quantification, model selection and prediction. To address these goals Legramanti et al. (2021) develop a novel class of extended stochastic block models (ESBM) that infer groups of nodes having common connectivity patterns via Gibbs-type priors on the partition process. This choice encompasses several realistic priors for criminal networks, covering solutions with fixed, random and infinite number of possible groups, and facilitates inclusion of node attributes in a principled manner. Among the new alternatives in this class, the main focus will be on the Gnedin process as a realistic prior that allows the number of groups to be finite, random and subject to a reinforcement process coherent with the modular structures in organized crime. A collapsed Gibbs sampler is proposed for the whole ESBM class, and refined strategies for estimation, prediction, uncertainty quantification and model selection are outlined. ESBM performance is illustrated in realistic simulations and in an application to Italian Mafia networks, where ESBM learns key block patterns revealing a complex hierarchical structure of the organization, mostly hidden from state-of-the-art alternative solutions. Extensions to populations of networks encoding different types of interactions among criminals will be also discussed.

Keywords

Stochastic Block Model, Bayesian Nonparametrics, Product Partition Model, Gibbs-Type Prior, Criminal Network

Prediction Sets for Labelled and Unlabelled Networks using Conformal Prediction

Anna Calissano, Matteo Fontana, Gianluca Zeni and Simone Vantini

Abstract

Statistical analysis of labelled and unlabelled graphs has been an interesting and popular research topic over the past years. However, few works have been focused on the definition of prediction sets for these type of complex data. During the talk, we will define a forecasting method for both labelled and unlabelled graphs based on Conformal Prediction, able to identify interpretable prediction regions in the shape of parallelotopes. The method is model-free, it achieves finite-sample validity, and it is computationally efficient. To explore the features of this novel forecasting technique, a simulation studies and a real-world example regarding human mobility during Covid-19 are presented.

Keywords

Population Of Networks, Prediction Sets, Conformal Prediction, Network Prediction

Global and local inference for network-valued data

Ilenia Lovato, Alessia Pini, Aymeric Stamm and Simone Vantini

Abstract

Networks have become a tool of choice for modelling interactions between entities and are now widely used in a variety of scientific fields such as transportation, mobility sharing, social sciences, neurosciences. While its original intended use was to provide a clear picture of the interactions between a set of entities using a single network, a step further is to analyse changes in this network over time, or a population of networks representing different individuals, etc.

In this talk, we tackle the problem of two-sample testing for network-valued data. We have had numerous collaborations with a large spectrum of applied fields in which colleagues were left unsatisfied with the simple answer that there is a difference between two groups. In effect, they would then systematically ask what is causing these differences. We therefore propose two solutions for network-valued data: (i) a first global approach which answers whether the two samples come from the same underlying probability distribution and (ii) a local approach which aims at localising the differences within the network structure.

The proposed framework takes two samples of networks, (ii) transforms them in a user-chosen matrix representation, (iii) evaluates their vicinity with a user-chosen distance, (iv) assesses the plausibility of a null hypothesis with a user-chosen test statistic and (v) approximates the null distribution of that test statistic using permutations. This pipeline gives the user a lot of flexibility as (s)he can choose among already implemented matrix representations, distances and test statistics or can even use his/her own implementations of any of these ingredients and seamlessly make them interact well with our framework.

The key feature is the use of the theory of permutations to approximate the null distribution of the test statistics that are used. In effect, it is hard to make any distributional assumption on spaces of networks and even harder to assess the validity of such assumptions. Moreover, sample sizes can be rather small in some cases such as neurosciences (e.g. studies of rare neurodegenerative diseases). Permutation testing alleviates both of these problems by providing testing procedures that are finite-sample exact and only require exchangeability of data under the null hypothesis.

The localisation of differences in the network structure requires that all sampled networks have the same nodes and that an initial partition of the network nodes is provided (usually using field expertise). A strong control of the family-wise error rate is subsequently guaranteed on the elements of this partition and between any two elements, by close-testing the entire sigma-algebra generated by the partition. We illustrate the local approach using electroencephalography data with which we were able to demonstrate unprecedented ability to differentiate children with non-syndromic autism from children with both autism and tuberous sclerosis complex.

The proposed framework is fully implemented in the R package nevada (https://astamm.github.io/nevada/). We will detail to some extent how the package is structured and how the user can easily plug in his/her own representations, distances and/or test statistics.

Keywords

Network-Valued Data, Two-Sample Test, Permutation Test, Family-Wise Error Rate, Multiple Comparisons, R Package Nevada, Neuroscience

The network structure of cultural distances

Luca De Benedictis, Roberto Rondinelli and Veronica Vinciotti

Abstract

Making use of the information from the World Value Survey (Wave 6), and operationalizing a definition of national culture that encompasses both the relevance of specific cultural traits and the interdependence among them, we propose a methodology to reveal the latent structure of a national culture and to measure a cultural distance between countries that takes into account the network structure of national cultural traits. Exploiting the possibilities offered by Copula graphical models for ordinal data, our approach infers for each of the 54 countries considered in the World Values Survey (Wave 6), the structure of their cultural networks and proposes a new summary measure of national cultural distances combining the information coming from the inferred cultural networks and the cultural traits distributions. The new network index of cultural distance shows that, compared to the methodology used by Ronald Inglehart and Christian Welzel in their cultural map, the world appears to be more culturally heterogeneous than what it was previously measured.

Keywords

Cultural Networks, Graphical Modelling, Cultural Distance

Like Father, Like Son. Influential actors in the lineage network of coaches in Australian Rules Football

Gordana Marmulla, Hagen Wäsche, Geoff Dickson and Ulrik Brandes

Abstract

In the Australian Football League (AFL), not even three percent of all elite players later become coaches, but 95% of all AFL coaches have a history as a professional athlete. The proposition that a coach is influenced by his own coaches while a player yields a temporal influence network. We aim to identify the most influential coaches in AFL history by assuming a novel process of influence diffusion on this network.

The proposed process establishes influence relationships between actors through two antagonistic forces: the susceptibility to be influenced (while a player), and liberating oneself from prior influence of others through own experiences (as a coach). On the macro-level, the two components are controlled by global parameters. On the micro-level, the former is adjusted for exposure time and the latter for individual rates that depend indirectly on success in the AFL. At any point in time, the process assigns to each node a distribution of accumulated influence from other nodes. The mechanism for influence propagation iteratively updates the influence distributions a node is exposed to during direct interactions. This entails that, in an interaction, a player is influenced directly by his current coach, as well as indirectly by all of that coach's sources of influence. In this way, indirect and time-respecting traces of influence are accumulated.

We apply the proposed process to data from the history of the AFL, spanning more than a century, and obtain a hypothetical network of influence relationships taking into account all lineages of coaches as a base for identifying the most influential coaches in AFL history. Names are revealed in the presentation.

Keywords

Social Influence, Temporal Networks, Methods, Sports

Process-driven network analysis of passing in professional football

Carolina Mattsson and Frank Takes

Abstract

In many areas of applied network science, researchers are interested in studying the outcomes of particular networked processes: the spread of disease, the development of consensus, the movement of people, etc. When this is the case, domain-specific research questions often center around the process rather than the network it is unfolding over Bockholt and Zweig (2020). Here we apply a process-driven network analysis to passing play in professional association football.

We consider recent datasets of spatio-temporal match events from seven professional football competitions collected by Wyscout and published in Pappalardo et al. (2019). This data includes all games played as a part of five first-tier domestic leagues (in 2017-18) and two international competitions (in 2016 & 2018). Records describe standard actions players take to progress the ball during play, e.g. "Pass", "Shot", and "Free Kick". Each record contains information on the player, period, elapsed time within period, event type, event sub-type, position on the field, and outcome of an in-game action. We interpret each match event as a step in a walk process over some unseen network.

Under this interpretation we trace the ball over consecutive steps to generate trajectories, which are particularly interpretable in this context. Since at least the 1960s, researchers in sports science have studied "possessions" in association football; these are passing sequences with particular criteria for delineating how they begin and end Reep et al. (1968). We adapt the definition laid out in Hughes and Franks (2005) to trace out trajectories and produce a dataset of possessions from the 2018 FIFA World Cup that is directly comparable to theirs from the 1990 and 1994 FIFA World Cups. Our systematic trajectory extraction reproduces their findings that over 80% of goals were made from "short" possessions with three or fewer completed passes, and that longer passing sequences produced proportionately more shots.

Moreover, it is possible to find the Markov order of a real-world walk process from trajectory data (Scholtes, 2017). In the context of association football, "second-order" passing processes correspond to complex multi-player dynamics where the next pass reliably depends both on who has the ball and from whom that player received the ball. We find that only a select group of very successful professional club football teams played with consistent second-order passing dynamics in the 2017-18 season. This includes the four top-ranked teams in England's Premier League, the six top-ranked teams in Italy's Serie A, as well as the champions of the Spanish La Liga, the German Bundesliga, and the French Ligue 1.

Keywords

Association Football, Process-Driven Network Analysis, Walk Processes On Networks, Trajectory Extraction, Higher-Order Networks

Spatio-temporal Network Analysis of Formation Characteristics in Soccer

Ulrik Brandes, Robin Chan and M. Eren Akbiyik

Abstract

We present a novel approach to construct and analyze spatio-temporal networks from tracking data in association football (soccer).

A vast array of network representations are used to analyze players, teams, and organizations. Match, event, and market data give rise to networks representing match outcomes, team composition, passing, transfers, and more. The increasing availability of high-resolution tracking data opens up additional possibilities including analyses such as pitch control and formation analysis.

Our goal here is to characterize the way teams interpret and vary formations through the lens of what Buldú et al. (Analytics in Sports Tomorrow, 2020) refer to as proximity networks. We introduce two novel methods to construct proximity networks using Delaunay triangulations of player positions, one respecting player identity and the other based on roles. Novel indicators of the evolution and geometry of these configurations are then used to characterize playing styles. Using data from European professional soccer matches, we highlight substantial differences in the way teams act out what would commonly be classified as the same formations.

Keywords

Spatio-Temporal Networks, Network Methods, Sports, Tracking Data

The use of passing network indicators to predict football outcomes

Lucio Palazzo, Riccardo Ievoli and Giancarlo Ragozini

Abstract

Summary statistics for football matches, such as ball possession and percentage of completed passes, are not always satisfyingly informative about team strategies seen on the pitch. Passing networks and their structural features can be used to evaluate the style of play in terms of passing behavior, analyzing and quantifying interactions among players. The aim of this work is to show how information retrieved from passing networks can have a relevant impact on the match outcome.

We directly compute and discuss network properties, such as centralization, clustering and cliques, from a football perspective. Then, we model the probability of winning the game through four competitive machine learning models including network-based indicators as explanatory variables with a set of in-field variables. The real dataset for application includes 96 matches in the Group Stage of the 2016–2017 UEFA Champions League, involving the 32 best European teams.

Results show how some network-based variables, such as diameter and betweenness centralization, can be related to the level of offensive actions and finalizations for a team. Furthermore, we show that such variables help improve all considered models in terms of explanatory power, compared to those presenting only in-field regressors. Among the presented models, binomial logistic regression shows the best results according to a set of performance indicators.

Keywords

Passing Networks, Football Outcomes, Predictive Models, Probability Of Winning

Assessing the impact of social movements on environmental policy change with social network analysis methodology

Anna Sokol, Valentina Kuskova and Dmitry Zaytsev

Abstract

Recently there has been a growing interest in the effects of social movements, especially with respect to environmental movement (Coglianese 2001; Dunlap and Mertig 2014; Mertig and Dunlap 2001; Spaargaren and Mol 1992). Many studies point to a lack of research of influence that social movements have on policy change (Burstein et al. 1995; Della Porta and Diani 2020), though it is an important point in the topic.

Political scientists try to answer the questions: "When and how do activists achieve their goals? Is protest a necessary and/or sufficient condition for producing policy change? Do social movements have any long-term legacies on our societies? Do they change the life choices of those participating in protest activities? How does all this vary both across contexts and across different movements?" (Bosi et al. 2016 p.3)

In this study we build a cross-national, longitudinal assessment of factors and actors that influence environmental policy change. Environmental social movements are only one of the possible actors and factors in this research. Environmental policy changes are measured both as policy outcomes (improvement of environmental qualities) and policy outputs (development of international cooperation, commitment, and concern about environmental problems). We use social influence network analysis model combined with structural equations modeling to test the hypotheses about environmental social movements impact in policy change.

Keywords

Social Networks, Policy Network, Environmentalism, Policy Outcomes

Towards a synthetic theory of policy efficiency: application of network analysis to the science, technology and innovation policy efficiency studies

Gregory Khvatsky, Anna Sokol, Dmitry Zaytsev and Valentina Kuskova

Abstract

There are many views on policy efficiency in social science. Some studies focus on the concept of goal attainment, while others focus on the ways policies adapt to changing social environment and interact with each other and the outside world (Bali, Capano, and Ramesh 2019; Stepp et al. 2009). Yet policies and their effects on society are complex social phenomena that cannot be measured with a single indicator without undue oversimplification. Why do people think that optimizing expenditures on education makes the educational outcome worse? Why do people still argue that Stalin and Hitler were efficient rules and managers? It all comes down to the definition of efficiency.

To fully understand the complexity behind the concept of policy efficiency we must, therefore, develop and empirically verify a synthetic theory of policy efficiency that will take into account the multitude of dimensions and possible understandings of the concept. By combining an extensive review of existing literature on policy efficiency assessment with a computational analysis of a large corpus of texts collected from both the new and old media sources, this study presents a comprehensive overview of the existing approaches to policy efficiency measurement together with an attempt of their empirical verification. We will use social network analysis (SNA) to test contemporary theories of policy efficiency and provide methodology useful both in academia and business.

The empirical focus of this study is the Science, Technology and Innovation (STI) policy of the Russian Federation. While remaining relatively politically neutral, the STI policy still is a controversial topic both in the public sphere and in academia (Klochikhin 2012). This makes the STI policy the perfect candidate for this study, as it is easy to collect a large amount of information on it including a wide gamut of expert opinions on it.

By combining both the theoretical work and empirical study, the presented work attempts to answer the questions in the realm of political science. What constitutes policy efficiency? Why are some policies efficient and others are not? How can we design efficient policies?

Keywords

Social Network Analysis, Policy Networks, Policy Analysis, Text Networks, Topic Modeling

Theoretical and Methodological Approaches to Assessing the Influence of Experts on Decision-Making in Education

Rustam Kamalov, Valentina Kuskova and Dmitry Zaytsev

Abstract

The problem of studying the power and influence of social actors is an important issue in modern sociology of power and political sociology. Despite the fact that there is a lot of sociological literature on this topic, the question of the methodology for assessing the influence of collective actors on different social spheres of modern society remains unresolved.

This work is devoted to the study of the phenomenon of social influence of such a poorly studied social group in modern sociology as experts using modern methods of collecting and analyzing data based on the existing theory of power and methods of its measurement.

Keywords

Social Network Analysis, Policy Efficiency, Impact Studies

Mapping specialisations in the international trade of automotive components and parts: a multilayer network analysis

Margherita Russo, Fabrizio Alboni, Jorge Carreto Sanginés, Manlio De Domenico, Giuseppe Mangioni, Simone Righi and Annamaria Simonazzi

Abstract

After 25 years of the North America Trade Agreement (NAFTA), in 2018, the United States request-ed new rules to increase, among other requirements, the regional content production for automotive components and parts traded with the three partner countries, United States, Canada and Mexico. Being signed by the three countries, the new trade agreement, USMCA, will be enforced by 2022. Nonetheless, after the USA Presidential election, this new treaty's future is under discussion, and its impact on the au-tomotive industry is not entirely defined. Another significant shift in this industry – the accelerated rise of electric vehicles – occurred in 2020: while the COVID-19 pandemic was largely stopping most plants in the automotive value chain all over the world, at the reopening, the scenario seems to turn away from internal combustion engine vehicles, at least in the announcements and in some large investments, planned in Europe, Asia and the USA.

The definition of the pre-pandemic situation can prove to be an indispensable starting point for the analysis of the possible of many co-occurring changes. The paper analyses the trade networks emerging in the past 25 years. In the economic literature on international trade, the study of the automotive global value chains has been addressed by using network analysis, focusing on centrality of geographical re-gions and countries while largely overlooking the contribution of countries' bilateral trades of components and parts in structuring the subnetwork of countries and their specific trades.

This paper focuses on such subnetworks as meso level structures emerging in the world trade net-work over the last 25 years. Using the Infomap multilayer algorithm of clustering, we identify clusters of countries and their specific trades in the automotive international trade network. We highlight the relative importance of such clusters, of the interconnections between them, and to analyse the contribution of countries and of components and parts in determining the clusters. We draw the data from the UN Comtrade database of directed export and import flows of 30 automotive components and parts among 42 countries (accounting for 98% of world trade flows of those items).

With respect to the past 25 years, the paper highlights denser and more hierarchical network gener-ated by Germany's trade relations within EU countries and by the US preferential trade agreements with Canada and Mexico, in the overall scenario of upsurge of China in the international trade. With a similar overall variety of traded components and parts within the main clusters (dominated respectively by Germany, USA and Japan-China), the Infomap multilayer analysis singles out which components and parts determined the relative positions of countries in the various clusters and the changes over time in the relative positions of countries and their specialisations in multilateral trades. Connections between clusters increase over time, while the relative importance of the main clusters and of some individual countries significantly change. The focus on USA and Mexico and on Germany and Central Eastern Eu-ropean countries (Czech Republic, Hungary, Poland, Slovakia) will drive the comparative analysis.

Keywords

Infomap Multilayer Analysis, International Trade, Automotive Components, Dynamics Of Change

Multiplexity Analysis of Networks using Multigraph Representations

Termeh Shafie and David Schoch

Abstract

Multivariate networks comprising several compositional and structural variables can be represented as multigraphs by various forms of aggregations based on vertex attributes. We propose a framework to perform exploratory and confirmatory multiplexity analysis of aggregated multigraphs in order to find relevant associations between vertex and edge attributes. The exploration is performed by comparing the frequencies of the different edges within and between aggregated vertex categories, while the confirmatory analysis is performed using derived complexity or multiplexity statistics under different random multigraph models. These statistics are defined by the distribution of edge multiplicities and provide information on the covariation and dependencies of different edges given vertex attributes. The presented approach highlights the need to further analyse and model structural dependencies with respect to edge entrainment. We illustrate the approach by applying it on a well known multivariate network dataset which has previously been analysed in the context of multiplexity.

Keywords

Random Multigraphs, Edge Multiplicity, Complexity, Multivariate Networks, Data Aggregation

Multilayer Network-based Approach for the Analysis of Media Data: an Application on LexisNexis News Database

Carla Galluccio and Alessandra Petrucci

Abstract

In the last decades, there has been a great scientific and cultural transformation, where information has taken on an epistemological value, becoming at the same time the main substance and key to understanding the world. In this context, data play a fundamental role, and consequently the process of extracting knowledge from them. More specifically, in this work we focused on a particular type of data, namely the news. The possibility of collecting and analysing a large amount of data in "news databases" provides a huge contribution to the study of social trends in time. Indeed, news media data can be employed to inquire into the transmission and perception of events with respect to which the attention and sensitivity of public opinion have increased, also as a consequence of the COVID-19 sanitary emergency. Herein, we focused on the social phenomenon of educational inequality. Educational inequality can be defined as intergroup disparities regarding the opportunities for academic achievement. These disparities can concern a variety of educational factors, such as resources, treatment, access, and/or results. In order to study how the journal narratives on educational inequality have changed in Italy over the last year, we carried out a study on four of the most important Italian journals included in the LexisNexis news database, an online platform that collects European and worldwide newspaper articles regarding different fields. More specifically, we focused on news about educational inequality published in Italy from September 2019 to May 2020, namely before and during the first wave of the COVID-19 pandemic (started in Italy at the end of February 2020). Our aim was to investigate how and how much the government's protective measures have affected educational inequality, for example introducing distance learning. In order to do this, we exploited network analysis and text mining methods to extract information from this unstructured textual data so as to examine and infer the structure of semantic relationships regarding this topic. In particular, the analysis is made up of three steps. Firstly, we extracted news about educational inequality from the Italian journals filtering news headlines through selected keywords; then, we pre-processed news body text by means of text mining methods. In the second step of our analysis, we obtained a multilayer network in which the layers are represented by different journals, the nodes are the words, and the links are given by the semantic relationship between them. Finally, we used factorial methods in order to statistically analyse and visually explore the gained multilayer network. In particular, we were interested in quantifying layer similarities and visually exploring the similarity of both network and node structures in every single layer and across layers.

Keywords

Multilayer Network Analysis, Text Mining, Educational Inequality, Lexisnexis Database, COVID-19

The media discourse about Female Genital Mutilation (FGM) as an example of niche building patterns in complex networks

Tanja Preböck and Alexander Brand

Abstract

Previous studies unveiled evidence of a complex relation of customs, regional authorities and institutions influencing the decision process whether girls are mutilated (Wilson 2017). Inferring the agents and topics that matter is a crucial aspect to understand actions which impact the lives of millions of women worldwide. Our contribution aims to identify patterns of the interplay and the structure between persons, organizations, and locations in the media representation of FGM to take the mutual referencing of such into account. Therefore, we analyse entity relations in newspapers available via LexisNexis. Methodologically, we conduct a data gathering approach consisting of three steps. First, we collected 1930 articles accessible via LexisNexis about FGM. Afterwards, we used Named-entity Recognition and qualitative coding to extract actors, places, and organizations. Ultimately, we built an entity co-occurrence network from these articles. Following this procedure, we ended with a network consisting of 660 entities and 34036 edges. We applied Stochastic Blockmodeling with Agglomerative Collapsing (Peixoto 2014) to identify which entities are structurally related and which factors are associated with group compositions.

Our findings show a disintegrated field with high heterogeneity. As our analysis points out, there is not one general discourse about the topic, but rather 15 subdiscourses with varying levels of geographical units (International, UK, West Africa) and embeddedment of non- governmental actors. Groups with local African or Indian actors are rather excluded from co-occurrences with global big players or a subordinated part of strong hierarchical structures. Consistent with previous qualitative studies, these findings back our assumptions on the complexity of the interplay between various actors on different levels. We conclude, therefore, that the Media Discourse about FGM is strongly separated between different spheres and authorities with Western / European Politicians, Activists and Organisations taking a lead and local authorities having to collaborate on unequal terms to gain attention.

Keywords

Named-Entity Recognition, Textual Data Analysis, Cluster Analysis, FGM/C

Using semantic importance analysis to evaluate energy storage awareness and acceptance

Andrea Fronzetti Colladon, Anna Laura Pisello, Ludovica Segneri and Claudia Fabiani

Abstract

The global population is facing important socio-political, economic and environmental challenges, also due to a variety of natural and anthropogenic actions. People act as a consequence of the information they are exposed to, including information from the news – concerning, for instance, climate change, global warming and technological innovation. This is particularly relevant for building occupants and designers, when it regards thermal energy storage, which represents a key evolution impacting all energy systems.

The Internet and the availability of online high-quality data sources present a real opportunity to understand how people are being made aware of new energy solutions and their advantages for environmental sustainability and energy conservation. In this scenario, analyzing online news, social media platforms like Twitter, or search volume data (like Google Trends) becomes particularly relevant. In this study, we focus on online news analysis, following an approach that can help understand people's behavior and plan future actions.

We use a composite index of semantic importance, known as the Semantic Brand Score (SBS), to evaluate the relevance of energy-related topics (ERTs), with a focus on storage solutions. In particular, we combinine methods and tools of Text Mining and Social Network Analysis, and refer to the SBS dimensions of prevalence, diversity, and connectivity. Prevalence identifies the frequency of appearance of ERTs in a discourse, as a proxy for their awareness. Diversity measures the heterogeneity and uniqueness of the words that are frequently co-mentioned with ERTs. It can be considered as the richness of their image. Connectivity expresses the brokerage power of ERTs, i.e. their ability to link different discourse themes. Combining these three dimensions leads to the measure of semantic importance, i.e. the SBS.

We use the SBS theoretical framework to investigate societal awareness about ERTs – with a specific focus on thermal energy storage, to identify its key drivers, for a better exploitation of new solutions and technologies.

Results show the importance trends of ERTs in online news. Focusing on energy storage, we find SBS peaks related to the topic of electric mobility and other important topics. Storage solutions are discussed more in terms of their costs than economic advantages. They would benefit from a stronger association to the topics of sustainability, green energy and renewables other than geothermal energy. Leveraging the visibility of these themes could foster the implementation of storage technologies on a broader basis.

We present a new approach for assessing societal awareness of energy-related issues that can support strategic decision making by policy makers. The SBS approach is applicable in a variety of energy and environmental contexts, potentially with the aim of supporting the diffusion of new energy conservation standards, policies, and practices. The same methodology could also be applied to identify information gaps, which may be reduced through improved media coverage.

Keywords

Semantic Brand Score, Semantic Networks, Social Network Analysis, Text Mining, Energy Storage, Sustainability, Societal Awareness, Online News Analysis

Statistically Validated Networks for assessing topic quality in LDA models

Alessandro Albano and Andrea Simonetti

Abstract

Probabilistic topic models have become one of the most widespread machine learning technique for textual analysis purpose. In this framework, Latent Dirichlet Allocation (LDA) (Blei et al., 2003) gained more and more popularity as a text modelling technique. The idea is that documents arerepresented as random mixtures over latent topics, where a distribution overwords characterizes each topic. Unfortunately, topic models do not guarantee the interpretability of their outputs. The topics learned from the model may be only characterized by a set of irrelevant or unchained words, being useless for the interpretation. Although many topic-quality metrics were proposed (Newman et al., 2009; Aletras and Stevenson, 2013; Roder et al., 2015; Nikolenko et al., 2017), the automatic evaluation of the coherence of topics remains an open research area. The main contributions of this paper are: i) to define a coherence measure (SVN-Coherence) based on a rigorous statistical model that approximates human ratings better than state-of-the-art methods, and ii) to filter out marginal associations of words and facilitate the graphical representation and interpretation of the obtained topics through Statically Validated Networks (SVN) (Tumminello et al., 2011). Specifically, the method builds a co-occurrence network for each topic whose most probable words are the nodes. We set a link between two nodes (words) in each network if their co-occurrences are statistically significant. The Hypergeometric distribution describes the probability mass function under the null hypothesis and it models the probability of co-occurrence between words conditionally to their marginals. Indeed, it allows taking into account the heterogeneity of the vocabulary on a collection of texts. Finally, we derive a global measure of coherence for each topic by considering the number of statistically validated links, the strength of the association between word pairs, and the relative relevance of each word in the topic. We claim that these links carry relevant information about the structure of topics, i.e., the more connected the network, the more semantically coherent the corresponding topic. The new measure provides a coherence-based ranking that distinguishes between high-quality and low-quality topics. We designed a survey to obtain human judgment, which we use as ground truth, to compare our method with the state-of-art coherence measures. Specifically, we asked 222 PhD students to evaluate the coherence of 32 topics (extracted from the New York Times articles dataset) on a 4-point scale. The results show that the proposed SVN-Coherence substantially outperforms all the state-of-art coherence metrics.

Keywords

Topic Model, Topic Coherence, LDA, Statistically Validated Networks

Networks of keywords for the bibliometric analysis

Carlos G. Figuerola and Modesto Escobar Mercado

Abstract

Authors of academic papers frequently are asked to provide several keywords describing their work. Such keywords are free vocabulary; although they could depict the thematic landscape of an specific discipline, its wide range as well as its big dispersion make difficult to interpret such landscape. However, as some of keywords occur in several scholarly papers, we can build a network of keywords, linking them when they occur in te same paper. In an intuitive way, keywords co-ocurring frequently could means a topic or research area. If we focus in papers (keywords) from an specific field or scientific discipline, keywords co-ocurring indicates, perhaps, sub-fields inside such scientific discipline. In such a network of keywords, communities of keywords can lead us to discovery such subfields, as well as to cuantify, in terms of number of papers, their importance. So, algorithms for detection of communities in networks can help to characterize the thematic resarch structure of a scientific field.

In addition, academic paper publishing evolves over time; as those papers has a date of publication, it is possible to track the evolution of a network of keywords and their communities or subfields. Dynamic network analysis help to observe and analyze the structure and its evolution, changing over time.

In this work, all articles from the field of Library & Information Science of the Web of Science between 1971 and 2020 were downloaded. This means a big amount of papers and, hence, of keywords; in other words, it is necessary work with a very wide network, which, in addition, changes year after year.

Using commnunity detection and dynamic network analysis, it was possible to indentify several subfields inside the Library & Information Science discipline; besides, those subfields were tracked in their evolution over time, not only in their cuantitative changes but also in their relationships with each others.

Keywords

Keywords, Bibliometric, Network Analysis, Community Detection, Dynamic Network

Concepts and practices. A pragmatist reading of Haslanger

Matteo Santarelli

Abstract

In her well-known essays on gender and race (Haslanger 2000), social kinds (Haslanger 2005) and power (2012), Sally Haslanger presented and developed an original understanding of concepts. In doing so, Haslanger distinguishes three different kinds and/or dimensions of concepts: the manifest concept – the idea that people explicitly have about a specific concept; the operative concept – what people actually do with that concept; the target concept – how this concept should be, according to our epistemic/political/theoretical/moral aims.

In my intervention I will discuss Haslanger's theory of concept, by focusing on the relation between concepts and practices. Specifically, I will introduce two hypotheses. The first hypothesis affirms the primacy of the operative dimension of concepts. The main idea is that it is impossible to account for manifest and target concepts, without considering the operative dimension of concepts. The second hypothesis concerns the relation between concepts and practices. The basic underlying intuition is that there is a correlation between some aspects of a concepts used by a group (e.g., its indetermination and contestability), and the structures and the practices characterizing this specific group. The two hypotheses will be presented and developed by retrieving theoretical resources from classical pragmatism, especially from William James, Charles S. Peirce and John Dewey.

Keywords

Concepts, Practices, Conceptual Engineering, Haslanger, Pragmatism

Nobility, Poverty and Stigma, an empirical case of Social Network Analysis: The Pio Monte della Misericordia of Naples in the 17th and 18th century

Roberto Rossi

Abstract

The Pio Monte della Misericordia (PMM) is a charity settled in Naples in the early 17th century, and still active in social care services and assistance to the disadvantaged. The institution was the result of the action of a group of noblemen, part of the most powerful Neapolitan families. The action of the PMM was directed in favour of the poor, sick and dead as well as captives, following Matthew's gospel (25, 34–36). Alongside these works, the PMM also acted in another peculiar direction, assistance to the "shameful poor", that is, the decayed nobles—members of noble families who were no longer able to uphold the "nobles' way of life". This kind of poverty was considered a weakness of the system because it called into question the social stratification of feudal society of the 17th century. For this reason, the nobility reacted by founding the PMM, which collected subscriptions from its associates, who were almost all of the most powerful Neapolitan noble families, and year by year it also included the small urban and sub-urban nobility.

The action of the PMM was mainly based on a social network represented by the Neapolitan noble families. The aim of the paper is to deepen and discuss the structure of such network (the strength of the weak tights) using the tools of Social Network Analysis (SNA). The paper deals with the issue of poverty and its social stigmatization, starting from the work of Georg Simmel, in order to demonstrate how networking favours the construction of the relationship between the poor and society (Graham and Grisard, 2019). The issue of poverty is one of the most debated and controversial in the literature. The political and social sciences have tried to trace the defining contours of a complex phenomenon that requires a necessary interdisciplinary approach. In fact, many have faced the issue and its inevitable connections with development, social cohesion, work and welfare. This study intends to verify how—through the empirical case study presented of Pio Monte della Misericordia of Naples (PMM) during the 17th and 18th century—networking illustrates and expresses the relationship between the poor and the rest of society. The social network represented by Neapolitan noble families acts as a bridge between the poor and the rich donor, providing the latter with the element of social recognition, at the same time creating a barrier between the two components and thus avoiding the stigma that can also affect the donor. Finally, it is conceivable that the web model adopted by the charity offers a point of articulation between the wealthy and the poor, providing each with a different moral relationship with the charity which constitutes the element of strengthening and normalization of their respective social status.

Keywords

Poverty, Stigma, Nobility, Social Network, Naples, Modern Age

Documediality, post-truth and conspiracy theories

Adriano Vinale

Abstract

Conspiracy theories have often been identified as a common element and a conceptual vector which, secularized, leads to political modernity. As a matter of fact, paranoia seems to be a dominant political discourse in western contemporary societies.

From this perspective, it may be useful to show the conceptual co-implication of conspiracy theories and post-truism, defined in the Oxford Dictionaries as «relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief».

A crucial theoretical common element to understand both conspiracy theories and post-truth reality may be the so-called documediality, i.e., a social relation mediated by registered acts.

According to Maurizio Ferraris, documediality's main effects are: (1) Self-valorisation and self-exploitation; (2) Waste of (social) time and human (social) sacrifices; (3) Social injunction to self-exposition; (4) Tribalization of truth.

Our question then are: To what extent has documediality led to post-truism? How has it affected social relations? How does, consequently, post-truism modify dominant narrative, conspiracy theories above all?

Keywords

Documediality, Post-Truth, Conspiracy Theories

On the Constitution of the Public Interest

Daniele Santoro

Abstract

In the philosophical literature, it is customary to distinguish between aggregative and non-aggregative conceptions of the public interest. According to one interpretation, the interest (or the set of interests) of a group is simply the aggregation of the interests of the individual members of that group. Such interests are usually defined as the object of a preference. According to a different interpretation, what constitutes the interest of a group is what its members have in common, whether or not they express a preference for it. Both theories can be interpreted in several ways. For instance, the aggregative conception sometimes requires selecting only the non-competitive interests shared in the group. In other cases, only the preponderant interests are taken into account. The common good conception can also be interpreted in several ways, for instance, as a general good that transcends the interests of its members; or as the set of those goods that constitute a minimal common denominator for all members of that group. Both the aggregative and non-aggregative views are exposed to objections, which I will briefly review.

In this talk, I outline a different approach to the notion of public interest. I suggest that, in order to clarify the notion of public interest, the explanation should move from what it means for a group to constitute a public and then provide an account of what it means for a public to have an interest.

The argument proceeds in three steps. First, I distinguish between structured and unstructured groups. A structured group presents a variable degree of common knowledge, coordination, hierarchy, commitment to non-conformity, and self-referentiality (members refer to themselves qua members of the group and are aware of common knowledge, including coordination rules and collective preferences). Unstructured groups do not require self-referentiality as a constitutive condition and may lack one or more of the other features. However, they are still groups insofar as their members can be classified into a set defined by properties different from those that characterize group interactions.

Second, I argue that only structured groups can have a common interest in something and express collective preferences in the self-referential mode, while unstructured groups lack sufficient complexity to be bearers of collective preferences. However, unstructured groups can be defined based on other goods that are in their interests to have. These goods constitute an objective feature of the group even when self-referentiality is absent

I use the concept of ‘social class’ as an example: a social class is not defined by the preferences of its members, but by a set of common interests, whether or not its members are aware of them.

I conclude that an account of the public interest requires only the minimal conditions for unstructured groups be satisfied. The public interest so defined is a set of goods that is in the interest of a political community to have, whether or not the community recognizes them as being in their interest to have.

Keywords

Interests, Public Interest, Structured And Unstructured Groups, Self-Referentiality, Social Class

Political debates on Social Innovation in Japan: a Discourse Network Analysis

Stefano Ghinoi and Miki Omori

Abstract

In recent years, the concept of social innovation has re-gained importance in the academic and political debate; in particular, its revival has coincided with the recent global economic crisis, which forced many countries to review their economic models and policymaking approaches. The idea of social innovation as an instrument for promoting a better quality of life – by developing new solutions for addressing social problems – became a sort of 'silver bullet' for many developed countries. This has been particularly true for Japan, a country affected by several social challenges due to its peculiar demographic situation, i.e. a mix of aging population, low immigration flows from foreign countries, and rural depopulation. The emergence of Japanese political and social actors focusing on social innovation dated to the 1970s, but only in the 21st century there has been a legislative effort towards the support of social initiatives targeting social innovation.

However, despite its popularity amongst policymakers, a clear definition of social innovation and its applications is still a matter of debate, both at academic and political level. Moreover, the processes that lead to social innovation and the characteristics of the actors that carry out social innovation have not been explored in depth in the literature. In this paper, we concentrate on one aspect influencing the social innovation process in Japan: how national policymakers (i.e. Japanese parliamentarians) discuss specific measures for supporting social innovation, and therefore explicitly promote and finance these measures. Policymakers express different positions in political debates, and the network patterns arising around one or more measures can provide an overview of the "discourse coalitions" in the political arena – and therefore how social innovation policies are addressed by the policymakers.

By examining a novel database on political discourses about social innovation in the Japanese National Diet from 2017 (following the 48th general election of members of the House of Representatives), we use Discourse Network Analysis (DNA) to investigate the "discourse coalitions" developed around specific themes related to social innovation. Through an extensive literature review, we identified seven themes characterizing policy initiatives on this topic: business ethics; local aspect; participation and inclusion; sustainability; collaboration and cooperation; social entrepreneurship; role of institutions. Our results from the observation of the core-periphery structure show a general agreement – independent from the party affiliation – on supporting collaboration between public authorities and the civil society, leading to the creation of heterogeneous coalitions; at the same time, while it is well-established the prominent role of social enterprises, there are conflicts between policymakers regarding the type of financial support that should be given to these actors, and the role of institutions in regulating their activities. In the end, social innovation emerges as a divisive topic only according to certain themes – where political ideology on the role of institutions creates a barrier between policymakers.

Keywords

Social Innovation, Discourse Network Analysis, Japan, Policymaking

The Network of Parliamentarian Committees and Stakeholders in Ukraine during 2020

Tetiana Kostiuchenko and Tetiana Khutor

Abstract

The Ukrainian Parliament which comprises of 23 committees with various thematic focuses involves different stakeholders in the legislative, controlling and organizational activities. The variety of stakeholders includes NGOs, filed experts, international organizations, education and science institutions, private sector etc.. This study initiated by the Institute of Legislative Ideas is based on the online-based survey of more than 200 stakeholders and committees' representatives, with additional 50 semi-structured interviews regarding the involvement of stakeholders into the activities of the parliamentary committees during 2020 when COVID-19 pandemic affected all spheres of life, including the legislative and other activities in the country. The results show the clusters of stakeholders in their interaction patterns with the committees and depict the most influential stakeholders that manage to set up strong ties with multiple committees. Besides, the cliques of stakeholders are revealed. The actor-level network indicators for every committee is matched with the legislative "efficiency", namely the number of legislative documents processed by the committee during a year. Overall, the assessment of the parliament and stakeholders productivity shifted mostly to the online format is conducted considering the limited opportunities for the stakeholders to participate in committee's meetings during the quarantine restrictions for in-person gatherings in 2020. The paper also contains recommendations to the stakeholders and committees on overcoming the gaps in communication and co-operation basing on the network structures revealed in the study.

Keywords

Parliamentary Committees, Stakeholders, Legislative Network, Ukraine

Identifying splinter coalitions in the US House of Representatives by optimally partitioning signed networks based on generalized balance

Samin Aref and Zachary Neal

Abstract

A signed network is one with positive and negative edges, and is k-balanced (clusterable according to generalized balance theory) if the nodes can be partitioned into k subsets (k-partitioned) such that only positive edges exist within subsets and only negative edges exist between subsets. We analyze signed networks of US House of Representatives from 1979-2018 by optimally partitioning legislators into k coalitions which minimize the inconsistent edges based on generalized balance.

These signed networks are inferred from co-sponsorship data using a backbone model such that having significantly high co-sponsorships is recorded as a positive tie and having significantly low co-sponsorships is recorded as a negative edge. Partitioning legislators using exact global optimization models allows us to obtain the best fitting coalitions of collaborating legislators. Substantively, we investigate the ideological composition and legislative effectiveness of these coalitions. This analysis pipeline allows us to examine the US House of Representatives similar to a parliamentary body, where coalitions form to achieve a majority voting bloc.

Our numerical results show that the collaboration patterns of US House of Representatives are structured by more than two coalitions, in contrast to the traditional two-party categorization. These $k>2$ partitions exhibit an extreme closeness to generalized balance. Through extensive computational analysis, we show that the number of clusters, k, has a limited range which rarely exceeds 4, suggesting a mechanism that prevents legislators from forming too many opposing coalitions. We then focus on the composition of the optimal 3-partitions as the most immediate point of departure from the traditional two-group categorization.

We analyze the liberal-conservative tendencies of the 3-partition coalitions over time by examining the distributions of DW nominate ideological scores for legislators belonging to the same coalition. Our results confirm that one coalition is always left-leaning and one coalition is always right-leaning, but the ideological tendencies of a smaller third coalition varies over time between far-left, center-left, and center-right. We observe that in most sessions of the US House of Representatives, this third coalition is ideologically aligned with the majority party.

Although 8.44\% of traditional coalition members' negative ties are with co-partisans (members of the same party), over one-quarter (25.6\%) of third coalition members' negative ties are with co-partisans. This suggests that, in addition to being political outsiders, members of the third coalition are willing to push back against their own party. This group of outsiders have significantly higher effectiveness in advancing their legislative agenda. These findings collectively suggest that staying out of the partisan divide could enhance legislative effectiveness.

Keywords

Signed Network, Political Network, Polarization, Legislative Effectiveness, US Congress, Generalized Balance, Graph Partitioning

Abstentions and Social Networks in Congress

Marco Battaglini, Valerio Leone Sciabolazza and Eleonora Patacchini

Abstract

We study the extent to which personal connections among legislators influence abstentions in the U.S. Congress. Our analysis is conducted by observing representatives' abstention for the universe of roll call votes held on bills in the 109th-113th Congresses. Our results show that a legislator's propensity to abstain increases when the majority of his or her alumni connections abstains, even after controlling for other well-known predictors of abstention choices and a vast set of fixed effects. We further reveal that a legislator is more prone to abstain than to take sides when the demands from personal connections conflict with those of the legislator's party.

Keywords

Abstentions, U.S. Congress, Personal Relationships, Party Discipline, Conflict

Dyadic Treatment Effect on Network Formation using Multi-valued Propensity Score Matching: Lobbying Activities and Legislative Collaborations

Costanza Tortù, Valerio Leone Sciabolazza and Laura Forastiere

Abstract

Firms and corporate companies often work to sway a legislator agenda. For instance, they financially support the electoral campaign of political candidates running for a seat, trying to influence their political activity once elected. It is thus natural to expect that politicians funded by the same firms will collaborate in Congress to achieve the goals of their funders. In this work, given the bipartite network of financial support from firms to politicians, we define a network of strong ties between congress members, where a strong tie is present if the two politicians have a substantial number of common supporters. We then use this network of support ties and the network of collaborations to evaluate the effect for two elected politicians of being supported by common firms on their legislative collaboration. To conduct our analysis, we develop an estimator for causal effects of the formation of links on a 'treatment network' on the formation of links on an 'outcome network', with both networks being directed. The estimator is based on an extension of the propensity score matching approach to handle multi-valued treatments, network data and conditional effects. Using data from the US House of Representatives (111-113 Congress), our results show that sharing common supporters encourages collaborations among politicians.

Keywords

Legislative Collaboration, Lobbying Activities, Political Networks, Network Formation, Causal Inference, Propensity Score, Network Data

The network of international trade in services

Lucia Tajoli, Carlo Piccardi and Federico Airoldi

Abstract

While the share of services in international trade has been increasing very slowly over the years, oscillating around 20 per cent since the 1990s, their role has constantly gained importance. Trade in services certainly faces many more obstacles than trade in goods, but its impact on globalization and countries' competitiveness is crucial, and it is therefore worth investigating its characteristics. Using a recently released international database on bilateral trade in services, the present work aims to analyse the networks of international trade in services and to unveil specific properties by exploiting a number of existing methodologies and algorithms. After describing the global properties of the networks of the various service classes, such as network density and centralization, we investigate differences and similarities among them, we discuss how these properties evolve over time and change across different types of services. We find that traded services display sharply different characteristics and we find that there two distinct classes of services, displaying different networks structures and different evolution over time. The last part of the analysis considers countries' position in these networks. We look for the most important/influential countries in international trade of services by analysing a set of centrality measures computed on the graphs' nodes, and by focusing on the topological properties of the nodes. Countries' positions in these networks are diversified, with connections unevenly distributed, especially for some service categories: trade of many services is strongly concentrated within a small group of countries playing a key role in the overall network structure, displaying some potential fragilities. We discover that the topology of the networks, identifies the role of countries much more clearly than the sole amount of services traded. Also, the position of some countries changed remarkably over time, confirming the evolution of the international service markets.

Keywords

Trade In Services Networks, Centralization, Network Distance, Countries Centrality, Countries Role

ROBustness In Network (robin): for Comparison and Validation of Communities

Valeria Policastro, Dario Righelli, Annamaria Carissimo, Luisa Cutillo and Italia De Feis

Abstract

In network science, one of the most relevant tasks is the research of structures underneath the networks. A network is said to have a community structure if the nodes are densely connected within groups but sparsely connected between them (Girvan and Newman, 2002). Communities allow us to create a large-scale map of a network since individual communities act like meta-nodes in the network, which makes its study easier. Moreover, community detection can help to predict missing links and identify false links in the network. Even though finding communities can be a computationally difficult task, a huge number of methods for community detection have been developed. However, their implementation leaves unaddressed the question of the statistical validation of the results. Hence, our main question is: are the detected communities significant or are they a result of chance only due to the positions of edges in the network? To answer this question, we studied the network structure and implemented a set of procedures to assess the robustness of the community structure and to compare two selected detection algorithms on the same graph. We specified a perturbation strategy and a null model in two main workflows.

The first one tests the stability of the partitions found by a single community detection algorithm against random perturbations of the original graph structure. We explored two different null models, the Configuration Model (CM) which preserves strongly heterogeneous degree distributions and the dk-series (Orsini et al. 2015) model which preserves the global organization of the original network at various increasing levels of details, such as degree correlations, clustering coefficient and the full clustering spectrum.

The second method, conversely, helps to choose among different community detection algorithms the one that best fits the network of interest comparing their robustness in pairs.

We implemented all the methods in the R package “robin” (available on CRAN: https://CRAN.R-project.org/package=robin) which gives the flexibility to use every kind of detection algorithm, even custom external functions, and every kind of null model. We tested the performance and the reliability of our procedures on a benchmark dataset, the American College Football, that had the ground truth.

Keywords

Robustness, Validation, Community Structure, Comparison

Correlation and Topological Analyses of Classical and Community-aware Centrality Measures in Complex Networks

Stephany Rajeh, Marinette Savonnet, Eric Leclercq and Hocine Cherifi

Abstract

Community-aware centrality measures exploit the community structure to design effective measures that allow to identify influential nodes in real-world network applications. Although several works have investigated the relationship between various classical centrality measures, the relationship between classical and community-aware centrality measures is still unexplored. In this work (Rajeh, et al. 2021), we investigate two questions: (1) How community-aware centrality measures compare to classical centrality measures? (2) What is the influence of the various macroscopic and mesoscopic topological properties of the network in the interplay between classical and community-aware centrality measures? First, synthetic data with controlled community structure properties (mixing parameter μ, degree, and community size power-law exponents (γ, θ)) are used to get a better understanding of their relative influence in the interactions between those two types of centrality measures. Kendall's Tau correlation is computed for all possible combinations between 10 classical and 9 community-aware centrality measures on a set of LFR synthetic networks. Results reported in figure 1 (left) show that the behavior of community-aware centrality measures is indeed different from classical centrality measures. Furthermore, the main parameter governing the observed differences is the network community structure strength. In networks with a strong community structure, community-aware centrality measures that rely on inter-community links (local) exhibit low correlation with classical centrality measures. This is not the case for those based on intra-community links (global), which show high correlation. Results are more mixed with community-aware measures based on both intra and inter community links (mixed). The behavior is reversed for networks with weak community structure. Second, a set of 50 real-world networks originating from diverse fields is used in order to link this behavior to the network topological properties. Linear regression is performed considering 6 macroscopic (Density, Transitivity, Assortativity, Average Distance, Diameter, Efficiency) and 9 mesoscopic topological features (Mixing parameter μ, Modularity, Embeddedness, Hub Dominance, Internal Density, Internal Distance, etc.). These are considered as the dependent variables. The independent variables are based on the correlation values obtained from the previous experiment. Results show that transitivity and the mixing parameter are the most significant features ($p < 0.01$). As transitivity increases, correlation between local community-aware and classical centrality measures grows. Furthermore, as the community structure gets weaker, the correlation decreases. The opposite behavior is observed for global community-aware centrality measures. Indeed, as transitivity increases, correlation decreases. Additionally, the correlation decreases when the community structure gets stronger.

Keywords

Centrality, Influential Nodes, Community Structure

Attributes Embedding in Networks Clustering

Luisa Cutillo, Pasqua D'Ambra, Clara De Santis and Panayot Vassilevski

Abstract

Complex networks can be described in terms of communities or clusters of nodes usually defined by network structural properties. A classic concept of community expresses the idea of well separated groups or modules of nodes, that are densely connected within each group and sparsely connected between them. On the other hand, nodes in a network could be grouped by prior knowledge on their similarity based on their roles or functions, when available. For example, political orientations in social networks could be used to partition the nodes into different parties; genes or cells in biological networks could be partitioned based on their known biological functions. In these cases, the nodes of a network are provided with external attributes, also called metadata, each naturally creating a partition on the network. Metadata provide extra layers of information about the relationship between nodes that is not necessarily expressed by links in the network. Attributes, when provided, can be included into the clustering process in the attempt of finding the most reliable network partition. Attributes can for example be an excellent vehicle for interpreting, describing, or validating communities. Recent network literature is attempting to use attributes as factors in the process of community network inference.

In this work we propose a new approach to detect clusters in undirected graphs when nodes attributes are provided. The aim is to group nodes which are similar both in terms of structural connectivity and in terms of attribute values. Our method relies on the integration of the structural and attribute similarities among the nodes in an augmented graph. The augmentation strategy consists of adding a new node for each attribute value and new edges representing attribute similarities. After the initial augmentation, we embed the graph in a low-dimensional Euclidean space associated to the graph Laplacian and apply a modified K-means algorithm to identify clusters. The modified K-means uses a vectorial distance measure where each original node is represented by a vector-valued set of coordinates depending on both structural connectivity and attribute similarities. We show the effectiveness of our method in the clustering of both synthetic and real-world attributed graphs.

Keywords

Attributed Graph, Attributed Network, Clustering, Metadata

Discovering Commonality Between Observed Networks through Two-Sample Graph Kernel Inference Procedures

Ragnar Gudmundarson, Dimitris Christopoulos and Gareth Peters

Abstract

There are different scenarios where hypothesis testing can be done on a sample of graphs in a practical setting. For example, testing whether two samples of graphs have the same generating mechanism or if certain kind of patterns are appearing in one or more graphs. There is still a lot of work to be done to solve these problems with an inference procedure. We suggest a machine learning method that does such procedures in a flexible way using kernel methods for graphs. Graph kernels are already well established and widely-used for solving classification tasks. They provide a very flexible way of comparing samples of graphs as they exist for a wide range of different graph structures, for example, weighted, directed, labelled, attributed and multimodal graphs. Moreover, these kernel methods can be used for hypothesis testing where the data is non i.i.d. allowing us to perform inferences on longitudinal networks. The choice of the graph kernel largely depends on the type of the graph structure being investigated and thus plays a central role in the inference procedure. Unfortunately, there is limited theoretical knowledge about the performance of different graph kernels, making it difficult to predict which kernel will achieve the highest power. Our main contribution is to describe and classify graph kernels based on their test performance in various different graph settings. Additionally, we present some real world applications where graph kernel hypothesis testing can be used.

Keywords

Graph Kernel Methods, Graph Two-Sample Testing, Graph Hypothesis Testing, Structured Data Analysis, Network Commonality

What is an opinion? The problem of weakly-defined measurements in agent-based modeling

Dino Carpentras and Michael Quayle

Abstract

Agent-based models have the potential to understand and possibly solve some of the most pressing social problems, such as vaccine hesitancy. Furthermore, models developed for this purpose may be used to identify countries at risk and design precisely tailored policies. However, to achieve these results, agent-based models should be carefully tested against real-world data.

Unfortunately, this task is extremely challenging because many of the models are based on weakly-defined concepts. One big example is the sub-field called "opinion dynamics" which deals with how people change opinion over time. Thus, for testing these models against real-world data, it is crucial to precisely measure people's opinions.

To better understand the concept of measurement and its properties in different fields, we start our discussion from physics. Indeed, in this field, scientists use what is know as an "operative definition," in which concepts such as a "meter" are not just theoretically defined. Instead, their definition consists of a practical explanation of how to produce such a measurement.

We then show that some concepts, such as opinions or polarization, are defined in a much different way which does not lead to a unique type of measurement. This possibility of having different measurements of the same construct has the effect of potentially producing also different dynamic behavior.

To show this, we start with an ideal example in which some people are measuring the number of chips in a bag. Since there is no operative definition of how to count a chip, each person may have a different way to deal with the broken ones. For example, one may count a chip only if it is bigger than a certain threshold, while another may count it only if the edges are not broken. Thus, if we break a really big chip in two parts, one may measure an increase in the number of chips, while another will measure a decrease.

We show also a more practical example in which we apply different measurement of polarization (all coming from the literature) to the same dataset (the European Social Survey). By applying the first measurement, we obtain that polarization steadily increased in the United Kingdom from 2002 to 2018. However, the second measurement on the same dataset, shows us that polarization decreased from 2002 to 2010 and then it come back to its original value in 2018.

We also show a mathematical proof of this phenomenon. Indeed, we selected three different opinion dynamics models in the literature (thus with different rules and dynamic behavior). Then, we show that each model can be converted into the other just by changing how the measurement of the opinion is defined.

We conclude our discussion highlighting that more attention should be spent on precisely defining the key concepts of a model. Specifically, how to measure the constructs, as their definition may completely change the model dynamics. Furthermore, the dependency on the measurement may also be used to better identify differences and similarities between models in the literature.

Keywords

Weakly-Defined Constructs, Measurement, Opinion Dynamics, Scales, Psychometrics

Developing an opinion dynamics model from real-world data

Dino Carpentras, Paul Maher and Michael Quayle

Abstract

Opinion dynamics is a sub-field of agent-based modelling which focuses on people's opinions and their evolutions over time. Despite the rapid increase in the number of publications in this field, it is still not clear how to apply these models to real-world scenarios. Indeed, there is no agreement on the precise rules describing how people update their opinion while interacting.

Some previous studies started bridging this gap in the literature by directly measuring people's opinion before and after social interaction. Since opinion dynamics models usually represents opinions as numbers, these studies asked people to directly report their answers in a numeric form. Even if this approach solved the problem of how to transform opinions into numbers, it forces people to exchange their opinions in an unnatural way. Indeed, in everyday interactions, people express their opinions using words and not numbers.

In our work, we collected data from 260 participants on 5 neutral topics. For each topic, we showed the participants a sentence to which they chose to either agree or disagree. After this stage, we showed them the answer of a fellow participant and, after a delay task, we asked again their opinion on the same topic.

To convert opinions in a numeric form similar to standard models we also collected participant's certainty. This was expressed as a number between 1 and 10 and then combined with the agreement answer to produce a "continuous opinion" ranging from -10 to 10.

Notice that, even if we collected certainty as a number, it was not used in the social interaction. Meaning that participants will see if the other participant "agreed" or "disagreed" but not their certainty value. Thus having a social interaction based on words instead of numbers.

From the analysis of the data, we observed a very weak, but statistically significant influence between participants. We also noticed three important effects. (1) Asking people their opinion is sufficient to produce opinion shift and thus influence opinion dynamics, at least on neutral topics. (2) About 4% of the time people flipped their opinion, while preserving their certainty level. This means that, for example, some people would change from an opinion of +10 to an opinion of -10, without passing through intermediate values. (3) People with extreme opinions exhibited much less change than people having neutral opinions.

We also built an opinion dynamics model based on the three mentioned phenomena. This model was able to produce realistic results (i.e. similar to real-world data). Specifically this model showed (1) polarization from an initially unpolarized distribution. This was achieved without adding repulsive forces. (2) Strong diversity. Meaning that the final distribution was not consisting of a series of isolated opinion clusters, such as the ones generated by the Deffuant model. (3) Dynamic convergence. Meaning that the opinion distribution does not become static after reaching its final shape. Instead, it keeps showing some minor changes, while preserving the overall shape of the distribution.

Keywords

Experimental Validation, Micro-Dynamic Rule, Opinion Dynamics, Update Rule

Implications of social structure for resource fever mechanisms

Rodrigo Martinez-Peña and Srebrenka Letina

Abstract

Rates of natural resource use tend to rise in unregulated contexts as profitability from resource exploitation increases, whether due to increase in the resource value, increase in accessibility or both. One of the processes that contribute to intensification of resource use is that opportunistic resource users join in, as in a "gold fever." However, there is limited understanding of the mechanisms underlying these resource "fevers." We contribute to middle-range theorizing of this phenomenon through an empirically informed agent-based model that explores the interplay of two mechanisms: 1) spread of information about profit opportunity, which is modelled as simple diffusion, and 2) contagion of opportunistic behaviour, modelled as complex contagion. Both mechanisms are causally intertwined as the former is a necessary condition for the latter. The model is based on the case of opportunistic fishing observed in Swedish small-scale fisheries during the Baltic cod boom that took place in the 1980s. We simulate observed and hypothetical scenarios of increase in resource abundance. Opportunistic agents´ decision making process is formalised in a composite threshold model that connects to the above-mentioned mechanisms. Agents are influenced by the information they receive about profit opportunity and by the network neighbours that join fishing, both factors are determined by their position in the network. We examine the effects of different network properties on the shape of the phase transition between two states of collective behaviour: zero opportunism and full opportunism. Specifically, we investigate the effects of: different network positions of "seeds" that bring information about resource abundance (central, peripheral), varying topologies of network structure (star/hubs network, "fishnet", core-periphery, a network with several clusters) at several levels of network density and size. We relate the investigated conditions with known situational circumstances in the context of fisheries Finally, we make tentative conclusions about the importance of network characteristics in enabling or constraining the process of behaviour change in the specific setting of resource fluctuations and place it within a wider interdisciplinary framework of social-ecological systems.

Keywords

Diffusion Of Behavior, Agent-Based Modelling, Complex Adaptive Systems, Regime Shift, Common Pool Resource, Cod Collapse, Network Topology

Skill, Status and the Matthew Effect

Mikael Bask

Abstract

There is a twofold aim of this paper. First, we present three social influence models of status hierarchies in the form of social network models. Second, we examine under which parametrizations these models are able to generate the Matthew effect in status attribution.

We model a network of researchers showing appreciation for each other, where the amount of deference depends on how skillful a researcher is perceived to be. Specifically, the more skillful a researcher is perceived to be, the more appreciation he/she receives from other researchers and the higher is his/her status in the network. However, researchers do not necessarily interact with all other researchers in the network. In particular, if the statuses of two researchers are too dissimilar, they will not interact with each other.

Moreover, researchers do not only rely on their own evaluations of the skills of other researchers in the network. This is because the intrinsic quality of a researcher is not directly observable and therefore not easy to evaluate. That is why researchers also rely on their colleagues' evaluations of the skills of other researchers in the network. Finally, it is agonizing to show respect to another researcher if the favor has not been repaid. Therefore, the humiliated researcher will show less appreciation to this researcher compared to if the favor had been repaid.

The models differ from each other regarding how the researchers' skills are modeled. In model (i), the skills do not change over time, whereas, in models (ii)-(iii), the skills vary over time. Specifically, in the latter two models, a grant-providing research council is introduced. To be more precise, in model (ii), a researcher is more likely to receive a grant if his/her skill as a researcher is higher, whereas, in model (iii), a researcher is more likely to receive a grant if his/her status as a researcher is higher. A research grant improves the skill, whereas the absence of a research grant implies a deteriorated skill.

We utilize a novel measure of the Matthew effect that was proposed by Bask and Bask (2015) and tested by Bask and Bask (2014) using data from the Music Lab experiment, who argue that an appropriate measure of the Matthew effect focuses on the dynamic process that generates inequality. Specifically, it is a process that is able to magnify distances between nearby status trajectories, and the proposed measure of the Matthew effect measures this ability.

We find that the Matthew effect rarely occurs when skills are constant, even if statuses vary over time. Moreover, there are minor differences between the parametrizations of the research grant models for the Matthew effect to occur. Specifically, the parametrizations that most likely generate the Matthew effect are when there is a low propensity to interact with status-dissimilar researchers, researchers rely heavily on colleagues' evaluations of researchers' skills, and researchers are very sensitive to non-repaid favors from other researchers in the network.

Keywords

Matthew Effect, Skill, Social Influence, Social Network, Status

Modeling Social Influence with Violations of DeGroot Model Assumptions using a Genetic Algorithm

Kara Johnson, Jennifer L. Walsh, Yuri A. Amirkhanian and Nicole Carnegie

Abstract

An ongoing study leverages social influence to increase willingness to use pre-exposure prophylaxis (PrEP) in an effort to combat misinformation and negative PrEP stereotypes for Black men who have sex with men (BMSM). This social network intervention is intended to decrease transmission of HIV among BMSM by identifying leaders within the community and training them to communicate the benefits of PrEP within their social networks. In order to assess the efficacy of the network leader intervention and inform public health policy, we are interested in modeling social influence using data about PrEP-related opinions collected from agents within the network. The DeGroot model is of particular interest because the parameters represent the influence exerted by each agent on every other agent; however, alternate algorithms to estimate the parameters of related models using data collected from an observed network diffusion process require large data sets that are often infeasible to obtain in public health or social science applications. In order to expand the use of social influence models to these and other applications, we developed a novel genetic algorithm capable of recovering the parameters of a DeGroot model for social influence using small data sets, including those with more model parameters than observed time steps.

We have already used simulated data to assess the performance of the algorithm across a variety of features of the networks and data sets where this method would be appropriate: network size, degree, stubbornness of agents, number of time steps, and proportion of missing data; however, these simulations represent ideal scenarios and do not reflect the issues present in many practical applications. We discuss the results of a second simulation study assessing the ability of the algorithm to recover the model parameters using ordinal data with measurement error, incorrectly specified ties, agents or other sources of information missing from the network, and model misspecification. We also present parameter estimates using preliminary PrEP data with a focus on possible assumption violations in the context of the simulation study results.

Keywords

Social Influence, Degroot Model, Parameter Estimation, Genetic Algorithm, Pre-Exposure Prophylaxis (Prep)

Knowledge spillovers through skilled-workers migration network: evidence from OECD countries

Saverio Barabuffi, Valeria Costantini, Valerio Leone Sciabolazza and Elena Paglialunga

Abstract

Mission-oriented innovation policies often contributes to the improvement of national production processes. These are ambitious and cross-disciplinary policies tackling clearly defined societal or technological challenges mainly applied through public R&D investment with a market-oriented purpose. The aim of this paper is to analyse the extent to which competitiveness improvement in the technological trajectory determined by such national policies is magnified by knowledge capital spilling from skilled migrants coming from other countries. Technological capabilities developed abroad to design and implement local processes of innovation might provide large benefits via positive externalities, where the capacity to gain from such spillover depends on the relative position of countries in the knowledge network. In order to conduct our investigation, we propose a simple analytical framework of national innovation system, where the innovation performance of a country –proxied by the number of registered triadic patents– is determined by its investments in mission-oriented innovation policies, weighted by its position in the skilled migration network. The model is then tested using a panel database covering 20 OECD countries for the time span 1987-2016.

A concern with our analysis is that skilled migrants will self-select into destination countries where they will find better opportunities, e.g., where innovation performances are already significantly high. This endogeneity issue might hinder the identification of skilled migration effects, since it might be that higher performances will be mechanically correlated with a higher presence of migrants, but not determined by them. For this reason, we propose an empirical strategy based on a two-step Heckman correction which sorts out such endogeneity concerns and allows a causal interpretation of our results.

Findings from our analysis show that high skilled migration networks magnify the effect of mission-oriented innovation policies in improving national innovation performances, even when controlling for other common drivers of innovation, and time and country fixed effects. On the contrary, being central in middle or low skilled migration networks has no statistically significant effect on innovation production.

At the same time, we find that the role of migrants is heterogeneous across countries. Their contribution to innovation production is highest in host countries where public R&D investments are still relatively low. On the contrary, the extent to which migrants' origin countries invest in mission-oriented policies does not exert any significant effect on their ability to contribute to innovation processes in the host country. This suggests that skilled migration is valuable to innovation regardless of its national composition, and it is most valuable when host countries are still on a catching-up path.

Keywords

Network, Spillover, Migration, Mission-Oriented, Innovation

Social Networks and Labor Market Mobility: Evidence from Danish Population Registers

Lasse Folke Henriksen, Thomas Lyttelton and Emil Begtrup-Bright

Abstract

Labor market mobility is the product of people traversing complex interdependent networks of institutions and people. Over the course of careers, workers build social networks to other workers through shared institutional and organizational histories. For a long time, scholars have studied how such networks enable and constraint the mobility of workers, shaping horizontal movement across workplaces as well as vertical movement in the occupational structure. In this paper we theorize the relative importance of different configurations of worker ego networks in enabling social mobility in labor markets, along with their changing utility across careers.

We consider family, education-, workplace-, and place-based ties and provide a theoretical framework that link synergies between the type, strength and power asymmetry of social ties to horizontal and vertical mobility outcomes. We present various analytical strategies for identifying workers' network configurations and for testing the relative importance of different configurations on different mobility outcomes. Combining linked employer-employee data with population registers and educational records we reconstruct the evolution of workers' network configurations. We focus on the labor market trajectories of cohorts born in the 1970s and model the effect of workers' network configurations on early career mobility outcomes from the age of 25 to 39 using a conditional logit approach. By combining dynamic multimodal network data with mobility outcomes across workers' early- to mid-careers we are able to demonstrate the multiple pathways by which networks inform labor market mobility.

Keywords

Labor Market Mobility, Family Networks, Educational Networks, Residential Networks, Collegial Networks

Bonding, bridging and linking social capital in the access of young people with unstable labour market trajectories to employment

Alejandro González-Heras and Joan Miquel Verd

Abstract
Unemployment has severely affected young people in Spain (and in other countries in Europe) during the latter years, especially since the last economic recession. The global pandemic situation does not seem to ease this situation, but rather it makes it worse. Personal contacts are highly used in Europe by young job seekers, and even more in situations of job scarcity (economic recession periods). In this way, social capital has proven to be highly important for accessing a job, although there is a important methodological discussion about measuring used and accessed social capital.

The aim of this paper is analysing the relationship between the use of social capital and career paths of young people with unstable labour market trajectories. When a quantitative approach is used, usually two different types of databases are used for these purposes: on the one hand, huge sample sizes (even multi country) but poor in detail and, on the other hand, small sample sizes but with a lot of detail. The dataset that will be presented in the communication is of the second type: we study a quantitative sample of 150 unstable career paths, where detailed information for every employment situation in the trajectory is obtained. The instrument to collect the (pre-pandemic) data was a hybrid survey, including a life history grid to collect information about (a maximum of) 20 labour events and (a maximum of) 3 social contacts (per labour event) that have somehow helped to access the job. The richness of data used allowed to characterise many characteristics of this social capital, being one of the most relevant the distinction between bonding, bridging and linking social capital.

Keywords
Labour Market, Social Capital, Bonding Bridging And Linking

Changes in professional networks in times of crisis

Deniza Alieva, Sherzod Aktamov, Gulnoza Usmonova and Shukhrat Shadmanov

Abstract

COVID-19 hit badly all the industries; however, tourism became one of the most negatively affected. In these times the importance of network of contacts in the market became obvious. The present study was conducted among tourism industry workers in Russia. 41 travel agents from the region of Moscow, region of Leningrad, and two cities: Moscow and Saint Petersburg were interviewed. In addition, their ego networks of professional relationships were created. The data was collected in two instances: in March of 2020 (start of the first COVID-19 wave in Russia), and January 2021. The results show the growing importance of the influence of social capital on the networks and shift from professional relationships to more personal ones. The participants noted increases in levels of trust and mutual support among their alters. Also, multiple cases of usage of professional networks to find an additional source of income or a side job were reported.

Keywords

Ego Networks, Professional Networks, COVID-19, Social Capital

The higher, the better? Testing the relative impact of social capital on high- and low-skilled immigrants' labour market integration.

Julia Rüdel

Abstract
The advantages and disadvantages of inter-ethnic and co-ethnic social contacts for immigrants' labour market integration have received increased attention in recent scholarship. In this paper, I go beyond existing approaches by linking social integration theories with general social capital theory more closely. Specifically, I argue that the effects of social capital differ for low- and high-skilled immigrants. For low-skilled immigrants the impact of social capital on labour market outcomes does not follow the dogma 'the higher the highest contact, the better the social capital return'; rather, contacts in similar social positions provide the best resources. For high-skilled immigrants, by contrast, it is indeed the highest social contacts that particularly benefit their labour market integration. To establish these differences, I use data of the National Educational Panel Study (NEPS) and its position generator that allows operationalizing social capital and testing its impact on employment and occupational status. Estimating fixed effects models with lagged independent variables, the results support my hypotheses for low-skilled and high-skilled immigrants with respect to both economic outcomes. This article advances our understanding of social capital in migration and integration research and specifies the kinds of social contact most beneficial for different immigrant groups.

Keywords
Social Capital, Labour Market Integration, Longitudinal Analysis

Educational crisis survey during COVID-19 in Italy: Open-ended question automatic coding

Stefania Capogna and Francesca Greco

Abstract

The spread of the Covid-19 was an unexpected and frightening event that led governments to take restrictive measures to reduce the spread of contagion. Educational activity was initially suspended and subsequently continued in a blended modality, introducing the use of the online learning. This was a societal shift that took managers, teachers, parents, and students by surprise. The following prolongment of the school closure and the home confinement raised a chorus of concerns about the lack of adequate educational stimuli consequences and its long-term effects on learning, highlighting a difficulty in adapting to the new educational proposal. Although, probably, the difficulty in adapting to the blended learning modality is connected to a much deeper crisis characterizing all the components of the educational alliance pre-existing the pandemic crisis. In order to understand stakeholders' experience of the educational crisis, we carried out a survey and the data collection was performed by means of a questionnaire with both closed and open ended question.

The use of the open ended question in survey is widely used although its use is still debated. It allows the collection of spontaneous responses since the responder answer with his or her own words but this implies a large variability of the answers and consequently the need for their coding. The coding procedure allows to classify the answer in a specific conceptual category, and it is usually performed by at least two human coders, a procedure that is complex and time consuming. The coding results should reflect as good as possible what responded meant in answering to the open-ended question, and the human coder has to perform the task reading between the lines in search for both the latent and the manifest content of the response.

Since the eighties, the text mining procedures were used to automatically code the responses when the data are too large to manually code all texts. One of the most commonly used procedure is the machine learning one, which need to be trained on a manually coded subset of texts (training model). As a consequence, the quality of automatic coding depends on manually coded data. The larger is the training model the better is the quality of the automatic coding but also the higher is the cost. To overcome this problem other statistical procedures could be used to classify the responses according to words cooccurrence. This study evaluates the accuracy of the automatic coding of open ended question responses of two statistical procedures based on multivariate and on community detection analysis. To this aims the multivariate and network analysis classifications were compared with the manually coded ones and accuracy measured. Finally, the misclassified responses were analyzed and misclassification factors identified.

Keywords

Text Classification, Text Mining, Community Detection, Multivariate Analysis, Open-Ended Question, Automatic Coding

Measuring the communication power of social media users

Francesca Greco and Alessandro Polli

Abstract

During the first lockdown, people have largely used the social media platforms to share their opinion and feelings about the Covid-19 and the political choices. Due to the lockdown, social media became the virtual agora of public discussion in which people freely expressed their opinions, sentiments, and feelings. The access to this information can be extremely relevant for health and political public institutions that could be interested in understand people perception and experience of the pandemic crisis and the diffusion of specific ideas in order to improve their communication strategies.

Social media can be studied both in terms of interaction and communication combining social network analysis (SNA) and text mining techniques. To study the spread of an information or an opinion within the social network, often the researcher subjectively chooses some social media users according to his/her evaluation of their relevance and then he/she analyses their network. Nonetheless, this procedure determines a risk of selection bias. This study presents a new approach for the investigation of social network based on the analysis of communication styles and social behaviors to automatically identify the relevant social users, overcoming the selection bias. Moreover, it presents a measure of social media user's communication power f specific ideas.

We select data collecting all the tweets containing a specific term. Then, use social network analysis (SNA) to measure social dynamics of each community, and we combine this with a social profiling method, Emotional Text Mining (ETM), for the identification of clusters of users based on their lexical profiles and sentiment. Finally, we analyze the overlap between sentiment clusters and virtual communities and we calculate user's power of dissemination of a specific opinion or idea.

We show the advantages of our approach by presenting a case study - where we analyze almost one hundred thousand tweets during the first step of the Italian lockdown. in this period, people have largely used the social media platforms to share their opinion and feelings about Covid-19 and the political choices. Accessing this information can be extremely relevant for the government. Through the ETM we detect four sentiment cluster (enemy within, enemy from abroad, forced confinement, paralysis), each one with its own reaction to Covid-19. Through the SNA we identify the main actors of the spread of information and we find almost two thousand communities. We discuss the comparison of the sentiment cluster of users and virtual communities that show a partial overlap.

Our study advances the research on the study of social networks, offering a new approach for the profiling of social media users, the analysis of Covid-19 representations and the study of communication-behavior. Our findings have important practical implications for the government and private institutions.

Keywords

Social Network Analysis, Emotional Text Mining, Virtual Community, Social Media, Social Profiling

A Social Network Approach of Visions of the Future: before and during the COVID-19 pandemic

Jose Antonio Rodriguez Diaz

Abstract

In this paper we attempt to identify, visualize and analyze the social structures underlying and shaping visions of the future of young people before and during the Covid-19 pandemic.

We use textual narratives created by university students regarding their visions of social and personal futures in 30 years. We extract and code the most relevant information characterizing each narrative. Then we transform that information into relational matrixes and we use Social Network Analysis tools to see those narratives as social networks. We see narratives as the space where interactions between concepts shape visions of futures.

We will use narratives of two groups of undergraduates (one from before the COVID-19 and the other during) and a group of Master students extracting information regarding their general positive or negative outlook of the future, their work and professional life, their family life and structure (spouses, children, parents), occurrence of environmental, political and or social crises, actions to deal with environmental decline, social and political reorganizations, Artificial Intelligence and Robots, health, life expectancy, happiness and wellbeing, technological progress and social improvements, the level of connection to virtual worlds or and technologies, space and life in other planets, etc.

Differential combinations of items produce diverse scenarios, diverse causal models and paths, as well as diverse levels of life enjoyment and happiness. They are combinations of probable, possible and preferred futures.

Keywords

Futures, Network, Narratives, Covid-19, Gender

Topics in the electric vehicles A-I-A space

Margherita Russo, Fabrizio Alboni, Giovanni Bonifati and Pasquale Pavone

Abstract

In the last two years, there has been an acceleration in the production of vehicles with electric motors or hybrid power and, of course, their components and parts and the infrastructure for power supply. Our research question is: How has the space of agents, institutions and artefacts involved in the regulation, research, production and sale of electric vehicles changed in the past 30 months?

To address such a question we rely on complex system analysis on innovation processes (Lane, 2016, Bonifati 2018 and 2021 for relevant references) and on a detailed data source of information that documents, in a daily newsletter, the major events that characterise the production of electric and hybrid vehicles worldwide. Beyond the expert reading of those texts, the authors explore and compare the results emerging by adopting two research strategies.

A preliminary step consists in creating a corpus made of the daily news. Through Taltac, lemmatized nouns and adjectives, nouns and adjectives of nations, proper names and acronyms that characterize the lexicon of the entire news dataset over the last 30 months have been identified and a matrix 4453 news x 9412 terms has been created (1 of 12 thematic domains, 2295 tags assigned by news editors; and the terms identified by using Taltac: 6556 keywords (Nouns+adjectives); 63 acronyms; 69 adjectives of nations and 128 nations. We also identified the verbs used in each news item.

Given this set of textual information and provided that each news item has a date, the three strategies are as follows.

(1) Elaboration of a factorial analysis of the matrix "documents x terms" and cluster analysis on that result, to identify groups of themes with which to characterise the individual news items. Then,the following steps will be undertaken for further analysis: (a) expert labelling of the themes characterising the various clusters; (b) identification of the relevant frequency for the analysis; (c) description of the temporal dynamics of each theme (frequency of each cluster over time); (d) elaboration of the semantic network of each cluster, also by sub-periods (using Gephi); (e) identification in each cluster, and periods, who are the entities (agents, institutions, artefacts), the relations (identified through verbs) and the places of action.

(2) Relevance index to detect topics ("relevant sets") emerging in the entire period. This analysis, still in an exploratory stage, adopts the method recently published by D'Addese et al. (Mathematics, 2021) to identify dynamical relevant sets of variables in complex systems and z-Igraphs to identify the meso-structures that characterise, over time, the set of changes that are individually described by the news. The micro-structure (described in each individual news item) and the aggregate collection of all entities and their interrelations mentioned in the news are grouped in clusters that incorporate the dynamical properties of the information in the set of news.

A discussion of the results comments on the advantages of the two research strategies.

Keywords

Topics Detection, Longitudinal Analysis, Electric Vehicles' Agents-Institutions-Artifacts Space, Complex Systems, Cluster Analysis, Relevance Index Analysis, Taltac

Thematic evolution as a new Culturomics tool: The case of tweets on Covid-19

Corrado Cuccurullo, Luca D'Aniello, Michelangelo Misuraca and Maria Spano

Abstract

In recent years, the integration of social media into contemporary society provides emerging opportunities for describing people's life and behaviour. Users produce and share contents online with a frequency and density that is culturally unprecedented. By analyzing these contents on social media, mainly in the form of texts, it is possible to reveal personal values, lifestyles, uses, and perceptions, giving birth to a new research domain known as Culturomics. This field is literally described as the study of human behaviours and cultural trends by analysing over time massive amounts of textual data available in digital format.

With the onset of the COVID-19 pandemic, social media has rapidly become even more a crucial communication tool for information generation, dissemination, and consumption. They allowed a rapid circulation of news more than traditional media but also an improvement of misinformation, triggering an over-production of comments and opinions and causing an actual infodemic.

This work aims at investigating the evolution over the last year of contents shared by social media users on Covid-19. To achieve this, we refer to statistical methods originally developed in Bibliometrics, named science mapping. Starting from the scientific literature related to a specific domain of study, science mapping approaches map its structure and development, by synthesising past research findings and then effectively use the existing knowledge-base and advanced lines of future research. We focus on two related methods, typical in a bibliometric framework: term co-occurrence networks, and strategic/thematic maps. The basic idea behind the term co-occurrence network analysis is that each topic can be represented as a set of terms. Following the network approach, a term co-occurrence matrix is built, where cell outside the principal diagonal contains the number of times two terms appear together in the same text (co-occur). Co-occurrence matrices can be seen as undirected weighted graphs in which each term is a node and the association between linked terms is expressed as an edge, visualising both single terms and subsets of terms frequently co-occurring together. Then, a community detection algorithm is usually applied to understand the main topics embodied in texts. Finally, the identified topics are plotted in a bi-dimensional diagram, the strategic/thematic map, where axes are functions of the Callon centrality and density, respectively. Centrality can be read as the importance of the topic in the collection, while density can be read as a measure of the topic's development.

The combined use of these techniques allows us to illustrate both how terms relate each others within each topic, the main topics within the collection, and how they develop. In this sense, these methods, even if originally developed for a different task and in a different context, could become a new tool for Culturomics. To test our proposal, we analysed the 40wita dataset, containing more than 2 million tweets written in Italian about the COVID-19 outbreak. Tweets are downloaded by considering a list of 43 different keywords that includes both trivial terms and hashtags related to COVID-19 and others that became popular in Italy during the emergency.

Keywords

Thematic Evolution, Topic Detection, Network Text Analysis

Bibliometric Analysis of the Crowd Myths: from “Madness” to “Creativity”

Stanislav Moiseev and Daria Maltseva

Abstract

In 1991 Clark McPhail published his book “The Myth of the Madding Crowd”, where he author presented the history of changes in scientific ideas about crowds. Clark McPhai showed how the idea of an irrational, criminal, destructive crowd was gradually replaced by its “normalized” image that fits into the logic of rational collective action.

In the last decades, the notion “crowd” has been also used as a metaphor for description and understanding of some forms of purposeful collective activity, which are commonly called “crowdsourcing” [Rogers, 2012; Wexler, 2011]. In this regard, another version of "rationalized" thinking about crowds has appeared in the research literature.

The research methodology is based on the bibliometric analysis of citation networks — a particular case of application of the methodology of social networks analysis.

The aim of this study is to reconstruct the development of scientific ideas about the crowd, based on the analysis of the keywords of publications with the word "crowd" occurs in the title.

Keywords

Crowd, Scientific Ideas, Bibliometric Analysis, Keywords Analysis

Community detection with node attributes in multilayer networks

Martina Contisciani, Eleanor A. Power and Caterina De Bacco

Abstract

Community detection is a fundamental inference task in networks. It is often performed using the information about interactions between nodes, in other words, the network topology structure. This information can be complex and rich, as is the case for multilayer networks, where one observes different types of interactions. Most network datasets, however, contain additional information about individuals, attributes that describe their features. This extra information is often neglected by state-of-the-art community detection methods, in particular for multilayer networks. It is thus a fundamental open question how to incorporate node attributes into community detection in a principled way. Here, we develop MTCOV, a method that incorporates both the topology of interactions and node attributes to extract communities in multilayer networks. It is a principled probabilistic method that does not assume any a priori correlation structure between attributes and communities but rather infers this from data. To the best of our knowledge, MTCOV is the first overlapping community detection method proposed for multilayer networks with node attributes. It is flexible, as it can be applied to a variety of datasets, directed, weighted, and multilayer and it outputs overlapping communities; it is thus a mixed-membership model. We study MTCOV on synthetic single and multilayer networks, a variety of single-layer node-attributed real networks, and several real multilayer networks of social support interactions in rural Indian villages. We compare its performance with state-of-the-art community detection algorithms for single-layer networks with node attributes; for multilayer layer networks, we tested against a state-of-the-art algorithm that does not use any node attribute information and measure the extent to which knowing both types of information helps inference. We found that it performs well in recovering ground truth partitions as well as in predicting missing links or attributes. It also leads to more interpretable community structures and allows to quantify the impact of the node attributes given in input.

Keywords

Community Detection, Attributed Networks, Multilayer Networks, Link Prediction, Generative Model

Label propagation-based item classification with attribute and consumption information

John Pougué-Biyong, Renaud Lambiotte

Abstract

We propose a semi-supervised, label propagation-based method to classify user-facing items (e-commerce catalogues, streaming platforms, tweets, etc.).

Given a small set annotated items, we classify the other instances by combining attributes information and user-item interactions (consumption) data. To do so, we build an heteregeneous network in which item, user, and attribute nodes lie. Labels propagate from labeled items to unlabeled ones via the user and attribute nodes.

One key challenge is to determine the relative importance (salience) of each node type when labels propagate. We propose to choose the parameters which maximise the "separability" of the network communities. We investigate different ways of defining communities in the heterogenous network and different community detection approaches.

Keywords

Label Propagation, Community Detection, Heterogeneous Networks, Attributed Networks, Classification

A Supervised Clustering Algorithm for Network Data

Bárbara Santos and Pedro Campos

Abstract

A new method of supervised clustering with attributed networks is proposed, based on Single Representative Insertion/Deletion Hill Climbing with Restart (SRIDHCR) algorithm (Zeidat and Eick, 2004). This method is evaluated by a fitness function, q(X), that measures the class impurity and the number of clusters. This way, based on a target variable, the number of classes is defined. The class impurity measures the percentage of minority examples in the different clusters of a certain clustering. The goal is to minimize q(X), to obtain class-uniform clusters, while minimizing the number of associated clusters. This method deals with representative-based supervised clustering, where a set of initial representatives is randomly chosen. By assigning each observation to the closest representative, clusters are obtained. With the adaptation made to the algorithm, the way nodes are associated to clusters does not only depend on their network distance, but also on the distances between their attributes. This can be accomplished through a combination of weights between the matrix of distances between nodes and their attributes, when defining the clusters. Hence, the method considers both structural and compositional characteristics of the network.

As a benchmark, we use the Subgroup Discovery perspective of Atzmueller (2015), using Network data. This view is based on the fact that classical community detection techniques focus only on finding subgroup of nodes with a dense structure, lacking an interpretable description (Atzmueller, Doerfel, and Mitzlaff, 2016). For this matter, Subgroup Discovery, a data mining technique that focus on discovering interesting relationships between different objects (Herrera, Carmona, González, & Del Jesus, 2011), can provide insights beyond connectivity within communities, and the relationships between subgroups of nodes as well. Subgroup Discovery focuses on detecting subgroups described by specific patterns that are interesting with respect to some target concept and a set of explaining features. Therefore, interesting patterns among subgroups can be revealed, for example, by inductive and exploratory data analysis tasks that find relations between a dependent and (several) independent variables (Atzmueller, 2015), considering the compositional aspect of the networks. This way, with the additional information supplied by attributed networks, Subgroup Discovery method can be applied in order to combine both structural and compositional characteristics of the network. For this work, SD-Map, a fast algorithm for exhaustive Subgroup Discovery (Atzmueller and Puppe, 2006), will be used to perform Subgroup Discovery on attributed networks.

The proposed methodologies are applied to an inter-organizational network, denominated by EuroGroups Register, a central register that contains statistical information on companies from European countries, provided by Statistics of Portugal.

Keywords

Supervised Clustering, Community Detection, Subgroup Discovery, Attributed Networks

Community detection in the real world: do communities really exist?

Riccardo Righi, Alessia Pedrazzoli, Simone Righi and Valeria Venturelli

Abstract

Community detection is one of the most used technique to reduce the complexity of networks and investigate subparts of them. Several algorithms are available to perform such analysis, and the evaluation of the output is usually based either on the investigation about the meaningfulness of the detected communities (in terms of the agents that are involved in it), or on the consideration of some statistics describing the cohesiveness of the communities.

However, especially when applying complex networks techniques to systems in which no info on existing affiliation of the nodes is available, the question should rather be: do the detected communities really exist? Do they have some specific meaning with respect of the real system that is considered? Or they are just the automatic output of an exhaustive algorithm?

To answer to this point, we outline a methodology based on cluster analysis, community detection and random networks. Our aim is to statistically investigate if the detected communities are associated with some structural emerging property of the observed system, or if the detected communities exclusively exist as an output of the algorithm that is run, and have with no specific meaning or effect in the real world.

We start by performing two separate analyses on the original network G. On the one hand, a cluster analysis of the nodes, based on some pertinent variables, and on the other, a community detection. Then, based on the clusters, we create random networks under the assumption that each node maintains the same number of connections by clusters, as it is observed in the original network G, but with random peers.

For instance, if node i_1 presents 3 connections with nodes belonging to cluster \alpha_1 and 2 connections with nodes belonging to cluster \alpha_2, then in any random network node i_1 will always have 3 connections with some random nodes belonging to cluster \alpha_1 and 2 connections with nodes belonging to cluster \alpha_2.

For each network, i.e. the original G and the random ones, we perform a community detection analysis and, afterwards, we exclusively consider within-community connections. Then, we compute the statistic \eta measuring the amount of connections (weighted or not) that, by clusters' combinations, are shared within-community. This is performed disregarding the specific community in which the connections take place.

Finally, we compare each value of \eta (one for each clusters' combination) observed in G, with the corresponding distribution of \eta that is observed in the random networks.

By means of Kolmogorov-Smirnov (KS) two-sided goodness-of- fit (GoF) test, we assess if the \eta observed in G is compatible with randomness or not.

The combinations showing significant values reveal that the within-community connections of corresponding clusters are not compatible with randomness.

This allows us to conclude that for the involved nodes, the community had a true meaning, in the sense that what detected within its borders reveals some emerging property of the system.

We explore our methodology with data regarding the network of investments realized on a UK based crowdfunding platform over the period 2011-2016.

Keywords

Community Detection, Complex Network, Cluster Analysis, Random Networks, Within Community Connections

Mustering Squads in a Police Academy

Julian Müller, Norman Conti, Patrick Doreian and Ulrik Brandes

Abstract

The substantive focus of this research is found in a police academy cohort in a major city of the United States. The academy assigned each member of this cohort to one of four squads, which led to increased within-group contact and thus served as a generator of social relationships between recruits. The relatively dense, almost planted networks within squads, however, obscure relationship structure between squads as well as the identities of recruits acting as inter-squad integrators in the cohort.

We analyze the inter-squad structure of social relationships, by applying a recent generalization of formal roles that is able to accommodate the rich multivariate data available on recruits and their social relationships. By incorporating tie and actor variables as well as multiple relations into the definition of role, we are able to identify previously unknown structural features. More importantly, we discover and characterize roles with regard to integrators with specific relational patterns across squads.

Keywords

Roles, Multivariate Network, Network Analysis, Police Training

Using Grounded Theory Methods to develop networking in welfare communities

Irene Psaroudakis

Abstract

By the results achieved at the end of a qualitative research about the impact of Covid-19 on Third Sector (TS) organizations in Italy during the first year of pandemic (Psaroudakis 2021), this abstract proposes a wider reflection about the use of Grounded Theory Methods in specific organizational contexts and larger relational structures. Our aim is twofold: a) firstly, we discuss the importance to develop and improve networking dynamics among all the nodes which make the local system of welfare; b) secondly, we want to debate the relevance of using qualitative methods (and mixed-methods) to investigate, understand, and promote the adoption of a network perspective, especially in complex settings as welfare system.

The research, conducted from July to November 2020, referred to the theoretical suggestions of Symbolic Interactionism (Blumer 1969), and to the methodological perspective of Constructionist Grounded Theory (Charmaz 2006; 2014), in order to gain the dramatic condition of pandemic as directly experienced by TS actors: 100 unstructured interviews have been realized with the Presidents of voluntary realities of the North, the Center, and the South of Italy, in order to catch the direct insights and the processes of meaning-making about the role played by voluntary work during social/health emergence, and the promotion of civic participatory processes whose consequence has been the enhancing of community building, and the collective empowerment of territories.

In Italy the recent Third Sector Code, according to the idea of an enlarged public sphere (Salamon & Anheier 1998; Wagner 2000), promoted the relevance of networking intended as an essential routine for voluntary organizations and institutional nodes, in order to elaborate the most coherent strategies to reach citizens' needs, and to understand the emergent social problems, and social claims. Particularly, during the pandemic the ability to act as a network among local entities emerged as one of the main positive outcomes, to be followed and developed; indeed, our research co-participants observed that, for TS organizations, interacting as a network has nowadays become even more necessary, especially after pandemic.

Therefore, our objective is to underline the importance of using qualitative methods, and mixed-methods, to describe the meaning of realizing networking practices for TS nodes.

Grounded Theory Methods may emphasize a micro point of view, noticing how it can be possible – for policy-makers, and for organizations too – to intervene to enhance networking not only during emergencies, but in the everyday-life activities within welfare communities. A network strategy has not to be understood as a formal agreement, but as a praxis: the combination between a grounded approach and the application of Social Network Analysis measures and precepts (Scott 1991; Wasserman & Faust 1994), may be useful to better understand how to realize network dynamics, both from an individual and a collective perspective. Particularly, Grounded Theory may help in providing the actors involved in taking care of contexts, the most fitting conceptual and methodological tools to develop a networking coherent path, gathering the most critical aspects and the potentialities of local settings (Krebs & Holley 2002).

Keywords

1.Grounded Theory, 2.Mixed-Methods, 3.Networking

Ambivalence, surprise and role-switching in narrative networks: a case study using James Bond films

Pete Jones and Dorottya Hoor

Abstract

Relational structures, which arise from meaningful interactions between social actors are indispensable for understanding social reality. Even though these networks often involve multiple overlapping relations or interactions between actors which may take different valences at different points in time, these non-positive relationships have been largely overlooked by scholars. While some network interactions may be largely positive in nature, others may be predominantly negative, and some may include both, resulting in 'ambivalent social ties'. Our paper thus delves into the mechanisms behind these complex interaction patterns and the complex social structures they produce by analysing narrative networks in a well-known spy movie franchise.

When networks reflect narratives or event histories, it raises interesting questions about the roles different actors play within the narrative and how this shapes the content of their interaction patterns. More specifically, do the signed interaction patterns indicate particular roles within the narrative, and can this aid our interpretation of a narrative's plot and structure? In this presentation, we explore the implications of such questions through an analysis of the James Bond film series. We record all character interactions in a content analysis and aggregate different categories of interaction into positive or negative interactions. We then consider the resulting networks from a number of perspectives. First, we look at the aggregated networks and observe the way in which ambivalent ties appear to be limited to certain character types. Then, with respect to the importance of temporal sequence and ordering for narrative interpretation, we consider the role of "surprise" in the plot, and offer a simple descriptive measure for identifying surprising events based on past interaction. We reflect on how narrative roles relate to the content of ties, identifying a number of archetypes that appear to emerge in our case study. We consider the implications of this beyond our example and discuss how it might be useful for identifying "turning points" and tropes in network analyses based on narrative or event-based data, as well as how different network roles may relate to different tie content.

Keywords

Signed Networks, Narrative, Negative Ties, Ambivalent Ties, Character Networks

Analyzing social networks of “Praxiszentren” as learning environments for school-based teacher education

Marco Galle, Liana Pirovino, Jennifer Shepherd and Annelies Kreis

Abstract

This presentation describes a qualitative procedure for collecting and analyzing social network data in the context of school-based teacher education (TE), a pivotal element of TE. With the aim of enhancing the quality of school-based TE (e.g., coherence between TE curriculum and requirements of the teaching profession), an increasing number of TE-universities collaborate with partner schools (van Velzen & van der Klink, 2014). However, not much is known about how educators and student teachers are interacting with each other in partner schools and whether the aims of such collaborations are met. This study examines how educators and student teachers collaborate at “Praxiszentren” (Kreis & Hürlimann, 2019) of Zurich University of Teacher Education, and how significant various interactants are considered as facilitators for professional development.

In the development project “Praxiszentren” we aim to converge university- and school-based learning environments by intensifying collaboration between school and university staff. This project is implemented in TE-programs for primary (1st - 6th grade) and secondary school (7th - 9th grade). In essence, a university-based educator and a cooperative teacher (an experienced mentor teacher with extended tasks) work together at a “Praxiszentrum” to provide learning opportunities for student teachers as well as lead and qualify a team of mentor teachers, who coach student teachers during internships in their classes.

As part of the mixed-methods research design of the project we conducted workshops with individual “Praxiszentren” in which university-based educator, cooperative teacher, mentor teachers, principals and student teachers draw ego networks for the first study year. In a second step, the group of student teachers and the group of educators each collaboratively developed a network for their “Praxiszentrum”. In the last step, the groups exchanged information about their group networks and discussed further steps for the development of their “Praxiszentrum”. We implemented these workshops on-site at six “Praxiszentren” in 2019 and, due to Covid, online at five “Praxiszentren” in 2021. We will present results from ego networks, in which participants indicate with whom, how often and regarding which content they have collaborated during their first study year, and which communication tools they have used for this. In addition, they indicated the significance of their collaborative relations for their own professional development.

The data is analyzed using qualitative structuring content analysis (Kuckartz, 2018). Initial analysis shows that the networks with the most people are listed in the ego networks of the university-based educator and cooperative teacher. For student teachers, the mentor teacher with whom they completed their internship, and the peers with whom they prepared and conducted lessons are the most significant actors. The results will be complemented with data from the online workshops, which took place in May 2021.

Keywords

Qualitative Network Research, Collaborative Learning Opportunities, Partner School, Third Space

Social Poverty and Embedded Agency – A Theoretical Approach

André Knabe

Abstract

Macro-level studies have shown that poverty is perceived differently by those affected depending on institutional, governmental and cultural contexts (Paugam). The theory of social capital suggests that individual resources and chances are strongly linked to social positions, respectively to the individual's affiliation to social groups and their resources (Bourdieu). These approaches suggest micro-macro-interrelations, but do not explain how individual agency is enabled and restricted by social structure, respectively how structure is formed by agency. Social network theory addresses this interrelation, focusing on both: structural embeddedness and individual agency.

My theoretical approach results from a mixed-methods-study on coping with poverty in North-Eastern-Germany with 57 problem-centred Interviews and a quantitative collection of the ego-centred network data of the interviewees. I propose to reconstruct individual situations of action against the background of the actor's embeddedness in network structures by identifying advantageous and disadvantageous ego-network structures to cope with poverty (Burt, Granovetter). The individual's ability "to act in accordance with their personal and collective ideals, interests, and commitments" (Emirbayer & Goodwin 1994: 1443) depends on the number and the constitution of reachable social contexts, respectively social circles (Simmel) or network domains (White). Referring to White and Emirbayer, I define agency as the actor's ability to influence his or her identity within and across network domains by the mechanism of switching.

In my presentation I will emphasize and discuss the theoretical potential of Social Network Analysis (SNA) for a better understanding of the (re-)production of socio-structural inequalities and poverty. Poverty is often associated with a loss of social relations, e.g. as a result of unemployment or the exclusion from expensive social activities. Drawing on the empirical and theoretical insights gained during my PhD thesis, I propose a definition of social poverty which bridges the micro-macro-gap: Actors are threatened by social poverty when material hardship leads into dependencies that endanger their identities in a central network domain or block the access to domains, that generate recognition and social participation. They are affected by social poverty if they are not able to compensate for these restrictions by switching to alternative identities from other domains within their network.

Keywords

Agency, Coping, Network Theory, Poverty, Inequality, Mixed Methods

Intellectual in Displacement: the role of cultural mediation in early modern and modern periods

Aurea Mota

Abstract

In this paper, data about the displacement of intellectuals through the fields of science and literature will be analysed and will feed the argument about the role of intellectuals as network creators and how it has based cultural transformations of modernity. The hypothesis is that displacements and connections in different time and through different space made by intellectuals and the network they have created are an important force in the transformation of the modern world and reveal its epistemic-spatial form. Against the view that modernity emerged in an insulated space and spread later on throughout the world, the reason developed is that the modern experience was made by the synthesis of practices that cannot be easily reduced to the central areas. The rise of a modern imaginary around the idea of the autonomy of human beings as individuals and collective persons and in relation to the possibility of making changes in the world in the name of this imaginary, is completely connected to the experiences of displacements of intellectuals and the connections they made. The argument is based on the postulation that the relation between displacement and knowledge was expressed differently in the early modern period and the period of the consolidation of modernity. Both in the early modern and in the modern periods the desire to produce knowledge, interpret, and transform the world through displacement has been equally important. However, what has changed from the nineteenth century onward is the role of spatial displacement as a privileged way of understanding the production of knowledge. This is so because displacements that gave rise to scientific knowledge and cultural shaped spatial transformation came to be seeing as a matter of personal experience, something to be hidden to accomplish with 'analytical neutrality'. This can be explained by the process of divergence between a philosophy of experience, meaning and subject from a philosophy of knowledge, of reason and of concepts (Foucault). Through the analysis of the displacement of intellectuals at two moments (the modern and early modern periods) the social networks that they formed will be analysed and give new lights about how can we understand cultural transformation in modernity. Research questions that will be addressed, such as inter alia: where/when did the intellectual go?; is there any known and/or public justification for this specific displacement?; what did he/she do in the place of destiny?; which kind of network was formed?; how did the displacement change a previous perspective?; what are the works authored by the person prior to and after the displacement?; is there interpretation or representation of the broader transformation that the author is inserted into?; which new nodes of an network emerged from this circulation?; is there any translation to other languages of the work?, to which languages? done by whom and when?. These questions would work as guidelines for the development of specific categories to analyse displacements and the social networks emerged from that to see impact of it for the constitution of knowledge and interpretation in modernity.

Keywords

Displacement, Modernity And Early Modernity, Intellectuals, Cultural Mediation

Structural explanations and mechanistic constraints in network analysis and policy design

Matteo Bianchin and Ingrid Salvatore

Abstract

Social networks hardly fit in the holism/individualism debate, yet the epistemology and the ontology of social networks have attracted little attention in the philosophy of social sciences and their implications for social and political philosophy have been underappreciated. While some of their properties are structurally defined, the cognitive and agential capacities and limitations agents are credited with, as well as their categorization into social kinds and the rules governing their interactions are crucial to the network dynamics and the individuation of nodes. The definition of a network structure therefore depends on its inputs and architecture as much as on sub-structural properties that constrain its design and operations. In the first step, we will frame the issue and make the case for a hybrid approach to social science explanations that goes beyond the holism/individualism debate and is responsive to network analysis. In the second step, we will illustrate the point by discussing Haslanger view of structural social explanations, Bicchieri's account of norms change, and current work on epistemic networks. Finally we suggest how this affect the analysis and design of social policies.

Keywords

Structural Explanations, Agency, Mechanisms, Social Policies, Social Networks

The effect of policies on the diffusion centrality of a risky behaviour: School tobacco policies and adolescent smoking in 38 schools from 6 countries

Nora Mélard, Liesbeth Mercken and Vincent Lorant

Abstract

Background. Adolescents tend to adopt behaviours and attitudes similar to their peers'. Peer effects are key to understand how behaviours and attitudes are shared in a network, but may also amplify the impact of policy interventions. An intervention might indeed have a direct effect on the impacted individuals, but also an indirect effect, as these individuals' behaviours impact those around them. Social network research has focussed a lot on the role of peer effects in the adoption of behaviours, but less on how policies affect this indirect effect. To address these research gaps, the present study will take the case of school tobacco policies and adolescent smoking. Instead of using common centrality indices that do not take into account the attribute of the individuals and how this attribute diffuses in the network, we will apply the concept of diffusion centrality, which translates the node's ability to diffuse a given property. Contrarily to standard peer effect measures that identify central leaders, the diffusion centrality rather identifies the most diffusive ones. We therefore adapted this measure to spot adolescents who were more likely to diffuse smoking in general and smoking on school premises. This study is unique with regards to diversity of policy contexts, as it encompasses two points in time and schools from six countries having different national tobacco regulations and heterogeneous implementations of school tobacco policies. Hence, offering a great variance across policies, longitudinally as well as transversally. We hypothesized that the perception of stronger school tobacco policies may lessen the diffusion centrality of smoking on school premises and of smoking in general.

Methods. A whole-network study was carried out in 2013 and 2016 in 38 schools from six European cities. Adolescents from 3rd and 4th grades (n = 18,805) were requested to complete a questionnaire describing their friendship ties, their smoking behaviour, and other information about their health, family, and school environment. General linear models were conducted to understand the association between the strength of the school tobacco policy and the diffusion centrality of smoking and of smoking on school premises.

Results. Overall, diffusion centrality of smoking and of smoking on school premises significantly decreased between 2013 and 2016. However, the decrease in the diffusion centrality of smoking on school premises was not significant in schools where the school tobacco policy was weaker in 2016 than in 2013. Moreover, the diffusion centrality of smoking and of smoking on school premises were lower when the school tobacco policy was stronger, even when controlling for confounding variables.

Conclusions. Our findings showed that smoking has less diffusion potential over time and that stronger school tobacco policies seem to decrease the diffusion potential of smoking among adolescents. This study offers new insights into the need for schools to have a well-enforced school tobacco policy, and more broadly, on the impact of a policy on the diffusion of a behaviour in a network. Adolescents with higher diffusion centrality could be good candidates as "champions" for peer interventions to stop or prevent smoking.

Keywords

Adolescent Smoking, Diffusion Centrality, School Tobacco Policy, Social Network Analysis

Continuous-time modeling of social influence on static networks

Nynke Niezink

Abstract

The attributes of social actors, such as physical, psychological or performance measures, can be affected by the actors to whom they are connected, a process generally referred to as social contagion or social influence. We present new methodology for the estimation of social influence effects on static networks, using stochastic differential equation models. To estimate these continuous-time models based on discrete-time observations, we propose a computationally efficient likelihood evaluation method, that avoids inverting very large matrices.

Keywords

Social Influence, Continuous-Time Modeling, Stochastic Differential Equations

Radical positioning on social networking sites about migratory crisis at frontier between Spain and Morocco

Paula Méndez Domínguez, Joaquín Castillo de Mesa and Luis Gómez Jacinto

Abstract

Social networking sites offer a rich source of real-time information about what is happening, especially valuable during social emergencies. The different authorities, organizations and professionals that respond to these emergencies are incorporating these measures to better understand the impact of hazards and respond appropriately to emergency situations. In this paper we analyze the social emergency related to the migratory crisis that has occurred in Ceuta (Spain) since the massive arrival of immigrants during May 17-18, 2021.

Using data extraction techniques, we analyze the reaction and interaction of users on Twitter during this event. Analizing interaction on social networking sites and using algorithms and netnography to detect communities and identify influential social actors was able to observe the reaction of local and global citizens as well as analyze emotions and feelings. The results of this study how social networking sites can contribute to amplify the public debate on migration processes, revealing radical positioning of society when people are feeling that can be attacked, building more extreme opinions and positions.

Keywords

Social Network Analysis, Interaction, Communities, Migrations

Local Reputation, Local Selection, and the Leading Eight Norms

Simone Righi, Shirsendu Podder and Karoly Takacs

Abstract

Humans are capable of solving cooperation problems following social norms. Social norms dictate appropriate behaviour and judgement on others in response to their previous actions and reputation. Recently, the so-called leading eight norms [1] have been identified from many potential social norms that can sustain cooperation through a reputation-based indirect reciprocity mechanism. Despite indirect reciprocity being claimed to extend direct reciprocity in larger populations where direct experiences cannot be accumulated, the success of social norms has been analyzed in models with global information and evolution. This study is the first to analyse the leading eight norms with local information and evolution. We find that the leading eight are robust against selfish players within most scenarios and can maintain a high level of cooperation also with local information and evolution. In fact, local evolution sustains cooperation under a wider set of conditions than global evolution, while local reputation does not hinder cooperation compared to global reputation. Four of the leading eight norms that do not reward justified defection offer better chances for cooperation with quick evolution, reputation with noise, larger net-works, and when unconditional defectors enter the population.

Keywords

Leading Eight, Evolution Of Cooperation, Local Selection, Reputation

How do they integrate? Social exchange and reciprocal integration among migrants and locals

Minna Paunova

Abstract

*** This is work in progress; I hope to find potential co-author(s) in the track ***

Much of the negative discourse surrounding migration today stems from a perception that migrants are a 'burden' to receiving societies, 'getting' more than they 'give'. I propose a novel approach to integration by developing a social exchange perspective on the relation among migrants and locals. Social exchange theory emphasizes the implicit cost-benefit analysis in our everyday choices concerning with whom we interact. This paper develops the idea that interactions among migrants and locals can be fruitfully examined with a social exchange lens, and contributes to a better understanding of integration by way of interpersonal relationships and reciprocity. Specifically, I define reciprocal integration as the accumulation of everyday, informal exchange interactions between migrants and locals that are returned in kind or paid forward. In the workplace, for example, these may be the continual exchange of favors, advice, birthday wishes, invitations to dinner, and so forth, among colleagues in acts that are not 'tit for tat' or mere professional obligations, but are mutually corresponding over time. The concept of reciprocal integration is the missing piece of a conceptual puzzle relating micro-level migrant-local interactions and the upper-level consequences of migration: the more constituent members of a social unit engage in reciprocal exchange with one another, the more integrated (i.e., socially cohesive) the unit becomes.

Exchange processes unfold in the following sequence: (1) exchange opportunity and initiation, (2) exchange transaction (if the initial exchange attempt is reciprocated or offer accepted), and (3) exchange relationship (if transactions are repeated and the partners develop a history of exchange). The aim is to refine a model of reciprocal integration on how factors such as power (i.e., numerical minority/majority group membership), status (i.e., level of development of the countries of origin), and culture (i.e., horizontal and vertical individualism/collectivism) structure the relationship among migrants and locals throughout the exchange process—and about the extent to which the resultant social structure is cohesive. An agent-based model (ABM) can fruitfully formalize the micro-macro structuration interface, exploring the conditions under which repeated bilateral trust games in a network of mutually dependent artificial agents produce a tightly connected social system characterized by reciprocity. ABM allows to study how social cohesion in diverse groups (i.e., complex macro explananda) emerge in populations of migrants and locals (i.e., heterogeneous software agents) interacting locally under plausible heuristics or simple decision rules (i.e., related to power, status, and culture). Artificial agents' initial 'investment' and reciprocity decision rules can be experimentally parameterized (i.e., calibrated using estimate values from trust games). Contributing to publicly available code, we can adapt existing NetLogo models, such as the 'Game of Trust', and the 'Network-Based Trust Games'. Decision rules related to power, status, and culture have remained outside the scope of these and other available models. For each iteration, network cohesion measures such as density and average degree will be of primary interest, but network patterns such as reciprocation and topology such as community structure may be relevant.

Keywords

Migration, Integration, Social Cohesion, Netlogo, Trust Games

Individual strategies for knowledge gains and knowledge problems

Christina Prell, Yi-Jung Lo and Karoly Takas

Abstract

Incentive-based models for network formation link micro actions to changes in global network structure, and/or other emergent outcomes such as knowledge gains or other resource distributions. Drawing upon literature on the strategic use of networks for knowledge gains, and using Stochastic Actor-Oriented Models (SAOMs) as a starting point, we develop an agent-based model (ABM) to compare different strategies for forming ties for purposes of learning (knowledge gains) and/or solving knowledge-based problems. Here, we begin with previously published, specified SAO simulation models that explored the co-evolution of networks and knowledge gains. Using these previously published models to inform a new model, we develop an ABM that creates 'exogenous knowledge-problem-crisis scenarios' in which actors seek to solve a given knowledge-based problem with either their own expert knowledge or that of a networked alter. Actors may seek out others via their social ties, and we compare which networking strategies best put actor in contact with the so-called expert alters. This talk will offer preliminary results of this ABM, for example, which network strategies (or combination thereof) are most successful for putting actors in contact with knowledgeable others, and how these same strategies compare, when a co-evolutionary dimension is included.

Keywords

Stochastic Actor Oriented Simulation Model, Knowledge Resource, Solving Knowledge Problems, Network Strategies

Assessing the mobility patterns of outgoing Southern Italian students

Ilaria Primerano, Francesco Santelli and Cristian Usala

Abstract

Students' internal mobility has been recognized as one of the factors that affect regional competitiveness and exacerbate disparities among territories. This is due to the role that universities have in fostering local development by allowing regions to benefit from the flows of incoming students this way increasing the local supply of human capital. Therefore, the mobility flows across territorial areas and universities in higher education have become of increasing relevance within the national and international debate on the attractiveness of universities. In Italy, this phenomenon is strictly related to the well-known Italian North-South divide, as also underlined by several studies investigating the implications of students' flows from Southern to Centre and Northern universities.

Understanding the main patterns of students' mobility among universities represents the core of this contribution. Specifically, we focus on Southern students who move towards a university located in a different macro area for attending their master studies by also considering the choice regarding the field of study. We rely upon micro-data at the student level that are available from the database MOBYSU.IT (1) managed by the Italian National Student Archive regarding all the Italian students enrolled in a bachelor's degree between 2011 and 2015 who also enrolled in a master's degree programme after graduation.

Students' mobility flows have already been read in the scope of Network Analysis to better understand the determinants of this phenomenon. Starting from this framework we define, for each field of study, a unipartite weighted and directed network at the university level in which the nodes are the universities and student's mobility flows represent the links weighted by the number of moving students. We consider as origin the universities located in southern and insular regions of Italy, while the destination ones are those located in central and northern regions. These networks are then organized as a multiplex network structure where the fields of study define the layers.

Given the multilayer approach, we propose a layer by layer comparison aiming to quantify the similarities between layers and to assess university centrality across different disciplinary fields. We aim to understand whether the mobility patterns of outgoing Southern students vary among different layers, and to identify the fields where the largest mobility flows are observed.

(1) Data - drawn from the Italian `Anagrafe Nazionale della Formazione Superiore' has been processed according to the research project `From high school to the job market: analysis of the university careers and the university North-South mobility' carried out by the University of Palermo (head of the research program), the Italian `Ministero Università e Ricerca', and INVALSI.

Keywords

Multiplex Networks, Student Mobility, Disciplinary Fields, North-South Divide

Simplifying multimode networks. Insight from student mobility flow in higher education

Vincenzo Giuseppe Genova, Giuseppe Giordano, Maria Prosperina Vitale and Giancarlo Ragozini

Abstract

Human mobility concerns the movement of people from one place to another. Movements of human capital are characterised by multilateral flows that enrich socio-economic wealth. However, socio-economic issues may arise when flows become unbalanced—such as students' unilateral mobility patterns from one geographical region to another. Identifying and studying such mobility patterns has recently become of interest to scholars for understanding the factors explaining this phenomenon.

Given the nature of the student mobility data in higher education (we refer to the MOBYSU.IT database which holds Italian students' data flows), that is flows of students connecting provinces of residence and universities of destination, network analysis has been adopted as one of the most appropriate methodological approaches to interpreting this phenomenon. The contribution aims at presenting first a procedure for simplifying multimode networks deriving from student mobility data and then to explore the presence of communities. Specifically, we defined a tripartite network structure where the three modes are given by: Italian provinces of residence, universities, and fields of study. Whereas students' flows between them provide the set of links. Recalling that this kind of tripartite network can be represented as a three-way contingency table and given the nature of our data, we assume that occurrences of students between the set of nodes provinces of residence and the other two depend on the joined pair of vertices (universities & fields of study). Following this assumption, the tripartite network is now simplified into a bipartite network where the two modes are given by: Italian provinces of residence and the set of hyper nodes (university & field of study). It is worth noticing that this method can be generalised to a multipartite case.

Preliminary results highlight the presence of clear community structures in terms of students' mobility in the path province of residence – (university & field of study). Furthermore, such communities suggest the presence of a dichotomy between "popular" and "unpopular" universities, especially in 2017, the time period under analysis.

Acknowledgement

The contribution has been supported from Italian Ministerial grant PRIN 2017 "From high school to job placement: micro-data life course analysis of university student mobility and its impact on the Italian North-South divide", n. 2017HBTK5P - CUP B78D19000180001.

Keywords

Students' Mobility, Higher Education, Multipartite Networks

Insights on the effect of network and individual characteristics on students' mobility choices.

Silvia Columbu, Mariano Porcu, Ilaria Primerano, Isabella Sulis and Maria Prosperina Vitale

Abstract

Quantifying and analyzing the Italian students migration patterns is a key factor in the the study of the determinants of mobility pathways and the attractiveness of universities. Based on the related literature of student mobility in higher education, five profiles of students are defined, from stayers to movers. Students are considered movers, at bachelor or master level, if they have enrolled in a university located in a region other than their home one and if the university's municipality is at least a 90-minute drive from their home city. Otherwise they have been classified as stayers.

In the present contribution we extract micro-data from the Italian National Student Archive gathered in the MOBYSU.IT Database [Mobilità degli Studi Universitari in Italia]. Data on two longitudinal cohorts of students enrolled at the academic years 2011--2012 and 2014--2015 in Italian universities have been considered to investigate the mobility patterns in the transition from bachelor's to master's degree programmes.

In particular, one-mode weighted network data structures are defined to deepen students' exchange between universities and territories for the different profiles. The probability for a student to be a particular kind of mover or not is analyzed adopting a multinomial logit model where the effect of the specific field of study is measured. Students' characteristics and geographical indicators jointly with network centrality measures defined to describe push and pull factors in the mobility phenomenon enter the model.

Keywords

Students' Mobility, Multinomial Multilevel Models, Network Measures, Disciplinary Fields

Qualitative social network analysis in the strategy of mixing methods in the social sciences: systematic literature review

Aryuna Radnaeva

Abstract

Social network analysis as an analysis of social structures consisting of units and relationships can be attributed to the statistical method. Deep social structures, as the subject of research in network analysis, can also be identified in qualitative methodology, if it is possible to combine the structuralist model with the interpretive model of sociological explanation. The qualitative method is able to reflect the construction of forms of relations and perceptions of their actors. However, is qualitative network analysis possible?

According to some authors, qualitative network analysis is possible as "a qualitative study of new types of networks and network strategies, which can then be connected to formal (statistical) network analysis", that is, qualitative network analysis is performed in stages: the interpretive part of the analysis, and then its structural visualization [Hollstein & Straus, 2006]. On the other hand, there is an opinion that there is no qualitative network analysis as a separate and independent methodology. The problem of defining and distinguishing qualitative network research is relevant today, namely, how network structuring in a qualitative methodology will be a qualitative network analysis.

A systematic review is characterized by a strict methodology for searching and selecting literature sources. Since the purpose of this article is devoted to the study of the practice of using qualitative network analysis, for its implementation, empirical studies were collected and analyzed indicating the use of qualitative network analysis. After considering different combinations of keywords for searching for sources, we stopped at the keywords "qualitative" + "social network*" + " mixed method*", for which 447 sources were found in Web of Science, 622 sources in Scopus, 22900 in Google Scholar. The choice was made in favor of 447 articles from the Web of Science database, since this database is characterized by a more traditional and narrow set of scientific papers.

The social science publications were selected for further analysis; in the course of their subtraction, the sample was reduced to 46 articles. The criterion for inclusion of articles in the array was the use of the SNA methodology and qualitative methods. The logic of the analysis implied the selection and analysis of articles with arguments for the use of qualitative network analysis, as well as articles of an empirical nature, the design of which implies the inclusion of a qualitative approach to network research in the strategy of mixed methods. Articles with a purely quantitative approach were not included in the study sample.

The conducted systematic review of the literature allows identifying the main possibilities of qualitative network analysis in studies with mixed methods. Examples of the application of the qualitative network approach in empirical research are considered, and 4 methods of analyzing qualitative data in network mixed studies are identified. Critical remarks of the position of the existence of qualitative network analysis as an independent methodology are described.

Keywords

Qualitative Network Analysis, Qualitative Methods In The Social Sciences, Network Analysis, Social Sciences

Social network analysis with the Net-Map tool - A systematic review

Christine Bosch, Lilli Scheiterle, Santiago Morales, Regina Birner, Athena Birkenberg and Eva Schiffer

Abstract

As participatory and visual social network mapping tool, Net-Map combines participatory action research, stakeholder and social network analysis with a sociological analysis of power relations. During group discussions or individual interviews, Net-Maps help in identifying, visualising and discussing what actors are involved in a given network, how they are linked, what their goals and positions are, and how influential they are with regards to a specific outcome. Since its development in 2006, there has been an increasing number of applications of Net-Map as a research method and as a tool to support project management and organizational development. Among others, Net-Map has been suggested to tackling the political character of public programs, adverse power structures and governance challenges in their implementation; or the plurality of actors, institutions, functions and values and consequent coordination failures in multi-stakeholder networks. Remaining challenges in the application of the tool include group dynamics which can hinder systematic data collection, and the aggregation and the comparability of the maps during data analysis.

The proposed paper has the objectives to (i) describe the origins of Net-Map, (ii) review its current applications, and (iii) derive implications for the future use of this tool. We carry out a systematic review of 87 peer-reviewed articles published between 2006 and mid 2021 in which Net-Map was used. Based on a detailed evaluation framework, we apply content analysis using the software MAXQDA.

Our results give a detailed overview on the disciplines and topics for which the tool has been used, on which theories the authors drew on, how they integrated the tool and their analysis with methodologies and other (qualitative) methods, how they analysed and used the insights gained from the net-map sessions, which limitations they mentioned and which solutions and quality assurance techniques are suggested.

Preliminary results show that peer-reviewed published articles using Net-Map are applied to a wide variety of disciplines, research traditions and contexts of social action, ranging from natural resource management, to agricultural and rural service provision, large-scale nutrition programmes, and innovation, research and policy processes. A majority of authors drew on social network theory, but articles also integrated other theoretical approaches like grounded theory. Most authors used the method within a qualitative case study approach and in combination with other qualitative methods, including narrative inquiry, ethnography and discourse analysis. Moreover, few quality assurance techniques are applied and the application of the tool is often not well described and discussed.

Based on these results we discuss the suitability of Net-Map for analysing these diverse contexts and identify benefits and limitations of different (combinations of) qualitative and quantitative perspectives. With a focus on the integration of theoretical and methodological perspectives, we provide a framework to facilitate the systematic use of Net-Map, and clarify basic principles of quality control.

Keywords

Qualitative Social Network Analysis, Systematic Review, Participatory Method, Visualization, Integration Of Theory And Method

Ambivalent and consistent relationships: the role of response networks in cases of domestic violence.

Elisa Bellotti, Susanne Boethius, Malin Åkerström and Margareta Hydén

Abstract

Social networks are usually considered as positive sources of social support, which has been extensively studied in the context of domestic violence. To victims of abuse, social networks often provide initial emotional and practical help as well useful information ahead of formal institutions. However, recent attention has been paid to the negative responses of social networks both in the context of domestic abuse and more in general in conflictual social environments. In this article we advance the theoretical debate on social networks as a source of social support by moving beyond the distinction between positive and negative ties. We do so by proposing the concepts of relational ambivalence and consistency, which describe the interactive processes by which people, intentionally or inadvertently, disregard– or align with –each other's role-relational expectations, therefore undermining – or reinforcing – individual's choices of action. By analyzing the qualitative accounts that describe relationships embedded in the social networks of 19 victims of domestic abuse in Sweden, we observe how ambivalent and consistent relationships play a role in supporting or undermining women in reframing their loving relationships as abusive; in accounting or dismissing perpetrators' responsibilities for the abuse; in relieving women from role-expectations and obligations or in burdening them with further responsibilities; and in supporting or challenging their pathways out of domestic abuse. Our analysis suggests that social isolation cannot be considered as the simple result of lack of support, but of the complex dynamics in which support is offered and accepted, or withdrawn and refused.

Keywords

Sociological Ambivalence, Domestic Violence, Social Support, Social Isolation, Social Networks, Qualitative Interviews

Social Network Analysis, Mobilities, and the Communities of Classical Potters and Painters in Athens and South Italy

Eleni Hasaki and Marco Serino

Abstract

Session: Networks and the Study of the Human Past

The potters's communities in Ancient Athens (520-300 BCE) and South Italy (450-300 BCE) are often studied in similar ways: the shapes, the decorative technique (so called red-figure), the scenes, and the ways that modern scholars identified painter's styles in both communities. Scholars used to apply a "Morellian-type" connoisseurship, characterized by a systematic analysis of the essential stylistic elements of an artist (such as faces, hands, bodies) to identify 'hands' of vase-painters and apprenticeship ties among them (Beazley 1963; Trendall 1967; 1970; 1973; 1983; Trendall and Cambitoglou 1978; 1982) The Collaboration of artists on a single pot has been establsihed both for Athenian pots (through signatures and style) and for the South Italian pots (mostly through style, as signatures are rare). In this study we juxtapose for the first time the organization of these communities through two on-going SNA projects, SNAP on Athenian potters and AGATHOCLES on the South Italian potters.

The interconnected social world of these named and nameless potters and painters for the Athenian system, and multiple connections in style for various South Italian workshops are crucial for research questions on craft, style, social, and economic aspects, but all data is currently presented in voluminous catalogues with associations often hidden. SNA can visualize these intricated connections and reveal previously-unnoticed associations. More than 1,000 "hands" have been identified for Athens, and more than 550 "hands" for the four major regions in South Italy (Lucania, Apulia, Campania and Sicily). These new sociograms generate more "network-oriented" identities for specific nodes (artists), highlighting who served as a bridge or broker and who facilitated technical innovations and secured lucrative financial deals though export trade.

Independently, the sociograms for each of these datasets offer an innovative way to focus on networks of collaborators and the strong stylistic influences between different workshops, breaking sharply with past traditional diagrams of focusing on one master, one workshop, or one region. SNA sharpens our eyes to discern paths of knowledge transfer, and the dynamics of a potter's quarter, and therefore it complements well the visual focus of connoisseurship.

Comparing the two datasets and their sociograms is equally informative, as the data on Athenian pottery derives from those potters/painters whose products were heavily exported whereas the South Italian potters data focuses on locally used, rarely exported, products. Moreover the Athenian potters/painters rarely moved, while the South Italian painters are believed to have moved among regional workshops. The SNA approach enables us to better capture and visualize these mobilities, that is mobility of products vs. mobility of producers, adding an important interpretative layer of SNA when combined with spatial analysis. Applying SNA to these production centers will illuminate how networks of collaborative workshops functioned, where the workshops themselves were not in physical proximity but had shared crew members.

Keywords

Social Network Analysis, Athens, South Italy, Red Figure Vase Painting, Communities Of Practice

Mythic Networks and Real-World Ethnicity in Ancient Greece

Benjamin Winnick

Abstract

In this paper, I argue that the fictional social networks in mythology can provide a fresh perspective on ancient Greek ethnogenesis. Ancient Greek mythology is a collective expression of ethnicity formed and modified over many centuries by disparate groups of people. Through social network analysis (SNA), the genealogies that connected the characters of mythology can be studied as a proxy for the networks of Greek ethnicity.

In 1997, Jonathan Hall argued that a myth of common descent and an association with a specific territory are the most important criteria of an ethnic group. The characters of Greek mythology wedded these concepts by being the literal or figurative ancestors of groups of people and having strong connections to specific locations. They were all related to each other and the genealogical networks that bounded these characters were the DNA of Greek ethnicity. I believe that SNA is the key to decoding this DNA.

My main source of mythic genealogies is Book 8 of Pausanias' 2nd century CE Description of Greece, a text which describes the sites, history, and mythology of the central Peloponnesian region of Arcadia. Pausanias' emphasis on mythic characters' connections to groups of people and territories makes him an ideal source for my investigation. The mythic genealogies he connects to Southwest Arcadia can help settle a debate about this subregion's ethnic development.

In 370 BCE, Arcadia united politically as the Arcadian Federation. A few years later, this federation reformed the tribal states and small settlements of Southwest Arcadia into a single city-state called Megalopolis. Roy (1968) argues that Megalopolis began life at its fullest territorial extent while Moggi (1974) believes the initial unification comprised a smaller area that only gradually encompassed all of Southwest Arcadia. I argue that the uniquely disassortative network component connected to this subregion supports Roy's interpretation more than Moggi's.

Most parts of Arcadia's mythic genealogy show a complex interplay of regional, subregional, and settlement-specific figures who were the products of centuries of territorial and ethnic negotiations. In contrast, Pausanias frames the genealogies connected to Southwest Arcadia as a simplistic series of eponymous settlement-founders with few genealogical connections beyond their father, King Lykaion, the eponym of Megalopolis' religious center, Mt. Lykaion. This imbalance between the degree of one vertex (Lykaion) and its adjacent vertices (his children) makes the southwestern component the most disassortative part of Arcadia's mythic genealogies. Newman and Park (2006) argue that disassortativity is a hallmark of an artificial network. The disassortativity and overall uniqueness of Southwest Arcadia's mythic genealogy implies a drastic and imposed rearrangement of the region's religious and ethnic identity, which corresponds to Roy's argument. If Megalopolis had grown gradually, as Moggi suggests, the mythic heroes of Southwest Arcadia would have retained more of a presence in Arcadian mythology instead of just being sons of Lykaion. In this way, I demonstrate one way that a network analysis of the fictional social networks of mythology can reveal ethnic changes in Ancient Greece.

Keywords

Ancient Greece, Ethnicity, Mythology

Augustus and the Transformation of Roman Spatial and Social Network

Brendan McCarthy

Abstract

The population of the city of Rome expanded quickly in the second century BCE, reaching perhaps one million people by the end of the millennium. These people lived in small “neighborhoods” called vici. Because the population was so large, and Rome’s street network so poor, those vici became the centers of tight social networks with few brokers, segmenting the population into social bubbles and perpetuating civil strife in the last century of the Republic (133 – 27 BCE). This paper will discuss how these networks were formed and how Rome’s first emperor, Augustus (27 BCE – 14 CE), was able to reshape those networks to lessen political dissent.

Augustus successfully mobilized the diverse networks of Romans to an extent to which his Republican predecessors failed. His success is due to scale: he had more time, more money, and more ambition with less competition than any leader of the Republic. These changes did not eliminate conflict, but did eliminate some barriers that encouraged isolated social bubbles in the Republic.

Augustus made three fundamental changes that affected spatial and social networks. The first was a policy change: he divided the city into 14 regions and made an official count of vici. This policy broke and reformed the spontaneous connections these vici had made with each other and combined them through shared services like watchmen and fire services. The second change was creating clear hubs that connected the city and encouraged more brokers to gather in fewer places. Augustus built a clear government center in the city by finishing Caesar’s Forum and creating his own which were both near the Roman Forum. He and his colleague Agrippa transformed the Campus Martius into a pleasure district with thermae (large bathing complexes), planned open spaces, and new worship spaces with pleasant porticos for people to linger within. The final change was the promotion of Augustus himself as a unifying force in the city. Augustus promoted himself as the son of a god (Julius Caesar who was deified after his death) and a father figure for the city of Rome. Romans responded by sacrificing to Augustus’s genius, the divine inspiration that supported the head of a Roman household. He replaced most of the Senate within his lifetime and promoted several artists, creating an entire class of opinion leaders dependent on his support. These actions created and diffused new social norms that grew in strength the longer Augustus found success as Rome’s leader. While manipulating Rome’s social networks was not Augustus’s goal, his policies had the effect of reshaping the way Romans interacted with their city and each other by centralizing their relationships in new and reformed spaces and in his own person.

Keywords

Broker, Segmentation, Augustus, Urban, Space, Archeology

Projecting Signed Two-Mode Networks

David Schoch

Abstract

Signed two-mode networks have so far predominantly been analysed using blockmodeling techniques. In this work, we put forward the idea of projecting such networks onto its modes. Two projection methods are introduced which allow the application of known dichotomization tool for weighted networks to obtain a simple signed network. It turns out, however, that resulting networks may contain ambivalent ties, defined as conjunctions of positive and negative ties. We show that this requires the reformulation of matrices related to the network and introduce the complex adjacency and Laplacian matrix. These matrices are used to prove some properties related to balance theory including ambivalence.

Keywords

Signed Networks, Two-Mode Networks, One-Mode Projection

Ranking in signed networks

Dmitry Gromov and Elizaveta Evmenova

Abstract

Complex social networks have become an indispensable part of our everyday life. Typically, we consider a social network as a large set of friendship relations. However, for a realistic representation of some interrelations between different actors, it is of great importance to consider not only positive but also negative relations, which can describe, e.g., distrust in or disagreement upon certain matters. In such a way, one can adequately describe the structure of the relations between individuals.

In this contribution we will consider the problem of ranking in a complex signed network. Such a problem has been extensively studied for unsigned networks, let us mention just Google's PageRank algorithm, which is based upon the application of the celebrated Perron--Frobenius theorem. However, these standard algorithms cannot be directly applied to the signed networks as the Perron--Frobenius works only for non-negative matrices, resp., unsigned networks. Therefore, several alternative algorithms for computing ranking in signed networks have been developed. We mention, e.g., the exponential ranking algorithm, complementary centrality method, the Bias & Deserve algorithm among many others. In contrast to the PageRank algorithm, which is based upon linear algebraic methods and can thus be relatively easily interpreted, the other mentioned methods are often difficult to decompose on fundamentals and see a specific theory behind them. In our presentation we will specifically consider the exponential ranking algorithm and present a number of results aiming at characterizing its properties. We shall also make a connection of this method to the linear algebraic methods of the PageRank type. All obtained results will be supported by extensive numerical analysis.

Funding: The reported study was funded by RFBR, project number 21-011-44058.

Keywords

Signed Networks, Ranking, Perron-Frobenius Theorem, Pagerank

Topological Characterization of Social Networks using Distributional Data Analysis

Giuseppe Giordano and Antonio Irpino

Abstract

This contribution proposes an exploratory strategy for the analysis of complex data arising from social networks. Many studies involve complex data structures shaped as network data, common sources of relational complexity may include changes over time, multiple relationships and large size. Reducing graph complexity involves scaling down information derived by network data, maintaining consistent statistics, and enabling further investigation. The idea applied to social network data consists of synthesizing a graph's topological properties toward the extraction of a set of relevant network statistics observed at node-level (Giordano, Brito, 2014).

Generally, the node-level statistics measured on a graph are summarized through some features (mean, standard deviation), which cannot significantly compare different topological structures. A proposal for overcoming such a drawback is to describe each graph by the distributions of the node-level observed statistics for each chosen topological measure and to analyze such a table of distributions using methods coming from distributional data analysis.

Distributional data analysis is a relatively new field of research where non-trivial statistical units are described by the empirical distributions of observed values for numerical statistical variables introduced in the framework of Symbolic Data Analysis as defined by Bock and Diday (2000). In particular, we use a dimension reduction technique for describing a table of graphs described by distributional variables.

An ad-hoc Multiple Factorial Analysis (a dimension reduction technique derived from the Principal Component Analysis) was introduced to explore distributional data by Irpino and Verde (2015). It is based on the decomposition of a measure of variance for a distributional variable based on the L2-Wasserstein distance between distributions. Graphs characterization as distributional data allows building a factorial subspace characterized by the quantile-variable (namely, a way of representing distributional data through quantiles) describing the network statistics. It allows representing a whole network as a single point.

The network statistics have been selected according to relevant topological properties. For instance, we used the typical centrality measures (Degree, Closeness, Eigenvector and Betweenness), the local Transitivity measure (or Clustering Coefficient, Watts & Strogatz, 1998) and the local Efficiency (Latora & Marchiori, 2003).

The clustering coefficient is higher in small-world networks compared to random networks. Local efficiency measures how efficient the communication is between neighbors of a node when that node is removed. Although the two measures are related, they show different patterns in how real networks deviate from random graphs and present increasing characteristics either of Small-Words or Interconnected Communities.

The main aim is to define a strategy for detecting social network characteristics and a visualization tool interpretable through the extracted features and traceable with respect to classes of known network topologies. The resulting factorial topological map could be used to compare real data with theoretical topologies.

To assess the validity of the proposed approach, we carry out a simulation study considering as controlling factors the network size (240, 480, 960 nodes), the network density (1%, 5%, 10%) and some typical topologies (that is, Preference Attachment, Small-World, Two-Isles, Three-Isles and Random graph).

Keywords

Complex Network, Distributional Data, Network Data, Symbolic Data

Factorial Embedding of Network Statistics Distributions for Anomaly Detection

Giuseppe Giordano and Raffaele Miele

Abstract

Nowadays, cyber-security is a critical topic, it has a great impact on economic growth and social wellbeing. Massive usage of computer systems is more and more subject to vulnerability and new threats emerge in a differentiated and innovative way. Anomalies are referred to as data patterns that do not conform to a well-defined characteristic. They are generated by a variety of abnormal activities. For example, an unusual traffic pattern in a network could mean that a computer has been hacked and data is transmitted to unauthorized destinations; anomalous behavior in credit card transactions could indicate fraudulent activities, and so on.

In this framework, the so-called "rule-based" approach seems like failing to detect them. This calls for new approaches, more flexible and less dependent from prior knowledge incorporated in a rule-based model. In order to detect new threats (ex. 0-day attacks), unsupervised machine learning, in the form of anomaly detection, seems to be one of the most promising approaches. Anomaly detection is an important data analysis task that detects anomalous or abnormal data from a dataset. It is an interesting area of data mining research as it involves discovering rare patterns in data.

In this contribute we present a Graph based approach for detecting network-wide anomalous conditions in a running time, that is, network data are captured periodically in successive time-varying windows slices. Such data are represented as graphs and typical social network statistics are computed at node level producing related statistical distributions. This kind of data holds relevant information on the topological structure of the network and tell about events happened in each node. The network data distributions are then arranged in a data frame which rows refer to networks observed at time t and columns hold the distribution quantiles for each variable (that is, for each network statistics we wish analyze: Degree, Betweenness, Eigenvector centrality, etc.). The full data set is a three-way array holding networks x distribution quantiles x variables.

The strategy of analysis consists in a data reduction, obtained in the framework of factorial techniques for distributional data. The Multiple Factorial Analysis generalized for data distributions allows to extract the dominant sources of variability and it is used to find an optimal embedding which encompass most of the topological features of each network. In this reduced subspace, the anomalies are detected within a statistical quality control approach based on a multivariate control-chart. A point "out-of-control" represents a network whose topological features deviate from the others and enables back-actions for possible causes.

Keywords

Botnet Detection, Distributional Data, Multiple Factorial Analysis, Multivariate Control Chart

Stopping network diffusion - agent-based models for simulating strategies of containing complex contagions in cases of sexual harassment

Jan Majewski

Abstract

Gossip is an abundant social phenomenon, that allows humans to communicate many different information. Rich literature, embedded in evolutionary theory, has shown how many functions – from sustaining group coherence, updating social information and promoting cooperation, to establishing group-normativity and punishing norm violators – it serves. However, there seems to be a gap in research on modeling gossip as a "weapon of the weak".

This presentation wants to explore the dynamics of gossiping interpreted as a complex contagion and attempt to a find solution to an established social problem of cases of concealed wrongdoing. In many social settings, the high-status individuals can abuse their underlings, because they have the power to conceal and contain the information about their actions. The literature shows, that there are several strategies of preventing the spread of information through the network of informal contacts. Most of them could be categorized either as instances of "silencing" (informed person is influenced to not disclose their knowledge of wrongdoing – the node is deactivated and unable to further spread received information) or strategies of "removing" the contagious individual from the network (e.g. a cut vertex possibly creating many connected components).

Those strategies can be simulated in an ABM with realistic assumptions about network topologies, gossip dynamics and psychological prerequisites drawn from scientific literature. Preliminary results show very high efficiency of some combinations of model parameters, which supports sociological observation, that it is extremely difficult to break the organizational silence even in dramatic circumstances. On the other hand, well-connected clique-like neighborhoods seem to show much more resilience, and may eventually lead to the exposure of wrongdoers.

Keywords

Gossip, Insider Threat, Sexual Harassment, Stopping Network Diffusion, Agent-Based Models, Computational Sociology

Targeted immunization strategies: Comparing the efficacy of traditional versus alternative centrality measures through agent-based modeling

Andrea Fronzetti Colladon, Cristina Ponsiglione, Simonetta Primario and Giuseppe Zollo

Abstract

This study aims to measure and compare the efficacy of established and alternative targeted immunization strategies based on the investigation of social network positions of individuals. In particular, it focuses on traditional and novel metrics of network centrality.

An extensive literature has proposed different strategies to prevent, manage, or mitigate contagion outbreaks in a population (Cohen and Havlin, 2010; Pastor-Satorras and Vespignani, 2002; Rosenblattid et al., 2020; Wang et al., 2016). The selection process, defining the order by which individuals are eligible for immunization, may depend on different criteria. Following a network-based approach, these criteria are usually related to the concept of centrality (Bonacich, 1987; Wasserman and Faust, 1994). Similarly, different validation approaches were used to assess the role of these metrics in identifying influential nodes (Batool and Niazi, 2014).

In recent work, Fronzetti Colladon and Naldi (2020) proposed a set of novel measures called Distinctiveness Centrality. Unlike the well-established centrality measures like degree, closeness, betweenness, and eigenvector, the introduced measures tend to attribute higher scores to nodes linked to loosely connected peers. The idea of using such alternative measures is that they can serve to identify nodes with many peripheral connections in sparse local communities, that however, have no strong connection with central authorities.

Therefore, supported by the results of Chami et al. (2017), which showed the superiority of network-based vs. role-based strategies, we wondered which kind of centrality measure could be more effective for targeting nodes and what role plays the topological structure of the network.

To answer these research questions, we developed a model that extends a basic Susceptible-Exposed-Infectious-Recovered (SEIR) model with network and immunization strategies. We used the NetLogo software to build several agent-based models that simulate different scenarios, with parameters related to the SEIR (i.e., transmission and mortality rate, incubation and infection period, or the number of initial exposed), the vaccination (i.e., efficacy, seroconversion period, or how many and when vaccines are available), the topological structure (i.e., power law, small world, random, or given network), the type of strategy (i.e., immunization or fragmentation), and the metric used to drive such strategy (i.e., degree, closeness, betweenness, eigenvector, distinctiveness).

Although still in a calibration phase, results of the first experiments highlight situations in which targeted immunization strategies driven by distinctiveness measures are more efficient than those using established centrality measures.

In future research, we plan to extend the proposed models to different contexts to study, for example, information diffusion and consumer preferences. For example, we could evaluate node-activation strategies focused on mitigating dysfunctional group dynamics emerging due to filter bubbles and echo-chambers (Pariser, 2011; Sunstein, 2001) or countering disinformation and fake news diffusion using fact-checking policies (Bessi et al., 2015; Margolin et al., 2018).

Keywords

Targeted Immunization Strategies, Agent-Based Model, Social Network, Vaccination

Prioritizing high-contact professions raises effectiveness of vaccination campaigns

Hendrik Nunner, Vincent Buskens and Arnout van de Rijt

Abstract

Recent studies have proposed network interventions for reducing the propagation of COVID-19. By restricting close-range contact to occur only within predetermined interaction structures, the speed and reach of COVID-19 spread can theoretically be reduced. However, even severe social distancing policies such as full-scale lockdowns can only temporarily reduce infections and hospitalizations, leaving large-scale vaccination as the primary vehicle for sustainable control over the SARS-CoV-2 virus. Nonetheless, global vaccine roll-out has logistical and financial limits. The challenge is how to effectively control the virus with limited supplies.

A twenty-year-old idea from network science is that vaccination campaigns would be much more effective if high-contact individuals were preferentially targeted. Implementation is impeded by the ethical and practical problem of differentiating vaccine access on the basis of a personal characteristic that is informal and private. Here we develop an agent-based model on how to effectively vaccinate in times of a pandemic by prioritizing specific occupational groups. We draw on data from a survey conducted at the beginning of the COVID-19 pandemic in early 2020 that measures close-range contact for occupational groups. The data reveal substantial occupational differences, with teachers and cashiers being among the most connected and computer programmers among the least connected. To investigate whether this variability can produce significant gains when exploited in targeted vaccination programs, we first used a genetic algorithm to generate networks of 10,000 nodes that map the occupational contact data onto network degree. We then simulated epidemics and compared the effectivity of vaccination campaigns that target individuals either randomly or targeted by occupational group membership, prioritizing the highest reported average number of social contacts.

Our simulations suggest that random distribution of vaccines amounts to 35% of nodes getting infected on average, compared to 60% in the baseline/no-vaccination condition. Prioritizing high contact professions, however, results in a mean of 20% of nodes getting infected, while the vast majority of epidemics are prevented entirely (median number of infections close to 0%). Furthermore, we show that the positive effect of targeted vaccination is stronger if networks are more clustered and if there is lower occupational group homophily. A comparison between random vaccination of 40% and targeted vaccination of 20% of the population (everything else equal) shows that the latter achieves similar numbers of cumulative infections with significantly later and lower epidemic peaks.

Based on our findings, we propose that occupational groups can function as a reasonably effective proxy to increase effectiveness of vaccination campaigns.

Keywords

Pandemics, Diffusion, Vaccination, Network Intervention, Professional Networks, Agent-Based Modeling

Empirically calibrated simulations with RSiena: The case of bilingual education and language group status.

Christian Steglich and Lysann Zander

Abstract

Language barriers are an important complicator of social interaction, and in consequence can become a strong determinant of friendship group boundaries. Because a migration background tends to coincide with a mother tongue different from the host country's, migrant integration usually starts with a language course. In the school context, the more systematic approach of bilingual education has been championed as a less assimilationist, more transcultural approach to integration, which puts both language groups on equal footing in two-way immersion education, instead of demanding a language-learning investment only from one group. To what degree are such programmes successful? What are the network mechanisms contributing to this success? Can we quantify and compare these contributions?

In our study, we analyse longitudinal friendship data obtained from a group of bilingual schools and a control group to find answers to these questions. In the literature on friendship networks, various network mechanisms have been held accountable for observed segregation levels. The three most commonly acknowledged ones are homophily (selectively being friends with the own group), sociality (dominance of one group, withdrawal of the other), and the moderating effect of triad closure ('friends of friends being friends') which acts as an amplifier of homophily. In our study, we want to investigate these and other mechanisms not only in terms of how strong the evidence for them is in a data set, but also in terms of how much of observed segregation can be allocated to their operation. For this aim, we use stochastic actor-based models for network change to first calibrate a mechanism-rich model to empirical data, and then modify it in non-empirical scenarios, and generate distributions of model-predicted segregation levels under each scenario. By systematic comparison of these scenarios, we can quantify the different mechanisms' contributions to the particular segregation measure under study.

Keywords

Stochastic Actor-Oriented Model (Saom), Simulation, Bilingual Education, Emergence

Network Oriented Ethnography: A Case of Interstitial Research in Transnationalism, Migration and Mobility

Ignacio Fradejas-García, Renáta Hosnedlová, José Luis Molina and Miranda J. Lubbers

Abstract

Migration flows and transnational connections can not only be explained by the aggregate of individual decisions of those who move in search of better opportunities. Agency is important in international mobility; however, it does not occur in the vacuum. The social structures in which people, things and ideas move are composed by a complex web of social relations and practices connecting places in different regions across borders. These structures have been conceptualized as transnational social fields (e.g., Glick Schiller, 2004; see Lubbers, Verdery, & Molina, 2018 for a review) but so far there have been few attempts at measurement (Mazzucato, 2007; Mouw et al., 2014) due to the enormous methodological, technical, and logistical complexity associated with this task. Moreover, the qualitative analysis of these social structures has been limited by the difficulties of making concurrent research in different places (Hage, 2005). Our main question is about the role of ethnographic research in the study of transnational fields, migration and mobilities, its practical difficulties, and its eventual contribution to the improvement of the existing knowledge about these phenomena.

The paper is drawn on the experiences and findings of a research project that investigates two transnational fields that link several localities in Romania and Spain, using a mixed methodology (Hollstein, 2008) that combines multi-sited ethnography with social network analysis, following a selection of active contacts of the people interviewed in both countries (binational link-tracing, n=496), thanks to two teams that have worked in a coordinated way at both ends of the transnational fields and a long term multisited fieldwork of one of the authors. We present here the important role of ethnography in this research, from identifying initial interviewees to giving trust to the community regarding our research, from understanding uneven power relationships in the field to the identification of geographic mobilities, from dealing with institutional control to opening avenues for public dissemination of results. Thus, our proposal of network oriented ethnography is both the analysis of the interdependent social meso-structures that affect the cognition and behavior of a group, and the study of the social and cultural practices performed in – and beyond – these social structures. In sum, the methodological combination of SNA and ethnography is here mutually constitutive and allows to research the inaccessible interstices of agency and structure in transnational social fields.

Keywords

Network Oriented Ethnography, Agency, Structure, Transnational Social Field, Romania, Spain

Unveiling network referents: Filter figures in an Haute-Cuisine Restaurant

Guillem Perez Sanchez

Abstract

Twenty-five cooks working in Tickets, an haute-cuisine one Michelin star restaurant from Barcelona, were observed and interviewed. With the use of Social Network Analysis we brought to light that some second level cooks (in terms of their position in the organizational chart) were Key Filter members and played an important role as Bridges to connect the Production Team with the next cooking shift, which finally created the dishes to be served. Other members arose as connectors between cooks and higher ranked staff. Production team had some peaks of workload supported by really experienced staff members. Other filter figures were determined by their contribution in Advice, Work Frequency and Knowledge Status networks. Finally, we looked into the use of checklists as an element of study that involves knowledge sharing, routines and decision-making processes.

Mixed methods based on a case study were used (field observations, interviews and questionnaires). Then SNA was applied to represent the organization, its inner collaborative interactions, the use of techniques and knowledge transfer paths. To fulfill this analysis two software were used: Coding in Python with NetworkX 1.8 (Hagbert et al., 2008) and UCINET 6.498 (to check the consistency of our code). As a result five graphs about creative processes and fourteen about organizational matters and staff relationships were presented.

The contribution of these concrete applications in the context of the whole research (i.e. the PhD objectives), inheritance of routines and the introduction of checklists was determined and linked to members that were part of the renowned restaurant elBulli (closed in 2012). Concretely, Chef Andrés Conde (five years in elBulli and Chef de partie in Tickets) was clearly defined as responsible to transfer and apply this knowledge.

Keywords

Filter Figures, Mixed Methods, Knowledge Sharing, Routines, Decision-Making Processes, Cooks, Haute Cuisine Restaurant

A way to study transnational identities

Luciana Taddei and Paolo Diana

Abstract

The contribution reflects upon a research about Italo-Argentinians, carried out adopting a mixed method approach in a digital context.

Nowadays, migrations lay on transnational relationship-wise networks affecting both the destination and origin countries and populations, in a non-stop of interaction and mixture mechanism. In an era of geolocalization, migrants do not move from a place to another without leaving traces: they keep having multiple and different interrelations with their origin, transition, and arrival countries, but also with all the other physical and digital spaces they enter in contact with.

In this scenario, ICT ease the development of transnational relationships and contribute to the raising and strengthening of the so-called "imagined identities". Italo-Argentinians, for example, developed continuous interactions allowing them to build and re-build their own culture and their own hybrid identity.

The research has been carried out through a digital ethnography providing the opportunity to observe the interactions among subjects identifying themselves as Italo-Argentinians: they were able to build a suitable environment, where their identity can live and grown up. Ethnography made it possible to study the network as a "field of relations", following the links likely to be significant.

Ethnographic method has been integrated with a web survey, allowing to deepen arguments and to develop an ego network analysis with the software Egonet, useful to understand the social networks importance in defining the cultural and identity belonging.

To verify one of the starting hypothesis, namely the influence of close ties on the identity of the Italo-Argentinians, we collected 119 self-administrated questionnaires. The survey identified the strong ties, the main relationships building the subject's first reference horizon. It asked to rank persons according to the degree of intimacy, also asking the category of belonging, nationality, means of communication, and the frequency of that contact. Nationality and compactness of the network proved to be important in building the transnational identity of the subjects.

The visualization of the ego-centered maps helped us to more intuitively show what were the relationship influencing the subjects interviewed. In particular, the graphic approach allowed to directly compare the networks of different individuals, in search of a significant similarity.

Keywords

Transnationalism, Egonetworks, Identity, Digital Ethnography, Web Survey

Who do you hang out with? Proximity-based social networks as a method to understand situated behaviour in a secondary school playground

Kerstin Sailer

Abstract

Proximity-based social networks are known from animal studies, which highlight the social group structure of species such as monkeys, since spatial proximity between animals can be treated as an indicator for the likelihood for interaction.

In this paper, a similar approach is taken, applying the principles of proximity-based social networks to the study of adolescent social networks in schools, hypothesizing that we can learn from the structure of proximity-based networks for understanding social life in schools. As a particular spatial setting, the school playground is chosen for various reasons: it constitutes an important part of the habitual routine of students; it is a place to bring students across classrooms and grades together; and contrary to the classroom, it gives students choice and agency to decide where to go, what to do and who to be with.

Therefore, based on observations of students in a playground, a proximity-based social network is constructed from spatial co-presence, whereby a node is an observed student in the playground and a tie between two students is formed when they are positioned in a way that they can see each other directly. Thus, spatial context can be treated as another type of relation relevant for the study of multiplexity in networks. This is exploratory research to establish the feasibility of the method to understand situated behaviour, locational choices, group formation and gendered behaviour.

The case study school is a mixed-gender London-based secondary school for more than 1,000 students aged 11-18, split into a lower school (years 7-9), an upper school (years 10-11) and the so called sixth form (years 12-13). In direct observations of the playground during the lunch breaks of the lower and upper school, undertaken in 20 non-consecutive days in the early summer of 2018, the locations of students (n=9206) were mapped on floor plans including information on locomotion (sit, stand, move), detailed activities (more than 30 different ones including chat, ball games, card games, etc.), gender (male, female) as well as group size and composition (boys, girls, mixed). For the proximity-based social network we use single snapshots, i.e. observed locations of students in the playground at one particular moment in time. The mapping was initially transferred to a GIS, then exported into R, where networks were constructed and analysed, both visually and statistically using network metrics such as degree and betweenness, but also community detection algorithms.

Results suggest an interesting differentiation of locational preferences, mainly by gender. Due to the complex two-level playground design with particular features including a bridge, walkways, sports fields, an amphitheatre-style seating and a landscaped area at the back of the school, diverse clusters in the proximity-based social network emerge.

The talk will reflect on results and draw parallels to insights derived from classic survey-based social network studies in schools, aiming to reveal to which degree this method can provide complementary findings to understanding the social life of students in schools.

Keywords

Student Communities, Copresence, Spatial Context, Gender, Group Formation, Educational Networks

Friends and the development of adolescents' educational aspirations - accumulation of advantages?

Eszter Vit, Sven Lenkewitz and Robert Krause

Abstract

The study examines the direct and indirect mechanisms through which within-classroom friends can shape primary school students' educational aspirations regarding secondary school tracks. Friends and the wider peer networks become more and more influential concerning students' development and behavior during adolescence. Friends can be an important source of social capital for students and thus influence their aspirations. Individuals can have access to resources through their social connections which are often sustained for other purposes. Some of those resources can be directly related to friends' attitudes and behavior, while others are linked to friends' parental assets. In addition to influencing aspirations, friendship ties can be endogenously selected along related dimensions. The study applies random coefficient multilevel Siena analysis to get an unconfounded effect of peer influence accounting for friendship selection in a Hungarian sample of 21 school classes in the fifth, sixth, and seventh grades of primary schools. Moreover, the analysis identifies same-behavior (aspirations) and cross-behavior (parental background, academic achievement) influence mechanisms. The results indicate that friends parental background can influence adolescents' educational aspirations as adolescents tend to adjust their educational aspirations to the more academic-oriented grammar school track when they have friends with tertiary-educated parents. There is some weak evidence that this mechanism is especially crucial for adolescents with a more advantaged parental background. Nevertheless, we find that high-aspiring friends do not lead to the upward adjustment of adolescents' educational aspirations and comparison with friends' academic achievement does not seem to affect the development of adolescents' educational aspirations. The results show that friendship selection processes contribute to similarity among friends regarding their aspirations. Overall, the abovementioned findings indicate that network processes can contribute to the accumulation of advantages regarding educational aspirations.

Keywords

Aspirations, Influence, Friendships, Random Coefficient Multilevel Siena Analysis

Consensus and Fragmentation in the Dutch Climate Debate: A Discourse Network Analysis

Marit Meijerink, Dongsun Suh, Jeonghan Lee, Christina Prell and Christian Steglich

Abstract

In response to increasing climate change and to build a sustainable society, the Netherlands wrote the Climate Act in 2019, a policy document which is an agreement between organisations and businesses in the Netherlands to combat greenhouse gas emissions. This document specifies a number of action points and policy goals to mitigate climate change, such as increasing sustainable energy sources and decreasing the use of natural gas. To understand the wider context in which this Act was written, we study the Duthc climate change policy discourse, as reflected in three mainstream, Dutch newspapers, over a 10 year time period (2010-2020). We adopt a Discourse Network Analysis (DNA; Leifeld, 2017) approach to identify and code statements about climate change, within each newspaper; along with the relevant policy actors that agreed or disagreed with each of these statements. The resulting dataset consists of three congruence networks, representing three separate time periods, i.e. Period 1 (2010-2014); Period 2 (2015-2017), and Period 3 (2018-2020). Each congruence network consists of a set of ties, in which a tie between any given pair of actors represents agreement on three or more statements. Digraphs, MDS analyses and centrality measures demonstrate which actors are most important, for each period, and which actors cluster together to form coalitions. Altogether, our findings offer an interesting overview of how the discourse network, and its patterning, changed overtime, both in terms of network composition (i.e. sets of actors) and network content (i.e. policy statements). The findings suggest general consensus among relevant actors concerning the risk of climate change. Fragmentation was found for specific statements around policy suggestions for climate change mitigation. We conclude with some reflections on how these findings shed light on potential next steps in the Dutch policy and policy discourse context regarding climate change.

Keywords

Discourse Network Analysis (DNA), Climate Change, COMPON Project, Social Network Analysis, Policy Networks

Forests in Conflict

Laura Roldan

Abstract

There is a feedback loop between the natural environment and socio-political conflicts. Scarcity and unfair distribution of natural resources lead to grievances over natural resources. These grievances lead to conflict in contexts of frail political and socio-economic conditions. The escalation of conflict puts pressure on natural resources, which leads to alterations in the ecological system, exacerbating scarcity and distributional grievances over natural resources.

The Colombian conflict is a ripe example of such a socio-ecological problem. Evidence suggests that conflict intensity is correlated with cycles of deforestation and recovery of ecosystems. These alterations to the ecological system are a consequence of warlike actions and strategies, such as illicit agriculture and mining, prime causes of deforestation, but also isolation and displacement, which tend to lead to ecosystem recovery.

In this paper, I compare the structure of the ecological network formed by forest cover change and the social network emerging from war dynamics. The underlying assumption supporting the treatment of deforestation data as an ecological network is that change in forest cover can be modelled as a contagion process. The social network is formed by the dyadic interactions between fractions of war through warlike actions. The research question I intend to address is: Is there a patterned dynamic between the interactions of armed groups in conflict and the changes in forest cover? I hypothesise that the deforestation process spreads in response to the intensity and modality of the conflict. To address this question, I use a relational event model for the analysis of the social system of armed conflict and a network autocorrelation model for the analysis of the deforestation network. I set the analysis in the Colombian conflict using deforestation data from 2000 to 2018 sourced from the Global Forest Change Data, and warlike actions data sourced from the Observatory of Memory and Conflict.

Keywords

Deforestation, Political Conflict, Relational Event Model, Network Autocorrelation Model, Colombia

How the quality of ecological dependencies influences actor collaboration

Martin Huber

Abstract

Environmental governance is complex because it often concerns multiple dependent ecological issues. Ecological issues are features of ecosystems that can be influenced by ecosystem management activities within a reasonable time, such as the water quality that is affected by the operation of wastewater treatment plants. Since interdependencies between ecological issues are often vastly complex, it is challenging for actors to understand their ecosystem management activities' full impact on ecological issues. One reason why interdependencies between ecological issues are complex is that they are not binary but can have different qualities. We study how the quality of ecological interdependencies influences actors' choices of collaboration partners when carrying out their ecosystem management activities. We ask: How does the quality of dependencies between ecological issues influence actor collaboration?

We adopt a Social-Ecological Network (SEN) perspective based on Social-Ecological System (SES) theory to address this research question. SENs are a recently developed approach used to describe and analyze intertwined social-ecological interactions based on multi-level networks. We contribute to the SEN literature by assessing different qualities of dependencies in the ecological network and analyzing how they influence the collaboration patterns in the social network.

First, we can only increase our understanding of ecological systems and the interdependencies between ecological issues by acknowledging these systems' inherent complexity. When SENs are applied to study SES, the ecological ties in those networks are often binary and do not include any information about the ties' quality. However, accounting for the quality of ties can help explain why many environmental problems entail conflicts of interest. Second, a better understanding of the ecological system and dependencies between the ecological issues therein is essential to evaluate collaboration patterns. The literature on Social-Ecological Fit (SEF) emphasizes that the alignment of collaboration ties within the social network with ties among ecological issues can enhance governance effectiveness. However, current discussions on SEF often do not account for the quality of dependencies between ecological issues. This limits the power of the concept of SEF since the achievement of social-ecological alignment is not only dependent on the existence but also on the quality of ecological ties.

The methodological approach of this study combines qualitative expert interviews and quantitative survey data with statistical modeling of networks. The data is conceptualized as a directed two-level social-ecological network. To model the SEN, we apply Exponential Random Graph Models (ERGMs). Empirically, we compare governance networks in six wetlands in Switzerland. Wetlands are among the ecosystems with the highest biodiversity. The research setting is based on six separated yet comparable case study areas with around 300 actors active in the local management of these wetlands. The case studies only differ in a few aspects, such as the number of area-specific government institutions as well as the size of the study areas. In response to the call from the field of SEN studies to move beyond single case studies, our study provides an exciting opportunity to evaluate and compare SEN in a comparative setting across cases.

Keywords

Social-Ecological Networks (SEN), Social-Ecological Systems (SES), Exponential Random Graph Model (ERGM), Natural Resource Governance, Collaboration

Institutionalized Public Participation in Local Environmental Governance in Ireland

Paul Wagner

Abstract

In 2014, the Irish Government established Public Participation Networks (PPNs) in each local authority area in the country to enable the public to take an active formal role in local policy making and oversight committees of their local authority. PPNs also provide a means for local authorities to connect with community groups around the country and to benefit from their expertise. Any local group can participate in one or more of three different policy areas: Social Inclusion, Community & Voluntary; and Environment. This paper analyses survey data collected from over 100 groups that participate in the Environment section of their local PPN to investigate their organisational structure, their activities, their beliefs, and the extent to which they engage with the Environmental Pillar – the organisation representing ENGOs at the national level and who provide a channel for Government and other social partners to engage with the environmental sector. Results show that most groups have very few members, are male dominated, have less than 100 members and are entirely made up of volunteers. Nearly all groups have a strong "pro-ecological" world view (on the New Environmental Paradigm Scale, Dunlap, 2008) and believe that citizens, local government, national government, and industry are not doing too enough to protect the environment. Groups mostly focus on biodiversity loss, climate change, water quality, planning & development and raising environmental awareness. The vast majority of the groups have few or no network ties with the national ENGOs that make up the Environmental Pillar. These findings are indicative of the fact that Ireland is one of the most centralized states in Europe, with local or regional groups having few responsibilities or resources. The consequences of the local groups being detached from national level ENGOs and from national decision-making authorities are that the government is less likely to be aware of their preferences and that these groups are unlikely to have much influence over decision-makers.

Keywords

Public Participation Networks, Environmental Governance, New Environmental Paradigm Scale, Environmental Ngos

Bound by belts: Modelling social networks in the early medieval Carpathian Basin, 7th to 9th centuries AD.

Bence Soós and Gergely Szenthe

Abstract

The Avars traditionally interpreted as a nomadic people who arrived in the Carpathian Basin in the 6th century AD. In the first half of the Avar era, their power was sustained primarily at the expense of their neighbours. War booty and gifts played a decisive role in operating Avar society.

However, after the mid-7th century, rapid changes led to the emergence of a radically new cultural and economic model, characterised by the setback of external communications, or otherwise, these were restricted on the mediation of some exotic and luxury goods. "This “Late Avar culture” emerged during early medieval times as part of a regionalisation process in the material cultures of the neighbouring European and Mediterranean worlds, brought about by the collapse of the previous Late Antique system.

This time, settlement grew thicker than ever before in the Carpathian Basin and early village structures occupied new, mostly hilly zones. Concurrently, the emergence of new regional centres or settlement ‘hubs’, and the restructuring and development of agricultural and craft production are well-proven. The majority of the intensive archaeological record is mortuary evidence, as more than a half of the 70–80,000 burials of the Avar era are dated its second half, the late Avar period. The majority of the graves are known from large cemeteries of the villages; graves are relatively richly furnished, although costume accessories and jewellery are made of copper alloys with very few exceptions. As a stunning trait of late Avar material culture, virtually the same objects or object types cover the entire ‘Avar’ settlement area, testifying to the existence of a thick communication network enmeshing the Carpathian Basin. In the material culture, there is evidence for a relatively intensive social network that operated the Avar khaganate as a social and power structure. In 10 percent of the Avar male graves, belt sets cast of copper alloys came to light. The ornate belts prove the survival of nomadic representation model although under severely changed economic and social conditions, among the members of farming communities. Morphologically, the belt ornaments are rendered in three, subsequent stylistic groups, each comprising several object types and their variants. Each ornate belt comprises of 4 to 7 types of belt ornaments that were selected from among all types of their respective morphological groups or more groups, in an apparently random fashion. This phenomenon led to high variability of belt sets convenient for statistical analyses.

Our network analysis is based on the combinations of 962 belt sets. The study aimed to identify cultural and social patterns behind the archaeological material. By applying network models and statistical methods we hypothesized the main traits of the social mechanisms that shaped the visual representation of prominent members of the Late Avar communities and patterns of interaction within the Late Avar society.

Keywords

Networks, Early Medieval Society, Social Representation

When the Black Death knocked on San Marco's doors: the persistence of political power in the Venetian Republic in the aftermath of the plague of 1348.

Adelaide Baronchelli, Roberto Ricciuti and Mattia Viale

Abstract

This paper aims to study the impact that the plague of 1348 had on the structure of political power in the Venetian Republic using Social Network Analysis (SNA). With a mortality rate between 35 and 60 per cent, the Black Death was one of the most devastating epidemics in human history and a seminal event in European history. The plague indeed halted the process of economic development of the continent by collapsing the aggregate output. However, it helped the European population to develop greater resistance to pathogens, promoted the building of stronger institutions, alleviated economic inequalities, brought a period of high income in which living conditions improved significantly, and eventually promoted a favourable cultural environment that was the cradle of the Renaissance.

Our analysis is based on "The Rulers of Venice, 1332-1524" dataset (rulersofvenice.org) which collects information from various historical records about the people elected to several political offices of the Republic over the pre- and post-Renaissance period. Using this data, we describe the power structure in the Venetian Republic by interpreting it as a two-mode network where the Venetian families (actors) are associated with the offices (events) where their members were elected. The choice of families as the unit of analysis is motivated by the importance of this institution in pre-industrial times. The political power was claimed on the basis of hereditary qualification and patriarchal power. States were familial states where political offices were distributed to men based on their family ties and position. Furthermore, to identify the effect of the Black Death, we construct two networks, the first relating elections held 10 years before the plague and 5 years after the event. The choice of the period is due to data availability and it allows us to include the main elective offices in the Venetian Republic. Finally, we compare the two networks using SNA statistics and we use community detection techniques to highlight hierarchies in the networks.

Preliminary results show that the families who held the power before the plague managed to maintain their influence after it. Centrality scores indicate that actors with the highest participation rate are the same in both the periods analysed. Furthermore, the identification of communities reveals there were no changes in the way the power was structured among main actors. In conclusion, our analysis suggests that families were able to use their surviving members to hold their place in the political life of the Republic.

Keywords

Two-Mode Networks, Political Elites, Plague, Venice

Searching for explanations of polarization during the European Reformation

Ramona Roller and Frank Schweitzer

Abstract

The Reformation was a major transformative movement in 16th century Europe that established Protestantism as an alternative to Catholicism. Supporters of Protestantism were divided into several factions about the question on how faith should be practiced. We call the formation of these factions ideological splits.

For example, Lutherans only supported the thrive for spiritual freedom whereas Baptists also supported the thrive for secular freedom so that individuals could renounce from their feudal lords.

By using a letter correspondence network between reformers of the 16th century (2,000 nodes, 30,000 edges) we see that ideological splits manifest in communities, densely connected groups of nodes. How did these ideological splits form? Different social dynamics serve as possible explanations and various community detection algorithms exist to extract groups of reformers. But which extracted groups capture the historical ideological splits best?

In this work, we relate different social dynamics to community detection algorithms.

We show that community detection algorithms define groups of nodes in different ways which correspond to distinct interaction dynamics between individuals. By comparing the results of different community detection algorithms to the known ideology of reformers we show how different social dynamics relate to ideological splits.

We examine three social dynamics: spread of ideas, power strategy, and byproduct of social norms. The spread of ideas dynamic assumes that reformers exchanged ideas via letters. Ideological splits correspond to chains of letters that connect reformers via the same ideas. The power strategy dynamic assumes that reformers compete for attention from others. Ideological splits form because a powerful reformer persuades others to follow him. The byproduct dynamic assumes that individuals follow social norms leading to increased interactions among groups of individuals. A relevant social norm is indirect reciprocity where a person returns a favor to a third party rather than to her original giver. For example, reformer Martin Bucer married the wife of his friend Wolfgang Capito after Capito passed away to ensure that she was well cared for.

We map each of the three social dynamics to a community detection algorithm: infomap, label propagation, and modularity maximization, respectively. Infomap models an idea as a random walker who travels between reformers via letter connections in the network to carry the idea from one individual to the other. Label propagation models the power strategy as majority influence where nodes have labels and adopt the label of the majority of nodes in their neighborhood. Modularity maximization models indirect reciprocity by selecting those communities where nodes show large amounts of closed triads.

The three community detection algorithms yield different numbers of clusters with different compositions. Infomap captures the Lutherans well, whereas modularity maximization accurately captures the relations between different ideological splits.

For example, Karlstadt and Müntzer started as supporters of Luther before rejecting his ideas and are therefore grouped into the Lutheran community. Our analysis highlights the importance of relating formal community detection algorithms to real-world social dynamics in order to choose the correct algorithm for the research question of interest.

Keywords

European Reformation, Letter Correspondence Network, Community Detection, Polarization, Protestant Ideologies

Kinship ties, family altruism and collective action: a network analysis of the 1691 revolt attempt in the city of Basel, Switzerland

Niccolò Giorgio Armandola, Malte Doehne and Katja Rost

Abstract

Context: A revolution attempt against a nepotistic government dominated by a small number of influential families took place in 1691 in the city of Basel, Switzerland. The coup failed after a year of political turmoil, known as 1691er Wesen. The event was well documented by both contemporary authors and Swiss historians. Using a comprehensive genealogical database, we analyse the role of kinship ties in mobilizing collective action.

Objective: The revolution attempt was neither a precursor of class movements nor a conflict between guilds. The historical sources refer to the 1691er Wesen as the escalation of family rivalries, but the empirical data shows that many families were represented in both parties of the conflict, hinting to conflicts within families rather than between families. Research on family altruism has focused on kinship relations amid members of the core family (parents and their children). In this study, we aim to explore more distant kinship relations and understand what the boundaries of family altruism are. We analyse the extent to which the absence of family altruism leads to the mobilization of ego against a related alter.

Design: Using genealogical data, we define different kinship relations that extend beyond and connect between nuclear families. For example, we define the relation between uncles and nephews as ties connecting males to their parents' brothers. By further distinguishing patrilineal from matrilineal lines, a complex web of distinct kinship relations emerges. Figure 1 shows the ego-graphs of six individuals who played an important role in the 1691er Wesen. We establish the strength of the kinship relations between ego and all its related alters by quantifying their proximity in terms of their shared bloodline. Thus, as shown in Figure 2, cousins represent weaker kinship relations (0.125) than siblings (0.5). Aggregated across families, this yields a weighted network in which rebels, neutral individuals and pro-elite are embedded and interconnected through different kinship ties.

Interventions: We analyse how the composition of local kinship configurations affected mobilization status. For example, we quantify the likelihood of ego being a rebel as opposed to pro-elite given its degree of kinship with every rebel or pro-elite alter. This allows us to quantify (a) the degree to which family altruism prevents people from harming their own relatives and (b) the extent to which different kinship ties influence individual behaviour.

Main Outcome Measures: We calculate the kinship distance/proximity between every pair of male citizens of Basel in 1690, operationalized as the weighted shortest path connecting the two individuals. This allows us to analyse the effect of kinship relations and roles that exist but are not explicitly labelled in traditional kinship systems, such as ego's father-in-law's brother.

Results: Our preliminary findings suggest that weak kinship ties among rebels did not compromise mobilization, while weak kinship ties between the rebels and the elite increased the probability of joining the revolution.

Keywords

Kinship Relations, Family Altruism, Collective Action

From Emperor to God. Statistical methods to analyse the spread of Roman Imperial Cult in the Eastern Mediterranean

Paolo Cimadomo, Carla Galluccio and Giancarlo Ragozini

Abstract

The aim of this paper is to try to establish the relation between the establishment of Roman rule and the development of the imperial cult in the Greek cities of the Eastern Mediterranean.

The imperial cult is generally seen as one of the main instruments used by Roman emperors to ensure their subjects' fidelity and, at the same time, one of the main changes that occurred in the public life of Eastern cities of the Empire.

The imperial cult spread extensively throughout the Empire, influenced by local political and cultural traditions. For example, in the Western Empire the image of a divine ruler was a political and religious novelty and required a heavier involvement on the part of the Roman authorities, in the East, instead, the stage was already well set by religious precedents developed as early as the Greek period through cults dedicated to commanders. These cults evolved after Alexander the Great's conquests, becoming a legitimate political instrument that ensured the relation between ruler and ruled throughout the Greek world.

In this paper we present and discuss some aspects of the worship of the Roman emperors (cult places, festivals, priesthoods) in the cities of Eastern Mediterranean. The evidence shows the tendency of these cities to integrate the emperors into their religious life as well as their political, social, and cultural world at large. Indeed, pre-existing sacred buildings were re-consecrated to the emperors, imperial contests were added to traditional Greek festivals, and the emperors were often assimilated to traditional gods in inscriptions, coins, and statues. Members of local aristocracies had a fundamental role in organising various events of emperor worship, particularly through the assumption of the office of priest of the imperial cult, usually assigned to prominent and well-to-do individuals.

From a methodological point of view, the relationship between the emperors, the Greek cities of the Eastern Mediterranean and the aspects of the worship of the Roman emperors can be seen as a complex network data structure, for which a multimode network approach can be carried out. A multimode network typically consists of vertices of different types linked together. Therefore, this network structure can be used as a model for a complex data structure. In this paper, the data at hand can be considered as a three-mode data structure, where the vertices are represented by the emperors, the Greek city and the aspects of the worship of the Roman emperors, while the presence of evidence of the worship of the Roman emperors in a Greek city represents the link between the vertices.

Keywords

Imperial Cult, Eastern Mediterranean, Roman Period, Multimode Networks

A Friend in Need? – Social Support and Integration of Asylum Seekers and Expats in Hungary

Dorottya Hoor

Abstract

Migration, with its profound effects on the daily experiences of individuals, often has far-reaching negative consequences on migrants. It is particularly true for those who have experienced forced displacement. As both migrants' integration process and support networks are shaped by multiple individual and contextual factors, the paper explores the personal networks of two markedly different groups- asylum seekers and expatriates- during the recent refugee crisis within the same national context of Hungary. To do so, it draws on the theories of assimilation, transnationalism and social support and employs a parallel mixed-methods social network design by combining personal network data with qualitative data based on interviews and ethnographic fieldwork with thirty-four migrants. It finds that asylum seekers' personal networks are smaller in size, especially when considering close ties and show a remarkable lack of friendship ties resulting in these migrants' limited access to social support. It also demonstrates that access to transnational support networks is a privilege of expatriates, while forced displacement entails a clear break in one`s social network, leaving asylum seekers with highly localised and resource-deprived networks mirroring a classical assimilation integration trajectory. Finally, it also highlights the intimate relationship between migrants' individual characteristics, integration process and access to social support, and concludes by arguing for a multi-layered and differentiated theoretical and policy approach to integration.

Keywords

Personal Networks, Migration, Social Support, Integration

Ageing Transnational Mobility Practices and Ego-networks Family Composition

Eva Fernández G. G. and Mihaela Nedelcu

Abstract

The current study examines the relationship between ageing cohorts' ego-networks family composition and individual transnational mobility – understood as individual behaviour. Family composition appears to be a relevant factor to explain behaviour at the individual level. Literature has thoroughly examined family structures as a result of intergenerational support vis-à-vis criteria of relatedness (high levels of intergenerational dependency) and separateness (low levels of intergenerational dependency). In addition, previous research has also shown that migratory trajectories and social capital are key factors for cosmopolitan practices. However, we lack in-depth analyses of core ego-network mechanisms associated with ageing and transnational mobility. Against this and based on an exclusive individual survey to study transnational ageing and post-retirement mobilities (N 3772), we analyse family structures among migrant and non-migrant populations aged 55 years old or more in Switzerland. Our study contributes to the current literature in two major ways. First, our analysis of ego-networks family composition integrates intergenerational perspectives of kinship and non-kinship network embeddedness. Second, we propose a conceptualization of transnational mobility as a set of individual lifestyle practices beyond people's country of residency (e.g. living some months in another country, travelling or transnational bordering shopping). To better understand the link between individual family networks and transnational mobility, we derive various network indicators concerning ego-network size, heterogeneity/composition, density and geographic proximity among ego's alters. Through our analysis, we seek to investigate the function of ego-networks characteristics as push or constrain factors to transnational mobility.

Keywords

Family Composition, Ego-Networks, Ageing Cohorts, Intergenerational Ties, Transnational Mobility

The influence of family and personal networks on migrants' trajectories: two research experiences compared

Carlo De Rose and Luciana Taddei

Abstract

The migratory experience often involves families and communities of origin of the migrants. This collective dimension of exodus has characterized the diaspora of many peoples for a long time. The decision to leave their land and move elsewhere to look for work or to build one's life in other contexts is rarely a purely individual choice. The support of the own family group and the activation of personal relationships are decisive factors, from which the success or failure of the migration project may also depend. The phenomenon of so-called "migratory chains" is itself the result of this collective mobilization in which the relational resources, starting with the family one, play a central role.

The proposed presentation concerns the activation of family and personal networks in the experience of international migrants. In particular, it is proposed to highlight how the family and personal networks are activated to solve problems and to meet the needs that accompany the whole migratory project: from collecting the resources necessary for the trip to the first accommodation in the places of arrival, from job search to social integration in the country host.

The ways in which family and personal networks are activated can be manifold. There is not only one model to refer to. Networks can be activated following different strategies, depending on a series of conditions, like the initial migration project, the cultural background, the migrants' attitudes.

To highlight these processes, we compare the results of two different investigations carried out in recent years. The first concerns the experience of three generations of migrants from Southern Italy who moved from 1950s in various regions of the world (Canada, United States, Argentina, Uruguay, Brazil, Australia, Northern Europe). The second concerns the paths and the experiences of a group of Senegalese immigrants in an Italian urban context (Genoa). Starting from partly different research methods, both investigations, thanks to the collection of deep interviews, detect how family and personal networks affect life-course trajectories and transitions.

Although these are different migratory experiences that develop in different eras and along with multiple routes/directions, their comparison - with the similarities and differences that emerge - offers interesting insights, because it allows us to reflect on the underlying processes the activation of relationships and the representation that migrants themselves give of the function development of family and personal networks.

By illustrating the two cases, it is also intended to draw attention to the model of analysis adopted, given that the ways of activating family and personal networks are analyzed starting from the biographical accounts, favoring the cultural and identity dimension underlying the networking practices of migrants.

Keywords

Family Networks, Migration Strategy, Family Biographies, Narrative Interviews, Network Building Process

Resilient relationships - Longitudinal analysis of egocentric network of highly educated young immigrants during the pandemic

Dóra Boelens and Éva Huszti

Abstract

This study focuses on the changes of egocentric social network in the case of highly educated young immigrants living in Hungary during the pandemic. The convoy-theory of network analysis emphasises the dynamic character of personal networks: the network size, the composition is under continuous change over time, as well other characteristics, e.g. the emotional closeness, physical availability, functions (Barrera, 1983) of each network-member can be effected by diverse life-events. However, the more stable, trust-based strong ties can support the individual in more efficient ways of coping, and even protect from the negative consequences from distress (buffering-effect), sometimes individuals need to face a decrease in available social support, while the need for it increases. Both the increased physical distance to the origin country after migration and the required physical distancing to prevent the spread of the coronavirus restricts the possibility of face-to-face interactions with significant others. In 2020, the qualitative data collection was done personally while in 2021 was online (N=30). The respondents were interviewed twice: the first wave of data collection (December 2019- March 2020) happened before the first COVID-19 case has been registered in Hungary, the second wave of the interviews has been taken one year later, just before the lockdown has been relieved. In the first part of the data collection, the supportive network of the respondents has been listed with name generator-questions based on emotional closeness (very close, somewhat close relationships) and the alters and ties has been described with different name-interpreting questions. After discovering the available social supports the respondents selected the alters from the previously created list whose help they could use in 8 hypothetical situations based on Barrera's dimensions of social support. After using the methodology of participant aided sociogram (PSN-map) the respondents categorised their relationships based on country of origin and country of living (host, origin, fellow, transnational) and emotional closeness. During this mapping process, guided by the interview questions, fruitful information was provided about the relationships and network changes. Analysis reveals that more than half of the respondents' personal network was resilient (57%). At the same time, 43% of the personal relationships disappeared, and almost the same per cent of the personal network contained new relationships to 2021, what - regardless of that there is no significant change in network size - let us suppose interesting founding in the network-composition. The information of interviews was used to help the better understanding of changes. The results of 2020 showed a caption of the respondent's acculturation strategies (integration, assimilation, segregation, marginalisation) while mapping their supportive network before the breakout of the virus, while the results of 2021 shows which relationships were resilient enough to be mentioned again in the network after a year of pandemic, which relationships changed (appeared, disappeared) and how it affected the process of acculturation. Data show that in 2021 it was an increase in the host and fellow relationships in the respondent's closest relationships, and a decrease in the origin-relationships, which supports integrational-, and segregational acculturation strategies.

Keywords

Egocentric Network, Acculturation, Dynamic Network, Pandemic, PSN Map

Blood is thicker than water: on the role of strong family ties for rental housing opportunities among young adults

Emanuel Wittberg and Martin Arvidsson

Abstract

Housing is important for an individual's welfare, as it affects life opportunities. For instance, individuals in economically disadvantaged neighbourhoods have an increased risk of ending up with lower earnings, worse career paths and less healthy lives. This essay focuses on the impact of social capital on the distribution of housing opportunities. Social capital is commonly defined as 'the ability of actors to secure benefits by virtue of membership in social networks or other social structures'. These benefits may be either emotional, informational, or instrumental and have a positive effect on the receiver. However, as raised by several scholars', social networks are exclusive in their construction and can be a source of inequality. Disadvantaged groups with low levels of social capital will be worse off if resources to a larger extent are distributed through social networks. This may especially be evident with regard to housing, which is a scarce resource. In this essay, we examine the role of social networks in providing access to apartments for young adults in the Swedish rental housing market. The purpose is to investigate the impact of social networks on residential mobility. For this specific application, we operationalize social capital as having one or two parents working at a rental housing company with authority over contracts for rental apartments. We hypothesize that such parents will use their network position, their information advantage, and their opportunity to influence their employers' apartments contracts decisions to help their children get an apartment contract.

To fulfil this purpose, we apply coarsened exact matching (CEM) on Swedish register data and focus on young adults that are between 20-30 and live with their parents. This is an age when most young adults in Sweden are starting their housing careers, meaning that they have neither the economic resources nor the connections generally needed to acquire attractive apartments. Therefore, we can expect parents' social connections to have a large impact on their entry into the housing market. We define young adults as connected if they have parents who either work at a housing company, own a rental company or have a leading position in a public agency with control over rental apartments. The hypothesis is that connected parents will use their social capital (job connections) to help their children get apartments contracts.

Our results show that while the number of young adults leaving the nest to move to rental apartments is small, it is much more common among young adults that have parents in strategic positions in the rental industry. This result is found for both public and private landlords, although the effect is stronger for private landlords. Consequently, young adults with connections are also more likely to leave their nest at an early stage in life. This shows that social capital in strong ties with individuals at strategic positions may be significant in the competition for scarce resources such as housing tenures.

Keywords

Social Capital, Social Networks, Family Networks, Rental Housing Market

Sports fandom between social networks and grassroots cultures: the analysis of Inter Milan fan communities on Instagram

Mario Tirino and Simona Castellano

Abstract
Starting from the concept of mediatization of sport (Frandsen 2014, 2019, 2020; Tirino 2019), exemplified by analyzing what is called the "SMS triangle" (sport, media and sponsors) (Martelli 2014; Bifulco e Tirino 2019), our paper aims to emphasize the phenomenon of sports fandom (Sandvoss 2003; Sandvoss, Gray, Harrington 2017) on social networks. In particular, we start from the assumption that social networks have brought about some changes in the world of sport (Frandsen 2019), not only from a technological point of view, but also from a socio-cultural one. These media, in fact, are part of a complex process involving sports organizations, athletes and fan. Sports fandom in particular adapted to new pattern of sports consumption (Sandvoss 2003; Williams 2007) and to new mediascapes configurations. Particularly interesting for this purpose is the analysis of the grassroots cultures that, in the world of sport and through online communities on social networks, remediate sports fandom, according to the typical methods of remix cultures (Navas, Gallagher, Burrough 2015). According to Hills, fans, in fact, interpret media contents in particular and unexpected ways, participating in community processes (Hills 2002) and become themselves producers of these contents on social networks. To investigate these phenomena, we will use media content analysis to study the production and the dissemination of memes of Inter Milan fan online communities on the social network Instagram. Our paper will try to highlight how these grassroots practices elaborate the connection between sports fandom and social network in an innovative way, relying on emotion and fun.

Keywords
Sports Fandom, Grassroots Culture, Social Media, Social Networks

Fan ballerino! Evolving trends in contemporary fandom: the case of Dylan Dog

Lorenzo Di Paola and Giorgio Busi Rizzi

Abstract

The activities and practices that concern fandom constitute a complex machine whose engine is constituted by the participation of fans capable of actively inserting themselves in the relation between media production and consumption, to the point of being able to significantly influence the production logics of the cultural industry. In a media landscape characterised by the affirmation of digital languages and cultures (Boccia Artieri 2012), it becomes more evident how both cultural convergence (Jenkins 2006a) and participatory cultures (Hills 2002; Bailey 2005; Jenkins 2006b) shape the strategies of current media franchising, while the role of fan communities becomes increasingly pivotal (Busse and Ellekson 2006; Gray, Sandvoss and Lee Harrington 2007).

In order to better grasp some evolving trends and deviations (be they social, technological, cultural or medial) that have altered the sphere of action of fan practices, this contribution aims to investigate the evolution of the fandom related to the Dylan Dog franchise. In particular, it aims to bring out, by comparing the first fannish experiences (notably the "Horror post" and "Dylan Dog Horror Fest") and the more contemporary ones that take place on social networks (including Facebook fanpages and the fanfilm on YouTube), the network of cultural practices that constitutes the constantly evolving medial - and social - environment at the foundation of contemporary spectatorship (Tirino 2020).

Dylan Dog has been - at least for an Italian audience - a momentous comic series, capable of responding to the audience longing for identification (Frezza 1995, 2017), and whose commercial success seems mostly reliant on the ability, by means of the frequent references to the cinematographic and literary universe, to prompt an intertextual, intermedial knowledge already stored up by its readers -i.e., in the words of Eco, to activate their encyclopaedia (1979) - who thus become active users of the text (Abruzzese 2016). A cult comic acclaimed by critics, Dylan Dog maintains an intense relationship with its fandom, which over time has transformed in accordance with the evolution of the media system. It has thus gone from a "niche" fandom with a strong internal homology to a larger audience whose sense of community is inevitably looser than those of the first fan communities. Recchioni's arrival at the head of the magazine, then, was only the spark that triggered on the Internet the (insoluble?) tensions between ‘fundamentalist’ gatekeeping fans and new followers - through widespread and well-known dynamics concerning social networks, echo chambers, the filter bubble and the polarization of information (Bentivegna, Boccia Artieri 2019).

Keywords

Fandom, Social Networks, Comics, Dylan Dog

Sweatpants are a sign of defeat. Fandom, Fashion and Networks

Vincenzo Del Gaudio and Irene Psaroudakis

Abstract

Fashion must be consumed immediately.
The best that can happen to a suit is to be worn.
Not to be exhibited in a museum.
Karl Lagerfeld

The concept of Fandom (Jankins 2006; Scaglioni 2016), as it has been structured within the social network society (Boccia Artieri 2012; Castells 2008), is a concept that can be applied to different production practices and information consumption in contemporary digital platforms up to traditionally considered external to the digitization process such as theatre and fashion. In particular, our paper intends to analyze that close link between the production of identities in fashion performances (Del Gaudio, Psaroudakis 2021) and fashion communities, and the horizon of fandom and audiences linked by fashion performances (Pasquali 2017; Pedroni, Mora 2017). In this perspective, our proposal, based on a visual and textual analysis, but using at the same time the theoretical and methodological contribution of the network analysis perspective (the Social Network Analysis, Wasserman & Faust 1994), intends to follow some parallel paths of reflection.

On the one hand, we propose the analysis of what could be defined as the primary fandom, i.e. fandom generated by communication models linked to the fashion horizon, which clearly includes both the models of community building around a given brand and the identity performances connected to it, as well the fan bases built around the figures of the influencers (Terracciano 2019). On the other hand, we analyze what could be defined as secondary fandom, i.e. that fandom generated by the relationship between identity and dress and moves from imagery produced in other media forms such as the ones linked to cosplaying practices and which, albeit tangentially, can be inserted into fashion performances.

Specifically in this context of multidimensional discourse we consider the mechanisms of social influence (Christakis & Fowler 2009), the properties of a small world network (Milgram 1967; Granovetter 1973; Wellman 1999; Gladwell 2000), and the dynamics of homophily (McPherson, Smith-Lovin, Cook 2001), which are particularly relevant in investigating the construction of communicative and identity styles around particular elements such as the logo or a certain verbal or non-verbal (expressive) language, and the way they act in the processes of in-groups and belonging, with outcomes in terms of marketing (brand culture), storytelling elaboration in the framework of viral communication, and the design of brand communities. The examination of some case-studies derived from the most recent phenomena in fashion - including Supreme, Gucci, Off-White, but not only - allows to build the link between the concepts of fandom, fashion, network and presentation of the Self.

Keywords

Fashion Performance, Identity, Fandom, Fashion Comunities, Supreme

TV fandom between entertainment and politics. The case of The Handmaid's Tale.

Antonella Mascio

Abstract

In the current mediascape, TV Series represent a flagship product. They tell exciting stories, pursue a “cinematic” logic (Mittell 2015) and attract an ever-wider audience. Their complexity is based on a storytelling able to give life to stories that span different genres, offering a range of potential narrative implications that appeal to the audience.

Although Tv Series traditionally belong to entertainment, often they are inspired by the narrative of real events. Even if the aim is never to propose a documentary, mixing fiction with reality produces effects on several levels. For instance, some audience groups considered Period Dramas a reliable interpretation of past events (Cfr. De Groot, 2015; Gao, 2016; Wodak, 2010).

In other series, where an undefined temporality is called into question as a sort of “near future”, the plot is often accompanied by a dystopian vision of events, while fictional frames offer different suggestions for a study of the real. Belonging to this dystopian sub-genre, we have Black Mirror (Netflix, 2011 – 2019) which sometimes has been quoted inside the news as a reference to phenomena arousing concern and anxiety. With regards to this sub-genre, in my presentation I would like to focus on The Handmaid's Tale (Hulu, 2017 -), a series based on a novel by Margaret Atwood. It is set in “the near future”, where a totalitarian theocracy movement has overthrown the US government. The Handmaid's Tale, usually included in the category of feminist dystopia, explores the subjugation of women as well as the various means that politics employs to enslave the female body and its reproductive functions (Cfr. Shi, 2017).

Here my focus is to investigate the uses that have been made of The Handmaid's Tale, starting from its airing in spring 2017, which was coinciding with many of the events organized by the #MeToo movement. Red costumes used in the TV Series have in fact quickly become the symbol of a female resistance, spreading throughout the world. With respect to the storytelling project, The Handmaid's Tale teach us how this kind of narrative should had been observed as a continuously evolving storytelling process, in which audiences increasingly participate. The political reading of that text has influenced lots of online discussions (forums, Facebook groups, ..) and collective actions. We can talk about demonstrative effects, like occupied streets and squares, participation in public discussion and municipal council groups. In particular, I am referring to some peculiar situations related to the Italian scene, in which the symbolic clothing of The Handmaid's Tale was worn by women, as a female protest against new motions related to the abortion law.

In brief the questions that have guided my research on The Handmaid's Tale can be summarized as follow:

- Can we consider the connection between fiction and reality as a "political" reading produced by the audience? Or is it "suggested" by the text (Hall 1980)?
- Why do fiction is useful for telling us uncomfortable realities? Is it fiction an help in describing our (dystopian) scenarios?

Keywords

Fandom, The Handmaid's Tale, Politics

To Build a Home. Vidding Communities and Digital Platforms as Gendered Spaces

Lucia Tralli

Abstract

Fan vidding as a media fandom practice has a long-running history, both offline and online, both analog and digital, dating back to the 1970s and has always been predominantly practiced by women (Coppa, 2011).

As for other fandoms, the 1990s have been the decade of the digital revolution, and the first online migration, on message boards, mailing lists, and, later, personal websites, before the creation of social media platforms that changed the community life once again. Since the early 2000s, multiple vidding communities flourished in different spaces, but mostly on social networking service Livejournal (LJ). As immaterial as some insist on perceive them to be (Cossutta et al., 2018), virtual communities are communities based on spaces nonetheless, intangible and potentially transnational spaces that shape the ways in which users talk, discuss, think and create within fandoms. In the case of vidding, we are confronted with communities of practice (Baym, 1999), whose members share a common set of activities that revolve around creating, watching, and commenting on audiovisual remixes based on movies and TV shows.

This paper aims to give a brief historical account of vidding communities in the first decade of the 2000s and how the different platforms they have inhabited have shaped them in different ways. We will focus, in particular, on two spaces, Livejournal and YouTube, and on how they have fostered different communities, with distinctive habits, practices, and patterns, due to their peculiar inherent properties (e.g., Livejournal has excellent networking capabilities while YouTube offers unique hosting options for vids). By investigating them, we will discuss how these communities were, at the same time, molded by these spaces' features, interfaces, and networking capabilities, and, at the same time, they shaped these same spaces to serve their purposes best.

In particular, we are interested in exploring some relevant aspects connected to the gendered nature of vidding as a practice. Firstly, the issue of visibility, and secondly, the issue of "playbor" so frequently associated with participatory practices.

For productive fandoms such as vidding, the internet has proved to be both an opportunity and a burden. Like all other fans, vidders managed to create online larger and more populous communities, profiting from the multiple tools available within web platforms. On the other hand, online worlds meant growing visibility and the risks connected to potential copyright infringements. Moreover, given the gendered nature of vidding, the different communities have shown different attitudes around this increased visibility and the risks that come with it in terms of maintaining safer spaces for their members. Fangirls have a notorious history of being shamed and attacked because of their attachment and "emotional" involvement with their fannish activities. The relative invisibility of the previous era was also a form of protection challenged by the platforms' visibility. Taking care of the virtual spaces of the community also implies notable efforts for some members that we will describe adopting the "playbor" framework in a gendered perspective, as digital reproductive work (Jarrett 2015).

Keywords

Fandom, Vidding, Gendered Online Practices, Online Communities

The other face of the Upside Down. How fandom reinterprets Stranger Things

Anja Boato and Claudio Riva

Abstract

This contribution aims to describe practices and attitudes recurring among the most active fan communities of the Stranger Things television series (Netflix, 2016 - in progress). Therefore, the analysis could be ascribed to the area of micro-sociological studies on fandom (Scaglioni 2006), focusing on the community of fans who rework on television series by producing original works such as stories, videos, illustrations, or cosplays. Usually, these works are shared on specific virtual platforms (Jenkins 2008; Gray, Sandvoss 2017), that promote the development of social and emotional ties (Riva, Boato 2020; Paasonen 2021). This phenomenon is encouraged by the spread of serial and transmedia narratives, which allow fans to collaborate on the expansion of the narrative ecosystem (Mittell 2017; Hills 2017).

The research is divided into two complementary phases. The first one is based on digital ethnography, focused on websites dedicated to fanfictions (EFP, Wattpad) and on the main social networks' groups (Facebook, Instagram), by collecting more than 300 posts. The second phase is based on semi-structured interviews with 15 fans of the television series who produce or have produced original content inspired by Stranger Things.

Firstly, we wanted to understand how the most active Italian fans of the Stranger Things series usually decline the original work in new representations. We were also interested in the reasons why producers of fanmade invest time and energy into the community. Finally, we analyzed the type of relationship that is established within the most active group of the fandom. The community plays an important role in the practices of consumption and rework of new products, by encouraging and rewarding grassroots participatory activities (Boccia Artieri 2012; Lamerichs 2018). All of this takes place within an inclusive social context, yet often very demanding towards high-quality standards. This contribution also aims to investigate the set of emotional and social advantages that feed the participatory culture.

Keywords

Fandom, Social Networks, Participatory Culture, Stranger Things, Tv Series

A meritocratic network formation model for User-Generated Content based platforms

Nicolo Pagan, Wenjun Mei, Cheng Li and Florian Dorfler

Abstract

One of the most crucial characteristics of some of today's most popular online platforms such as Twitter, Instagram, or Twitch, is that they allow people to contribute with their User-Generated Content (UGC).
Thanks to the use of hashtags and the integrated search engines, this UGC can be easily explored by platforms' users in search of new content or connections. As a result, the underlying directed online social networks witness the interaction between users who eventually share interests, but often times are otherwise strangers.
In social media marketing, UGC is considered an effective form of word-of-mouth publicity.
Compared to traditional brand-generated content, UGC gives a genuine feeling, hence it enhances users' trust, and ultimately it has a stronger impact on consumers' purchase behavior.
Of course, not all the UGC has the same effect on persuading potential consumers or followers: better quality UGC is more likely to attract users because of its higher emotional value.
Thus, intuitively, the network formation process on these platforms roots in a meritocratic principle in which the individual decision to follow or not other social media users depends on the quality of the UGC, measured by the alignment with the follower's interests, i.e., homophily, and its intrinsic ``goodness''.
Given the predominance of these services in our daily lives and their universal diffusion (especially within the young generations), the large impact on social media marketing strategies, and the spreading potential of these highly influential nodes, it is important to understand (i) how the UGC relates with the emergence of tremendously fast-growing social media influencers, and (ii) what are the properties of the resulting networks.
Despite the UGC being a fundamental ingredient of many social media platforms, the large multidisciplinary interest in the study of network formation has so far privileged topological and socio-economic aspects observed in offline social networks.
In our proposed framework, we consider a directed unweighted network in which actors are associated with an attribute that denotes the quality of their User-Generated Content.
We then assume that actors choose their followees in order to maximize the quality of the content they receive from them.
We support this intuitive meritocratic principle by means of a longitudinal Twitter data-set on network scientists.
We statistically study the proposed network formation dynamics as well as the network properties at equilibrium.
We discover that the indegree distribution exhibits a specific pattern: the highest quality node expects to have twice (three times) as many followers as the second (third) highest, and so on. This regularity, called Zipf's law, has been found in many real-world systems, including growing social networks.
Conversely, the outdegree distribution is similar to a log-normal distribution, with expectation equal to the harmonic number of the network size.
Finally, in order to empirically validate our model, we collected three data-sets from Twitch, a fast-growing platform for online gamers.
The successful comparison with the theoretical predictions suggests that our model, despite being of simple and parsimonious form, already captures several real-world network properties.

Keywords

Social Networks, User-Generated Content, Social Network Formation, Zipf's Law

The Rise and the Decline of a Market: The case of the electronic Market for Interbank Deposit (e-MID)

Federica Bianchi

Abstract

Despite the existence of many recent studies on interbank connections we still know very little on the actual functioning of interbank market until its final collapse in 2019. We know that the interbank market allows banks to buy and sell cash equivalent assets as well as to manage risks that arise from customer business. But we do not know what mechanisms connect individual transactions to either use. I exploit the quasi-experimental research design produced by successive financial crises to identify discrete time periods marking market-level shifts in exchange preferences. In doing so, I detect what micro-mechanisms have progressively dissolved and eventually seized up the whole market. In an analysis of original data that I have collected on e-MID, a major high-frequency trading platform for the exchange of interbank liquidity, I examine the deconstruction of the micro-relational structure of the e-MID market during its whole history (1999-2019). I show that the more the global economic scenario exacerbates, the more European banks tend to engage in financial transactions by sticking to either role of buyers and sellers, then reducing the interactions on the trading floor and decreasing their volumes. I model the 1.5 millions of trading encounters between 350 banks with a newly extended version of REMs capable of capturing the temporal evolution of the main mechanisms of network dependence – e.g., repetition of trades, direct and generalized reciprocity, and transitive closure.

Keywords

Financial Networks, Interbank Market, Micro-Relational Structure, Rems

Accounting for the Regulation of Elite Conflict through Social Network Analysis : Modeling Contending Bureaucratic Networks in Post-Revolutionary Iran's Diplomatic Corps

Guillaume Beaud

Abstract

The state scholarship has long posited that fragmented state institutions in environments of elite conflict and factionalism weaken regimes' staying power (O'Donnell Schmitter & Whitehead 1986, Huntington 1991, Gandhi & Przewoski 2006, Magaloni 2008, Svolik 2009 2012). The neo-Weberian literature suggests that states' inherent tendency to fragment and diversify must be circumvented, as it challenges states' sovereignty and unifying role (Poggi 1977, Du Gay & Scott 2010). Nonetheless, since the 1979 revolution, Iran's political system hinges upon a dual sovereignty, constitutionally divided between the government (vox populi) and the Supreme Leader (vox dei). This fragmented political authority translates into competing regime elites and state institutions' duplication, between those answering to elected and non-elected bodies.

In this "house with many masters" (Buchta 1998) lacking elite and state cohesion, authoritarian endurance is puzzling (Keshavarzian 2005). Because the link to regime strength is unclear, scholars curtail their analysis of elite pluralism and bureaucratic jurisdictional overlap as causing policy inefficiency and structural burden –– "schizophrenia" (Chehabi 1991, Djalili 1989 2001, Buchta 2000).

Moreover, the foreign policy literature has traditionally opposed two stances: (i) since the 1990s, Iran has conducted "Thermidorian" diplomacy toward regime normalization and enhancement (Adelkhah Bayart & Roy 1993, Mozaffari 1999), (ii) this attempt constitutes a "reformist illusion" veiling the continuation of revolutionary diplomacy and state arrangements (Djalili 2001, Terhalle 2009). More generally, few works have addressed diplomats within trajectories of state reforms and engaged with the bureaucratic politics literature (Haglund 2015). The fragmentation of diplomatic apparatuses remains unexamined in relation to fragmented political networks and policy agendas.

This article contends that, while fragmented state institutions sustain elite cleavages and hamper uniform policymaking, they nonetheless provide the architecture for a 'division of bureaucratic labor', that accommodates competing policy agendas. Hence, state fragmentation is not always conducive to zero-sum elite competition but can also regulate and channel elite conflicts within the state. Precisely, we show that in allowing the co-existence of multiple networks within the diplomatic apparatus, institutional fragmentation makes Iran's "multiple-voice" diplomacy (Djalili 1989) conducive to regime strength, not weakness.

We provide an empirical assessment of this 'division of diplomatic labor', using Social Network Analysis (SNA), supplemented by data analyses. We rely on biographical (prosopographic) data of 158 senior Iranian diplomats' educational and career trajectories. We built a scaled 1-mode "co-affiliation" matrix, in which two diplomats' tie constitutes the amount of sub-bureaucratic segments shared throughout one's career. SNA and centrality analyses (t-tests) allow to identify clustering patterns of career trajectories. Complemented by multiple linear regressions, the same tools allow to explain the structuring of networks of diplomats that carry political networks' distinct foreign policy agendas, using variables such as educational trajectories. We also used semi-structured interviews conducted with Iranian actors, and archival work. We show that while a central cluster of diplomats mostly trained at the ministerial 'School of International Relations' leads the governmental agenda of diplomatic opening towards European and Asian powers, a peripheral cluster that underwent distinct trajectories sustains Iran's revolutionary diplomacy in the Near East and Persian Gulf.

Keywords

Bureaucratic Politics, Social Network Analysis, Elite Competition, Diplomats, Post-Revolutionary Iran, Careers

Social Participation of Children with Intellectual Disabilities in Sports

Fabian Mumenthaler, Alexander Steiger and Siegfried Nagel

Abstract

Introduction

People with disabilities are at risk of social exclusion. Even though the Convention on the Rights of Persons with Disabilities (CRPD) has been adopted in many countries, research efforts on the social participation of children with intellectual disabilities (ID) show that they remain at risk of social exclusion. Because these findings predominantly stem from research in the school context, little is known about their social participation in other life domains addressed in the CRPD, such as sports (article 30).

We found in our research project in a former analysis that children with ID have significantly fewer friendships at school but are equally likely to make friends in organized sports groups as their peers. In this analysis, the data from the organized sports sample is scrutinized. We analyze whether the gender of the child with ID, the type of sports (team sports vs. individual sports), and/or the level of ambition (competition vs. no competition) are relevant factors for the social participation of children with ID.

Sample and data

The sample consists of 24 integrative organized sports groups from the German-speaking part of Switzerland (children without ID: 306; children with ID: 25). More boys than girls with ID are in the sample (16 boys). Because most groups are gender homogenous, more boys than girls are in the total sample (29% girls). Most of the children speak Swiss-German or German at home (82%). Thirteen sports groups practice team sports and 16 participate in a competition.

Data analysis

Every group was analyzed using exponential random graph models (ERGMs). A full ERGM includes the following endogenous and exogenous factors: density, reciprocity, activity, popularity, transitivity, gender homophily, similarity in performance level, language (in- and outdegree), and ID (in- and outdegree). If a model did not converge, activity, popularity, and transitivity were removed and re-entered by a backward-forward model selection procedure. Then, meta-analyses were calculated with the resulting ERGMs for the three factors of interest (team/individual sports, gender of child with ID, competition or not).

Results

With respect to children with ID, results show the following tendencies: better social participation in team sports than in individual sports, boys form friendships more easily than girls, and better social participation if the group participates in a competition. Significant findings exist in the other endogenous and exogenous factors, e.g., similarity in performance is a significant factor for friendship formation in individual sports ($p=.04$) but not in team sports ($p=.23$).

At the conference, further results of the aforementioned endogenous and exogenous factors will be presented and discussed with respect to their relevance for the social participation of children with ID.

Keywords

Social Participation, ERGM, Intellectual Disabilities, Children, Organized Sports, Friendships

Stratified stochastic variational inference for random-dot models

Emanuele Aliverti

Abstract

There has been considerable recent interest in Bayesian modeling of high-dimensional networks using latent structures. Some examples incluse stochastic block-models, latent distance approaches and random-dot models.
In this article, we focus on the random-dot model (also referred to as latent factor model), a widely used approach to model the latent space of network data. We develop scalable algorithms to conduct approximated Bayesian inference by stochastic optimization. By exploiting sparse representations of network data, the proposed algorithms show enormous computational advantages and allow inferences to be conducted in environments with thousands of nodes. We show the benefit of the proposed methods on a case study illustrating the relationships across Venetian marriages within the 18th century.

Keywords

Bayesian Inference, Latent Factor, Variational Bayes, Marriages

Environmental Migration? A quantitative overview of the literature

Elisa Scibè, Maria Cipollina and Luca De Benedictis

Abstract

In a world of changing climate and increasing occurrence of natural hazards, the role of environmental factors in shaping migration patterns has become a most debated topic within institutions and academia. As opposed to a simplistic vision of a direct role of environmental factors as determinant of migration process, more complex analysis and scenarios have emerged with results going towards different directions. This may not only be due to the intrinsic complexity of their extent and scale, but also to differences pertaining to specific characteristics of scientific and academic contributions. The aim of this paper is to map the economic literature on these topics moving away from a classical literature review and offering a methodology that integrates three stages. The analysis starts with a systematic research of the literature through main bibliographic databases and collecting previous reviews and meta-analyses, followed by a review and bibliometric analysis of all collected articles. This first step produces a sample of 151 empirical and non-empirical contributions, spanning throughout the last 20 years and focusing on different geographical areas, taking into account different socio-economic factors, applying different methodologies and empirical approaches. Most importantly, the sample provides a variety of different outcomes on the impact of climatic changes and hazards on migration, revealing three main possible scenarios: (1) active role of environmental factors as driver of migration; (2) environmental factors as a constraint to mobility; (3) non-significant role of environmental factors among other drivers of migration. To investigate the determinants of this extreme heterogeneity of outcomes, we postulate the assumption that the interconnectivity of articles may play a role in shaping such opposite conclusions. Considering the ensemble of works referenced by each contribution included in the sample, we build a bibliographic coupling network, where articles are linked to each other according to the number of shared references. This citation-based method allows for the formation of a network of contributions in the literature space and highlights some potential common grounds among papers. We then run a community detection of the resulting network that produces four main clusters that gather studies together according to certain characteristics and outcomes of the analysis. We use the clustered structure in the third step of the analysis: a meta-analysis of all estimated effects of environmental variables on human mobility. We build a unique dataset that synthesize the estimated coefficients of 97 empirical analyses included in the sample concerning the effect of slow- and rapid-onset natural events on different kind of human mobility (international and internal, including urbanisation), accounting for main potential sources of heterogeneity (scope, level, unit and area of analysis, theoretical and empirical approaches, publication biases) and the results of the community detection. Overall, the meta-analytic average effect estimates a small impact of slow- and rapid-onset variables on migration, however positive and significant. When the communities of studies are accounted for, however, a significant heterogeneity emerges among the four clusters, giving rise to new evidence on the formation of club-like convergence of literature outcomes.

Keywords

Climate Change, Natural Hazards, Migration, Citation-Based Networks, Community Detection, Meta-Analysis

Think tanks as boundary organizations. Uncovering relational logic of the field with network-geometric analysis of prosopographical data

Szymon Talaga, Rafał Miśta and Bartosz Ślosarski

Abstract

When viewed from the vantage point of Pierre Bourdieu's field theory think tanks play an important and very specific role in the power structures of contemporary nation-states. They are brokers mediating flows of knowledge, information and sometimes also resources between different, more typical fields involved in struggles in the field of power such as political, economic and cultural fields. Being a kind of "boundary organizations" think tanks and their very existence are dependent on occupation of strategic positions within complex webs of interrelations between heterogeneous sets of institutional actors as well as concentration of different species of economic, social and cultural capitals. As such they constitute a very interesting object of study for relational and field-theoretic approaches in sociology. In particular, they provide a good research opportunity for combining social network analysis (SNA) and geometric data analysis (GDA) methods.

In the talk we will present the results of a study on the field of think tanks in Poland. We focus on a particular subfield consisting of five leading opinion-forming organizations with their own popular publishing platforms (as opposed to more "traditional" think tanks focused exclusively on consulting, lobbying and writing of reports and policy proposals). All of them represent different "regions" of Polish socio-political landscape and jointly are quite representative of it. We study the selected think tanks primarily based on prosopographical data about their members. We use individual biographies to reconstruct a complex web of relations between the think tanks and other organizations of different types (government agencies, NGOs, media etc.). Then, we combine the network data and individual-level attributes to reconstruct the field with respect to compositions of capitals held by different organizations and their differential strategies for securing resources and asserting influence over the field of power.

Last but not least, we will use the study as an opportunity to discuss, based on particular examples, different ways in which network and geometric methods of data analysis may be combined to study social systems in explicitly relational manner.

Keywords

Field Theory, Social Networks, Geometric Data Analysis, Correspondence Analysis, Prosopography, Think Tanks, Social Capital, Cultural Capital, Economic Capital

Network features and funding support of scientific topics in the space of disciplines

Radim Hladik and Yann Renisio

Abstract

The scientific field, defined as a relatively autonomous space composed of agents (institutions, disciplines, journals, people) oriented towards the production of knowledge, is generally studied at the scale of disciplines, authors, or properties of papers. Recent studies (Foster, Rzhetsky, and Evans 2015; Gerow et al. 2018; Dias et al. 2018), however, demonstrate that cognitive and discursive dimensions of science, which are instrumental in navigating, constituting, and communicating scientific knowledge, do not match exactly with the social structures of science. We proceed to map in greater detail the positioning of the knowledge elements of science in the social space of disciplines.

To account for the knowledge component of science, we rely on topic modeling. Topics are empirically constructed in an unsupervised manner and provide a middle ground, with a degree of semantic interpretability (Chang et al. 2009), between simple word features and corpus-level measures. Topic models have been previously used to map the cognitive composition of, e.g., sociology (Bohr and Dunlap 2018), economics (Ambrosino et al. 2018), literary studies (Goldstone and Underwood 2014), or computational linguistics (Hall, Jurafsky, and Manning 2008). However, less is known about the role of topics in the relationships between disciplines or about the structural properties of topics within disciplines.

We present here the application of a methodological advance in topic modeling - the TopSBM algorithm (Gerlach, Peixoto, and Altmann 2018), which employs hierarchical stochastic block modeling of communities in a bipartite network of words and documents to discover topics. Our model is built atop of abstracts of 81571 research outputs published in 2018 and 2019 by scientists in the Czech Republic. The algorithm estimated 4 levels of topical hierarchy with increasing granularity, going from 52, through 327 and 965, to 1993 topics. The data were retrieved from the Information Register of R&D Results. Unlike traditionally used bibliometric datasets (such as Web of Science or Scopus), this administrative database of the Czech government is exhaustive with regards to both the publication types (books, book chapters, journal articles, and conference papers) and the fields covered (all SSH and STEM disciplines active in the country). The data also includes information about national sources of funding for each publication.

The topic model allows us to explore the tension between the cognitive structure of the entire system of science and its disciplinary divisions. We analyze the distribution of topics across disciplines and provide a measure of interdisciplinarity from the topic perspective (Nichols 2014). Furthermore, we construct a network of topics (Blei and Lafferty 2007) and consider their network features in the context of disciplinary relationships. Finally, we identify in each discipline the topics with the highest recognition expressed in terms of external funding.

In future work, introducing a temporal dimension into our data will enable us to measure the degree of closeness or openness of disciplines in time or the emergence or disappearance of disruptive topics (that connect otherwise non-connected domains). Such research design will also permit us to observe how funding participates in these concurrent dynamics of the scientific field.

Keywords

Topic Modeling, Semantic Networks, Disciplines, Interdisciplinarity, Science

The configuration of the creative network and its marginalization effects. A case study of the film industry in Italy

Cristiano Felaco and Sabrina Pedrini

Abstract

For several decades now, cultural industries have been at the center of the debate on local development, and there is much talk about their role in creating new jobs. There are only a few studies, however, that pause to analyze how much, within this production sector, gender discrimination, the marginalization of the role of women is repeating over time.

Despite meritocratic beliefs and romanticism about cultural work, the cultural industries are unfair and unequal. Alongside evident rewards, there is evidence of discrimination, misrecognition, and inequality in terms of education, access, and wages. Culture industries represent a particularly complex and challenging source of inequality: high level of risk and uncertainty, emphasis on reputation, demographically based marketing, and a product that embodies cultural idioms about gender, race, and age help to feed a narrative that leads to an underrepresentation of gender in cultural activities, regardless of the possible position occupied.

Cultural work, like any other kind of work, is subject to equal opportunity policies, employment rights, and various kinds of protection, often freelance, part-time, project-based, precarious, or insecure, these rights and policies are not always applied to creative occupations major impact on women creative workers. Persistent gender pay gaps across industries and professions and this difference are wider in cultural industries. Women are less likely to participate in the labor force than men. The gender segregation of women and men exposes them to different career opportunities, employment practices, and reward systems that can amplify or diminish sex differences in other work outcomes tend to average fewer hours of paid labor per week and fewer weeks of employment per year. Vertical segregation by gender in creative professions is standard and yet is deeply concerning because it represents both structural inequalities as well as more culturally prescribed and 'hidden' forms of discrimination.

The study uses a database of film titles and producing film, made between 1978-2020 only composed by personalities of Bolognese origin. We performed social network analysis on movie producing teams formed by directors, producers, writers and actors in order to reconstruct linkages between them. These relationships may be represented by a multimodal network where the link among two subjects indicate they worked together in the same film. The contribution shows how the role of women has been remained constantly marginal in the film industry, despite the European regulation on gender rights. In particular, the main results show the role of centrality in the network of specific actors in the period considered, and the low and relatively constant incidence of women in terms of the gender composition of the production film and, therefore, a weak capacity for decision making.

The underrepresentation of women in the film industry may help to describe better this important sector, to produce new data-gathering to policy design and could, in the future, lead the policymaker to the most efficient and inclusive job polities for creative sectors.

Keywords

Cultural Industry, Film Industry, Marginalization, Gender, Social Network Analysis

The networked field of journal board memberships. Studying field positions and network positions in an affiliation network of Italian sociology journal boards through Cluster Correspondence Analysis

Marco Serino, Ilenia Picardi and Maria Carmela Agodi

Abstract

This paper sets forth an analysis of the boards of Italian top-ranked sociology journals as a networked social space, which is formalized as an affiliation network made of scholars participating in the same editorial boards. The related methodological framework is one which uses recent developments in geometric data analysis applied to affiliation networks, in order to obtain a field-theoretic representation of that social space. The affiliation network we deal with is made of sociologists (actors) participating in the boards of Italian leading sociology journals (events). The journals included in the dataset are those which are ranked as Class A by the Italian National Agency for the Evaluation of Universities and Research Institutes (ANVUR). We thus apply to the affiliation (binary) matrix of journal editorships a method that permits to group simultaneously individuals and variables for binary matrices, namely Cluster Correspondence Analysis (Cluster CA), and which allows to classify both scholars and journals at the same time. Hence, by Cluster CA it is possible to highlight different dimensions in a metric space and to look at how the different clusters (network positions) relate to each other. In addition, this approach permits to assess whether the journals exhibit similar or different patterns of participation in their boards. Our results reveal that the field of journal board memberships is structured along two dimensions that contrast both journals and scholars because of their mutual relationships. In the spirit of Bourdieu's approach to field analysis, the participation in journal boards of different subgroups of scholars linked by joint editorial memberships is seen as a form of position-taking. Moreover, the visual interpretation of the results has a clear substantive meaning in that the distance of the points from the axes origin indicates whether the patterns of participation in boards is characteristic and "rare" or, instead, common and unstructured.

Keywords

Academic Field, Scientific Journals, Bourdieu, Social Network Analysis, Cluster Correspondence Analysis

Does the structure of the personal networks of patients with severe mental illness is associated with well-being and mental health outcomes?

Hélène Garin and Vincent Lorant

Abstract

Introduction: Social support provision, in terms of quantity and diversity of support, generally increases with the size of an individual's personal network. People with severe mental illness (SMI) have smaller and less diversified personal networks compared to the general population, which limits their access to social support. Yet, lower levels of social support are associated with poorer mental health outcomes, as time spent in in hospital, compulsory admission, social integration and subjective quality of life. Most research has assessed support attached to a network according to the size and composition of the personal network. However, the support depends also on the relationships between network members. Therefore, a challenge when studying social support from a network perspective is to identify how patterns of relationships across alters supporting ego influence the flow of resources between networks members. Few structural features have been studied among SMI people and efforts to link them with support provision led to describe types of networks that provides more or less and diversified support. A way to reveal the structural diversity of personal support networks is to classify these support networks. Typology uncovers patterns of associations among networks structural characteristics and health related outcomes. To our knowledge, the ability of a structural typology to explain and predict mental health outcomes remains unexamined in SMI population. This study has two objectives. First, we applied two recent classifications of personal networks using only structural indicators: R. Vaccal typology (2019), based on subgroup identification and I. Maya-Jariego typology (2021), relying on cohesion and fragmentation indicators. In the second part of the analysis, we investigated whether this classification is associated with health outcomes.

Methods: We used a sample of 574 personals networks of individuals with severe mental illness. Patients were recruited in several in- and outpatient mental health services in three Belgian areas. Structural variables used in Vacca's typology are modularity, number of isolated nodes and dyads (namely "singletons") and number of components of at least three nodes. Clusters are identified with a k-medoid analysis. Maya-Jariego classification is determined by three indicators: centralization, number of cliques and number of components and results from a hierarchical cluster analysis. To measure mental health outcomes, we used HoNOS scale (psychosocial functioning), Dialog+ scale (perceived quality of life), the SIX score (social integration) and asked respondents about the number of previous hospitalizations in a psychiatric service. We applied Generalized Linear Model to investigate associations.

Results: Vacca's classification allowed the identification of 11 types of networks. A significant subgroup structure and the number of singletons were two key dimensions to describe the variability of the personal networks in the sample. We observed no association between the network types and the number of previous hospitalizations. We observed a low but significant association with the SIX score and the HoNOS score. Results regarding the application of Maya-Jariego's typology to our datasets are still preliminary and must be deeply investigated.

Keywords

Personal Network, Egonetwork, Typology, Structural Measures, Social Support, Mental Health Outcomes

Human after all: on the need for face-to-face interactions alongside our digital lives

Mattia Vacchiano and Riccardo Valente

Abstract

While computers and smartphones have become pervasive in our lives, face-to-face interactions remain irreplaceable. This seems worth emphasising even more so today, as restrictions on social life have made online activities the primary means of being together with many of our most significant contacts. While online activities are known for helping to reach resources embedded in weak connections across time and space, face-to-face activities are (still) the best known means of creating social bonds and mobilising those forms of social support that are fundamental to our mental health. Using a sample of 8148 cases from the Swiss Household Panel (SHP), we test hypotheses related to these topics in the context of leisure activities. We describe an autoregressive cross-lagged model linking offline and online leisure with perceptions of support from relatives and friends (relatedness), and with an indicator of psychological distress over a span of three years (2015-2018). Our findings show that pre-existing psychological distress leads to greater engagement in online leisure, such as browsing the Internet and online chatting, which is alleged to be due to social anhedonia. By contrast, engagement in both offline leisure and face-to-face interactions appears to be a key mechanism in activating those processes of social capital mobilization that help cultivate feelings of relatedness and are associated with better mental health. However, we do not find evidence that screen-use activities per se lead to mental distress over time, thus suggesting that more work is needed to distinguish those who avoid engagement in face-to-face interactions from screen-users as such. Hopefully, this conclusion will stimulate the creation of novel theoretical frameworks capable of addressing this subject through the tools of Social Network Analysis.

Keywords

Social Capital, Social Support, Leisure, Mental Health

Core discussion and instrumental networks as determinants of socioeconomic inclusion

Verónica de Miguel-Luken and Livia García-Faroldi

Abstract

Social capital, derived from the individual embeddedness in a net of personal relationships that gives access to a pool of potential resources, is crucial to understand how some people experience a higher risk to fall into social exclusion. In this paper, we relate some compositional and structural factors of egocentered networks to some measures about economic deprivation and social exclusion. We propose an index of social exclusion, created from information regarding family income, housing, labour situation, economic help received in the past year from formal institutions and household composition. We aim to examine to what extent the relational fabric prevent individuals from suffering material deprivation.

Different dimensions are considered to explain the degree of social exclusion: ego's psychological features, ego's sociodemographic characteristics (sex, age, educational level, migrant status…) and ego's social capital. Social capital is measured both in terms of expressive and instrumental support and takes into account network size, density (for weak and strong ties), diversity (range in prestige) and highest prestige. Structural indicators are just available for expressive, core discussion networks up to five elicited persons. Special attention is paid to the effect of inherited capital (through kin) versus achieved capital (through friends, partner, acquaintances), a distinction that is normally missing in the literature.

Data from the Spanish General Social Survey 2013, focused on social support, were used to answer the research question, and regression models were applied to the nationally highly representative sample of adult population (n=5,094). This survey was inspired by the American General Social Survey (Burt, 1984). As far as we know, this is the first work that uses these data to analyse how structural factors were associated to social exclusion during the last economic crisis.

Regressions show interesting results both at the meso level and at the individual level. First, regarding network structure, resources and composition, there exist an association between social exclusion and lower prestige of achieved relationships, fewer resources for obtaining economic or medical help (but more resources for caring children) and smaller networks of expressive support. Second, at the micro level, many variables are associated with social disadvantage: age (youth), sex (women), place of birth (immigrant status), education (lower level), labour situation (unemployed) and psychological features (do not trust others). Although Spain is a familistic society, results confirm that achieved social capital is more important than ascribed one to be socially integrated. This means that, although the country has a strong economic inequality, social mobility is possible and the socially excluded have options to escape from this situation.

Keywords

Achieved Social Capital, Deprivation, Egocentered Networks, Inherited Social Capital, Spanish General Social Survey

Local employment services as providers of resources useful for labour market (re)integration in a context of employment scarcity

Joan Miquel Verd and Joan Rodriguez-Soler

Abstract

The worldwide emergence of the Covid-19 pandemic has only worsened the risk of employment exclusion that young people suffered as a result of the Great Recession. In this context, the measures aimed at generating social capital that are developed or could be developed within the framework of active labour market policies take great relevance. It should be remembered that the use of personal networks as providers of resources for labour, such as information, brokerage or directly and employment offer are the main means of job searching and job finding for young people. This collection of resources can be labelled as network social capital. In times of job scarcity this need of support increases even more.

Young people with a low labour market status and precarious labour market trajectories mainly use bonding-type contacts, obtained in close spheres, which contribute little to job finding in contexts of high unemployment. However, bridging and linking contacts are much more effective for the job search of young people. Local employment service staff could counterbalance this lack of good personal contacts by providing, by formal and informal means, the useful resources this profile of young workers do not have, but this does not always happen. The paper studies, using a qualitative approach, the degree and way in which the measures conveyed as a part of the labour market policies developed at the local level may contribute to developing a useful personal network supporting the labour market insertion. The results obtained in the research show that these local policies generate, indeed, useful social capital for labour market insertion. This generation of social capital occurs, firstly, through the creation of contacts as an indirect outcome of training actions and work placements, and secondly, through informal mentoring developed by the workers of local employment services. This finding suggest that deliberate and comprehensive social capital building actions could be even more beneficial for the group of young people studied.

Keywords

Youth, Labour Market, Social Capital, Social Inequality

Social resources and life satisfaction in a cross-country comparison

Marina Hennig and Bastian Laier

Abstract

The growing literature on life satisfaction has identified a number of factors that influence subjective well-being. These relate to family relationships and individual financial security, but also to people's work experiences, their community ties and friendships, health, personal freedom and individual values. However, there are only a few studies that also consider the role of the state in influencing subjective well-being. Analyses of the relationship between public policy outcomes and life satisfaction show that the welfare state as a "resource giver" generates inequalities in people's quality of life. The aim of our paper is to investigate whether and how the impact of social resources on life satisfaction differs across countries.

In a multi-level analysis, we examine the resources embedded in networks as well as personal resources on one level and macro information on the welfare state on the other. For this purpose, we use data for 29 countries from the 2017 ISSP Social Network Survey Module as well as indicators from other external sources.

Keywords

Subjective Well-Being, Life Satisfaction, Cross-Country Comparison, Personal Networks, Social Resources, Social Capital, Network Support

Networks of confessional affiliation: religious choice during the schism of Utrecht

Jaap Geraerts and Demival Vasques Filho

Abstract

In 1723, schism in the Catholic Church in the Dutch Republic was formalized by the election of Cornelis Steenoven as archbishop of Utrecht. From then onward, there were two competing Catholic Churches in the Dutch Republic: the Church of Utrecht and the Roman Catholic Church. However, already since the suspension of Petrus Codde, the apostolic vicar (leader) of the Holland Mission in 1702 and his subsequent removal from office in 1704, the Dutch Catholic community had started to fragment as individual believers opted either to take the side of the priests loyal to Codde or of those who remained firmly committed to Rome.

In order to study this fragmentation and the choices individual laypeople made for one of the two competing Churches, a dataset has been created which is based on a set of serial sources, namely lists of baptisms, burials, and marriages. This data allows one to chart kinship relations and examine the movement of people between the two Catholic Churches through their participation in events which took place in these Churches. Moreover, this data has been enriched where possible, e.g. including information about one's profession, enabling a socio-economic analysis.

Apart from using a custom-designed graph database to detect patterns in the data, we created two-mode networks connecting individuals to church events (e.g. baptisms and marriages) in which they participated and the corresponding co-participation projected networks. These are temporal networks spanning about 150 years built in order to enhance our understanding of how the schism evolved among the Catholic laity in two mission stations in the cities of Leeuwarden and Utrecht. For that, we use several network techniques including community detection and the analysis of core-periphery structures.

In this paper, which is a status update of ongoing research, we describe the process of creating the dataset and our exploratory investigations into the application of network analysis. We will, too, present the first initial findings of our forays into the area of network analysis and show how it can help us to discern different patterns of confessional affiliation in these two cities. In the end, then, the paper will highlight how the application of network analysis enhances our understanding of this fascinating but seriously understudied episode in the history of early modern Dutch Catholicism.

Keywords

Dutch Catholicism, Religious Choice, Early Modern, Two-Mode Networks, Historical Network Research

Power across generations. Family dynasties in the South of Italy business network over Unification (1820-1900)

Maria Carmela Schisani and Giancarlo Ragozini

Abstract

Rooted family ties in a society may be regarded as being of less of benefit to activating the forces of economic change and modernization (Banfield 1958, Putnam 1993). Particularly for the South of Italy this form of "bonding" solidarity within families or kinship webs has been considered as a determinant of its backwardness (Putnam 1993). In the literature, claims about the entrenched power of the "logic of surname" (Macry 1988) – primarily regarding the traditional Southern landowning aristocratic elite and narrow middle-class groups of the late 18th and 19th century rising bourgeoisie (Davis 1979, Macry 1988) – have been largely speculative and backed up with qualitative evidence. We address the topic by a new different perspective by studying the power of kinship ties in the entrepreneurial environment of the Southern largest city, Naples, the most representative to interpret the dynamics of power that affected the economy of the South in the 19th century. We study the accumulation of power across generations in the 19th century business network. Particularly we present evidence of the force of social and economic advantages that elite families accumulate by building, inheriting, strengthening and transmitting relationships across time even in presence of a breakthrough institutional upheaval, like Italian Unification.

We use original archival data on the universe of Naples enterprises to build the networks of business relations between individual economic actors for the twenty-year periods before and after Unification, between 1820 to 1900. By using the line island approach, we compute measures of centrality and test the persistence of power through

the correlation of these statistics across generations. As a measure of persistence of power, for each period we rank all the actors with respect to their betweenness and take the corresponding percentile. For a selection of families, for which the family tree has been exactly reconstructed, we consider the maximum percentile reached by the living family members for each period. Looking at the evolution of the percentiles along time,

we find that business, financial and political power appears self-perpetuating. We find that those who held power for longer were more likely to have relatives in a central position in the core network.

Keywords

Family Business Ties, Business Power Persistence, South Of Italy In The 19th Century

The characteristic and spatial mapping of cooperative relationship between foreign firms and banks in the British Concession of Shanghai in modern times(1939,1947)

Ming Yang and Jie He

Abstract

Many existing studies examine the relationship between foreign firms and banks in modern Shanghai, discussing their financial function, position, and role in the market. In the field of financial history, research has yet to be conducted on their cooperative relationship and the use of social network and spatial clustering to study them.

This study examines the British Concession in modern Shanghai as it existed between 1939 and 1947 based on the material conditions, in an attempt to explore the patterns of the cooperative relationship between foreign firms and banks, as well as its spatial representation. It is analyzed primarily in three respects: behavior characteristics, regional aggregation, and mapping of behavior characteristics. In order to cluster behavior patterns in a social network, we use blockmodeling, then explore the relationship between the type, existence time, and country of the institution. Using spatial clustering, we will explain the relationship between the three characteristics of institutions and aggregation space. Finally, we compared the cooperative relationship pattern with the spatial aggregation to see if there are similar characteristics.

Two time slices (1939 and 1947) show that the characteristics of the cooperative relationship between foreign firms and banks in the British concession in Shanghai have some similarities to the types, the time of existence, and the countries in some of the other concessions.

Keywords

Blockmodeling, Spatial Clustering, Mapping, Modern Shanghai, Cooperative Relationship, Foreign Firms, Banks

Networked coincidences analysis to represent an interactive and dynamic history of culture and science

Cristina Calvo López and Modesto Escobar Mercado

Abstract

Taking advantage of the amounts of data on the Internet and the computer facilities to process and visualize data, this presentation will show a reticular representation of the history of culture and science from the ancient to the contemporary ages. This is achieved through a set of maps linking their main authors via their coincidences in time, movement, and genre or field.

The preparation of these maps is based on dynamic two-mode network analysis with scientific and cultural figures and their different classifications. The main conclusion that can be drawn from these networked representations is that artistic movements make similar cohesive subgroups than time does, while genres create very isolated and different communities from those generated with the previous characteristics.

Finally, we will present the application of these techniques, named as dynamic cohorts and networked coincidences analysis, to other data types to generate structural maps of relationships, and various R functions from the netCoin package that allows to perform this type of analysis and representations.

Keywords

Network Coincidence Analysis, SNA, History Of Culture And Science, Historical Figures, Data Visualization

Networks, Mobility and Resources in the Central Mediterranean during the 3rd millennium BC

Maja Gori and Andrea Di Renzoni

Abstract

The 3rd millennium BC is crucial for European prehistory, as people across Europe started using an international suite of novel material culture including early metalwork and distinctive ceramics. This supra-regional expansionistic phenomenon covered wide parts of the continent forming connections between regions and landscapes that were previously culturally separated. These networks spread also throughout the Central Mediterranean. What is known in the literature as the 'Cetina culture' can be described as a wide-spread pattern of interconnection that during the second half of the 3rd millennium BC is traced through a peculiar ceramic style from the western Balkans to the Peloponnese, peninsular Italy, eastern Sicily, Malta and the Aeolian Islands.

It is now widely recognized that the spread of Cetina and Cetina-like material culture across the Central Mediterranean, and especially in the Adriatic and Ionian Basin, is evidence for a vast network of interconnections, reflecting the movement of small groups of seafarers (Maran 2007; Gori 2020). So far, most of the research focusing on the Cetina phenomenon has adopted a large-scale approach, which whilst it reflects the need to cross regional boundaries and produce an explanation that fits into the 'big history' of the Mediterranean (Knodel & Leppard 2018), yet fails to grasp the complexity and multifaceted aspects existing at medium and small scales. Strategies for gaining access to resources, and a commerce connected to metal are generally thought to be the main driving forces behind the Cetina expansion (Maran 2007). It is beyond any doubt that long-distance networks were crucial for the emergence of the Cetina phenomenon, but any depiction of Cetina as a unitary pattern of connectivity driven primarily or only by the metal economy downplays other aspects, such as the significance of medium/small-scale interactions and the key role of other type of resources (Forenbaher & Perhoč 2017) and their transformative potential as triggers for social change.

In this paper, different types of archaeological record connected to the 'Cetina culture' will be used as proxy for human mobility in the Adriatic-Ionian Basin with the intent of understanding long-distance and short-distance networks and their proprieties throughout a time-span of approximately 250 years. We attempt to provide explanation for patterns observable in the archaeological record by adopting a community of practice approach in the study of networks. The basic definition for Community of Practice (CoP) is a collection of people who engage on an ongoing basis in some common endeavour and emerges in response to common interest or position. On the basis of the available archaeological record, within the 'Cetina culture', we singled out three different and intertwined cultural domains based on different communities of practices: a– craft (pottery); b– ritual (funerary structures, "special" objects); and c– resources (raw materials).

By focusing on the representation of archaeological datasets as networks we will attempt a characterisation and analysis of structural features of those networks, and will empirically test theories regarding the relationships between network structure and attributes exploring the relationship between different communities of practices and mobility in the Adriatic-Ionian Basin.

Keywords

Mediterranean Prehistory, Resources, Mobility, 3rd Millennium BC

The differentiated effects of the Covid-19 crisis according to life cycles

Michel Grossetti, Claire Bidart, Adrien Defossez, Guillaume Favre, Julien Figeac and Lydie Launay

Abstract

Population confinements are an unprecedented situation that entails very significant constraints on social interactions (talking to each other, working together, carrying out common activities, etc.). In France, the duration of the spring confinement (a little less than two months) is short in terms of interpersonal relationships, but these relationships were put to the test and may have been altered, withdrawn or, on the contrary, strengthened, while new links were being established. We can therefore ask ourselves to what extent, with the establishment of the crisis in the long term, relationships are not only momentarily tested, but are more durably affected.

One of the objectives of the survey "Life in Confinement" launched in April 2020 by a group of sociologists (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3807975) was precisely to study the effects of the crisis on interpersonal relations. The first wave of the survey (April 14-May 10) included a series of questions about relationships, which allowed us to make an initial analysis of the strain that confinement has placed on this aspect of social life. We observed that the relationships of the young people were particularly affected in a context where outings and other social activities, which are particularly frequent in this age group, were prevented. More generally, we observed that people were preoccupied with maintaining or strengthening relationships with close friends (family, certain friends) and tended to sort out their other relationships, with a reinforcement of the "entre-soi" of the most qualified. Moreover, women seemed to be more involved than men in maintaining all kinds of relationships.

Of the 16224 people who responded to our first questionnaire, 5434 had left an e-mail address and expressed an interest in continuing the survey. We sent them a second questionnaire between December 17 and January 26 and collected 3620 responses. This second questionnaire of course included questions about changes in personal relationships, based on the responses to the first questionnaire. The in-depth analysis of the data from the first questionnaire, reinforced by that of the data from the second, now allows us to propose a perspective on the effects of the crisis on personal relationships.

In this paper, we start by presenting the data we have on personal relationships in the two questionnaires, as well as the characteristics of the samples. Then, we will show that age (coded in brackets allowing to capture approximately large life cycles) is the variable most correlated with those concerning variations in the loss or deterioration of interpersonal relationships, more than the level of education, the professional category, the gender or the configuration of confinement. An exploration by these broad age categories will show the differentiated effects of the crisis on interpersonal relationships.

Keywords

Life Cycle, Personal Networks, Covid19

Migrant women's networks and the care sector

Isabella Corvino and Sara Nanetti

Abstract

This work aims to propose a reading and analysis of the behaviors of migrant women's networks (Milgram 1967; Granovetter 1973; Wellman 1999; Gladwell 2000) and imaginal and cultural dynamics that are triggered when they come into contact with the health and care sector (Farge, Ruzza 2016; Connel 2016). The relevance of the migration network (Bunse 2019) before and during the migratory experience has already been dealt with in sociology but the possible influence of this, both positive and negative, in the integration process and during transition phases in which we deal with the theme of health or the problematization of tradition and culture of origin need further deepening (Corvino 2021). The network is a fundamental resource to facilitate anticipatory socialization processes and to support subjects in their integration into the destination country but can also cause tensions at the individual and network level. Interpersonal relationships guarantee support and protection but also represent the possibility of a partial closure to the experience of life in a new context.

The methodology chosen for the survey is that of the analysis of second-level sources and qualitative interviews with the health personnel who usually deal with these women. Semi-structured interviews will provide qualitative data while creating understanding of the issue for both the researcher as well as the interviewees. Migrants' life stories could help enrich research material and facilitate the analysis of behavior. The networks of interest will be those of the Chinese and Nigerian community. The moment of contact with the health sector is identified in that of childbirth (Oram, Robin Baker 1991, Francisco-Menchavez 2018) and care as a significant time from a personal and collective point of view. At this juncture of life, the desire for safety and tradition confronts women with new approaches that are not always welcome. Sometimes the difficulty of communication and attribution of meaning to certain actions can lead to problematic differences. The birth of a new family unit in another context turns out to be an important moment to address issues related to the transmission of culture, the management of the network in a phase of rooting and the comparison of subjects with well-defined regulatory and social frameworks. Authors think that the chosen methodology could be useful to study the "resistance level" of migrants to new cultural approaches perceived as an attack to identity. This will be an experimental study that will need further investigation and more quantitative analysis.

Keywords

Network, Migrants, Women, Health Sector

Egocentric Contact Networks of Older Adults

Fruzsina Albert, Beáta Dávid, Eva Huszti and Gábor Hajdu

Abstract

Our analysis focuses on how the theory of constraints, the socio-emotional and functional selectivity theories can explain the egocentric networks of older adults. The contact diary method is applied on a randomly chosen subsample of a nationally representative cross-sectional sample in Hungary enumerating all active ties and encounters with social contacts of 181 adults aged 50 and above. Age is negatively associated with network size, but it is positively correlated with average tie strength. Retirement, declining health, and death of the partner act as external constraints, and are associated with a shrinking network. Our results support the socio-emotional selectivity theory, but not the functional selectivity theory.

Keywords

Contact Diary Method, 50+ Year-Olds, Socio-Emotional Selectivity Theory

Social Connectedness and Health for Families Served by Integrated Pediatric Care Clinics

Danielle Varda, Rose Hardy and Amanda Beacom

Abstract

Background:

What takes place in the formal healthcare system only affects 15% of the outcomes for an individual and their family. The other 85% is attributed to our social determinants of health, or SDH, which include the social and economic barriers that people experience such as housing issues, food insecurity, transportation and mobility challenges, and access to economic opportunities.

One particularly influential yet hard to understand social determinant of health is social connectedness. Adverse social connectedness can play a role in not just a person's physical and mental health, but their mortality, too.

Understanding how families function and how they can leverage their social support networks is critical to improving child health. We described pediatric patient family SDH needs and their social support networks to identify ways that care plans and resource referrals can be more effectively tailored to the needs of a family, using a strengths-based approach to identifying personal social support assets.

Methods:

We analyzed survey data from projects at two pediatric care clinics in Colorado, USA. In these clinics, families were screened on their SDH concerns and asked to describe the people and organizations in their social support network, using an interactive data collection tool called PARTNERme. Dimensions of their relationships with these members included trust, dependency, and type of relationship (family member, friend/neighbor/coworker, medical/social worker, group member). Patient families were also asked how these network members were able to help with their current SDH concerns. We transformed these data into network maps of patient families and concerns. We further visualized their social support networks and how these networks helped with current SDH concerns, analyzing the data across demographics and subgroup characteristics.

Results:

Forty-four families were surveyed (at the time of abstract submission) at two integrated pediatric care clinics in Colorado. Many patient families had multiple SDH concerns and varying levels of perceived social support. Patient families tended to have lower dependency on their network members (2.99 out of 4) and higher trust in these network members (3.60 out of 4). An increasing number of SDH concerns did not necessarily mean that a family had less robust social support networks.

Conclusions:

Understanding a patient family's SDH concerns may not be enough to effectively help a family and improve child health. Leveraging a family's social support network and seeing how these support members can help with these current SDH concerns provides critical insight to care providers as they tailor care plans and resources to the families they serve.

Keywords

Social Connectedness, Social Support Netwoks, Families And Kids

The Contribution of Social Resources to Gender and Class Labor Market Inequalities

Thomas Lyttelton, Lasse Folke Henriksen and Emil Begtrup-Bright

Abstract

Do members of subordinated groups require different kinds of networks to their advantaged peers to succeed? When social networks are homophilous and convey a valuable resource they have the potential to exacerbate inequalities (DiMaggio & Garip, 2012). Labor market disparities by gender and class persist in most settings and networks are highly homophilous on both dimensions (McPherson et al., 2001). Extensive prior research suggests that network processes contribute to gender disparities (Cullen & Perez-Truglia, 2019; Ibarra, 1992), and that successful women's networks are less homophilous than successful men's (Ibarra, 1992). However, little research considers class origin, and in each case prior research rarely examines the individual and joint effects of ties, alter characteristics, and broader network structure.

In this project, we use Danish population data from 2010-2018 to examine, first, how workers' ego networks differ and second how networks are differentially mobilized by class and gender. Examining first and second-degree ex-coworker and educational networks (i.e. ex-coworkers, and ex-coworkers' ex-coworkers) we will show relative tie frequency and density, tie homophily, and the distribution of high-status ties (high earners and managers) by race and gender. Doing so will reveal potential disparities in the social resources available to Danish workers.

Second, we will examine the role of social resources in job mobility and earnings by class and gender. We will model the association between labor market attainment and multiple configurations of direct and indirect ties to a new workplace, varying degree, homophily, and contact status. We suspect that women and workers from working-class backgrounds will be more reliant on weak ties to high status actors (second degree contacts) as they are likely to have fewer direct connections to such individuals, compared to their more advantaged peers. We will use conditional logit and linear fixed effects models to net out unmeasured individual characteristics and include controls for potential workplace-level confounders, such as firm size and prestige. Finally, we will decompose earning gaps for this cohort of workers to quantify the overall contribution of social connections to gender and class origin earning disparities in Denmark.

By bringing population-scale data to bear on the question of network inequalities, we will contribute to the network inequalities literature by showing the relative and joint contributions of network configuration and mobilization, by considering class origin as a dimension of inequality, and by quantifying the importance of social resources for inequality at the national level.

Keywords

Gender, Class Origin, Social Resources, Inequality, Social Capital, Network Structure, Homophily

Gender differences in the categorisation of tie strength: an empirical analysis

Cecile Plessard

Abstract

In the analysis of personal networks, the strength of the relationships that bind individuals has received much scholarly attention. While the intensity of ties was first defined by Mark Granovetter through the notion of weak ties and strong ties (Granovetter, 1973), the criteria for relationship intensity are numerous and can vary from one individual to another. Thus, for some, geographic distance is not an element that impacts the strength of a relationship (Bidart, Degenne and Grossetti, 2011). For others, the content of the relationship does not have to be so intimate or personal for it to be considered strong or very close (Bidart, Degenne and Grossetti, 2011). However, much less is known about the impact of gender on the intensity of relationships.

If we consider the strength of a tie based on affective closeness, one might wonder how do individuals themselves characterize the intensity of their relationships? Taking into consideration the professional, friendly or family register of a relationship, according to what logic(s) is the categorisation, or even the hierarchisation of relationships based? What are the different ranks that govern this categorization? And, crucially, what is the impact of gender on these mechanisms? While previous studies have assessed the impact of gender in terms of sociability practices (Vandervoort, 2000), network composition (Maclaughlin et al, 2010), homophily (Bidart, 2006) and position (Déchaux, 2009), this paper will further explore the issue by asking whether the intensity of relationships, as experienced and categorised by individuals, changes depending on the gender of the person. In other words, does gender have an impact on how people experience the level of intensity in their relationships? Does the process of categorisation and hierarchisation of relationships show differences across gender groups?

Based on relational biographies of 37 interviewees (egos; 20 women et 16 men), we have collected the emotional closeness to each of the alter quoted during the interview. The quotation of these alter corresponds here to the name generators, contextual and affinity, and refers the social relationship as "reciprocal knowledge and commitment based on interactions" (Grossetti, 2009, p. 59) direct and affinity. In short, the purpose was to collect the ordinary entourage of individuals. The alter were thus positioned on several concentric circles ranging from the most intense affective closeness to neutrality in the relationship.

Based on a statistical and thematic treatment of the data collected, we will therefore analyse the way in which the interviewees divided their alter into hierarchical circles according to their gender. The data collected will also allow us to confront this so-called subjective proximity with the "classical" criteria used to describe the relationship and its strength, such as the content of the exchanges, the frequency, the distance, the history of the relationship, etc. Finally, as half of our sample consists of people in couples, both of whom were interviewed, we will also analyse these elements within a couple's network. We will then be able to highlight the gender differences in intensity experienced and described for the same alter.

Keywords

Personal Network, Gender, Tie Strength, Affective Closeness, Relational Biographies

Gender inequalities, academic status and social capital in interlocking editorships. A study on an affiliation network of leading Italian sociology journal boards

Marco Serino and Ilenia Picardi

Abstract

The present paper aims to discuss how gender inequalities affect the participation of scholars in the committees of Italian leading sociology journals. Academic journal boards represent arenas of symbolic struggle made up of positions of power that may depend on researchers' individual characteristics and academic position, prestige or experience. It is known that the distribution of roles and memberships in academic journal boards tend to exhibit a gender bias: female scholars are often underrepresented in such boards and serve as editors-in-chief less frequently than male scholars. Often, this bias is neglected or unnoticed, as if no gender inequality were occurring at all. This underrepresentation of women may also be intertwined with that of non-tenured researchers with respect to established academic figures. In this paper, we thus focus on the weight gender and academic position have in the composition of Italian top-ranked journals' committees in the field of sociology. Therefore, our analyses focus on how these categories are jointly underrepresented within the boards of these journals and, more specifically, in the networks formed by scholars participating in the same editorial boards. We conceive of journal interlocking editorships as an affiliation network of Italian sociologists (actors) involved as members or as editors-in-chief in a given set of sociology journal boards (events), these latter being selected among those Italian journals which are ranked as Class A ones according to the Italian National Agency for the Evaluation of Universities and Research Institutes (ANVUR). We first present a descriptive analysis of the composition of boards with respect to gender and academic position. Then we analyse the scholar-by-scholar one-mode projection derived from the affiliation network. We focus on structural and topological features of this network and, in particular, on centrality measures as indicators of scientific and social capital, and on academic position as indicators of academic and symbolic capital. In addition, we use Burt's measures of effective size and constraint – which are known to have positive and negative association with social capital, respectively – to further examine the network advantage (e.g., brokerage and control over information flow) of journal editors. Analysing such network may help understand how the invisible college of scholars linked by common participation in editorial boards is characterised by the presence/absence of female and less established scholars, and with regard to the role these latter play within the network itself.

Keywords

Gender Differences, Academic Networks, Social Capital, Academic Journals, Editorial Boards, Interlocking Editorship

Gendered interaction patterns in small R&D teams. A microdynamic approach using hierarchical dynamic actor network models (DyNAM).

Jörg Müller, Álvaro Uzaheta Berdugo and Julián Salas Piñón

Abstract

Inspired in part by advances in the study of the "microdynamics" and "emergent phenomena" in working groups, diversity research is moving away from "static collectivist" accounts that have focused on simple, linear effects between team-level diversity predictors and team-level outcomes. Rather, current developments pay closer attention to the structural features of interpersonal relations within teams and how the ensuing dyadic relationships, uneven member contributions, motivations, and behaviors shape team-level outcomes over time.

The following presentation contributes to an overall microdynamic account of team diversity by analyzing the choice of interaction partners as captured by wearable sensor proximity data. Integrating a status-based perspective on group interaction with the social categorization/similarity approach, our main aim is to discern the relative contribution and importance of gender, age, tenure, and team role for the emergence of global interaction patterns and information sharing.

Data and methods

The empirical data for this research has been collected in the framework of a H2020 project (gedii.eu). 11 R&D teams were recruited during and beyond the project in Spain and the UK. While three research teams are located at public universities, five teams work in research centers and three teams work in a private company. A total of 101 individuals wore during five consecutive working days wearable sensors (Sociometric Badges, Humanyze Boston, USA) collecting data on Bluetooth proximity, Infrared (face-to-face interaction), speaking time, and body movement. Participants also filled out a short questionnaire concerning socio-demographic data (age, gender, tenure, highest qualification, and team role) and indicated their friendship and advice-seeking ties with each of their team colleagues.

We use hierarchical Dynamic Actor Network Models (DyNAM) to analyze the face-to-face interaction event data among team members on a per-team basis. DyNAMs investigate the dynamics of relational events as an actor-oriented decision process where the actions are considered goal-oriented and incentive-driven. Furthermore, the hierarchical approach allows to investigate the interaction dynamics at the event-level and their variation across teams in a principled manner. By analyzing interaction data with DyNAMs, we combine the structural features of interaction with their temporal dimensions and show how status hierarchies in teams and social affinity affect the choice of interaction partners, ultimately reproducing interpersonal status hierarchies within groups.

Results

Preliminary results from a team by team analysis indicate that gender and age are important structuring factors for team-internal interaction – after controlling for advice seeking and friendship relations. In addition, we underline the continued importance of gender for face-to-face group processes and provide new perspectives for exploring gender issues from a social network perspective.

Keywords

Gender, Status, Dynamic Actor Network Models, Wearable Sensors

The Role of Preference-Based Selection in Socioeconomic Homophily: Evidence from a Three-Week Summer Camp

Marion Hoffman and Timothée Chabot

Abstract

Homophily is ubiquitous in the study of social relations. Among the range of attributes on which homophily operates, socioeconomic attributes are of particular interest for the study of social inequalities. Crucially, understanding the origins of socioeconomic homophily among adolescents could be crucial to tackle inequalities in academic achievement and later stages of life.

Socioeconomic homophily in adolescent relationships likely emerges from a complex combination of several processes. Some of these may pertain to subjective preferences for socioeconomically similar friends (e.g., similar tastes), and others to external constraints and opportunity structures (e.g., segregated neighborhoods). However, identifying and disentangling these processes is particularly challenging in empirical studies, either because some information is missing (e.g., unknown extracurricular activities in school networks) or because some factors are intrinsically intertwined (e.g., when similar individuals belong to a particular social focus, they could have met in this focus or chosen to join it together).

In this presentation, we propose to address these two issues by studying the particular context of a three-week summer camp in France. This camp constitutes an environment free of the usual school-year constraints of school, activities, and parents, and gather teenagers from varied social backgrounds, who do not know each other outside of this context. It therefore provides an opportunity to observe the sociability of adolescents in closed, well-bounded settings, with few unobserved foci, and where structural meeting opportunities have been equalized among individuals. We argue that these conditions let us narrow down the specific role of individuals' preferences for similar peers.

We rely on two types of relational measures: subjective friendship nominations reported by the participants (twice during the stay), and co-seating arrangements during meals, which were directly noted by an observer (thirty-eight partitions in total). We start by assessing the overall level of socioeconomic homophily in the camp, using permutation tests for our two measures. We then ask how preferences specifically contribute to explaining this observed outcome. To do so, we resort to the Stochastic Actor-Oriented Model (SAOM) for the analysis of friendship networks, and to a longitudinal extension of the Exponential Random Partition Model (ERPM), a new class of models specifically developed for the statistical analysis of partitions of individuals.

All in all, we find no evidence for either socioeconomic homophily or the expression of homophilic preferences in the reported friendships. However, we do find some evidence for a small level of homophily in the meal-sharing groups. Furthermore, our statistical models suggest that this homophily is explained by expressed preferences for others with similar socioeconomic background, net of other possible mechanisms. We discuss possible interpretations of this finding and potential implications for future research.

Keywords

Socioeconomic Homophily, Adolescent Networks, Adolescent Groups, Stochastic Actor-Oriented Models, Statistical Models For Groups

Student mobility patterns from high school to master's degree. A statistically validated network approach

Vincenzo Giuseppe Genova, Michele Tumminello, Fabio Aiello and Massimo Attanasio

Abstract

Human migration is about the movement of people from one place to another. In general, movements of human capital are characterised by multilateral flows that enrich socio-economic wealth. However, socio-economic problems may arise when flows become unbalanced—a prominent example is students' unilateral mobility patterns from the South to the North of Italy. This work aims to explore students' mobility from Sicily towards universities in other regions. In particular, our goal is to study the three-step migration path: area of origin (Sicilian provinces); region of bachelor studies; and region of master studies. The data used in this study include six cohorts of students, from the 2008/09 to the 2013/14 academic year. The dataset is represented as a multipartite network with four sets of nodes: students; Sicilian provinces; regions of bachelor studies; and regions of master studies. By projecting the student set onto the others, we obtain a tripartite network where the number of students represents the link weight. We reveal three-step preferential mobility patterns by generalising the Statistically Validated Network approach (Tumminello et al., 2011) to jointly test three-node motifs in multipartite networks.

Results show that the big Sicilian cities—Palermo, Catania, and Messina—have different preferential paths compared to small Sicilian cities. Furthermore, the results reveal preferential paths of 3-step mobility that only, in part, reflect a south-north orientation in the transition from the region of study for the bachelor degree to that for the master's.

Acknowledgement

The contribution has been supported from Italian Ministerial grant PRIN 2017 "From high school to job placement: micro-data life course analysis of university student mobility and its impact on the Italian North-South divide", n. 2017HBTK5P - CUP B78D19000180001.

Keywords

Students' Mobility, Higher Education, Networks

Dynamics of the football market transfer: an application to the Italian Serie A teams

Roberto Rondinelli and Lucio Palazzo

Abstract

Transfers between football teams involve usually complicated negotiations which turn into a trade network where four parties act: the selling club, the buying club, the player and his agent. Football clubs can be seen as nodes and their relationships (commercial exchanges) as links in the network. Characteristics of the transaction, the agent or the features of the player involved in the negotiation, could represent attributes of that relationship. Making use of data from the Transfermarkt portal, we focus on Italian football teams trade during the 2019 summer transfer window. Specifically, from the databases contained in this portal, we extract network information and the main features (attributes) regarding the nodes and their links, such as the main features of teams, players and transaction contract terms. Focusing on team-based networks, in order to study the many facets occurring during negotiations between these parties, the project is divided in different steps. Firstly, we provide an overall description of the network to highlight the behavior of the entire market and the importance that parties recover in it. Secondly, we explore the community structure of the network, here the aim is twofold: we first analyse the internal anatomy of each obtained community, on the other side we investigate their connections. Thirdly, we apply the Exponential Random Graph Model to have a more analytical proof of what we found in the descriptive analysis. Besides the main structure organization of the network, the contribution of the agents in the network formation process inside the Italian Football market is statistically significant.

Keywords

Market Network, Teams Clusterization, ERGM, Agents' Role

Balance in economic sanction collaboration: A relational event model with initiative

Sana Lakdawala, Nynke Niezink and Shihan Li

Abstract

Countries often rely on economic sanctions to express discontent or disagreement with the actions of their peers in the international community. These sanctions can have a tremendous negative impact on the trade between the sender and target states and often damage the economies of all states involved, thereby directly impacting citizens. Countries can issue sanctions individually or jointly, in a multilateral sanction.While sanctions are inherently relational, few studies have considered their emergence from a network perspective. Moreover, those that do primarily studied the sender-target relations of sanctions. In this paper, we will instead focus on the collaboration relations induced by multilateral sanctions. In particular, we will study the role of balance in the establishment of collaboration. Social actors have a tendency to seek balance in their positive and negative relationships (e.g., an enemy of an enemy is often a friend). In the context of international relations, there is a long tradition of applying balance-theoretic ideas to understand positive and negative relations between states. The role of balance in the formation of sanctions, however, has so far remained unexplored. To study this process, we propose an actor-oriented relational event model with initiative and reciprocal confirmation to model the creation of collaboration ties. That is, we assume that in a typical multilateral sanction, a primary sender proposes collaboration to potential partners, after which each potential partner either accepts or rejects the proposal. We use this model to evaluate the evolution of the multilateral sanction network between 1945 and 2005 based on the Threat and Impositions of Sanctions dataset, developed by Morgan, Bapat, and Kobayashi (2014).

Keywords

Relational Event Models, Economic Sanctions, Balance Theory

Common Knowledge on Facebook Communication Networks: Models and Experimental Findings

Sarah McDonald and Gizem Korkmaz

Abstract

Social media platforms such as Facebook are critical tools in organizing collective action, such as the Occupy Wall Street protests and the Arab Spring, and more recent Black Lives Matter protests and the 2021 Storming of the United States Capitol. We propose a game-theoretic model of collective action on communication networks based on interactions on Facebook. We model collective action as a coordination game in which individuals communicate their willingness to participate (threshold) to the network.

Previous models of collective action through coordination on Facebook-type networks (Korkmaz et al. 2014) assume that all communication is undirected. Our model relaxes the assumption of bidirectional communication and assumes that communication can occur in one direction. We characterize the communication patterns that facilitate common knowledge and coordination for two cases in which the network structure is globally known (standard assumption) and locally known, to make our model more realistic. We theoretically show the conditions and network structures required for common knowledge to occur. We find that when the network structure is globally known, agents must learn each others' thresholds through maximal, reciprocal paths of distance-2, or through a common neighbor to have common knowledge and participation. When the network structure is locally known, all agents must have at least one outgoing link and all agents must be neighbors.

We conduct human subject experiments to identify the effects of both network topology and communication and to test the predictions of these models. We developed an experimental platform oTree and recruited 120 students. When network structure was locally known and participants were unable to communicate with one another, the entire network chose to participate in 10 of the 30 networks. When Facebook wall communication was allowed, the full network participated in 29 out of 30 networks. Of these 29 networks, our theoretic results were met in 25 networks. Our data reveal that choices are affected by the ability to communicate and the network structure, and they move towards the theoretical predictions with communication.

Keywords

Common Knowledge, Collective Action, Facebook, Communication Networks

Who rules the French private equity field?

Fabien Foureault

Abstract

This paper deals with the transformations of French capitalism through the development of the private equity field. Private Equity (PE) is a new mode of ownership and control of firms that has developed tremendously in France during the last 40 years. The main practice of PE firms are Leveraged Buy-Out (LBO) operations, in which they acquire the majority of shares of a target company by using debt provided by banks in order to increase its returns and then sell its capital after around five years. In my perspective, PE is not an industry with clear boundaries and fixed players, but a strategic action field where different kinds of actors intervene.

I order to identify the actors driving the transformations of French capitalism I ask this question: who are the incumbents and challengers in the French PE field? I gathered data on 1428 LBO operations realized in France from 2000 to 2010. Data of interest here are organizations' characteristics and resources (n = 355) as well as multiplex and directed network data on the relations between them (l = 789). A first look indicates that almost every type of organization is able to dominate given the multiplicity of resources, from Anglo-American PE firms to the regional investment firms and the French State itself. So I ask two more questions: is there any structure in the distribution of resources? Is there any structure in the exchange of these resources?

The first question is answered by a principal components analysis on five resources: assets under management, prizes, market volume share, market value share and overall network centrality. The first two dimensions explain 75 % of the variance. The first is the volume of all resources and the second the structure of these resources with economic resources being opposed to social and symbolic resources. The volume of resources is associated with being quoted on the stock market or dependent from an insurance company (which are critical resource providers). It is also associated with English origins. The most dominant organization would be Axa PE (now Ardian). The second dimension (social and symbolic resources) is associated with age and not being English: older and domestic organizations seem more legitimate.

The second question is answered with a network analysis of the relations of co-ownership, people movements and secondary transactions between the 355 entities. The network is composed of a main component (55% of nodes) and a disconnected periphery. In this main component, the integrative potential of subnetworks differ in terms of the resources involved: the structure of the exchange of companies is less hierarchical and less vulnerable than the one of property ownership or professional mobility, respectively. There is a strongly interconnected component, which is a dense core comprising 26 % of all organizations. Membership in this core is associated with French origins, main specialization in LBO and location in the posh 8th arrondissement of Paris.

Keywords

Social Network Analysis, Geometric Data Analysis, Organizations, Strategic Action Field, Private Equity

From local champions to global players: A long-term perspective on Swiss companies' connections across territorial scales

Michael A Strebel and André Mach

Abstract

How do companies' ties to national institutions and organizations evolve over time? Existing research has found an increasing transnationalization of company networks and a decline of companies' ties with national institutions since the end of the 20th century. However, these studies have neglected the question of how companies are connected to the localities where they have been founded and have their seats. In this paper, we engage in a long-term analysis of the multilevel ties that companies maintain with the local and the national context they are embedded in. To do so, we adopt a positional approach and identify the board members of the largest companies in the three major Swiss city-regions (Basel, Geneva, and Zurich) from 1890 to 2020. For seven benchmark years, we track the evolution of company leaders' multipositionality in local and national networks. In addition, to capture the transnational embeddedness of business leaders, for which we do not have systematic data on interlocking directorates, we look at the evolution of their "geographical background": their nationality, place of origin, place of birth, place of residence, and place(s) of education. We expect to find three different phases of company networks' multilevel ties. A first phase from the end of the 19th century to World War I, where networks were mainly local and partly transnational, characterized by strong ties of companies to local institutions, weak ties to national institutions, and diverse spatial backgrounds of company board members. A second phase from the interwar period to the fall of the Berlin wall where companies' ties were essentially national, with lesser importance of local connections and an absence of international backgrounds among board members. The third, transnational, phase from the end of the 1980s onwards is characterized by a decline of local and national ties of company boards and an increase in transnational backgrounds of board members. Documenting the evolution of the relational embeddedness of companies allows us to show the changing scales of companies' activities in a long-term perspective. The results of this analysis further our understanding of the origins and the evolution of global capitalism.

Keywords

Business Networks, Multilevel Governance, Urban Areas, Elites, Multipositionality

Effective agents in the field of power. How the Swiss elite core evolved between 1910 and 2000?

Thierry Rossier

Abstract

Elites can either be seen as a coordinated homogeneous "class" or as a heterogeneous and conflictual group. First, different elites, identified through their position at the top of the structure of the main institutional orders, coordinate through vast and complex organizational networks. At the very centre of these networks lays a multisectorial core, that sometimes takes the form of a "power elite" (Mills 1956), formed of the individuals who occupy key positions and take "important" decisions. The members of this very interconnected group are affiliated to a small number of institutions and share similar psychological and moral values. Second, elites own a variety of transferable capitals, resources and assets, which make them occupy a particular position in the social space and oppose to one another, among others according to the volume and composition of economic, cultural and social capitals they own. The dominant individuals of all fields are organized into the field of power (Bourdieu 1996 [1989]), where the specific capital of the field confers power over the various kinds of capital. In this field, the effective agents (Bourdieu 2005 [2000]) detain and exert this form of capital. Through their multi-positionality they bind various fields and act as brokers in the negotiation of the relative strength of different forms of power. In this sense, we argue that the elite network's core and the effective agents of the field of power mostly overlap and are composed of the same individuals.

We build upon a collective prosopographical project on Swiss elites identified through their institutional affiliation to the main sectors of power (politics, state administration, expert committees, companies and business associations, unions, academia, other interest associations, and the military generals) on five historical cohorts for a total of 1,832 institutions and 14,784 individuals. We follow a two-step analytical strategy. First, through a slightly modified version of a methodology used to study Danish elites (Larsen & Ellersgaard 2017), we apply to each of the five networks a k-shells decomposition procedure and identify the Swiss elite network's core for each date (n: 1910=76, 1937=103, 1957=211, 1980=197 and 2000=96). We are able to show the changing composition of the core of the network in terms of proportions of the main sectors represented as well as gender, geography, language, age, social background (through father's occupation), family ties within the elites, diplomas and international ties. Second, through a certain number of effective resources measured through economic integration, cultural certifications, network indicators, careers and inherited assets, we establish the main oppositions among those effective agents in the field of power by means of multiple correspondence analysis. Preliminary results show that the integration to the economic order, related to a large amount of inherited and organizational economic capital, increase in importance during the historical period, while cultural certifications and other forms of cultural capital are becoming less central in structuring the field.

Keywords

Elites, Field, Core, Field Of Power, Capital, Power, K-Shells, Multiple Correspondence Analysis

The social foundations of political nomination

Elisa Klüger

Abstract

This article employs a combination of social network analysis (SNA) and multiple correspondence analysis (MCA) to examine the social foundations of political nomination. The paper aims to answer if the relations that lead to political nominations connect individuals with similar social backgrounds and if their social proximity varies according to the environment in which these individuals met. This question will be discussed following the examination of the answers of the directors of the Brazilian National Development Bank (BNDES) regarding the source of their nomination and the circumstances of the establishment of the relations that led to the nomination. The data was collected throughout a series of 41 interviews with presidents, vice-presidents, and directors of the BNDES that I conducted between 2012 and 2016. The interviews also collected systematic data on their social origins, education, cultural practices, and political positions. The use of MCA to display, describe and correlate this data allows detecting the existence of four profiles of directors and delineating how they are systematically scattered on the social space as a result of their unequal origins, preferences, and practices. Based on the information about their nominations, it is possible to connect the dots representing the directors in each pair of axes of the MCA when a connection is reported. The average distance of linked points is, then, compared with the average distance of any two points (for each combination of retained axes). As a result, it is possible to analyze how social homogeneity is expressed in the political nominations. Moreover, since there is information regarding the establishment of the ties, it is possible to detect which environments bring together people with similar profiles.

Keywords

Political Nominations, Multiple Correspondence Analysis, Social Network Analysis, BNDES

Social Resources and Well-Being: The Japanese Urban-Rural Divide

Stefan Hundsdorfer and Dionyssios Askitis

Abstract

Social cooperation and tightly knit social networks have been the trademarks of rural Japanese rice-farming communities for centuries. Due to economic decline, population ageing and out-migration these communities are threatened in their very existence. As a countermeasure the Japanese government was seeking to foster community-level social capital in rural areas. The presumably high level of community social capital is under scrutiny in our contribution focusing on the question of its measurability on the individual level. Questions of divergent effects of social resources on well-being in Japanese rural and urban regions will be tackled as well as discrepancies in resource availability. Trying to answer these questions a nationwide online survey was conducted. Using a modified resource generator, traditional social capital measures and culture-sensitive measures of interdependent well-being along with measures for personality new insights into the social determinants of subjective well-being could be generated. Considering the supposed culture-bound reluctance to burden fellow human beings with personal problems, the differences between perceived availability and received social support is examined. Furthermore, in a multidisciplinary endeavor, links between the psychological concepts of interdependent and independent self-construal and potential links to the notions of bonding and bridging social capital are explored. The preconception of high rural social capital and urban economic capital can be partially corroborated but has to be complemented by a more fine-grained gendered life-course perspective.

Keywords

Resource Generator, Social Capital, Urban-Rural Comparison, Subjective Well-Being, Life Course

Emotional closeness and geographical proximity of confidants in old age: Revisiting the convoy model of personal relationships

Jing-Yi Wang

Abstract

There is strong evidence that for older people, living near their confidants (family and friends) is crucial for their well-beings. Although many forms of contact help maintain people's relationships, geographic proximity influences the quantity and quality of support people give and receive. Prior research shows that older people are more likely to give and receive support and confide in people who live near them. While many studies show that contact frequency and geographical proximity are strongly positively linked; confidants who live far away are not always less important than those who live close by. In contrast, they can be so important that they can stay in people's network even when they are far away. For example, previous research shows that geographical distance is less influential on the quality of intergenerational relationships than on the quality of friendship. In this study, we investigate the associations between geographical proximity and emotional closeness for different personal relationships in old age.

Three hypotheses are made for investigating relationships with parents, children, siblings and friends, who are regarded as members of one's core discussion network. First, we hypothesise that the geographically closer confidants are, the emotionally closer they are to the respondents, as the opportunities of support exchange would link to their quality of support exchange. Second, we hypothesise that the quality of personal relationships in old people's network might not be easily affected by their geographic proximity. Confidants who live far away are likely to be perceived as at least equally emotionally important as confidants who live close by. Finally, it is possible that the more far away the confidants are, the emotional closer they are perceived by the respondents. This could be the case that although their meeting opportunities are fewer, and the effort of maintenance could be higher, they are not replaced by others who live close by.

Using data from Survey of Health, ageing and Retirement in Europe (SHARE), the level of emotional closeness between respondents and their confidants are analysed with ordered logistic regression models. In this paper, I demonstrate that the closer the old people live from their children, the emotionally closer they feel to these children after contact frequency were controlling for. But for the relationships with parents, the geographical distance is not significantly associated with emotional closeness. Regarding siblings and friends, after controlling for contact frequency, the more far away the old people live from their siblings and friends, the emotionally closer they feel towards them. These findings provide empirical evidence of emotional support mechanisms from different types of personal relationships in old age. The implications for personal and family relationships in old age and theoretical contribution to the convoy model will be discussed.

Keywords

Emotional Support, Kin And Non-Kin Relationships, Personal Relationships, Egocentric Network, Old Age, Social Convoy Model

Harnessing the Power of Social Networks: Feasibility Trial of a Social Network Intervention to Reduce Risky Drinking among Residential College Students

Lily Davidson, Carol Keane, Gary Chan and Leanne Hides

Abstract

Introduction / Issues: Given the crucial role of peer influence on young peoples' drinking, there is excellent potential to utilise the power of social networks in interventions for risky drinking. We ran a feasibility trial of a two-stage social network intervention, in which social network analysis was used to identify influential people in a network of first-year students at an Australian residential college, to receive a brief alcohol intervention.

Design and Methods: Five residential colleges were recruited. At all colleges, the first-year network participated in an educational workshop (Stage 1) about alcohol and other drugs and harm minimisation strategies, during orientation week. During the workshop, consenting students completed a baseline survey about their substance-use. The largest, co-educational college was selected to participate in Stage 2, a targeted social network intervention. The cohort selected for Stage 2 completed another survey four-weeks post-baseline, which included a social network measure. Social network data collected at 4-weeks was used to perform the Strategic Player analysis (Ott et al., 2018) that identified potentially influential network members, based on their centrality amongst other heavy drinkers in the network. Sixty Strategic Players were identified and invited to receive a brief motivational interview-style telehealth intervention that was developed by the research team, called QuikFix (Hides et al., 2014). All participants in the study will complete follow up surveys at 3, 6, and 12 months post baseline.

Key Findings: The AOD workshop (Stage 1) reached over 507 participants. In the college selected for Stage 2, 91% (148 out 160) of first year students enrolled at baseline (50% female; mean age = 18.13 years). Of those, 134 (90%) provided valid social network data at 4-weeks. Most students in the Stage 2 cohort (73%) scored 8 or above on the Alcohol Use Disorders Identification Test (AUDIT; WHO, 1992), indicating that most students were drinking at harmful levels. Despite a norm of hazardous drinking, enrolling Strategic Players in the personalised intervention proved difficult. Most students did not see their drinking as problematic, despite experiencing an average of 8 negative alcohol-related consequences in the past month. Analysis of the 3 month data (June 2021), 6-month data (August) and 12-month data (February, 2022) will show if intervention efforts, including the network-wide workshops (Stage 1) and the targeted social network intervention that followed (Stage 2), lead to changes in drinking among the Strategic Players and the wider social network.

Discussions and Conclusions: This study provides valuable insights into the feasibility and effectiveness of interventions that utilise social network analysis, particularly in the context of targeting substance use in close-knit networks like residential colleges.

Disclosure of Interest Statement: All authors declare no competing interests.

Keywords

Social Network Analysis, Adolescent, Young Adult, Alcohol

Social network range, but not size, is longitudinally associated with cardiac biomarkers in Korean older adults

Ekaterina Baldina, Sung-Ha Lee, Hyeon Chang Kim and Yoosik Youm

Abstract

Background

Social relationships are associated with an increased risk for cardiovascular diseases. However, previous research focused on social network size overlooking range. We aim to examine the effect of both – social network range, a number of other groups that can be reached through social networks, and size on cardiovascular health.

Methods

Data were derived from the Korean Social life, Health and Ageing Project (KSHAP), which includes both the complete social network matrix of residents in the whole township as well as measures of the cardiac biomarkers - Brain Natriuretic Peptide (BNP), Troponin, N-Terminal -proBrain Natriuretic Peptide (NT-proBNP), and Cystatin. We analyzed the variables from three waves, – 2011 (wave 1), 2016 (wave 4), and 2019 (wave 5) (n = 685, mean age 72.06 years (SD =7.05), female 58.4 %). Fixed-effect models were applied to control for endogeneity.

Findings

Fixed-effects analysis showed that respondent's opportunity to reach two villages was associated with lower levels of cardiac biomarkers (BNP: β=-0.17, p=0.006, Troponin: β=-0.78, p<0.001, NT-proBNP: β=-0.43, p=0.017, Cystatin: β=-0.04, p=0.001), while there was no association if the number of reachable villages grew. Social network size was not significantly associated with cardiac biomarkers.

Interpretation

Social network size has little effect on cardiovascular health. In the contrast, social network range is strongly associated with the levels of cardiac biomarkers. Social network range might indicate access to diverse information and resources that help to maintain cardiovascular health in the elderly population living in remote rural areas.

Keywords

Social Network Range, Cardiac Biomarkers, Complete Social Network, Older Adults

Network topology and smoking norms: an international longitudinal study of adolescents

Vincent Lorant and Mark Tranmer

Abstract

Introduction

The spreading of a risky/deviant behaviour in a network may depend on the network's topology, i.e. the overall structure of the relationships between its agents. According to the simple-contagion theory, a strongly connected network will enforce norms and contain the spreading of risky behaviour; while according to the complex-contagion theory, a network displaying a small-world structure will facilitate diverging norms and lead to the spreading of risky behaviours. However, empirical research has been inconclusive, due to the limited number of networks examined and the challenge to consider the different normative environments to which networks are exposed. Here, we investigated the effect of network topology on adolescent smoking behaviours and norms in a school context marked by increasing smoking denormalisation over time.

Method

In 2013, 38 schools were recruited in six European countries and participated again in 2016. All adolescents in grades corresponding to 14-16 years old were invited to participate in a social network survey (n=22,212; participation rate=80%). Adolescents reported their in-school friendship ties and smoking behaviours and norms. Three outcomes were examined at the ego-level: disapproval of smoking, having tried smoking, and regular smoking. The topological features of the socio-centric school networks were assessed with two groups of indices that captured cohesion (average degree, connectivity, centralization, hierarchy, reciprocity, multiplexity) and small-world structure (clustering, average path length, and diameter). A factorial principal component analysis with varimax rotation was performed on the topological features to extract the main factors. The school normative environment related to smoking was measured by the prevalence of parental smoking. Multilevel models were created including a random intercept at the school-level, and all models were controlled for adolescent socio-economic status, age, sex, parental smoking status, and ego centrality (indegree, betweenness, and closeness).

Results

Factor 1 (44% of the total variance, hereafter "connectivity") increased with average degree and connectivity; and decreased with the proportion of isolates, hierarchy, and with centralisation. Factor 2 (22%of the variance, hereafter "clustering") increased with reciprocity, multiplexity, and with clustering. Factor 3 (16% of the variance, hereafter "distance") increased with average path length and with the diameter.

The connectivity factor was associated with higher disapproval of smoking (beta=0.23, t-stat=3.2), with fewer members of the network having tried smoking (beta=-0.31, t-stat=-7.35), and with fewer regular smokers (beta=-0.25, t-stat=-4.25). The clustering factor 2 was associated with less disapproval (beta=-0.15, t-stat=-2.05), with fewer network members who tried smoking (beta=-0.23, t-stat=-4.7), and fewer regular smokers (beta=-0.28, t-stat=-4.2). The distance factor 3 was not associated with any outcome. Finally, topology had a more pronounced effect in networks exposed to an intermediate level of parental smoking than in networks exposed either to a very low or to a very high level of parental smoking.

Conclusions

There is empirical support for both simple-contagion and complex contagion theories, particularly when the school has faced a shifting normative smoking environment. The topology influences norms and behaviour in different ways.

Keywords

Topology, Norms, Smoking, Adolescents'health

Review of approaches to blockmodeling of dynamic networks

Aleš Žiberna

Abstract

Blockmodeling of dynamic networks aims to cluster units based on dynamic networks. While several problems can fall under this name, we will focus on blockmodeling units on networks measured in several time points (discrete time measurement) where both cluster membership and the blockmodel image (connectivity pattern) is allowed to change in time and not all units have to be present in all time points. Most attention will focus on binary networks. In addition to methods specifically designed for such problems (e.g. Matias and Miele 2017, Bartolucci and Pandolfi 2020, Xu and Hero 2014), methods that impose some limitations such as fixed connectivity patterns and methods designed for more general problems such as for blockmodeling of lined networks (e.g. Bar-Hen et al. 2020, Žiberna 2020) will also be considered. We will attempt to provide a "classification" of methods based on their properties.

Keywords

Blockmodeling, Network Clustering, Dynamic Networks, Temporal Networks

Comparing different approaches to blockmodeling dynamic networks

Marjan Cugmas and Aleš Žiberna

Abstract

Blockmodeling aims to reduce large and complex networks to smaller, comprehensive, and more interpretable structures (Doreian et al. 2005). Several blockmodeling approaches to blockmodeling dynamic (i.e., measured at several time points) networks (e.g., Matias and Miele 2017, Bartolucci and Pandolfi 2020, Bar-Hen et al. 2020, Žiberna 2020) have been proposed in recent years. These approaches have yet to be thoroughly compared on empirical network data. Therefore, the preliminary results of a Monte Carlo study that addressed this issue will be presented. Special attention is paid to the algorithms for generating dynamic networks with a specified blockmodel and partition. These algorithms generate links by considering different local network mechanisms like mutuality, popularity, and transitivity. These generated networks are argued to more closely represent real-world networks. The networks are generated so that the blockmodel type and partition can change in time.

Keywords

Dynamic Network, Stochastic Blockmodeling, K-Means Blockmodeling

Blockmodeling temporal networks described by temporal quantities

Vladimir Batagelj

Abstract

Temporal networks described by temporal quantities were introduced in the paper (Batagelj and Praprotnik, 2016). In a temporal network nodes/links activity/presence, nodes properties, and links weights can change through time.

To the traditional blockmodeling (BM) scheme (Doreian, et al. 2005) we add the time dimension - the BM partition μ is described for each node v with a temporal quantity μ(v,t): μ(v,t)=i means that in time t node v belongs to cluster i. The structure and activity of clusters C_i(t) = { v : μ(v,t) = i } can change through time, but they preserve their identity.

For the BM μ the clusters are mapped into BM nodes μ : C_i → [i]. To determine the BM we still have to specify how the links from C_i to C_j are represented in the BM - in general, for the model arc ([i],[j]), we have to specify two temporal quantities: its weight a_{ij}(t) and, in the case of generalized BM, its type T_{ij}(t). The weight can be an object of a different type than the weights of the block links in the original temporal network.

To develop a BM method we specify a criterion function P(μ) measuring the "error" of the BM μ. We can consider additional knowledge by constraining the partitions to a set Φ of feasible partitions. We are searching for a partition μ* ∈ Φ such that it minimizes the criterion function P(μ).

At the Sunbelt 2020, we presented a procedure for BM temporal networks under the assumption that the partition μ doesn't change through time. In this talk, we will present a procedure for BM with general time partitions, but assuming structural equivalence. We will illustrate the proposed approach with the results of BM some temporal networks.

Keywords

Blockmodeling, Temporal Network, Temporal Quantity, Optimization, Algorithm

Studying travel agents: relational capital and organizational factors

Isidro Maya-Jariego, Deniza Alieva and Daniel Holgado

Abstract

Travel agents in the tourism market are a profession that is based on the management of relational capital and, as part of their work, they retain data on their business contacts. To study their personal networks, it is advisable to previously develop a relationship with the group, clearly present the research objectives and establish a reciprocal, mutually beneficial relationship with the research participants. In this paper we reflect on the impact of organizational factors on the validity of the information obtained, as well as on the ethical challenges it poses for research. We examine the central role of power relations in organizations, and how they are modulated by cultural context.

Keywords

Personal Networks, Organizational Factors, Cultural Diversity, Ethic Challenges

The Presentation of the Networked Self: Ethics and Epistemology in Social Network Analysis

Louise Ryan and Alessio D'Angelo

Abstract

For decades, social network analysis (SNA) has experienced a growth in volume and subject areas, accompanied by the development of technological tools, increasing availability of data (Borgatti et al., 2014) and the prominence of visualisation techniques (D'Angelo et al., 2016). Whilst opening new pathways for sociological investigation, this also raises specific ethical challenges, an aspect which often has been overlooked in academic discussions. As argued by Borgatti and Molina over a decade ago: 'the newness and surprising power of network analyses cause both researchers and research subjects to seriously under-estimate the risks of participation' (2005: 108). Thanks to the rise of the internet and social media, recent years have seen increased attention towards the ethics of researching online networks (see e.g. Hoser and Nitschke, 2010). If anything, however, this seems to have pushed the broader discussion of the inherent challenges of SNA, especially when focusing on 'off-line' networks, further into the background.

Drawing on the seminal work of Goffman, Krackhardt and others, this paper argues that there is a crucial step in between participants' perceptions and the collection and visualisation of data – i.e. what we call the presentation of the networked self. We employ examples from our own empirical work in the UK to argue that presentation of the networked self requires researchers to adopt a highly reflexive approach. Framing our analysis within the context of contemporary society – including the impact of social media on a 'networking mindset' – we explore the range of ethical dilemmas which can emerge during a research encounter.

Keywords

Social Networks, Ethics, Presentation Of The Networked Self, Mixed Methods

Research ethics in the age of digital platforms

José Luis Molina, Paola Tubaro, Antonio Casilli and Antonio Ortega

Abstract

The ethics of research in social science is informed by standards in life and health sciences. The first principle of bioethics is to guarantee the autonomy of participants by collecting informed consent and the right to quit the experiment at any moment without consequences for the treatment (sic). This rationale conceives compensations to subjects as repayment of expenses or for the time devoted to the study.

In no case are they ever meant to be incentives to join in. This principle assumes that participation is free, in the sense of being both unconstrained and pro bono. Nevertheless, research in digital labor platforms challenges these assumptions. To make time to participate in a survey or interview, workers may have to renounce the completion of remunerated "gigs" or "tasks", which are often necessary to meet their basic needs. Especially on microworking platforms, where fragmented and poorly paid data tasks are performed, workers cannot always afford to join a research for free, including studies of their living and working conditions. In this context, is it ethical to apply the bioethics framework? Based on evidence from our project "El trabajo de la inteligencia artificial" (TRIA) and other germane studies, we discuss the conditions under which framing participation in a research as a paid microtask on a platform can be considered ethical.

Keywords

Research Ethics, Digital Labor Platforms, Microworking

Discovering communities of practice in Twitter with active node classification and graph traversal strategies

Michelangelo Puliga, Alessandro Chessa, Vincenzo de Leo, Martina Erba, Filippo Capriotti and Andrea Filetti

Abstract

Social network platforms like Twitter empower their users to build a variety of social ties that can be more or less stable in time, efficient or inefficient in propagating the information, and keen to generate user engagement. In this framework, transient networks are formed, for instance, when the users join a discussion group with interactions that are, usually, short-living. In Twitter other networks, such as Friendship networks play, instead, a special role since the information flow follows the friendship direction (outgoing links) and not the opposite one represented by the followership (ingoing links). This feature is by design in Twitter where a user can see the posts of his friends but cannot hear the voice of his followers resulting in an asymmetry that shapes how the users are exposed to information, and how they engage in discussions.

In this work, we explore a specialized network of Twitter users made of experts, professionals, and companies of the Energy world. To recover this network we developed a graph traversal procedure based on a machine learning classifier that actively selects the users of this community of practice. The algorithm starts from the manual selection of a seed of nodes we know being part of the energy sector, then getting their friends, and from the descriptions of their Twitter accounts building the ML classifier to identify the proper nodes. With the help of this tool, we then explore the second level of friends (friends of friends) getting a much larger network of relevant nodes. There is no need to explore further levels as the “small world” effect ensures, as a matter of fact, that all relevant nodes in a friendship network are close to each other. Since the initial seed orients the development of the network, we made 100 different starting samples to recover the average network and ensure robustness.

We used the reconstructed network (4954 nodes and 13825 edges) to study the interactions of users with the citation (“@”) tool in tweets, and we compare this activity with other non-specialized friendship networks. We discovered that citations in specialized networks are much rarer than in generic ones. Moreover, the few citations are used to involve other Twitter accounts created for specific business purposes (for instance a company is citing the organizer of a media event). This communication style can be extracted from the user timelines, and encoded in numeric features for the classifier; in this way the ML mode becomes able, during the graph traversal exploration, to recognize nodes sharing a common communication strategy.

The graph traversal procedure, complemented with an active machine learning classifier is not only computationally efficient in exploring recursively the network but is also able to recover internal subgraphs according to desired features such as communication styles. We claim that this methodology is not only important to reconstruct communities of practice but also to better understand corporate communication strategies in social networks.

Keywords

Twitter, Graph Traversal Methods, Machine Learning Classifiers, Active Node Classification, Communities Of Practice, Corporate Communication, Media Strategies

Assessing the risk of infodemics in response to COVID-19 epidemics

Riccardo Gallotti, Francesco Valle, Nicola Castaldo, Pierluigi Sacco and Manlio De Domenico

Abstract

Our society is built on a complex web of interdependencies whose effects become manifest during extraordinary events. The recent explosion of publicly shared, decentralized information production that characterizes digital societies and in particular social media activity provides an exceptional laboratory for the observation and the study of these complex social dynamics, and potentially functions as a laboratory to understand, test and validate possible solutions to large-scale crises. Global pandemics are certainly an instance of such crises, and the current outbreak of COVID-19 may therefore be thought of as a natural experiment to observe social responses to a major threat that may potentially escalate to catastrophic levels and has already managed to seriously affect levels of economic activity, and radically alter human social behaviors across the globe.

In this study, recently published on Nature Human Behavior, we analyzed more than 100 million Twitter messages produced within the Covid-19 Infodemics Observatory. This dataset includes messages posted worldwide in 64 languages during the epidemic emergency due to SARS-CoV-2. We classified the reliability of news diffused to show that information dynamics tailored to alter individuals' perceptions and, consequently, their behavioral response, is able to drive collective attention towards false or inflammatory content, a phenomenon named infodemics, sharing similarities with more traditional epidemics and spreading phenomena.

For each message, we identify the presence of links pointing to external websites: for each link we verify if it comes from a trustworthy source or not by aggregating information by several fact-checking databases. The number of followers of a single user is then used to define the exposure in terms of potential visualizations at first-order approximation. Exposure and reliability are useful descriptors that, however, do not capture alone the risk of infodemics. For this reason we have developed an Infodemic Risk Index (IRI) which quantifies the rate at which a generic user is exposed to unreliable news.

Tracking the evolution in time of the IRI across the globe, we find that contrary to what it could be expected in principle, on the verge of a threatening global pandemic emergency, human communication activity is to a significant extent characterized by the intentional production of informational noise and even of misleading or false information. This generates waves of unreliable and low-quality information with potentially very dangerous impacts on the social capacity to respond adaptively at all scales by rapidly adopting those norms and behaviors that may effectively contain the propagation of the epidemics.

Fortunately, we also find that the escalation of the epidemics leads people to progressively pay attention to more reliable sources thus potentially limiting the impact of the infodemics, but the actual speed of adjustment may make a major difference in determining the social outcome, and in particular between a controlled epidemic and a global pandemic.

This casts new light on the social mechanics of the infodemics-epidemics interaction, and may be of help to policy makers to design a more integrated strategic approach, by suitably embedding communication and information management into a comprehensive, extended public health perspective.

Keywords

Infodemics, COVID-19 Epidemics, Twitter, Disinformation, Misinformation, Risk Assessment

Twitter Networks of Discussions on COVID-19 During Every Hour of the Last Week of 2020

Moses Boudourides

Abstract

From the Panacea Lab COVID-19 Twitter database, 1,495,736 tweets were hydrated. All these were tweets written in English and they were acquired from the COVID-19 Twitter Stream chatter during the last week of 2020, i.e., from 2020-12-25 0:0:0 GMT until 2020-12-31 23:59:59 GMT.

In this dataset, the following attributes were extracted and counted: 75,318 unique hashtags, 653,762 unique sender tweeple, 179,405 non-sender mentioned tweeple, 54,698 sender mentioned tweeple. Moreover, using the standard NLP techniques of POS tagging, 177,705 named-entities were identified in the dataset. Starting with an exploratory data analysis and time series statistics of all these attributes, the dynamics of the circulation of COVID-19 Twitter chats in English during the last week of 2020 was examined.

Furthermore, the following three networks generated in the tweets of the studied dataset were analyzed: (i) networks of co-occurring hashtags, which is an undirected graph of 62,448 nodes (hashtags) and 274,993 edges (hashtag co-occurrences), (ii) networks of mention-ed/-ing tweeple, a directed graph of 193,383 nodes (tweeple) and 301,349 edges (mentions among tweeple) and (iii) networks of co-occurring named-entities, an undirected graph of 88,559 nodes (named-entities) and 106,867 edges (co-occurrences of named-entities).

These three networks were analyzed as temporal (multi-layered) graphs (forming 168 hourly layers) and the objective was to rank the top and most salient attributes (hashtags, mentions, named-entities) and also the corresponding emerging community partitions for every hour during the seven days of the last week of 2020.

Keywords

Twitter, Networks Of Hashtags, Networks Of Mentions, Networks Of Named-Entities, COVID-19

The release of #SilviaRomano: a case of polarized intersectionality

Elena Pavan and Antonio Martella

Abstract

This paper proposes a joint application of online network analysis and topic modeling with the aim of contributing to ongoing discussions on the multiple, intersected ways in which women, their bodies and choices are included in but also constituted by contemporary hybrid media discourses.

It does so by examining the Twitter conversation that sparked in conjunction with the release on 9 May 2020 of Silvia Romano, an NGO aid-worker kidnapped in Kenya eighteen months earlier. The event triggered a heated public discussion permeated by doubts about the political negotiations behind the release and, most notably, by violent attacks against the young woman herself inflamed by a Islamophobic and misogynistic gaze. Counteracting these overtly hostile recounts, were public expressions of relief and enthusiasm which stressed her enduring commitment to international cooperation.

Our work approaches the case of Silvia Romano as a case of polarized intersectionality, that is, a (mis)representation of women in the public discourse that develops at the intersection of different axes of discrimination (in this case age, religion, and gender) and in conjunction with political polarization dynamics.

We analyze the structure and the implications of this (mis)representation along the following broad research questions:

RQ1: Was the online conversation about Silvia Romano organized around partisan conversational areas?

RQ2: How were Silvia Aisha Romano and her experience framed within such conversational areas?

RQ3: What contributions did political elites and media actors set to such a collective framing process?

To answer our questions, we lean on a dataset of 55.897 tweets collected over the period 8-18 May 2020. We build a bipartite network user by tweet based on retweet relationships and derive a semantic network representing the overall discursive system produced by users tweeting about Silvia Romano. Through the application of community-finding algorithms, clusters of tweets are isolated that approximate the conversational areas structuring the Twitter discussion about Romano's release. Focusing specifically on the main (three) conversational areas pivoting around media and political accounts, we derive their overall political leaning starting from the number of contributions set by political parties and leaders to each of them. We then analyze conversational areas through Structural Topic Modeling techniques in order to identify the different topics organizing the discussion. After comparing similarities and differences between communities to infer general levels of semantic polarization, we analyse more in detail the frames and polarity emerging within each conversational area. We thus associate political and semantic positionments with specific (mis)representations of the aid-worker at the crossroads between gender, religion and age. Finally, we assess the actual contribution of political and media elites to the formulation of these (mis)representations by leaning on the topic detection formula as allowed by STM.

Our preliminary results seem to confirm that mediated intersectional (mis)representations of Silvia Romano permeate the whole online discussion albeit in different forms and, in fact, depending on the varying geometries of partisan oppositions.

Keywords

Women Representation, Media Discourse, Intersectionality, Polarization, Twitter, Semantic Network, Topic Modeling

Storylines of Climate Change: A Network Analysis of the EU Agencies' Discourse on Twitter

Kristin Olofsson, Karina Shyrokykh and Sandra Gerda Eckert

Abstract

The European Union (EU) is a global climate leader promoting climate change mitigation and adaptation policies internationally. Effective climate policy formulation at the level of the EU requires an adaptive governance approach that recognizes the complexity and uncertainty of the issue and the necessity for a networked approach that includes experts. Agencies in the EU are hubs of expertise as generators of information and as experts for the European Commission and member states' national agencies. As EU agencies grow into expertise communities, they become increasingly vital sources of information and the discourse among the agencies becomes a source of knowledge and legitimacy for the European Commission itself. The social media presence of EU agencies plays an important role as a conduit of information as well as a means of justifying agency legitimacy. Numerous EU agencies have a mandate in policy areas that are directly related to climate governance: European Environmental Agency, Agency for the Cooperation of Energy Regulation, European Fisheries Control Agency, European Food Safety Authority, and many more. For other agencies, climate issues may only be tangential to their mandate but may still be relevant in other ways, nonetheless. Different agencies can have different understanding of what deserves the most attention in the EU's climate policy and what does not in connection to climate change. To better understand how patterns of discourse emerge behind interpretations of climate risks, we study how (i.e., mechanisms) and when (i.e., conditions) coalitions among EU agencies form behind individual storylines in climate discourse. Agency discourse can reveal its climate risk interpretation; however, little is known about how discourse between agencies can fill a knowledge gap in adaptive governance. Through discourse networks generated by online exchange of information between EU agencies, we trace the main climate storylines and explore the structure of climate discourse coalitions via the mechanisms and conditions under which they are more likely to be formed. Data is drawn from official Twitter accounts of all 38 EU agencies from 2009 to 2020. We test relationships between agency characteristics and climate discourse coalitions and find that there are distinct patterns to the online exchanges among EU agencies. This work contributes to a deeper understanding of the utility of online exchange in expert networks, existing research on EU agencies, and a literature on their social media activity that is just emerging by shedding light on the mechanisms and conditions that shape their online interaction.

Keywords

Discourse Networks, Public Administration, Public Policy, Social Media, Inferential Network Analysis

Together we stand? An analysis of the digital connections developed by LGBTQIA* collective actors

Aurora Perego

Abstract

Social movement scholarship has extensively focused on alliances between civil society organisations (CSOs), emphasising that inter-organisational cooperation increases individual political participation and movement efficacy. Since the last decade, researchers have also started to consider the establishment of digital ties between CSOs, showing that collective actors deploy digital platforms as venues to communicate and mobilise.

Scholars have found considerable variability in the extent to which CSOs engage in inter-organisational cooperation. Although cross-movement cooperation has so far received scant attention, actors tackled by different inequality structures (such as gender, class, and ethnicity) have been shown to be less likely to unite around shared causes or to support each other. In particular, the LGBTQIA* (lesbian, gay, bisexual, transgender, queer, intersexual, asexual, and others) collective action field has often been described as both internally fragmented and not tightly connected to other collective action fields. However, recent studies have observed the emergence of so-called 'intersectional alliances' between LGBTQIA* civil society organisations and other collective actors, such as migrants and racialised individuals.

This paper addresses this discrepancy by analysing the digital ties developed by LGBTQIA* organisations both within the LGBTQIA* collective action field (within-field relations) and with challengers mobilising in other fields (cross-field relations). The investigation aims to understand which circumstances may enhance the formation of such ties, with particular attention to the socio-political context in which the actors are embedded and the collective action frames they mobilise. To do so, this paper compares different networks resulting from public digital interactions on Facebook between LGBTQIA* organisations located in two European metropolises (Milan and Madrid) at three different points in time (2011, 2015, 2019). This case selection allows for a twofold comparison: on the one hand, we consider how networks change over time; on the other hand, we consider how they differ across cities. Information is collected on three types of digital ties: (1) discursive ties, where organisations express solidarity or support towards other organisations; (2) event-oriented ties, where organisations either promote or partake collective action events organised by other organisations; (3) sharing ties, where organisations share contents created by other collective actors. Firstly, the paper maps within- and cross-field multiplex networks and discusses network- and node-level measures to explore how such ties may have evolved over time and may change across contexts. Secondly, it performs a QAP (quadratic assignment procedure) regression to test the correlation between the within- and cross-field discrete networks and overlapping collective action frames, controlling for organisational characteristics.

To conclude, this paper proposes a preliminary investigation of the circumstances that may enhance the establishment of within- and cross-field ties across contexts and their evolution over time. By doing so, it aims to contribute to literature on collective actions and political networks in two ways. On the one hand, it articulates an initial investigation of how LGBTQIA* collective actors make use of digital platforms to establish within- and cross-field digital interactions; on the other hand, it proposes a preliminary exploration of the factors that may encourage the development of such interactions.

Keywords

LGBQTQIA*, Digital Activism, Inter-Organisational Cooperation, Alliances

Trump and Other Dominating Intersection Subgraphs from Wikipedia Pages Associated with Christian Nationalism

Moses Boudourides and Amitabha Palmer

Abstract

The rise of Christian Nationalists represents one of the most significant recent trends in American politics. This identity group lies at the intersection of Conservatism, Libertarianism, white Christian Evangelicalism, ethno-nationalism, and rightwing populism. It has influenced national policy debates on a wide range of disparate issues including immigration, trade, foreign policy, vaccinations, public health, environmental policy, the role of religion in politics, and gun rights.

In this paper we attempt to build on previous work investigating how Christian Nationalist and adjacent institutions and individuals are interrelated—both on and offline. Specifically, we seek to uncover power relationships. To identify connections and power relationships, we analyzed the connections between the over 6000 Wikipedia pages associated Christian Nationalist subgroups, institutions, and individuals. The pages were collected from the Wikipedia category indices for subgroups and issues related to Christian Nationalism.

Our network analysis is motivated by a combination of standard bibliometric networks with graph domination theory. Networks of Wikipedia hyperlinks are similar to citation networks (although the former networks are not directed acyclic graphs). Furthermore, since for every Wikipedia page u there exists a “maximal” dominating Wikipedia page v containing u and not contained in (the neighborhood of) any other page (notice that it is possible that v=u), one may consider the induced subgraph of “maximal” dominating pages as an intersection graph. In this sense, the resulting “maximal dominating intersection graph” is a much smaller graph than the starting Wikipedia hyperlink network which preserves the structure of power and dominance among the totality of collected pages. Thus, our aim is to study the centrality indices and the community partitioning of major pages/nodes in the dominating intersection graph in order to interpret how Wikipedia represents the power structure, the groupings and the polarization among various individual politicians and Christian Nationalist organizations.

Keywords

Wikipedia Hyperlink Networks, Graph Domination, Ego-Centric Subgraphs, Christian Nationalism, Rightwing Populism

Hyperlink networks between organizations - the next frontier in policy network studies or a hopeless mess? Fresh evidence for an ongoing debate

Mario Angst and Laurence Brandenberger

Abstract

On the face of it, the use of hyperlink networks holds enormous promise for the study of policy networks. Using automated methods such as webcrawlers to gather connections among actors in policy networks makes it possible to gather data on large policy networks at low cost; avoids high rates of non-response common in survey research; and can gather data on network development over time, which is severely lacking in policy network studies. But these upsides come with a cost. Most crucially, it is unclear, what hyperlink networks actually measure in terms of organizational relations. We contribute to an ongoing debate on the use of hyperlink network data (Yi and Scholz (2016) provides a starting point) in two important ways. First, we provide new evidence on how well hyperlink data is able to predict survey evidence on multiple possible types of organizational relations. These include issue-based organizational ally and opponent relations, as well as information exchange among organizations and forum co-participation from a national-level water governance study (n = 312). Second, we add methodological sophistication to the debate by utilizing and showcasing the use of Generalised Hypergeometric Ensembles of Random Graphs (gHypEGs) in order to model both hyperlink and survey network data directly as multi-edge networks.

Keywords

Hyperlink Networks, Policy Networks, Multi-Edge, Network Data Gathering, Data Gathering, Network Surveys

Re-organizing the Babylon – A systematic review of a maturated research field

Ruth Wiedemann and Marlene Kammerer

Abstract

In her seminal article, "Organizing the Babylon – Different Conceptions of Policy Networks" Tanja Börzel (1998) was among the first scholars to disentangle the variety of meanings and applications of policy networks. Back then, she identified four key conceptions in the public policy literature, namely policy networks as a metaphor for "new" forms of (good) governance, as a method to investigate the relations between political actors, as an analytical tool to operationalize theoretical concepts of the public policy literature, and as a "proper" policy network theory. Even though all four conceptions are relevant today, many policy scholars tend to apply networks as an analytical tool and /or method to study the behavior and motives of political actors. As such, they often use concepts from social network or graph theory, such as homophily, centrality, structural equivalence, transitivity, cliques, etc. to test and expand theories of the policy process. What is more, studies drawing on networks can be found in other sub-disciplines of political science, for example in international relations, governance research, political psychology, electoral and party research, political communication, political economy, political sociology to name the most prominent ones. The common nominator of all these studies is the essential idea that any political activity is relational. Against this backdrop, this article strives to present a systematic review of network applications in political science. We focus on research using empirical data to study how the relations between different political actors (e.g. countries, states, governments, international organizations, interest groups, non-governmental organizations, parties, parliamentarians, etc.) shape their behavior, their beliefs, their strategies, or their motives. Further, we consider such studies that investigate how different actor constellations, i.e. the characteristics or structure of networks influence political outcomes. A first output of this endeavor is a systematic overview of how the variety of sub-disciplines uses the network concept to test and develop their theories. In this regard, we aim to understand how and why political science scholars use the relational perspective to inform and develop theories and/ or theoretical concepts. Additionally, we scrutinize to what extent scholars perceive a network perspective to be beneficial for answering research questions in their respective sub-discipline. Further, we are interested in the kind of relational data scholars use and the methods they apply for data collection and analysis, as well as the challenges they associate with different data types and methods. Such knowledge helps us to make suggestions about what type of network data serves best to operationalize specific theoretical concepts. Further, with this overview we aim to provide practical guidelines for specific research projects in the context of concrete questions related to time, personnel, or other substantive constraints.

Keywords

Policy Network, Policy Actors, Network Data, Systematic Literature Review, Political Science

Understanding the role of the state and the internationalisation of voluntary digital standards using an NLP-based co-occurrence network analysis: the case of consumer IoT code of practice guidelines.

Saheli Datta Burton, Srinidhi Vasudevan and Madeline Carr

Abstract

The world-leading Code of Practice (CoP) for Consumer Interne of Things (IoT) security published by the UK government in October 2018 has experienced rapid international uptake since 2018. An analysis of the scope and dynamics of such diffusion presents a unique opportunity for better understanding the uptake-dynamics of digital technical standards. However, a similar phenomenon is yet to be studied, mainly due to data being only available in online formats such as company websites that are uncaptured by the academic source remit of classical bibliometric analysis. Thus, the study of digital technical standards internationalisation is inextricably tied to a methodological challenge. This paper addresses this challenge by presenting a unique methodological 5-step fully automated approach using Natural Language Processing (NLP)-based co-occurrence networks for studying unstructured datasets. This method is expected to be useful for future research where classical bibliometric approaches cannot be readily applied. Findings from the application of this novel methodology provide a first of its kind, fully automated and randomised, overview of the ways in which the CoP has taken a leading role in shaping global discourse where securing consumer IoT is concerned. This sheds light on the global dynamics that underlie internationalisation of voluntary digital technical standards, specifically the facilitatory role of the state in shaping a global governance structure for governing global (cybersecurity) commons.

Keywords

Co-Occurrence Networks, Bibliometric Analysis, Knowledge Discovery, Consumer Internet Of Things, Cybersecurity Standard

Comparing network structure derived from from surveys data and website searches: a case study in water resource governance

Karen I Trebitz

Abstract

Applying adaptive, ecosystem-based co-management as a governance approach to addressing resource issues on a regional or local scales requires a functional network of governance partners. A researcher studying such resource governance networks must decide how to collecting relational data. Defining the network limits and who are the actors within those limits is an early challenge. Yet, relational data collected via website hyperlinks or archival documents differs from network data collected by a survey even if it investigates the same set of policy actors. In practice, choosing a method of data collection has different implications for research requirements such as time, personnel, and cost constraints. In the present study I compared networks constructed for a water resource governance network in the St. Joe/St. Maries sub-basin watershed in the northwestern United States. I constructed networks once from online surveys, and again from secondary information including web-site hyperlinks to other actors, web-site mention of other partner/actors, and partners mentioned in water resource governance documents that were posted online. I asked survey respondents about which other actors they communicated with for water resource issues relating to the St. Joe/St. Maries sub-basin in the past two years (from 2013- 2015). Simultaneously, I used archived documents and Internet hyperlinks to other actors' websites to construct a network in the St. Joe/ St. Maries sub-basin that was focused specifically on sharing data and information in water resource management for the same area during the time period of 2010 - 2015. Both matrices consisted only of unweighted, directional contacts (1 = contact, 0 = no contact). All but one actor identified by survey respondents was also present in the Internet search network. Visualization of the two networks revealed similar central membership and core-periphery structures, albeit with visible differences in the peripheral regions. I used Quadratic Assignment Procedure to compare the resulting networks. Despite a slight mismatch of network focus (water resource governance in general from the survey vs. specific to data/information exchange from the web), the networks correlated moderately on centralization scores of in-degree and total degree. The Internet search method captured extra actors in place-based sub-networks—especially on peripheral actors—that were not considered as relevant or important actors by respondents in the survey-based study. Results suggest that useful networks can be efficiently constructed using only archival data and linkages found on the Internet, yet researchers must be cognizant of geographic boundaries and granularity of a search. Furthermore, my results suggest that data found via hyperlinks and archived documents on the Internet can help in reconstructing missing network links due to survey non-responses, provided these are not investigating qualitative response data.

Keywords

Governance Networks, Water Resources, Quadratic Assignment Procedure, Surveys, Hyperlinks, Core-Periphery Networks

Stochastic blockmodeling approach to linked networks using weighted likelihood

Damjan Skulj and Aleš Žiberna

Abstract

We present a stochastic approach to blockmodeling linked networks. The aim is to simultaneously cluster two or more sets of units into clusters based on the network where ties are possible both between units from the same set as well as between units of the different sets. Our estimations are based on the CEM algorithm that iteratively estimates the parameters through maximizing a suitable likelihood function and reclusters the units according to the parameters.The model fit is measured by a likelihood function, which yields a stopping criterion to the iterative process, which is terminated once the likelihood function ceases to improve.

In the case where the sets of units and the subnetworks they induce are severely imbalanced, the algorithm would give more importance to some parts of the network simply due to their greater impact on the likelihood function, which may be affected by the unbalanced structure. To mitigate such effects, our model allows weighting of the likelihood function.

Keywords

Stochastic Blockmodeling, Linked Network, Weighted Likelihood, CEM Algorithm, Mixture Model

Inclusion of nodal attributes in dynamic Stochastic Block Models

Francesco Bartolucci, Maria Francesca Marino and Silvia Pandolfi

Abstract

Stochastic Block Models (SBMs, Holland et al., 1983; Snijders and Nowicki, 1997; Nowicki and Snijders, 2001; Daudin et al., 2008) are gaining increasing attention in the social network literature, when the interest is focused on discovering communities and clustering individuals in terms of social behavior. Recently, SBMs have been extended to longitudinal networks data (Yang et al., 2011, Matias & Miele, 2017, Bartolucci et al., 2018), where multiple snapshots of the network are observed at different time points. These dynamic SBMs provide a flexible tool for dynamic clustering of the nodes and for studying the evolution of the network across time. In particular, we consider discrete-time dynamic models assuming that network nodes belong to one of k distinct blocks, which are identified by a sequence of latent variables evolving over time according to a homogeneous Markov chain. Nodes belonging to a given block (state) at a given time occasion share similar social behaviors. It results a hidden Markov model (Bartolucci et al., 2013; Zucchini et al., 2016) for dynamic networks. Parameters of the model are the connection probabilities indexed by block memberships, and the initial and transition probabilities of the Markov chain. These are typically assumed to be common to all nodes and all time occasions. We also consider the alternative version of the model recently proposed by Bartolucci et al. (2018), in which every dyadic relation between nodes is explicitly modeled by specifying a conditional log-linear model, given the latent blocks. In this case, different parameterizations may be assumed in order to describe reciprocal relations.

In this work, we extend dynamic SBMs to assess the impact of nodal attributes or covariates on the block structure. Indeed, in some situations, the homogeneity assumption underlying the latent structure of the model may be restrictive, while individual characteristics may play a role in determining the evolution of the groups across time. Therefore, we propose to include node- and time-dependent attributes in the distribution of the latent variables, through a suitable multinomial logit parameterization on the initial and transition probabilities. This extension may be adopted either if a Bernoulli distribution is assumed for the relation between pair of nodes, conditional to the block memberships, or if the dyad probabilities are parametrically specified.

Estimation of the proposed models represents a challenging matter as computing the likelihood requires the evaluation of a multiple summation defined over all possible configurations of the latent variables. Here, we rely on variational approximation methods that represent a quite classical solution in the frequentist context (e.g., Yang et al., 2011, Matias & Miele, 2017). In particular, we propose to extend the exact algorithm developed by Bartolucci and Pandolfi (2020) relying on the assumption of a posteriori independence across nodes, but not across occasions. A similar algorithm is also implemented for the dyadic version of the model, based on the assumption of posterior independence between dyads. The proposed approach is illustrated by both simulations and empirical applications.

Keywords

EM Algorithm, Hidden Markov Models, Individual Covariates, Longitudinal Data, Variational Inference

A Stochastic Block Model for collection of networks: Do the networks share a common structure?

Saint-Clair Chabert-Liddell, Pierre Barbillon and Sophie Donnet

Abstract

We observe a collection of networks which share some characteristics such as their edge direction and their mode. The objective of this work is to find a structure that is common between these networks.

The stochastic block model (SBM) is a probabilistic model that assumes the existence of latent variables representing the classes of nodes in the network and that allows, via its parameters, a succinct description of the structure of the network on a mesoscopic scale.
On small networks this mesoscale structure is sensitive to small sampling variations, moreover these networks may have different sizes and densities making the comparison of their structures difficult.
We extend the SBM to jointly model a collection of networks. These networks are assumed to be independent, but their latent blocks are shared across all networks. Doing so allows us to describe each network mesoscale structure as a part of a larger connectivity pattern which is common to all networks up to a density factor.
The model parameters and the latent blocks are estimated via a variational EM algorithm.
The existence of a good compromise between the mesoscale structures of these networks is not guaranteed. We use an integrated classification likelihood (ICL) criterion to select the number of blocks and also to establish the relevance of using this common structure.

Keywords

Blockmodeling, Collection Of Networks, Model Selection

Whose results are these anyway? Reciprocity and the ethics of "giving back" after social network research

Paola Tubaro

Abstract

Bridging the social networks, field methods and ethics literatures, I make the case that the process of reporting research findings is an ethical issue, and recommend elevating it in the research design. I draw on a reflective account of three research experiences with settings in, respectively, online health communities, economic organizations, and the mainstream media. I proceed in steps, discussing release of personal network results to individual participants, of whole network results to the researched community, and finally of general results to wider audiences, under a unifying idea that a reciprocity obligation underlies the reporting process. I claim that communication should follow an iterative rather than a linear approach to reach all relevant stakeholders, thereby mitigating the vulnerabilities that arise from research.

Keywords

Research Ethics, Reporting Results To Study Participants, Reciprocity, Communication Outside Academia, Social Network Research, Network Visualization

New ethical approaches through collective reflexivity

Paola Tubaro, Louise Ryan, Antonio Casilli and Alessio D'Angelo

Abstract

Research in social network analysis (SNA) faces unprecedented ethical challenges today due to both technological developments ('big' data) and a growing tendency toward institutionalization of ethics governance. We argue that a suitable response requires a more comprehensive approach to SNA ethics, and we identify two main paths toward this goal. First, we need to recognize the breadth of the subject, no longer limited to anonymity and consent. Second, we need to encourage the active participation and contribution of SNA scholars. We advocate a need for greater reflexivity at both individual and collective levels, whereby researchers can learn from their own and their peers' experiences, and foster a more ethically 'virtuous' approach within the whole SNA community.

Keywords

Research Ethics, Social Network Analysis, Reflexivity

Ethical implications of network data in business and management settings

Bruce Cronin

Abstract

Reflecting on the compilation and analysis of a range of network datasets drawn from our own work and some prominent examples, we consider the ethical challenges in dealing with network data in business and management settings. We argue that the managerial processes that characterize such settings introduce particular ethical sensitivities in the stages of commissioning and research design, and when collecting, analyzing and reporting network data. These sensitivities arise from the imperatives of business, motivations for commissioning network analyses and the legal authority that managers have over employees. We argue that ethical considerations are much more pervasive in business and management network research than in many other fields.

Keywords

Research Ethics, Business Networks, Business And Management, Organisational Networks, Social Network Analysis

Toward a Critical Social Network Analysis

Ronald L. Breiger

Abstract

Presentations by members of this panel contribute to enriching the continuing discussion of major ethical dilemmas that social network analysts need to confront. These papers encourage us to replace silence with thoughtful considerations and innovative paths forward. I highlight three themes that emerged in my reading of these contributions: moving beyond 'ethics vs. science;' deepening reflexivity; and possible approaches toward a critical SNA.

Keywords

Ethics, Reflexivity, Critical SNA

The role of AI in the analysis of fake news and their use as bot detectors

Jessica Camargo Molano, Daniele Battista and Jacopo Cavalaglio Camargo Molano

Abstract

The spread of fake news is an increasingly important problem in contemporary society. According to a survey conducted by the Fondazione Mondo Digitale, in 2020 48.2% of young people and 44.8% of adults consider the Internet to be the main vehicle for information. Among young people, the widespread use of social networks for information purposes also emerges, which, on the other hand, are only consulted by 1 in 3 adults. And social networks are the most fertile ground for the spread of fake news. Only 19% of young people surveyed said they conduct a critical reading of the information together with an adult. Fake news is nothing new, but certainly with the network their diffusion has been, very often, uncontrollable.

"The world of information - said the President of Mattarella on the occasion of the Ceremony of the Fan 2020 - has been questioned by the virus and, despite the objective difficulties experienced by the sector and by individual journalists, has shown that it knows how to be at the service of general interest and citizens. Fake news - counterfeit news - are usually the product of malicious actions, usually anonymous, concerted in order to deceive public opinion, relying on the multiplier effect of the web and the absence of sanctions that characterize a world devoid of definable responsibilities. The claim of a "non-place", as it has been called, where one can afford to propose alleged facts, false or non-existent, without any sanction ".

The issue of fake news is therefore extremely topical and of great social relevance. This survey focuses on the problem of fake news and the method of contrast through the use of artificial intelligences. The development of Artificial Intelligences has led to an increase in the use of chatbots and the like for the dissemination of fake news (Riva, 2020). This analysis aims to understand how machine learning and deep learning can be used as bot detectors, highlighting the strengths and criticalities in the use of artificial intelligence in the fight against fake news.

In particular, the main artificial intelligences that can be used with a bot detection function will be analyzed and 3 case studies will be presented that exemplify the current state of the art of the topic investigated.

Keywords

Artificial Intelligence, Bot Detector, Fake News, Machine Learning, Deep Learning

Egg Jarping: the Network of Amicable Resolution in the Customs and Manners of “E-Eggbattle” Cultures

Theodoros Katerinakis and Zisis Kiriakakis

Abstract

In the current paper the real-life network with sound GLAM origin, “crack the egg of your opponent” is showcased using the analytics of on-line participation and network metrics. It is a case of a semantic artifact deriving from "galleries, libraries, archives, and museums" that connect religious ritual with practicing customs. The empirical part introduces data from sub-networks in a name day, as well as a primary school class where the network revitalized a class adjusting from COVID-19 precautions. Major concepts of cultural literacy in a value system of fairness and strategy proofness are part of the metrics: proportionality, envyfreeness and randomness, scale invariance, persistence in repetition.

Easter (and Christmas) are milestones in the Christian calendar and shape the social life of major populations. Easter is a self-challenging ascetic process towards resurrection as observed by majority populations of Russian Federation, the Balkans, Greece, Cyprus, Poland among others, as well as their diasporas. Countries are identified with the birth and re-birth concepts connecting families and commons together, in networks with actors, ties, and relations. Competing with eggs ("avgomachia") resembles a duel of good with evil, in a contest that leads to friendly conflict resolution, as described in GLAM sources. Eggs encapsulate life and substances of life, whereas Christmas cake incorporate the value of sharing. The modus operandi of e-avgomachia is founded around the virtues of peace, agape, resurrection, hospitality, respect, and unity as values of social capital; values that make people assemble around eggs and cake expressing preference, desire, motivation and homophily.

Eggs as the means of peaceful conflict resolution are incorporated in several folkloric and spiritual traditions. Libraries, galleries, and archival sources include plentiful references, images, stories, or even fossils and tangible transformations of eggs (like the Imperial eggs Fabergé) coupled with messages of rebirth.

The current project is using the GLAM context to highlight the iconic festival in the calendar year, as part of a cultural DNA for diverse populations around the world: egg-cracking in the Easter period (using e-avgomachia) is extended in world championships of egg-tapping. When these the festivity moves online, a robust network structure is revealed as catalyst for community resilience and social cohesion.

Although operating for years in a dilemma “manners face-to-face or customs online”, both cases became prominent during the current pandemic by sustaining custom-ization aligned with enculturation, in a social distancing reality where “on-line is the new normal”.

E-avgomachia is an on-line network that increases the “productivity of culture” in a Habermasian lifeworld of interconnected members. Beyond that, both networks function as focal points of a cultural compass supporting navigation among cultural value preferences and behaviors, in Hofstede’s terms. It is a case of conceptualization of GLAM masterpieces for Easter with snapshots of social-documentary networks, an on-line assisted network of customs enhancing amicable resolution and bonding.

Keywords

Glam Artifacts, Resurrection, On-Line Assisted Network Of Customs, Customization

Propagation of misleading information in Facebook Like Pages. An agent-based model of virality in an echo chamber

Vanessa Russo, Federico Cecconi, Eugenia Polizzi di Sorrentino, Mario Paolucci, Giulia Andrighetto and Mara Maretti

Abstract

The research presented is part of the studies of Computational Social Research Laboratory (CSRlab) of the University "G. D'Annunzio" di Chieti-Pescara (Maretti, Fontanella, 2019; Russo et al., 2020), aimed to analyse the birth and development of conspiracy phenomena within the digital space (Boberg et al, 2020; Risius et al, 2019).

The dissemination of misleading information online is amplified by the increasing use of Social Networks and social media (Mocanu et al., 2015). Specifically, some social networks are specialized in the sharing of information from unofficial sources. This is the case of Facebook. These pages are linked in a singular "sharing" network in which specific contents spread creating an echo effect (Quattrociocchi et al 2016).

In this framework the research aims to describe and analyse the development and characteristics of a conspiratorial echo chamber in Facebook using both the Agent Based simulation and Social Network Analysis (van Maanen & van der Vecht, 2013).

The underlying assumption is: some contents in the digital space have properties that make them desirable from specific Facebook pages and based on this of specific characteristics these contents spread in the Social Network. The identified properties concern respectively the content of the article and the web site from which it comes (blog, or online information portal).

The first property identified concerns the reference themes of the articles in terms of: conspiracy narratives, political orientation, incitement to hatred and incitement to fear. The property called source is instead made up of two variables: fame and exclusivity. The fame was calculated respectively by building a synthetic index taking into consideration the number of articles from a site and the number of interactions obtained within Facebook. Otherwise, the exclusivity value was detected following a qualitative classification on a scale from 1 to 5 of the contents coming from that site.

Under these assumptions, the research was structured in five stages: 1) mapping and analysis of the echo chamber network of the conspiracy movement in Facebook through the interactions of specific content within the social network; 2) Analysis and classification of the articles and sources detected; 3) construction of the simulation model based on the features identified in the classification and in phase 1; 4) analysis of the network obtained from the simulation model in relation to the empirical results emerged in phase 1;5) Experimentation of the simulative dynamic network model. It was pointed out, through the SNA, how the topology of the echo chamber varies depending on the properties defined in the preliminary phase.

Keywords

ABM Models, Echo Chamber, Misinformation, Facebook, Social Network Analysis

A space filling sampling approach for network analysis

Luigi Ippoliti, Emiliano del Gobbo, Lara Fontanella, Simone Di Zio and Roberto Benedetti

Abstract

In some real-world problems, data are inherently represented as a graph. Such data, which are commonly referred to as network data, arise in the context of social networks, scientific collaboration, spreading of infectious diseases, company structures, etc. In such networks, nodes generally represent instances or particular objects of interest while edges, represented in an adjacency matrix A, provide information about their relations. By means of their nodes and edges, a graphical structure provides an effective, compact, flexible, and comprehensible representation of large-scale complex data.

When dealing with large graphs, a wide variety of interesting applications of machine learning require the labelling of the nodes in the network. In fact, many of the major machine learning breakthroughs of the last decade have been catalysed by the release of labeled training datasets. Supervised learning approaches that use such datasets have thus increasingly become key building blocks of many classification tasks. For many real-world applications, however, large hand-labeled training sets do not exist, and are prohibitively expensive to create.

In this work, we are concerned with the problem of creating labelled training sets from an existing network. A common assumption in statistical machine learning is that the training set is composed by a randomly chosen number of statistical units. Here, to improve the quality of the training set, we focus on optimal spatial sampling designs strategies. The notion of optimal design is intuitive and corresponds to the objective of choosing n nodes in the network in an optimal fashion.

There are numerous design criteria, such as A- or D- or G-optimality that have been extensively studied in a variety of contexts. In these and many other criteria, the major downside is that the optimality criterion depends on the model chosen as well as on the computational complexity of the chosen objective function. To avoid these problems, we introduce a space-filling sampling strategy aimed at obtaining a well spread node sample over the network. In particular, we propose a simulated annealing algorithm which relies on an objective function based on geometric measures of how well a given design covers the graph of interest. Adapting distance-based criteria proposed in a geographical context to the graph framework, we shall show that the proposed procedure is very flexible and that it ensures a uniform coverage of the nodes of the network by also allowing the inclusion “spatial” constraints on possible patterns. The procedure also easily adjusts to the case of semi-supervised learning where a set of seeds have to be selected. To showcase our method, we provide results both from simulations and real-data examples.

Keywords

Supervised Classification, Network Analysis, Optimal Spatial Sampling, Space Filling Design

Inclusive Universities. Evidence from the Erasmus Program

Silvia Leoni and Luca De Benedictis

Abstract

The Erasmus Program is the main international mobility program in Europe and worldwide. Since its launch in 1987, it has been growing both in terms of participants and budget devoted to its activities. However, despite the possibility to obtain additional funding, the participation of students with special needs to the program remains extremely low. Contextually, the literature has not explored and quantified this phenomenon. This gap may be related to the scarcity and inaccuracy of statistical data available for international students with disabilities.

This work quantifies the participation of these students to Erasmus and explores the network of universities involved in their mobility adopting the tools of social network analysis. Findings show that students with disabilities participating to the mobility are ten times lower than those in domestic universities. However, the number of participants with disabilities has more than doubled between 2008 and 2018 following the general trend in the overall participation.

The network of universities involved in the mobility of students with special needs appears much sparser than the overall network. The gender bias characterizing the overall network persists and increases along the period 2008-2013, contrary to the mild tendency found in the overall network. In the years of reference, an increasingly low share of participants study a STEM discipline. Universities involved in the mobility of students with disabilities polarize in the role of senders or receivers, with the exception of universities located in countries' capital cities, which act as both senders and receivers. In particular, sending universities are located in Italy, Germany and Eastern countries, whereas receiving institutions follow a South-West North-East axis, including Spain, France, UK, and Northern countries such as the Netherlands and Sweden.

In addition, the work explores the level of inclusiveness of participating universities, by proposing a novel index to measure the level of inclusiveness of universities welcoming international students with disabilities. Only 13 universities hosted Erasmus students with special needs in every year between 2008 and 2013 and among those some institutions outperform the average level of inclusiveness of their respective country, e.g. the University of Oslo and the Rijksuniversiteit Groningen, while others show a lower level of inclusiveness with respect to their country average, e.g. the University of Valencia and the Polytechnic University of Valencia.

This research shows that much work is still needed to reach a fully inclusive Erasmus program. Quantifying and analyzing the participation of students with special needs to international mobility could increase awareness of the issues related to this phenomenon and it could provide the basis for better designing targeted policies aiming at widening their participation to international mobility.

Keywords

Erasmus, Disability, Special Needs, Gender Bias, Inclusiveness, Social Network Analysis

Entertainment or Enrichment? Evaluating the Drivers of Erasmus Mobility Flows Using Social Network Analysis

Micol Morellini

Abstract

Previous research has highlighted how the Erasmus exchange network of European higher education institutions (HEIs) is of great interest to both social network and educational researchers. Indeed, HEIs participating in the Erasmus programme are linked to each other by directed flows of students, thereby generating a large multilayer social network. Moreover, the partnerships between HEIs have progressively grown beyond the mere exchange of students, now encompassing mobility flows of researchers and staff, and serving as driver of wider research and project collaboration. In light of this, the Erasmus initiative and its network set-up are of interest to migration scholars as well. By bridging the micro and macro dimension, social network analysis (SNA) might allow to move past the traditional divide in theories of migration, where formulations either stress individual agency (micro models) or structural constraints (macro models). Nonetheless, there are comparatively few studies employing SNA to study migration, mainly due to the very nature of mobility flows (often unidirectional) and to the lack of suitable data.

This scholarly omission motivates further research at the intersection of SNA and migration studies. High-skilled mobility across the Erasmus exchange network represents a perfect opportunity to conduct such an endeavour. Because the Erasmus programme involves several actors – individuals, institutions, and countries –, it incorporates multiple levels of analysis and reconciles the micro-macro divide. In fact, individuals who want to join the programme retain agency in that they can choose their preferred destinations, but at the same time their choices are limited by their nationality, location and by the overlying structure of institutional partnerships, as the Erasmus initiative only authorises mobility between institutions located in different countries.

Using novel data on Erasmus exchanges at the institutional level, I conduct an analysis of the determinants of Erasmus mobility flows in 34 European countries over the period 2008-2014. More precisely, I use multiple regression quadratic assignment procedures (MRQAP) tests to investigate factors shaping Erasmus mobility referring both to SNA principles and to theories of short-term migration and mobility of the highly-skilled.

This theory-guided approach allows for the evaluation of mobility determinants operating at different levels of analysis, and thus for the assessment of competing interpretations. Furthermore, the inclusion of both student and staff mobility flows allows for greater flexibility in the analysis of exchange and partnership motivations. In this setting, under the null hypothesis there would be no significant determinants of mobility, as individuals would want to join the Erasmus programme for its own sake. Any significant result deviating from this "ideal scenario" would suggest more complex mechanisms behind individual and institutional preferences, shedding more light on the implications of the Erasmus initiative. Finally, the application of SNA to questions of high-skilled migration offers a unique perspective, as disentangling these mobility flows into a network permits the uncovering of their structural complexity.

Keywords

Erasmus Mobility Flows, Multilayer Networks, Migration

A study of the interaction patterns in students mobility flows

Kristijan Breznik, Giancarlo Ragozini, Marialuisa Restaino and Maria Prosperina Vitale

Abstract

The internationalization of higher education has become a priority for the university system. Therefore, it is crucial for all higher education institutions to study international student mobility flows across different European and non-European countries, and identify the factors pulling and pushing students in a foreign country to complete higher education, in order to implement university policies in order to increase the number of ECTS gained abroad.

In line with related studies, the present contribution aims at studying the characteristics of the student mobility trajectories involved in both Erasmus and ErasmusPlus programmes by considering a network analysis approach. Starting from the theoretical and analytical perspective, the main purposes are to discover the role played by each country revealing the presence of national hubs (i.e. good exporting countries) and authorities (i.e., good importing countries) and to explore the global network pattern identifying core-periphery or other topological structures in the destinations of students. Moreover, since the networks could be dense due to the large number for nodes, the paper aims at reducing the edge set, to identify the relevant and more interesting structure of a weighted network without losing any information.

Thanks to the European Union Open Data Portal (EU ODP), a statistical overview of Erasmus and ErasmusPlus mobility for students from 2008/09 to 2013/14 and from 2014/15 to 2018/2019 is obtained. Temporal network data structures (i.e. weighted and directed one-mode networks) are defined where the nodes are the countries and the links represent the student mobility exchange between them with a weight proportional to the number of students involved. Hence, the directed networks are built considering the outgoing students and the incoming students.

Keywords

Student Mobility, Weighted Network, Normalization, Hubs And Authorities

Insights on European student mobility and collaboration network through a multiplex approach

Ilaria Primerano, Maria Prosperina Vitale, Kristijan Breznik and Marialuisa Restaino

Abstract

The social impact of universities has become a key factor to measure when dealing with their 'third mission'. In fact, alongside with their traditional aims of education and research, universities are required to encourage activities that contribute to the economic, social, and cultural growth of society, through a continuous exchange of knowledge. In this framework, the internationalization of higher education has become a priority for the whole university system. The rapid increase of student and/or academic staff participating in international mobility programs, together with the dissemination of research projects involving different European countries, provide unique insights into the European educational context. Likewise, from one side, universities are expanding international collaborations to strengthen the quality of their research and teaching activities, on the other side their participation in EU research projects is essential for knowledge diffusion and economic growth of the country where it is located. As already highlighted in recent literature, both mobility and collaboration can be treated as proxies of the social impact of universities and their locations.

This contribution aims to shade some lights on the different levels of mobility experienced by universities at European level by identifying several kinds of flows: students' mobility, academic staff mobility, and collaboration networks. In particular, if the first and second kinds of flows account for the attractiveness of the Universities located in each country, the latter allows to inspect the connections among educational and non-education institutions, and thus countries, in the EU-funded projects. We rely upon data extracted from the official European Commission website on Erasmus and Erasmus+ programmes and related projects. These data, opportunely read in the scope of Social Network Analysis, enable us to obtain three different weighted and directed network at country level, i.e. the countries where the institutions involved in the exchanges are located represents the network nodes. To our aim, we investigate the overlaps of these networks by defining a multiplex data structure, consisting of three non-interconnected layers. Each layer holds a specific kind of flow, Erasmus student, academic staff, and collaboration in projects. Specifically, the links connecting the countries depend on the layer while their weight is related to the frequency of the connections. As for the two layers of mobility networks, two countries are linked according to students or teachers travels among them. As for the collaboration network, two countries are linked if they co-participate in the same projects.

Starting from this context, the joint interpretation of the international patterns of mobility and project collaboration networks allow to identify the active cores of countries that play a fundamental role in higher education, facilitating students and academic staff movements and, at the same, by means of similarity measures, to quantify the impact of collaboration on mobility and vice versa.

Keywords

Eu-Project Collaboration, Erasmus Mobility, Layer Similarity, Social Impact

Populist Anger vs. Anger about Populists: Discourse Network Analysis of European Election Campaigns 2009 and 2019 in Germany

Monika Verbalyte

Abstract

Thirty years ago, European Union was kept together by permissive consensus and has been an accepted reality by the majority of Europeans, without much of their emotional involvement. In the 90s, however, the EU decided to get nearer to its citizens and with its policies became more relevant in people's lives, this permissive consensus turned into constraining dissensus (Hix 1999; Hooghe & Marks 2005). People and national politics semmed to become more emotionally engaged with Europe, yet mainly in a negative rather than positive way, e.g. emotional blame attributions to Europe in the national political communication (e.g. Hameleers et al 2017) and wide-spread public Euroscepticism (Lubbers & Jaspers 2011).

Heightened emotionality in regard to the EU is also often put in a relation to the populist upheaval of the last years (Rico et al 2017; Wirz 2018). The anger of populist parties is indeed very often directed at European politics, decisions as well as the whole existence of the EU (Capelos & Katsanidou 2018, Pirro & Taggart 2018). The question, though, is whether they really put the new layer of emotionality to the public European debate or whether it has already been present before, yet more successfully mobilized and capitalized on by the populist political parties. Also, maybe some emotions in particular started to dominate the discourse rather than emotional intensity in general, e.g. populist anger, fear or hate.

To tackle these questions, I analyse the coverage of two European Parliament elections (2009, 2019) in the German online media (in particular, spiegel.de), one before and one after the rise of Alternative for Germany (AfD), German new right-wing populist party. Germany is a very suitable example for this research question because it is one of the founding and for a long time one of the most pro-European countries in the EU, yet still could not prevent the success of the anti-European populist party. I will compare media discourses in regard to expressed emotions, their subjects and objects. I will use a method of Discourse Network Analysis (Leifeld 2017) which combines qualitative Discourse and quantitative Social Network Analysis, in order to better depict the whole media landscape in regard to the European elections. Network approach also allows for a better distinction of most polarizing themes and emotions, as well as assessment of the relations of dominance and exclusion of specific objects and subjects in the medial discourse.

Keywords

Election, European Union, Emotion, Populism

The Global Network of Social Policy Relations

Sebastian Haunss and Alexander Polte

Abstract

Social policy research has a long tradition of comparative studies. But despite this transnational focus very few studies have so far analyzed the network of social policy interdependencies. Unlike trade relationships or military alliances, the networks that are created through social policy relations between nation states and between nation states and international organizations have so far been largely ignored.

The goal of this paper is to present a first global analysis of the network of social policy relations between the countries of the world. We analyzes the structure of relationships that is created through bi-lateral social policy agreements and social policy related financial transfers (esp. remittances and development assistance for health) and we compare these networks to interdependencies in other areas. The goal is to understand how the global network of social policy relations emerged and to analyze whether strong connections in the field of social policy correspond to strong connections in economic and political relations or whether social policy relations are governed by other, field-specific logics.

The paper draws on the NATLEX database on Bilateral Social Security Agreements and combines this data with relevant information from the emerging Welfare State Information System (WeSIS) at the University of Bremen.

Keywords

Transnational Networks, Social Policy, Dynamic Networks, ERGM

Mass polarization in Europe in the 21 century: studying belief networks in 15 countries

Tymofii Brik and Oleksiy Krimeniuk

Abstract

Mass polarization is an important social phenomenon that often renders negative consequences for societies. Polarization implies fragmentation of extreme positions toward specific ideas. Although polarization has been widely researched, empirical studies still have many limitations. Researchers typically measure polarization via survey instruments. They use independent items to measure beliefs and then investigate extreme answers. Therefore, researchers could arrive at different conclusions depending on which particular items they selected and which beliefs they addressed. Moreover, this approach ignores that in real life, beliefs are not independent of each other. Instead, beliefs are clustered in groups. Our master thesis employs an alternative approach by studying beliefs as parts of networks. Each society might have many such networks. Therefore, polarization is conceptualized as strengthening ties in the belief's networks (in contrast to extreme positions on isolated questionnaire items). In this scenario, polarization implies that specific ideas (e.g., about politics, culture, economics) become more connected and interchangeable for respondents, implying reducing pluralism. Thus, if some people disagree on one issue, it strengthens the disagreement in many other issues. Drawing on the nine rounds of the European Social Survey data, we analyze 52 survey questions about political, social, and economic aspects of life in 15 European countries. Using social network analysis metrics, we analyze how the network structure of 1,326 pairs of beliefs changed between 2002 and 2018. We employ a walktrap community detection algorithm, density, centrality measures, and bootstrap our data to construct intervals and ensure the statistical significance of the results. Our data suggest that polarization increased in eight European countries. Although previous research did argue that the electoral behavior of Europeans radicalized, and some scholars indicated growing affective polarization in Europe, our research adds new evidence to this debate. We show that the belief networks of Europeans became polarized with time.

Keywords

Political Polarization, Public Opinion, Belief Networks, Political Pluralism

For all the right reasons: Using network entailment models to examine support for military intervention among UK security elites

Lorien Jasny and Catarina Thomson

Abstract

How do the motivations to support the use of armed force in times of conflict affect the outlooks of those well-versed in security matters? Do those who support use of national troops out of concern with national interests display similar thought processes? What about those who perceive a nation should intervene militarily out of a moral obligation to act? Questions such as these are tricky to tackle, and the field of international relations has typically attempted to address such issues using qualitative methods such as in-depth interviews. In this exploratory paper, we analyse the first-ever national survey of security elites in the United Kingdom (UK) as well as a survey of the public to help examine these issues from a quantitative perspective. Using entailment models, we search for shared network structures in terms of what threats are considered critical and what foreign policy goals should prevail among future military commanders, staff officers, and security experts who support military intervention. Entailment methods treat every question in a survey as a node and edges represent 'if-then' type relationships among the questions forming networks for each population of respondent which can then be compared and modeled using network methods. We show first that the elite respondents have much more similar, coherent, and complex network structures on foreign relations than the public, and second that nationalism is similarly a far more coherent ideology than morality in foreign affairs. We conclude by showing how these network methods reveal new insights that other survey methods could not.

Keywords

Entailment Networks, Belief Networks, International Relations, Foreign Intervention, Military, Elite

The mismatch of statistical and theoretical models in network analysis

Per Block

Abstract

The statistical modeling of networks with advanced methods such as SAOMs or ERGMs has become a standard approach in the social sciences interested in analysing networks. In important ways these methods differ from “classical” regression analyses, for example on the types of questions addressed and on core assumptions about dependence structures in the analysed cases. However, other fundamental modelling principles should be the same across all statistical models in case they are used to explain and understand social processes. A particular principle that has received ample attention in “classical” regression analysis but much less in the statistical modelling of networks is the congruence between statistical models and theoretical models. In the ideal case, statistical models represent a theoretically assumed process. This is paramount to deepen our understanding of real world processes that we intend to model. However, current applications of SAOMs and ERGMs often lack a coherent theoretical justification for the included structural parameters. Instead a battery of “structural controls” is included in a model (such as reciprocity, transitivity, or degree centralisation) that is derived from statistical theory, experience with Goodness of Fit test, and various mechanisms that often result from ad-hoc theorising. In many cases the justification for including structural parameters are internally inconsistent, as they tend to start from different assumption what a tie actually is – if the model specification is discussed at all. In this presentation I point out common inconsistencies in modelling choices, discuss in which instances this is especially problematic, and propose cautionary steps empirical researchers can take.

Keywords

Saom, Ergm, Statistical Network Models, Theoretical Models

Assessing the goodness of fit in relational event models

Viviana Amati, Alessandro Lomi, Tom Snijders and Christoph Stadtfeld

Abstract

We develop a method for evaluating the goodness of fit of relational event models. Because the dependent variable of these models is the time to the next observed event, we propose to assess the goodness of fit of relational event models by relying on a set of auxiliary statistics that represent the internal time structure of relational mechanisms. Consistent with standard statistical models for networks, the goodness of fit procedure we develop compare the observed distribution of the auxiliary statistics to the corresponding distribution computed on simulated event data from the estimated model. We propose that a relational event model fits the data well to the extent that its empirical estimates are consistent with the observed internal time distribution of the relational mechanisms that generate the observations. Because the time distribution of these mechanisms is not modelled explicitly, the approach we propose provides a particularly stringent test for the empirical adequacy of relational event models. After reviewing the logic and the steps of the procedure, we present recent advances in the definition of the auxiliary statistics and the simulation strategy used to generate sequences of relational events from the fitted model. We use data on relational coordination among healthcare organizations to explore the empirical value and limitations of the goodness of fit concepts that we develop and to compare the proposed procedure to more conventional methods for the assessment of the fit of event models.

Keywords

Goodness Of Fit, Internal Time Structure Of Relational Mechanisms, Relational Event Models

Modeling Overlapping Groups: Stochastic Actor Oriented approach.

Stepan Zaretckii, Christian Steglich, Marijtje van Duijn and Tom Snijders

Abstract

Methods for community detection in social networks tend to partition actors into disjoint groups, which are densely connected within and sparsely between each other. However, in most social contexts one can be a member of several groups. For example, a student affiliated with both a sports group and a study group in a high school friendship network. Multiple group affiliations allow a richer and more realistic view of the role of subgroups and core-periphery structures in social networks. In this study, we come up with a formal definition of a social group, which allows for multiple memberships. Given that definition, we propose a new approach to model and detect overlapping subgroup structures. A latent affiliation network Z in a stochastic actor-oriented modeling framework (SAOM) defines the group affiliations. These are assumed to be co-dependent on an observed social network X. Focusing on the cross-sectional case, this presentation explores the performance of the new method on the basis of stylized and artificial data (Z, X) where Z=Z0 reflects the group affiliations in X. Under the assumption that only the social network X is observed, we calibrate a SAOM to recover the latent two-mode affiliation network Z. First, we analytically explore the parameter space of the SAOM in equilibrium, where none of the actors have incentives to drop or create a tie. Second, using these parameters in the model specification we simulate the latent affiliation structure Z for the given network X. Finally, we validate whether Z0 is a central value in the distribution of the simulated networks Z. In that sense, this is a confirmatory blockmodeling approach. In future research, the model performance will be assessed using empirical data sets and insights into the SAOM specifications for the latent group affiliation structure obtained in this study. Further understanding of overlapping group structures aims to help in the explanation of social processes such as inclusion, cooperation, and polarization.

Keywords

Overlapping Communities, SAOM, Actor-Oriented Models, Siena, Community Detection

Does co-citation lead to intercitation? Exploring multiplex networks through dynamic network actor models

Alejandro Espinosa-Rada

Abstract

In this presentation, I explore whether co-cited authors perceived to be working on similar topics in a scientific community leads to intercitation among authors. To investigate this tendency, I use multiplex networks of citation and collaboration of a cohort of astronomers developing the local scientific discipline after the largest radio astronomical observatory's arrival. This ongoing research used the dynamic network actor models (DyNAM), exploring citations and collaboration as events. Also, it further explores a strategy to deal with simultaneously events through the randomization of the relative position of the byline hierarchy in the scientific papers. The current results indicate that co-citation as a multiplex tendency is a relevant sign of authors that share a similar context citing each other (intercitation), leading that the perceived citation among the community encourages citation as a group formation process.

Keywords

Scientific Networks, Dynamic Network Actor Models, Multiplex Networks

No Evidence for Structural Balance in the Family

Jonas Stein, Jornt Mandemakers and Arnout van de Rijt

Abstract

Previous studies have shown that relationship sentiment in families tends to follow a pattern wherein either all maintain positive relationships or there are two antagonistic factions. This empirical result has been interpreted in support of the network theory of structure balance that individuals befriend their friends' friend and become enemies with their friends' enemies. Fault lines in family conflict would thus endogenously emerge through the same kinds of interactional processes that are thought to organize nations into axis and allies. We argue that observed conflict patterns may instead exogenously come about as the result of personal attributes, such as a difficult father or homophilous partitions of family members. Differentiating between these alternate theoretical possibilities requires longitudinal data on relationship sentiment. The present study tracks the sentiment dynamics of 1,710 families in a multi-actor longitudinal panel study. Results show the same static patterns suggestive of balancing processes identified in earlier research, yet dynamic analysis reveals that conflict in families is not generated or resolved in accordance with balance theory, supporting our argument.

Keywords

Structural Balance Theory, Nuclear Family Networks, Within-Family Relationships, Panel Fixed Effects

Typologies of Duocentered Networks among Low-Income Newlywed Couples and Associations with Relationship Quality

David Kennedy, Benjamin Karney and Thomas Bradbury

Abstract

Decades of research indicate that the quality and structure of couples' social networks influence relationship satisfaction, conflict, and the success or failure of their marriages. The social network surrounding couples can provide support, constraint, as well as a normative template for couples to develop expectations for their own relationships. Understanding the social networks of low-income couples is especially important because these couples may experience greater stress and less support due to lower social capital in their extended networks. It is also important to understand how couple networks are formed in the early stages of marriage as spouses begin the process of transitioning from their separate social worlds into a combined couple network. Prior research has recognized that the networks of couples are multidimensional with a mixture of composition (e.g., the proportion of family members vs. friends) and structural characteristics (e.g. density, degree of overlap between spouses' networks). Several studies have used cluster analyses to summarize couple networks into discrete types that are associated with relationship quality. There are several limitations to previous research on couple networks. First, there is a lack of studies on the social networks of couples with low-incomes despite the importance of the social context of marriage for this vulnerable group. Second, few studies have examined the development of social networks longitudinally as they form in the early stages of marriage. Third, previous studies have primarily been based on global ratings of couples' network characteristics or network data collected from one partner or the other, rather than their combined, "duocentered" couple network.

This presentation addresses these limitations by presenting preliminary findings from a longitudinal study of low-income newlyweds. The study sample includes 3 waves of network data from 213 newlywed couples at the outset of their marriages. We conducted separate personal network interviews with husbands and wives, asking each partner about 25 of their network contacts, and then asked a series of questions about each of these alters. Spouses also evaluated the ties between each unique alter-alter dyad. After identifying which alters named by each spouse were the same people, the separate personal networks were combined into one 'duocentered' network for each couple. We generated a set of composition and structure measures for each of these duocentered networks and then used cluster analysis to identify duocentered network types. Network variables included in the cluster analysis include overall network density and the density of the sub-network of alters nominated by both the husband and the wife, counts of types of network members, such as family and friends, and the number of network members nominated by both spouses. We present detailed descriptions of the characteristics of each network type identified by the cluster analysis. We also present results of analysis of the association between duocentered network type and spouses' relationship quality.

Keywords

Marriage, Egocentric Networks, Personal Networks, Duocentric Networks, Cluster Analysis

Personal networks in various family formation stages: evidences on the role of family practices

Vida Cesnuityte and Eric D. Widmer

Abstract

Researches on interrelation between family and personal networks, often focus on functions which the personal networks play in the lives of the family and its members. Meanwhile, issues on networks' formation around the family still lack attention. The present research aims to contribute to knowledge on how life-course of the family formation relate with the changes in personal networks of the family. The main research question is the following: how different stages of family formation intertwined with the family practices contributing to creation of personal networks of the family and its members?

Theoretically, the research is based on family practices' approach proposed by Morgan (1996, 2001) stating that various family practices make impact on creation of distinct personal networks dominated by particular (bonding or bridging) social capitals. Family practices, including national traditional celebrations (Christmas Eve, Christmas, New Year party, Easter, All Souls' Day), families' traditions (Mother's Day, Gathering of relatives, Anniversary of the marriage), personal celebrations (Birthday) and various daily practices (joint dinner daily, Sunday lunch together), explored in this research. The empirical data collected during the quantitative survey run under the research project "Trajectories of family models and social networks: intergenerational perspective explored. The fieldwork conducted at the end of 2011 and beginning of 2012. In total, 2000 respondents represent habitants of Lithuania born between 1950 and 1985.

The results show that family practices are associated with distinct family configurations that embrace not only individuals from the nuclear and extended families but also persons from beyond the family. It was revealed that the families of procreation and orientation create and maintain their personal networks by celebrating national traditional celebrations, and family's traditions and personal celebrations. Even more, family of orientation is much open and active: invite persons not only from the extended family, but also non-kin (even for such intimate family feast like Christmas Eve); members of the family of orientation are involved into much more activities. Such practices help to create wider and not so centralized around ego social network. Meanwhile, young people, who just start to create their own families behave in different way. Being in premarital cohabitation, they participate in celebrations personal celebrations but not national traditional celebrations or families' traditions. Only after certain time spent in cohabitation, when they already have at least one child, both partners are invited into the national traditional celebrations or families' traditions together with members of the families of procreation and orientation. At the stage of divorce or widowing, participation in the family practices again change: personal networks are created by participation of in the joint vacations at least once per year, having joint Sunday lunch or other meals, etc. In summary, the research results revealed some of the mechanisms linking family practices in different life-course stages with generation of the different structures of personal networks of the family and its members.

Keywords

Personal Networks, Life-Course, Family Formation Stages, Family Practices

Population-scale social network analysis

Frank Takes

Abstract

This work is centered around a population-scale social network analysis study of all 17 million inhabitants of the Netherlands. In the considered (anoymized) population-scale social network, node and edge information stems from register data: official government registers containing highly curated records on family, work, school, household and neighborhood relations.

First, we discuss how the considered data is fundamentally different from the type of data commonly used to define connectivity in socials networks, such as survey data, spatiotemporal proximity data or online social media data. To understand how to derive meaningful insights from the considered more \formal" social ties, we first revisit some of the fundamental issues in network analysis, relating to the unit of analysis (Butts 2009), measurement errors (Kossinets 2016, Wang et al. 2012) and the boundary specification problem (Laumann 1989, Nowell et al. 2018).

Second, we present characteristics of the constructed multilayer social network, in which 17.2 million nodes are connected through 41.1 million household links, 233.8 million school links, 270.2 million family links, 352.7 million neighbor links, 566.0 million work links. In total, there are 1.423 billion unique links between individuals, as some of the layers overlap. As expected, the network as a whole has an overall skewed degree distribution and is highly clustered, the latter in part due to the fact that some layers are in fact projections of underlying two-mode affiliation networks.

Third, a more in-depth analysis of the family layer of this multilayer network dataset reveals the family structure of all 17.2 individuals living in the Netherlands. We present unique statistics on the statistical properties of this population-scale family network, consisting of directed parent-child relationships. We do so in light of two concrete examples with relevance in the family studies and sociology literature. Purely based on the structure of this network, we can now for the first time, at scale, validate existing findings and hypotheses in this area. In particular, we look at household composition for children with parents that are no longer together and remarriage behavior of parents with and without children. The two issues above can quantitatively be addressed by investigating at the overlap of the family layer with for example the household layer.

Finally, we demonstrate the advantages and disadvantages of using register data as compared to the use of household survey data in the study of family networks, and how the interplay between the family layer and other network layers can be used to answer a plethora of other network-driven socio-economic questions of interest.

Keywords

Population-Scale Social Network Analysis, Large-Scale Networks, Multilayer Networks, Family Networks

"Fault lines" in the family network: Contact and substitution between children, parents, and paternal and maternal grandparents in divorced and non-divorced families.

Vera de Bel, Gina Potarca and Marijtje van Duijn

Abstract

This study compares to what extent contact between parents and their own parents differs from contact between parents and their (former) parents-in-law, a divide we refer to as a "fault line" in the family network. Based on kin-keeping theories we investigate to what extent the depth of this fault line varies across parents' gender and between divorced and non-divorced families. Whether children 'reach' the grandparental generation is dependent on parents' intergenerational relationships because parents often act as generational bridges between grandchildren and grandparents. To investigate whether families are resilient and find ways to substitute less than average contact with family members on one side of the family by higher than average contact frequencies with equivalent family members on the other side of the family, we study associations between parent-grandparental dyads and child-grandparental dyads. Multi-actor family data from the Divorce in Flanders (DiF) study are used to analyze 4,436 families with 1-5 family members reporting on contact with 1-7 family members. Analyses with the Social Relations Model found support for the fault line hypotheses. Although contact frequencies differ between fathers and mothers, parents have less contact with their parents-in-law compared to their own parents, especially when parents are divorced. The negative associations between child-paternal grandparental dyads and child-maternal grandparental dyads, as well as between parent-paternal grandparental dyads and parent-maternal grandparental dyads provide evidence for substitution in divorced and non-divorced families, but not for a stronger substitution effect in divorced families.

Keywords

Family Networks, Three-Generational Relationships, Divorce, Gender, In-Laws, Substitution, Social Relations Model

Peer recognition and publishing strategies of Russian sociologists

Angelika Tsivinskaya

Abstract

Many researchers are seeking strategies to become salient in the eyes of others and join the club of elite scientists (Ebadi et al. 2005). Some groups are disadvantages in this race despite their efforts (Karimi et al. 2018, Azoulay et al. 2020). Comparing to natural sciences the structure of the co-authorship network in social sciences is less stable and collaborations are smaller and last shorter, which makes it harder to become a part of the disciplinary core (Cugmas et al. 2016).

Our contribution intends to add new empirical evidence on the topic of the impact of collaboration on recognition among peers and research productivity in sociology. To achieve this goal, we will analyse two sources of data jointly collected in 2020. The first source is the co-author publication network among Russian sociologists based on the data from the national bibliometric database (RISC). We have collected bibliometric data for 7,846 authors, which had at least one publication in sociology. The second source is the results of a disciplinary survey of 3,689 Russian sociologists carried out to establish the group of scholars that were named notable researchers. This is in a way a unique data as we can compare recognition among peers through opinion survey as well as using citation metrics from bibliometric data.

In our research we would like is to compare publication strategies of the researchers occupying important positions in term of the collaboration network and named as highly estimable scholars. Also, we want to test whether ego networks are different for highly cited sociologists and those mentioned in the reputation survey.

In addition, we will try to test if the structure of the publication network, particularly, the level of homophily in terms of gender can explain why women are less cited by other researchers and mentioned in the survey. Of those who are the notable exceptions whether they have the support from the community of women researchers and specialized in areas that are dominated by female researchers such as sociology of health, family etc.

We hope that our research can enlighten our understanding of whether chosen strategies publication strategies affect your position in the community.

Keywords

Sociology Of Sociology, Reputation, Ego Networks, Academic Career, Research Performance

The co-authorship network of Italian academic statisticians: new evidences?

Silvia Bacci, Bruno Bertaccini and Alessandra Petrucci

Abstract

Since the last decade of the 20th Century, the dissemination of new technologies has favoured the communication among scholars from different universities and countries and has made easily accessible a huge amount of data and scientific works. At the same time, the knowledge of scholars has become more and more specialized. For these reasons, the collaboration among scholars is nowadays a key element for the advance of knowledge in many scientific fields.

This is especially true for statisticians, because Statistics is, by its very nature, a multidisciplinary science that provides support to many different fields of knowledge (e.g., social and economic sciences, medicine, biology, psychology, …).

In Italy, statisticians employed in the universities are clustered in groups (named Scientific Disciplinary Sectors, SDS): Statistics, Statistics for Experimental and Technological Research, Economic Statistics, Demography, and Social Statistics. Basically, an SDS should identify the prominent orientation of the scholar's research profile. In general, we expect a different style of work and collaboration between SDS that, in turn, is expected to affect the scientific productivity of scholars (e.g., in terms of quantity of scientific works, editorial classification, number of co-authors, scientific field of the co-authors). Obviously, the scientific productivity has a strong impact on the opportunities to enhance one's academic career. In Italy, the access to public competitions for the advancements in the academic teaching role of professor is subordinated to the achievement of a national scientific qualification. For this aim, the current legislation detects numerous competition sectors that, generally, correspond to the SDS, with some exceptions. As concerns Statistics, at the moment some SDS are grouped in a same competition sector.

Aim of the presented contribution is to understand if the work and collaborative style of scholars belonging to these SDS is so similar that justifies the grouping at level of competition sector. For this aim, we analyse the co-authorship network of Italian statisticians and investigate the collaborative styles for the sub-groups of scholars identified by the SDS.

The analysis is based on the database of scientific works published since 1990 and downloaded by Scopus, where at least one of the co-authors is a statistician employed in an Italian university. From this database, we obtain a network composed of 758 nodes, corresponding to the Italian academic statisticians distributed among the five SDS. Moreover, an edge connecting a pair of node arises whenever two nodes co-authored at least one work referenced on Scopus; globally, the network has 1730 edges. Edges are weighted by the number of co-authored works: for each work, the weight is defined taking into account the total number of co-authors.

Preliminary network analyses outline differences in the distributions of the centrality measures (e.g., degree and node degree strength distribution) at SDS level, thus suggesting the need of further research to understand the differences in the collaborative styles.

Keywords

Academic Network, Co-Authorship, Scopus Database

Do R&D diversification policies change the cognitive structure of knowledge networks? Evidence from France using a meso-structural approach

Delio Lucena

Abstract

National authorities have implemented R&D diversification policies in order to foster the emergence of new topics, thus developing new markets and increasing the competitiveness and resilience of both national and regional R&D systems. This work explores the effects of diversification – i.e., the combination of knowledge from different sectors of activity – on collaborative knowledge networks. It proposes a little-known methodology for the study of structural equivalence in affiliation networks – the place-based methodology – in order to capture the aggregate properties of groups (research consortia) and overcome the artificial clustering problem of classical one-mode projections. In this methodology a "place" is a unique combination of affiliations in a bipartite network, thus represents a structural equivalent position where every node in a "place" share the same aggregate properties coming from the groups. Once the places are identified in the 2-mode network, the network is projected to obtain a network of places linked by shared groups, and analysed keeping the aggregate group's properties and without the biases from the artificial clustering. The place-based methodology combined with the cohesive-block analysis allows us to properly identify the community structure of the network. Moreover, in this work we associate this methodology with the concept of proximity – geographical but also organisational, in the sense of the French school of proximity, which includes cognitive proximity – allowing us to identify the main research topics – those well-integrated – of the collaborative knowledge networks. More generally, the association of the methodology with the concepts of proximity and relatedness allows us to identify the cognitive structure of the collaborative network through consortia-project affiliation data (without qualitative data about research projects and actors). Using data on collaborative research projects from France's funding program FUI (from 2006 to 2015), we analyse 31 collaborative research networks by activity sectors and cohorts. We find that diversification incentives are actually associated to the emergence of well-integrated diversified topics. However, there is no evidence of an effect of these policies on the enlargement of knowledge networks' portfolios of topics. Additionally, the effect of diversification policies on the emergence of diversified topics is unequal across sectors. This suggests that more "surgical" measures (best suited to the technological nature or cycles of clusters and productive sectors) might actually be needed.

Keywords

Knowledge Networks, Collaborative Innovation, Diversification, Socio-Cognitive Groups, Structural Equivalence, Place-Based Methodology

Citizenship Regimes: Dynamics of Scientific Polarisation or Consensus in the Field

Lukáš Lehotský, Eva Fernández G. G. and Manlio Cinalli

Abstract

This paper presents a bibliometric analysis of the scientific use and evolution of the Political Opportunity Structure (POS) studies on contentious politics, building on the analysis of citizenship regimes and their interplay with political behavioural outputs. It unveils the predominant understandings and schools of thinking which have influenced the scientific use of the citizenship regimes in social movement studies. Citizenship regimes refer to predominant understandings of boundaries and rules to access the community and full citizenry rights, whose basic premise suppose an exogenous factor driving or inhibiting political mobilisation.

Despite consensual research on how the citizenship regimes (POS) shape political action, ways of measuring the POS factors have been mostly contested. The main variation across the scientific community concerns the dimensions of study to differentiate between regimes. By focusing on the idea of rights and status, scholars have put out front two main schools of thinking in the field: one based on one-dimensional versus one based on multi-dimensional measurements of citizenship regimes. Yet, there is a lack of knowledge on whether these two scientific research trajectories converged over time, or polarised into scientific niches instead.

Therefore, this paper evaluates the state and dynamics of scientific contestation on issue based on analysis of co-citation networks since 1990 to 2020. The goal is to find polarisation in the existing literature, which is indicated by specific citation patterns. In addition, it uses bibliographical coupling networks, which provide snapshots of key articles' referencing similarity, which may detect subcommunities within the research niches.

Keywords

Citizenship, Co-Citation, Bibliometric Networks, Political Opportunity Structure, Political Participation

An Agent-Based Model to Investigate the Impact of Responsible Research and Innovation on Collaborative Innovation Networks

Enrico Cozzoni, Carmine Passavanti, Cristina Ponsiglione, Simonetta Primario and Pierluigi Rippa

Abstract

The European Union, with Horizon 2020 (European Commission, 2014), aims at a new approach that anticipates and assesses the potential implications and societal expectations about research and innovation, with the purpose to foster the design of inclusive and sustainable research and innovation: Responsible Research and Innovation (RRI) (European Commission, 2012). This new approach not only inspires every objective of Horizon 2020 but is the key action of the Horizon 2020 transversal program "Science with and for Society" (SwafS) (European Commission, 2020).

One of the most critical challenges of the SwafS program is "to model and better understand the dynamics of the complex webs of innovation value chains and the openings they offer for RRI", to which the project I AM RRI - Webs of Innovation Value Chains of Additive Manufacturing under Consideration of RRI - responds.

Central in the I AM RRI project is developing a dynamic model to simulate and visualize the behavior of collaborative innovation networks under various conditions to arrive at an overall understanding of the opportunities provided by Responsible Research and Innovation practices.

This paper presents an agent-based model in which innovation networks in the context of Additive Manufacturing are created, evolve, and interact to diffuse knowledge and RRI practices.

The developed agent-based model starts from the existing agent-based model SKIN - Simulating Knowledge Dynamics in Innovation Networks - (Gilbert et al., 2007; Pyka et al., 2007) and enriches it with new elements and extensions.

The proposed model is a "double-industry" model in which agents can belong to the Automotive industry, the Biomedical applications industry, or both (this is the case of "broker" agents, able to be involved in Innovation Value Chains in both industries).

Agents' inclination to ethical and societal values is modeled through three endogenous variables representing three fundamental thematic areas in RRI identified by the European Commission (2012): public engagement, open-access, ethical thinking. These RRI characteristics influence agents' decisions, the network's performance, and how they interact with the environment and other agents. Furthermore, the model considers different types of actors (AM technology company, Supplier, Customer, Research Institution, OEM) assessed by Regulators and Standard Organizations. Each type of agent is characterized by a peculiar knowledge domain, from which it develops a fuzzy idea of innovation. Through cooperation and learning, the idea can be defined, developed, and improved.

This dynamic model is a useful tool for understanding agent behavior involved in collaborative innovative networks and the effect of their ethical inclinations; it will also be an essential element in the formulation of strategic guidelines for policymakers to support them in governing dynamic networks of innovation and in implementing and incentivizing RRI principles.

Some virtual experiments and their analysis and implications will be presented to analyze the impact of agents' RRI inclinations on the performance of the networks in which they participate.

Keywords

Responsible Research And Innovation, Innovation Value Chains, Complexity, Agent-Based Model, Additive Manufacturing

The Effects of Network Position in Open Innovation Communities

Bruce Cronin, Mu Yang and Chunjia Han

Abstract

User ideas, 'crowdsourcing', is regarded an important input in open innovation processes. But what sorts of users' ideas are most useful? Engaging users, when they contribute ideas, provides a source of diversity beyond existing internal processes. But the value of a user input extends beyond simple diversity. Some contributors are effective aggregators of general opinion, 'mavens' in Gladwell's popular typology, others effective 'connectors' among diverse views, still others effective 'persuaders.'

Testing this long-debated question of brokerage and closure in social network theory, we present the results of a study of collaboration among 10,000 participants in the open innovation community of users of Microsoft's Business Intelligence product. We identify the network characteristics of the participants with the best ideas, those adopted by Microsoft engineers for product development.

We find distinct social network characteristics of idea generators and idea refiners and surprising roles for brokerage and closure in this process. The findings add nuance and depth to the established theory in this area.

Keywords

Open Innovation, Collaboration, Brokerage And Closure, Small Worlds, MRQAP

Concept, implementation and first results of a social network analysis to support cross-company workplace health management

Gabriele Fohr, Bert Droste-Franke, Carina Hoffmann and Andrea Schaller

Abstract

Since the Prevention Act from July 2015, workplace health promotion (WHP) has been a crucial setting for prevention in Germany. This is especially true for small- and medium-sized enterprises, which often lack the resources for WHP [Taylor 2016]. Within the KomRueBer project, funded by German Federal Ministry of Health (BMG), a cross-company network for promoting physical activity has been set up in a business park in North Rhine-Westfalia, Germany.

With the BIG-Manual as a theoretical framework and step-by-step guidance for physical activity promotion, the cross-company network has been developed by a network manager. Its phases (A) finding, (B) preparation, and (C) cooperative planning process, are being evaluated by SNA methods.

In line with the focus on the workplace, on the individual or node level we modelled a network of companies located at the business park and engaged in WHP, as well as other supporting organizations, that form the cross-company network of WHP. In addition, a second type of node was introduced: the sequenced events of the finding, preparation, and cooperative planning phase. We then got a two-mode network of WHP with events and participating organizations, aggregated for each time step (current time step plus earlier time steps). It was projected to one-mode to be able to calculate network-specific measures.

The analysis covers first results in terms of visualisations (two-mode and one-mode, t1 to t5) as well as individual (company level) and community (cross-company level) network metrics. We were able to identify key actors and their roles within the network, and to evaluate the development of the complete network over time. Further work has to be done to evaluate following time steps, subgroups, non-responder, and a potentially conducive network composition for WHP.

Keywords

Cross-Company Network, Workplace Health Management, Two-Mode Network, Physical Activity Promotion

Who steps up after a merger? The effects of boundary-spanning on post-merger taking charge behavior

Stefan Breet, Lotte Glaser and Justin Jansen

Abstract

Although prior research on mergers and acquisitions (M&As) has suggested that cross-legacy boundary-spanners serve as organizational change agents, an emerging line of research highlights the costs of developing and maintaining boundary-spanning ties. Building on the social networks and organizational identification literatures, we develop a social network perspective on cross-legacy boundary-spanning and post-merger taking charge behavior. More specifically, we argue that employees without boundary-spanning ties are more likely to engage in taking charge behavior when they are closely connected to the boundary-spanners of their legacy organizations. Our analysis of the social network of a post-merger organization shows that cross-legacy boundary-spanning has a negative effect on taking charge behavior, while proximity to boundary-spanners has a positive effect. Our study also reveals that the positive effect of proximity on taking charge behavior is strongest for employees who weakly identify with the new organization.

Keywords

Intra-Organizational Networks, Boundary-Spanning, Post-Merger Integration, Organizational Identification, Proactive Behavior

Organizational change and social network resilience among scientists over 20 years: A multilevel approach

Emmanuel Lazega, Avner Bar-Hen, Béatrice Milard and Antoine Descoubet

Abstract

Analyses of multilevel (“Fish/Pond”) networks of superposed and partially connected interdependencies (the first being inter-organizational, the second inter-individual) have shown the importance, as explanatory factors of scientists “performance”, of the size and centrality of researchers’ laboratories at the inter-organizational level relative to the importance of their own individual centrality in inter-individual networks. In this paper we take advantage of the fact that the period under examination in this study was a period of great reorganization of laboratories in French cancerology to look at the resilience of inter-individual networks over time as organizational contexts change or disappear. We track the institutional trajectory of 127 top level researchers and look at the extent to which co-authorship ties survive between these individuals over twenty years in spite of (or thanks to?) multiplication of affiliations, bifurcations and mobility from one organizational context to the other. We interpret the result in light of a combined theory of collegiality and its emphasis on the importance of personalized relationships for the coordination of collective agency in innovative activities such as scientific research. But also in light of public policy strategies using organizational "lego games" to drive scientific research and resistance to such strategies.

Keywords

Multilevel Networks, Organizational Dissolution, Network Resilience, Sciences Policy

Establishing publication profiles of Russian universities: bipartite institution/journal network co-clustering approach

Angelika Tsivinskaya

Abstract

Over the last decade, research on bibliometric networks has received a lot of attention but it usually focused either on citation networks or on collaboration networks. These bibliometric networks are usually based on direct relations between publications or focused on the collaborations formed at the level of authors or institutions (Carusi et al. 2019). The aim of our analysis is to build a map of institutions and identify groups of universities similar in terms of publication profiles using a two-mode network between universities and journals (García et al. 2012). This research is grounded on the idea that researchers from different institutions prefer to publish their work in a different subset of journals in terms of not only disciplinary mixture but also quality and impact. The organisational culture can have a great impact on the choice of where to publish, especially if the cash-per-publication reward policy is present (Quan et al. 2017). The relationship between institutions and journals is utilized to identify scientific community clusters employing a co-clustering detection on a bipartite network. The suggested approach has the potential of leading not only to the detection of academic institution communities based on the similarity of their research output but also to the clustering of scientific journals based on which are the most representative of each community. This methodology does not rely on predefined categories for publication profiles and purely based on similarity in term of publication strategies (Carusi et al. 2019). Our proposed approach is applied to the Russian universities using the data collected from the national bibliometric database (RISC). We chose this source over other alternatives as it has better coverage of journals compare to international databases which are skewed towards natural sciences and the English language. With our data, we have an opportunity to identify whether universities strive to publish in international journals or oriented towards the production of knowledge only for the local market.

Keywords

Bipartite Network, Clustering, Community Detection, Universities

When spatial dimension matters: comparing personal network characteristics in different segregated areas

Éva Huszti, Fruzsina Albert, Adrienne Csizmady, Ilona Nagy and Beáta Dávid

Abstract

Living in segregated areas negatively affects the quality of life, including the availability of local jobs, access to services, and supportive social relationships. The degree and structure of spatial separation markedly vary when examined through macro- (neighbourhood) to micro-scale (street) level. In such spatially varied areas, individuals'/households' social support network systems are also twofold: the supportive ties either facilitate or, on the contrary, impede social inclusion.

In a medium-sized town in Hungary, in two segregated areas (S#1; S#2), we identified three segregated neighbourhoods (N) based on various characteristics (the degree of spatial separation, infrastructure, availability of services etc.) S#1 is integrated into the fabric of the city, S#2 N#1 is semi-integrated (integrated into surrounding residential area but isolated from the city), and S#2 N#2 is non-integrated. Of the 394 households, 271 are represented in our sample (one person from each household).

Data on one's core discussion networks and weak ties (by a position generator) were collected. We aim to elaborate on the extent to which social exclusion is aggravated by spatial segregation by constructing the personal network structures in the three neighbourhoods. We show the structural and network differences between the majority non-Roma and the minority Roma population. We not only take into account the differences in network size but analyse ethnic and spatial homophily. Based on this analysis, we recommend that these aspects be taken into account when planning municipal interventions to prevent the accumulation of further disadvantages.

Keywords

Bonding - Bridging, Ethnic Homophily, Roma, Social Capital, Spatial Homophily, Segregation, Policy Intentions

The network of the cultural and creative system in the City of Cagliari

Antonello Podda, Marco Zurru and Clementina Casula

Abstract

In the last decades, growing interest for the cultural sectors within the debate over the creative economy (Santagata 2007), where cities play a pivotal role (Florida, 2002). The debate has emphasized how the provision of urban services supporting the diffusion of a creative cultural atmosphere, supports the activation of innovative processes of cultural production which may have positive effects in a number of areas: from urban regeneration, to the well-being and health of citizens, from equality and social cohesion to the education and training of young people, thus benefiting both workers in the sector, as well as tourists and citizenship, favouring sustainable forms of local development (Giuliani 2018; Pais and Provasi 2015). The debate calls local authorities to confront with a more proactive role in the definition of the new policy tools to attract creative talents and unleash the capacity for innovation and cultural production of their territories (OECD, 2018).

In Italy, cultural production often praised as one of the main (present and potential) resources for the development of the Country, however, still marginal role of innovative strategies and sound investments in the sector (Fondazione Symbola Unioncamere 2019), although gradually increasing attention. Historical bias for a policy approach oriented towards the conservation of cultural heritage, more than of cultural production and innovation (Santagata, 2007).

Available data (Istat, INPS ex ENPALS, ASIA, Registro RACLI, SIAE) confirm the pivotal role of the system of cultural production of Cagliari within the Sardinian region. The research project was drafted by the UniCa research team, co-financed by the DPSS (UniCa) and the Department of Culture (Municipality of Cagliari), the latter interested to an updated mapping of the system of cultural production in the city. Until recently, this type of mapping could represent a relatively simple, bureaucratic operation, listing the different production sites (theatres, cinemas, libraries, museums, etc.) associated to a distinct type of production and audience, but today, processes of cultural declassification and hybridization require to define cultural production in a more fluid way, intertwining different styles, languages, operators and audiences.

The main goal of the research was to mapping of the different organizations constituting the universe of artistic and cultural production in Cagliari (both as the main site or recipient of their production), identification of their different weight, in terms of artistic and economic production.

To understand their organizational logic, both at the individual level as well as at the systemic level, we proceeded to analyze the networks of the strategic patterns of cooperation, with private and public institutions and with other organizations, in different fields and at different territorial level (local, national and international level).

We use a mixed methods approach (quantitative and qualitative analysis) (Arcidiacono, 2017), and a questionnaire with a section dedicated to the reconstruction of collaboration networks through a set of “name generator” questions. This is an analysis still in progress, in which we have reconstructed the collaboration networks of 171 organizations of the cultural and creative production system of the city of Cagliari (558 nodes and 637 ties).

Keywords

Artistic And Cultural System, City, Local Development, Social Network Analysis

The process of setting up local development networks. Evidence from the National Strategy for Inner Areas (SNAI) in southern Italy.

Carlo De Rose and Antonio Samà

Abstract

The conditions for the development and the quality of life in the countryside and in the small villages far from cities and towns is back as a theme of discussion in recent years. Economists, sociologists, and geographers are examining more frequently the alternative models of innovation that is possible to pursue in those areas affected by massive demographic exodus and ageing of population; those areas where productive systems are penalised by the peripheral position and from where young generations are escaping as they do not see the benefits in remaining.

Around the possible revenge of places that don't matter (Rodríguez-Pose, 2018) and around the opportunities that could emerge in the nearest future however there are various opinions: some more pessimistic and others more optimistic.

In Italy the debate on this theme has came alive and has been renewed thanks to the ambitious programme for relaunching the declining and lagging-behind areas (SNAI, National Strategy for Inner Areas). Moving from the experience of activating processes for local development promoted by this programme, this paper aims to explicit the dynamics for setting up networks among local institutions (local authorities) and other stakeholders from the area (business, third sector organisations, educational institutions, health, and social care services).

Comparing four homogenous areas in Southern Italy, this paper will present the representations local stakeholders hold of networks according two implicit dimensions: the relational one and the territorial one. To this end a typology of the attitudes and the evaluation towards the operating of designed/set up networks will be presented for supporting the process of defining the innovations to be promoted in the areas. Concerning this point, the attention is given to: the process of setting up the networks, the cultural resistance this has met, the perceived strengths and weaknesses, the degree of activated participations, the pursued objectives and the expected outputs, the relevance personal relations have taken.

The presented four cases are then used to introduce few observations both theoretical and methodological on the development of multilevel analytical models rooted in a qualitative approach rather than quantitative.

Keywords

Models Of Innovation, Setting Up Networks, Territorial Network, Local Development, Multilevel Analytical Models

Social network approach to the analysis of urban segregation

Tamara Shcheglova

Abstract

Segregation has always been an integral part of cities and a subject of longstanding interest in academic research. The study of socio-spatial urban segregation is conducted at the intersection of different disciplines: Urban Planning, Geography, Sociology, Political Science, City Economics and others. However, different methodological approaches interpret urban segregation in their own way. Segregation is a rather complex and extensive concept, encompassing different forms and types. In this sense, one can speak of residential, labor, educational, gender, racial, ethnic, socioeconomic, age, religious segregation, and so on.

Today, racial and ethnic criteria for segregation play a lesser role, and segregation by place of residence is no longer the only distinguishing factor of individuals in urban space. The types of interests, recreational activities, and social connections are of particular importance in analyzing the phenomenon of segregation.

This study is an attempt to rethink the concept of segregation in modern realities. In order to evaluate new forms of urban segregation, we propose a methodological approach that combines the spatial, social and network aspects. Focusing on the networks or relationships that exist between people and places, rather than on their individual characteristics, helps to overcome the shortcomings of the traditional approach, which is based on predefined categories and considers social entities as independent.

The results of the study on urban segregation can be applied by urban authorities and developers in planning and designing urban spaces. In addition, understanding how a city is segregated and how different social groups interact within it can help a business solve geomarketing problems and find optimal locations for opening stores, restaurants, pharmacies, and other points of sale for goods and services.

Keywords

Urban Networks, Urban Segregation, Social Network Analysis

Embracing Serendipity in Times of Disruption: Simulation of A Place Prosperity Agenda to chart Practical Improvement in Slum community

Aisha Abubakar

Abstract

Slum demography in developing region cities remains high, currently over a billion people living in a range of informal, illegal, and declining settlements, and this figure is forecast to double by 2030. This paper presents the implementation and testing of a Place Prosperity Framework (PPF) in a slum community (Gengere) improvement project in Lagos, Nigeria. The PPF is proposed to support effective slum intervention that enhances prosperity, this, by helping to compile and interactively map the unique social, spatial, physical, and environmental properties that characterize the complex nature of a slum. Then, via an analysis of the unique structure of the property map, guide stakeholders to deliberate on the most appropriate and practical target of intervention that address key vulnerabilities and can catalyse the widest degree of positive change. The PPF is also designed to capitalize on community assets, build capacity, psychological ownership, enhance inclusivity and rights to participation in city development. However, the paper also tells a story of how the research adapts to certain limitations on the project brought on by the Covid-19 pandemic to fulfil set objectives, further validating the framework.

Engaging and training a community volunteer team to understand the principles, actions, and support facilitation of the PPF project, is a pre-action component in the PPF that is aimed at enhancing participation, ownership, and building capacity. Training sessions with a cohort of Gengere volunteers had just started, when the second Covid-19 wave struck, prompting a project delay. In response, first, a simulation component was integrated in the training, following initial vibrant participation, responses, and feedback from volunteers, which presented the potential for remote working. Over a course of sessions, and through their knowledge and lived experiences, we were able to build a sharp overview of the character of their community via a Gengere property map, with background context, vulnerabilities, and assets. By adopting the use of a bespoke interactive online project dashboard that integrates key network functions, we were able to deliberate on catalytic priority areas of intervention, primarily focused on violent youth gangs. Furthermore, rally community support to outline requirements for improvement, all without facilitators on ground. Second, a focus group discussion was held with external project stakeholders to obtain insight into their perceptions of prosperity, Lagos slum management, and limitations faced in implementing projects. Furthermore, to deliberate on and validate paths of action to improve Gengere while consulting the project dashboard and give feedback. The external stakeholders agreed on the target of action and requirements identified by the cohort of community volunteers and further validate the robust social capital in slums but, highlight the need to streamline institutional roles to deliver effective management. Thus, providing a basis for a pilot initiative to drive change for the soon and now in Gengere settlement. The exercise also highlighted the need for an educative component aimed at upskilling urban management practitioners on aspects that comprehensively capture the nature of places – especially social-cultural-subjective – and which we can operate within to support local-level people-environment prosperity dimensions

Keywords

Prosperity, Property Map, Ownership, Slums, Dashboard, Lagos

Analysing foreign entrepreneurship in urban contexts. Ego-network of support in setting up enterprise

Maria Camilla Fraudatario and Anna Maria Zaccaria

Abstract

Foreign entrepreneurship depends on the structure of opportunities shaped by both contextual factors (institutions, market opportunities, and urban history) and the agency of economic actors, and by resource endowments and individual capabilities as well. The theoretical perspective of the Mixed Embeddedness (ME) was particularly productive in this research since it aims to analyse the entrepreneurial performance of two immigrant groups in urban contexts: Ceyloneses in Naples (rione Sanità) and Pakistani in Greater Manchester (Rusholme neighbourhood). Starting from the premise that the resources owned by the individual and the opportunities/constraints of the structure produce different entrepreneurial initiatives and experiences, we carried out an analysis of the link between territory and economic behaviour of immigrants through an ego-network approach. Two questions were formulated: i) what entrepreneurial strategies have immigrants adopted regarding the urban contexts? ii) based on informal (co-)ethnic relations and formal relations with the institution and other local stakeholders what kind of embeddedness do enterprises configure?
This contribution would show similarity and difference in the embeddedness of the immigrants in their urban context and move a general consideration about how the SNA approach might advantage in the study of the social-economical dynamics at the micro-level of the territorial scale.

Keywords

Foreign Entrepreneurship, Ego-Network Of Support, Urban Studies

Cuando los abuelos no pueden: Estrategias de conciliación y redes de apoyo de cuidados de menores durante la pandemia de Covid-19

Livia García-Faroldi

Abstract

Con la incorporación de la mujer al mercado de trabajo, las familias españolas con hijos pequeños deben afrontar el problema de cómo conciliar los horarios laborales con las responsabilidades familiares. Estudios previos han demostrado la relevancia que tienen las redes de apoyo familiar, especialmente el apoyo de los abuelos, para lograr dicha conciliación. Este fenómeno se debe a dos motivos principales: por un lado, la población española se caracteriza por una fuerte solidaridad familiar, especialmente entre padres e hijos; por otro, la insuficiente oferta de servicios para cuidar a los menores durante el horario extraescolar.

Sin embargo, la situación de confinamiento debida a la pandemia de Covid-19 desde marzo hasta junio de 2020 llevó a una situación inédita a las familias españolas. Por un lado, muchos progenitores tuvieron que seguir trabajando mientras sus hijos menores no podían asistir a los centros educativos y debían quedarse en casa. Por otro, acudir a las redes familiares en busca de apoyo (y principalmente a los abuelos) podía implicar un riesgo de contagio para la población más vulnerable. Esta comunicación presenta los resultados preliminares de una investigación de carácter cualitativo financiada por el Centro de Estudios Andaluces. En dicho estudio, se entrevistó a 15 parejas heterosexuales en las que ambos miembros trabajaban a tiempo completo antes de la situación pandémica y que tenían hijos menores de 14 años a su cargo. Los resultados que aquí se analizan describen qué estrategias de conciliación siguieron las familias durante la época de confinamiento y cómo cambiaron sus redes de apoyo de cuidado de los hijos debido a la crisis sanitaria.

Keywords

Pandemia, Apoyo Familiar, Conciliación De La Vida Laboral Y Familiar, Cuidados

Bank substitutability and financial network resilience: insights from the first globalization

Olivier Accominotti, Delio Lucena and Stefano Ugolini

Abstract

This work presents a detailed analysis of the international financial network during the First Globalization of 1880-1914. At that time, most international financial transactions took place through the London discount market for bills of exchange. Sterling bills of exchange were used by merchants, firms and banks across the whole world to finance their commercial and financial activities.

We rely on a unique data-set built from a previously unexploited archival source: The Bank of England's Discount Ledgers. This source reports systematic micro-level information on all agents involved in the origination and distribution of bills of exchange circulating on the London discount market. Our data-set contains information on all individual bills rediscounted by the Bank of England during the year 1906 (23,493 bills) and it allows us to analyse the structure of the sterling bill market. Using network analysis, we reconstruct the complete network of linkages between agents involved in the origination and distribution of London bills.

Sterling bills always involved actors in three roles: a "drawer" (a borrower, mostly located in a foreign country), an "acceptor" (a London firm who guaranteed the bill's payment), and a "discounter" (an ultimate lender). Thus, bills are origination and distribution chains where all three roles are interdependent – no bill can exist without any one of the three roles or any of the links between them. This has important implications at both the theoretical and analytical levels, as we present in this work.

In our approach, the origination and distribution chain for sterling bills must be treated as a high-order interaction unit – viz. a supra-dyadic structure. To properly capture the aggregate properties of the sterling bills – viz. the interdependence between the roles in bills – we propose a novel methodology grounded on the hyperstructure approach: the chain-based methodology.

Today, interbank networks have core-periphery structures (hierarchical and disassortative), where confidence is linked to the size/centrality of actors. As a result, the network's resilience to shocks depends on individual characteristics. This entails disastrous consequences when a centrally-situated node fails –as revealed during the global financial crisis of 2008. By contrast, in the 19th-century global interbank network the confidence problem between lenders and borrowers appears to have been solved in a different way.

We develop new metrics allowing to analyse the structure of the sterling bills of exchange market and to what extent this interbank network was resilient to shocks. Following the contemporary finance literature, we define "systemicness" as each financial actor's substitutability within the network. By simulating different scenarios, we analyse how various nodes were able to destroy other nodes' connectivity to the rest of the network. Our results suggest that actors were much more substitutable in the 19th-century network than nowadays, pointing to a better resilience to financial shocks.

Keywords

Financial Network, Resilience, Systemicness, Substitutability, Meso-Analysis, Hyperstructures, Chain-Based Methodology

The future of personal networks: notes for a research agenda

Isidro Maya-Jariego, Deniza Alieva, Romina Cachia, Elena González-Tinoco, Sergio Granados-Chahín, Daniel Holgado, Esperanza Márquez, Andrés Muñoz-Alvis and Francisco J. Santolaya

Abstract
The study of the structural characteristics of personal networks has made great advances in the last two decades. Among other developments, efficient data collection strategies have been implemented, clustered graph techniques have been applied, visualization has been integrated with qualitative biographical description, and statistical models have been built for the analysis of structural properties. In this paper we explore the future of the study of personal networks and establish a short-term research agenda. To do this, we review the design of name generators, visualization innovations, the identification of cohesive subgroups, stratification techniques, the construction of typologies and the integration of structural analysis in mixed methods designs. As a conclusion, we propose structural cohesion and organization in cohesive subgroups as two keys to knowing the structural properties of personal networks.

Keywords
Personal Networks, Research Agenda, Structural Properties

Women characters on Pixar animation movies over time: A research using a mixed method approach for SNA

Francisca Ortiz and Pete Jones

Abstract

In the last decade, it has been an increase of studies focusing on which are the representation presents and absents on movies. Gender studies had led many of those researches, making visible the existence of gender inequalities trough movies. Accordingly, that involved many different genres of movies, and the animations ones, are not an exception. In the literature had been some studies already exploring different representations, although there has been a gap in looking how those representations had change over time. Then, this paper aims to explore how the women characters has been represented in animation movies during 25 years. More specifically, in those 23 movies created by Pixar studios between 1995 and 2020. The methodological approach is a mixed method study using two strategies of analysis: narrative and social network analysis. The narrative analysis was applied into the 23 animation movies created by Pixar studios during that period. Following this, there was applied a social network analysis to look deeper into some selection of those movies. The authors concluded that there is a change through the years on how had been women represented, which had been more inclusive over time. Although, there are still some aspects of those representations persisting, visible only by a deeper look into the scripts, visuals and dialogues.

Keywords

Mixed Method, Narrative Analysis, Character Networks

The conditioning of social networking sites in the formation of migratory chains of young unaccompanied minors

Joaquín Castillo de Mesa, Paula Méndez Domínguez, Luis Gómez Jacinto and Antonio López Peláez

Abstract

The relational uprooting faced by young unaccompanied minors, when they undertake a migratory process places them in a situation of extreme vulnerability. Timeshare in the Center for Minors offered relationships between themselves, which are later maintained and reflected on social networking sites. The content that can be shared on social networking sites could condition the subsequent migratory itinerary travel and the migratory chains that are formed.

In this study, the profiles on social networking sites of 51 unaccompanied minors will be analyzed one year after having passed through a Center for Minors located in Malaga (Spain). Through social networks analysis, netnography and certain algorithms for community detection, cohesion and emotion analysis, the connectivity and interaction patterns shown by these young people on social networking sites (Facebook, Instagram) will be analyzed, identifying leaderships and detecting communities that influence the formation of migratory chains. The results show how the patterns of connectivity, interaction and leadership reflect migratory chains. The excess of positivism shown on social networking sites influences the decision-making of migratory destinations for other unaccompanied minors. Contradictory emotions are noted around their integration processes that can influence radicalization behaviors.

Keywords

Unaccompanied Minors, Social Networking Sites, Migratory Chains, Communities, Radicalization

The academic inclusion of students with Special Educational Needs in Chile: Integrating two SNA approaches

Rosario Escribano, Diego Palacios, Lorena Ortega, Ernesto Treviño and Cristóbal Villalobos

Abstract

The standard for educational inclusion of students diagnosed with special educational needs (SEN) has evolved from securing access to mainstream schools to guaranteeing equal learning opportunities and social integration. Therefore, relational factors and processes operating within the classroom are increasingly seen as critical contributors to educational inclusion (Loreman, 2014). As educational inclusion is not achieved by mere physical proximity, social network analysis appears as a valuable framework for studying and visualizing students' inclusion in academic interactions in the micro-social space of the classroom (e.g., Cappella et al., 2013; Lomi et al., 2011). This study aims to explore the extent to which students with Special Educational Needs (SEN) experience barriers to learn and socialize in the classroom by investigating their centrality in terms of two types of networks: i) teacher-student interaction networks and, ii) academic peer networks. We expected that SEN students would be significantly more peripheral in their class' teacher-student interaction networks than their non-SEN peers, with teacher-SEN-student interactions being less frequent than teacher-non-SEN-student interactions. We also hypothesized that adolescents would be less likely to nominate SEN students as studying partners, and SEN students would study with other SEN students. The sample includes 40 public schools in Chile. Surveys from mathematics teachers (n=41) and their 7th-grade students (n=986) were collected, and a regular lesson of each participant class group was video-recorded and coded using a protocol for systematic classroom observation. Students' frequency of interactions with their teacher was modeled using Poisson multilevel regression (with students nested within classrooms and distinguishing interactions initiated by students and teachers), and peer networks were analyzed using stationary stochastic actor-oriented models (SAOM) controlling for structural network effects (density, reciprocity, and transitivity). In both cases, we control for students' characteristics (gender, parents' education, and the number of years in the school). The results indicate SEN students have significantly fewer interactions with their math teachers, especially in pedagogical interactions. Regarding studying peer networks, while there were no significant differences in the number of outgoing and incoming nominations between students with and without SEN, there was a tendency to study with peers with the same condition. These results shed light on a scarcely explored topic in Chile, despite its relevance to monitoring the impact of the increasing classroom diversity on students' learning opportunities. This study contributes to previous literature (1) expanding traditional conceptualizations that limit their focus to students' access to, and participation in, formal education; (2) providing new and robust empirical evidence, based on a large sample, on the educational experiences of SEN students in Chile; (3) applying an innovative combination of advanced methods to investigate teacher-student interactions and peer networks: systematic classroom observation, multilevel models and inferential social network analysis; (4) combining ego- and complete networks approaches.

Keywords

Classroom Observation, Social Network Analysis, Special Educational Needs, Educational Inclusion, Chile

Descriptive questions and Statistical Network Models

Tom Snijders

Abstract

The values of parameters in statistical network models such as the Exponential Random Graph Model (ERGM) or the Stochastic Actor-oriented Model (SAOM) do not have a straightforward interpretation. They do not have a direct connection to descriptive questions, e.g., comparisons between two networks with respect to descriptive statistics such as average degree, proportion of geodesic distances less than 3, or the extent of homophily on a given attribute. For the SAOM, this already holds for two networks observed in panel waves of one data set. For the ERGM, it would be attractive to have a good way of comparing networks with different node sets.

For a good alignment of statistical network modelling using the ERGM or the SAOM with substantive theory it is helpful to have methods for directly linking effects in the specification, or differences in model specifications, to differences in expected values of observable quantities. This is to some extent similar to marginal regression coefficients for logistic regression, and relates for ERGMs to the concept of marginal parameters. A major issue here is to decide on the observable quantities, or statistics, to consider. Another issue is how well we can approximate, or (in statistical terminology) predict, these statistics. This can be framed as a question about model-based standard errors of descriptive statistics, and is connected to goodness of fit.

Keywords

ERGM, SAOM, Interpretation, Marginal Effects, Goodness Of Fit

Regime Switching in Dynamic Network Actor Models

Alvaro Uzaheta, Viviana Amati and Christoph Stadtfeld

Abstract

Social networks frame relationships among actors, and those relationships often emerge from actors' actions. Here, we consider actions collected as relational events. The Dynamic Network Actor Models (DyNAMs) investigate the dynamics of relational events as an actor-oriented decision process consisting of two decision levels in the tradition of actor-based modeling.

The specification of DyNAMs assumes that the social mechanisms determining changes in relations operate homogeneously over time. This assumption is not tenable, e.g., in scenarios where the system is subject to trend shifting. For example, reciprocation could be a considerably important mechanism in the early stage of a dynamic process but diminishes its importance after a consolidation period.

We present an extension of DyNAMs that allows controlling for time-heterogeneity by including time-varying parameters. Changes in the parameters are modeled using Markov regime-switching models that express the coefficients' states and switching dynamic for a predefined number of regimes as a hidden Markov chain model. We illustrate the method and discuss how inference on time heterogeneity helps to explain the dynamics of network mechanisms in several social contexts.

Keywords

Dynam, Relational Event, Time Heterogeneity

Change Point Detection in Relational Event Models

Mahdi Shafiee Kamalabad, Roger Th A.J. Leenders and Joris Mulder

Abstract

The Relational Event Model (REM) has been a popular tool to model the interaction between actors in a social network, given the past event history. The advantage of the REM is that it can be used to study fine-grained temporal social network evolution, as opposed to the other models in this context, which have limited ability to study how networks develop over continuous time.

The conventional REM implicitly assumes that interaction behavior between actors is static. This implies that the endogenous and exogenous effects of the model are assumed to be constant over the entire event history. This assumption seems unrealistic in the real world situation as social interaction behavior can be very dissimilar across various periods of time. For example, the observational period can be categorized in critical and non-critical situations, which have fundamentally disparate styles of communication. Therefore, the conventional REM cannot detect the critical/non-critical situation onset. It is of great interest to find the location where such a change occurs and estimate the size of the change.

Despite the increasing methodological interest in the dynamic analysis of social networks, relatively little work has been carried out in this direction.

In this study we present a novel statistical method for testing and detecting whether change points likely occurs during the observational period, and if this is the case, extend the conventional REM to CP-REMs. The new model employs a Bayes factor in order to detect the locations of time points for each individual statistic in which the event rate changes drastically.

A simulation study is carried out to show the performance of this method on inferring segmentation and segment specific effects. On Apollo 13 Flight Director's voice loops data as a real event data, we
found evidence for change points which can be explained by the highly dynamic/problematic situation of the mission.

Keywords

Relational Event Model, Change Point Model, Bayes Factor

Extraversion, Neuroticism, and the Evolution of Friendship and Conflict Networks

Evgenia Dolgova, Ajay Mehra and Olga Kornienko

Abstract

To study origins of the social network emergence, we explore how does personality affect social network dynamics, focusing on how the Five Factor personality affects friendship and conflict. We studied friendship and conflict relationships among the 193 members of a top collegiate marching band from a large public university in the United States. To account for processes of friendship and conflict network selection, we used RSiena, which allowed us to separate network processes based on actors' characteristics from network structural processes (such as reciprocity and triadic closure) and socio-demographic controls.

We found that Big Five personality traits of extraversion and neuroticism substantially impacted the processes of friendship and conflict formation well beyond the structural processes and beyond the impact of demographic controls (race, gender, rank, and section). First, extraversion was significantly related to the rate of change in an actor's conflict network—extraverts appear to get into conflicts with others faster than do introverts. By contrast, neuroticism was unrelated to the rate of change in friendship and conflict networks. Second, participants strived to befriend others who would be higher than themselves in extraversion, but befriended people who were similar to themselves in terms of extraversion (emergent homophily). Individuals who scored in the middle range on extraversion befriended others more, whereas those scoring at the high and low ends of the extraversion scale were more reluctant to befriend others. Band members were more likely to get into conflict with others who score in the mid-range of extraversion. Third, participants displayed personality-based heterophily with regard to neuroticism – i.e., a tendency to develop friendships with those different from themselves in terms of neuroticism.

Keywords

Rsiena, Personality, Friendship, Conflict, Individual Differences, Five Factor Model, Big Five

On the analysis of a sample of exponential random graph model estimates

Jan-Willem Simons and Marijtje van Duijn

Abstract

It is currently unclear how researchers should obtain exponential random graph model (ERGM) estimates over a network sample. Most often, a meta-analysis is used, which averages over the estimates of a set of ERGMs which have been applied to a network sample. The conditions under which a meta-analysis produces valid ERGM estimates are however not known. It is additionally unknown whether auxiliary statistics goodness-of-fit (GOF) can be used to reliably quantify the fit of such estimates.

The objective of this study was to identify the conditions under which a meta-analysis produces a valid ERGM with respect to a sample of completely observed social networks. It additionally sought to investigate the conditions under which a subset of the currently available GOF measures can identify sub-par GOF on the level of the network sample.

An empirical simulation study was used to provide an answer to the two research objectives. Network samples were simulated from two population-level ERGMs while varying the size and heterogeneity of the network sample. The size of the network sample refers to the number of networks in the sample, which were 25 and 75, respectively. The heterogeneity of the sample refers to whether the networks were sampled exclusively from the first population model, or by way of an 80/20 split from the first and second population models, respectively. Given the various samples, the complexity of the ERGM specification that was used to obtain estimates over the different network samples was varied. This factor consisted of three categories: a structural model which was not complex enough, a true model, and a model which was too complex. The bias of the ERGM was subsequently inspected to evaluate under which conditions the ERGM estimates most closely approximated the underlying population models. Observed and simulated values of the auxiliary statistics GOF index for the first meta-analysis were inspected to evaluate its consistency.

The results indicated that the bias tends to increase when a meta-analysis is obtained over an ERGM that is either not complex enough or too complex relative to either of the population models. The results additionally showed that bias tends to increase when a meta-analysis is conducted over a mixed as opposed to a homogeneous sample. The auxiliary statistics GOF index was found to closely resemble the observed distributions for the set of auxiliary statistics for the first meta-analysis in each cell.

The tentative answer to the research objective is that a meta-analysis can be used to obtain valid ERGM estimates when the discrepancy between the population level ERGM and the ERGM specified by the researcher is low as opposed to high, and when the heterogeneity of the network sample is low as opposed to high. Auxiliary statistics GOF was furthermore found to function as a reliable indicator for the fit of a meta-analysis of ERGM estimates.

Keywords

Exponential Random Graph Model (ERGM), Meta-Analysis, Goodness-Of-Fit (GOF), Social Network Analysis

Collaborations and social networks for the adaptive reuse of religious cultural heritage: the case of the oratories in the historic center of Naples

Marcella De Martino, Valentina Apicerni, Stefania Oppido, Stefania Ragozino, Lusia Fatigati, Rosa Maria Giusto, Giuseppe Giordano, Alfonso Morvillo and Fevzi Okumus

Abstract

The reuse of religious cultural heritage has been at the center of national and international debate in the last decades years. The vastness and importance of this heritage in Italy makes it extremely urgent to address its sustainability, and therefore to identify strategies that are consistent with the set of values it embodies (cultural, social, economic, and environmental). By exploiting cultural resource as a driver of local development, heritage-led regeneration approaches are aimed at generating economic, social, and cultural values in the territory. These approaches are particularly suited to highly complex contexts such as the historic centers of metropolitan areas which, in addition to the challenge of sustainable management of their cultural heritage, are called upon to deal with the consequences of urban degeneration processes such as crime, social marginalization, gentrification, urban decay and the progressive loss of cultural identity and traditions. In these contexts, the unused or underused heritage can represent an opportunity to improve the social, economic, and cultural well-being of metropolitan areas if properly valorized through specific adaptive reuse interventions. In line with this scenario, the Ad Maiora project aims to valorize, in a network logic, some of the unused or underused oratories (churches) through the definition of innovative services systems and related business models, able to bring out and promote the identity of this heritage and support local development processes. From the methodological point of view, the starting point for designing effective adaptive reuse interventions is the analysis of the context in which these oratories are located, namely, the historic center of Naples. At this regard, this exploratory phase of the project can be approached through the application of the Social Network Analysis (SNA). Some recent studies apply the SNA to the study of cultural organizations, analyzing the contribution of the social network to the value co-creation processes in customer-supplier interactions, as well as to the generation of social, cultural, and economic values in local context. By applying the SNA to the study of reuse initiatives of the cultural heritage, the objective of the paper is twofold: to outline the associated “social and relational patterns” and to identify the structural characteristics of the reuse initiatives network through a set of indicators. Based on the network centrality measurement, it is possible to identify and evaluate power and dependence, influence or prestige of local stakeholders depending on their positions and relational patterns in the network. The empirical analysis involves public and private actors (such as cultural associations, foundations, individual, and public institutions) that manage religious cultural heritage assets, such as churches and cloisters. Through the administration of an open-ended questionnaire, the aim is to identify actors with whom they collaborate in the provision of social, cultural, and economic services, as well as in the organization and participation of events and initiatives in their neighborhood. This study is highly innovative as, to the knowledge of the Authors, it is one of the first to apply SNA to the study of collaborations and social networks in heritage re-use initiatives.

Keywords

Adaptive Reuse Initiatives, Religious Cultural Heritage, Collaborations, Social Networks, Network Centrality

Redistribution of advertising revenue between news websites and social media platforms

Luca Sandrini and Robert Somogyi

Abstract

In February 2021, Australia announced a law that mandates digital platforms (notably Facebook and Google) to compensate news websites for the loss in advertising revenues they are suffering. The economic motivation behind this law is that the digital platforms free ride on content created by third parties (i.e., news) that increases the value of participation in the platform. The new regulation comes after an intense and very public debate and its definitive version allows Facebook and Google to "negotiate" the compensation owed to the news websites. At the same time, it mandates digital platforms to directly invest in local editorial activity.

Although discussions on the monopolization of the advertising market by Facebook and Google are far from being a new topic, the Australian regulation is a one-of-the-kind intervention. Ever since its announcement, the new code has solicited an extensive debate all over the world, with some commentators hoping that other countries would pass similar laws. Among others, France has recently reached an agreement with Google for compensation of content posted on the platform. Similarly, Canada and UK recently announced to be considering a regulation like the Australian one.

This paper aims to analyze the Australian policy and potential alternative regulatory solutions in this market. The main challenge is to address the problem taking into consideration the peculiarity of the market, where consumers benefit from novel content creation on the social network while suffering from large advertisement levels. However, as ads represent a source of revenues that may be fundamental for new content creations, a trade-off clearly emerges.

Thus, in order to investigate the issue in depth, we design a model that satisfies four main properties: i) two channels compete for ads, a news website, and a social network; ii) advertising on the social network implies a higher click-through rate, and therefore, a higher return from advertising, ceteris paribus; iii) the news website creates novel news content and reaches consumers by posting news on the social network; iv) novel news content increases consumers' value of joining the social network, while ads exert negative externalities.

We believe this simplified model can capture the essence of platforms' free-riding on third-party content and their monopolization of consumers' attention. Moreover, we investigate the trade-off between allocating ads to the more efficient channel and allowing content creation to generate a positive externality for consumers. Second, we evaluate a policy instrument that would redistribute ad revenues from social media to news websites in a socially efficient manner.

Our preliminary results suggest that it is always possible to design a transfer that compensates news websites for the loss in advertising revenues. Also, we find that this transfer is socially efficient, i.e. it maximizes the sum of welfare of all market participants. In addition, we find that under some conditions a simple transfer from the social network to the news website constitutes a Pareto improvement, meaning that it makes all market participants strictly better off.

Keywords

Social Media, Advertising, Social Network, Third-Party Content

Collaborative networks for innovation and resilience of cultural destinations: the case of the Venice hospitality system

Anna Moretti and Veronica Leoni

Abstract

The 2020 pandemic profoundly affected the global tourism industry, and cultural destinations were those suffering the most from the limitations of national and international travel. The restrictions imposed by the sanitary emergence, in fact, stressed heavily the usual tension between protection vs. valorization of cultural destinations: in fact, they highlighted how cultural destinations' public and social spaces, emptied of tourists, were neither able to match residents' needs, nor capable of being rapidly reconverted in an economically sustainable way. The response to this situation was twofold: on the one side, there were activities that opted for closure waiting for the recovery of tourism flows; on the other, there were activities that started a (sometimes) difficult process of innovation in order to adapt to and resist the adverse environmental conditions, often diversifying their proposals towards a residential demand. In the quest for alternative solutions to survive, the hospitality system was particularly challenged by the lack of visitors, and it is now struggling to understand how to recover from the losses and to start the transition towards a more resilient development.

Through the analysis of the Venice hospitality system, we aim at exploring these dynamics particularly focusing on the relationship between resilience and innovation dynamics, through the multi-level networks analytical lens. Relying on the literature on network organizations and innovation management, we aim at advancing our understanding of how formal and informal networks for innovation may contribute to hospitality firms' resilience. Formal and informal networks have been extensively studied as forms of organizing conducive of innovation, but they have not been, to our knowledge, put into relation to the organization's resilience (in its "adaptive" connotation), namely its capability to absorb shocks and recover from crises, through the transformation of their structures for tackling future changes and uncertainty. Networks have been studied both as the potential locus of innovation and the sources of external knowledge firms can rely on for their learning processes. From a theoretical point of view, both structural network properties and firms' relational capabilities associated with innovation outcomes could constitute the premise for organizations' resilience: however, the mechanisms, interdependences, and scope conditions of these relationships between networks, innovation, and resilience, has not been explored yet. Tourism management literature has somehow been more attentive in the exploration of the resilience issue as a response to risk management. However, this literature has been informed by innovation and network literatures only partially, and its focus on organizational learning, adaptation, and knowledge management has been associated only to research on the resolution of crises and reflection. The present paper aims at bridging these two fields of research in order to understand the role of networks in improving hospitality firms' abilities to innovate and adapt to changing environments, even in the case of disruptive events. The paper presents some suggestive results coming from a structural analysis of hotels' networks of a paradigmatic cultural destination – especially for its failures in governing tourism: the city of Venice.

Keywords

Innovation, Resilience, Collaborative Networks, Hospitality System, Tourism

A dynamic perspective on destination governance success: The case of an emerging network in the Dolomites

Maria Martini Barzolai

Abstract

Tourism is a fundamental lever to generate local sustainable development; however, the value created by tourism within destinations relies on resources that are shared among diverse destination stakeholders and actors. In order to achieve the goal of sustainable development, destinations need to manage these actors' different and often divergent interests under a process of destination governance. Stakeholder theory has highlighted how the conceptualization of sustainable development depends on the point of view of the actor-at-stake, and a large part of the governance process regards negotiating and mobilizing actors towards a common and shared idea about its meaning and operationalization. Network theory has provided important insights into these processes, focusing attention on the emergence, evolution, and outcomes of relationships among destination actors. However, the ingredients of a successful destination governance process are still highly debated. We explore this issue through a case study of an emerging destination governance network in an Alpine destination. We followed the case through a longitudinal, action research approach observing how destination actors interacted and tried to build a collective understanding of the destination and what it had to become in order to be successful. The analysis of the case revealed how different levels of commitment and competence of the destination's stakeholders resulted in different cognitive frames about the future of the destination. Dynamics of interaction led central and more powerful network actors to mobilize each other towards two alternative competing frames, without reaching a final agreement. We therefore propose commitment and competence as critical variables to be considered when starting up a destination governance network. Moreover, we complement extant destination governance literature with a dynamic perspective: framing and mobilizing are key processes of micro-interaction that ultimately contribute to how such governance evolves towards successful or unsuccessful outcomes.

Keywords

Destination Governance, Governance Success, Networks, Commitment, Competence, Framing, Mobilizing

Travel bloggers and multi-actor engagement in social media platform for collaborative network management: a model of value co-creation

Letizia Lo Presti and Giulio Maggiore

Abstract

The influence of the message very often depends on the authority and credibility of the author of the message itself (e.g. Moldovan et al., 2017; Xiong et al., 2018). Since social media platforms, and in particular Twitter, encourage the exchange between followers and writers, the sense of "attachment" increases the ability of bloggers to influence their readers. Furthermore, the similarity between bloggers and followers, in terms of psychological and demographic characteristics, favors the influence of online community (e.g. Casaló et al. 2018) on the image of the destination (Rak, 2005; Wenger, 2008). Knowing if and what are the links between actors in the social media platform helps to understand the dynamics inherent in the relationship between travel bloggers and followers, and to know how to co-create value within the network. The closer the relationship is, the more importance is given to the exchange of information because it is based on trust and credibility. These ties are very often strong ties that engage people in sharing information. Trust and familiarity of the social network platform favors consumers' responses (including their attitude towards the endorsement and brand) and a collaborative approach in which individuals and brands help each other (Casaló et al., 2018). This paper seeks to determine the multi-actor engagement in the network by highlighting who is the center of information flow in online discussions and what co-creation approach is adopted. The goal of the paper is to understand if and how travel bloggers are influential nodes of promotional networks. Therefore, we explore the Twitter profiles of the top ten most powerful travel and tourism influencers and analyze the links with stakeholders in order to trace hierarchies and individuate the dynamics of influence between the actors involved in the discourses on tourism and hospitality. By calculating micro-level measures, such as various centrality measures (in-degree, out-degree, betweenness centrality) we determine the most connected members in the network, showing who is influencing information flow in online discussions. In this way, in line with the latest trends in influencer marketing (e.g. Appel et al., 2020), we want to individuate micro, micro, and celebrities profiles that into the network have the power to influence other readers and co-create value. The network approach focuses on how patterns of interaction provide a setting for resource exchange. The collaborative approach activated in the network generates co-creation of value supported by the active participation and engagement of community members in a social media platform. Therefore, studying the travel bloggers within the network approach allows to promote the value co-creation in the social media platforms and to take advantage by the multi-actor engagement.

Keywords

Travel Bloggers, Multi-Actor Engagement, Social Media Platform, Collaborative Network Management, Value Co-Creation

Start-ups and incubators: a two-mode network of Italian emerging firms

Lucio Palazzo, Domenico Boris Salvati, Francesco Santelli and Riccardo Ievoli

Abstract

Entrepreneurial ecosystems basically rely on the presence of incubators in supporting the process of creation and development of (new) innovative companies (Aernoudt, 2004) such as start-ups and innovative Small and Medium Enterprises (SMEs). The concept of start-up is generally in line with newborn venture presenting business opportunity and potential impacts. Moreover, incubators are organizations providing access to physical resources, administrative services, financial resources, assistance with procedures and partnership services (Shih & Aaboen, 2019).

The main innovative contribution of this work is to explore the potential of network analysis to study the relationships between start-ups and incubators and the relevant factors that encourage to create such links. Geographic location, sector of activities, features of the start-up, and type of services provided by incubators may have a relevant role generating these ties. Therefore, it may be crucial to assess whether there are start-ups connected to more than one incubator, explaining this phenomenon also through more detailed analysis.

Since the introduction of the so-called "Start-up Act"' (Decree Law 179/2021 and then Law 221/2012), the number of start-ups in Italy has been growing rapidly. Nowadays, the Italian Ministry of Economic Development provides quarterly updates of the data and the OECD proposed guidelines for further adjustments of the current policy setting (Menon et al., 2018). Within the almost 200 Italian incubators, 40 are registered in the Italian Chambers of Commerce as "certified incubators", benefiting from special facilities such as the simplified access to the guarantee found for SMEs.

We start collecting data from official sources. Start-ups can be classified according to the European Classification of economic activities (e.g., NACE or "ATECO") and through the location of the legal addresses (e.g., considering NUTS 2 or NUTS 3 Regions). Other relevant information may regard the presence of "social" entrepreneurship and prevalence of female, young or foreign employees. We collect network information from the websites of both certified and non-certified incubators.

From a methodological point of view, we propose a two-mode network approach to obtain more in-depth information about the relationships between these two economic actors. To the best of our knowledge, this framework is novel within this context, although two-mode network methodology has already been applied to connect investors to companies (Alexy et al., 2012) in start-ups market.

The aim of this work is twofold: firstly, we describe, visualize, and discuss the overall pattern of the two-mode network regarding the Italian market. Given the network, we then apply a community detection procedure well suited for undirected and bipartite networks, following the recent development of Beckett, Liu and Murata (2010) and Beckett (2016), to figure out and outline different clusters (communities) including both start-ups and incubators.

Keywords

Two-Mode Network, Innovation, Entrepreneurship, Community Detection

The collaborative efforts of survivors and newcomers in the Ukrainian Parliament: tracing the legislative network

Tetiana Kostiuchenko and Alina Samoylenko

Abstract

The pre-term parliamentary elections in July 2019 formed pro-presidential majority in the Ukrainian parliament; however, this majority comprised of new-comers, most of whom had no political experience before getting MP seat two years ago. In contrary, the opposition factions contains long-term survivors in political elite – some of them had been MPs for decades. Therefore the question is what the collaboration networks of joint legislative initiatives the new-comers managed to build and whether any real legislative collaboration and coalitions between pro-presidential and opposition factions can be revealed through the joint draft laws that had become acting laws.

The paper contains the results of the two-mode network analysis of the co-authorship in over 600 draft laws submitted by the MPs of pro-presidential and opposition factions of the Ukrainian Parliament during July 2019 – May 2020. We apply subgroups analysis to the one-mode networks of MPs – to assess the connections between the pro-presidential and opposition wings of the Parliament; we also depict the clusters of draft-laws by the thematic scope. The centrality measures are applied for defining the influential legislators among the long-term politicians and new-comers. We also test the hypothesis whether the co-authorship of MPs from confronting factions increases (or decreases) the chances for the draft law to become an acting law.

Keywords

Collaborative Efforts In The Parliament, Legislative Network, Ukraine

Is collaboration a luxury? Interorganisational collaboration approach within the Higher Education

Anna Piazza, Srinidhi Vasudevan and Madeline Carr

Abstract

2020 has changed how we are all working, including how educational institutions are engaging with everyone within their network. The recent increase in cyber-attacks have had a crippling effect on Higher Education Institutions (HEIs) which calls for collaborative efforts through Cyber Threat Intelligence (CTI) that will result in timely, actionable insights for institutions. While HEIs operate independently and in "silos", attackers are increasingly working together as evidenced by the Advanced Persistent Threats. Even though researchers have already investigated the cybersecurity collaborative work practices, few research has emphasised the social interaction process that shape collaboration among organisations in the cybersecurity market space. This paper takes a relational approach to explore the social mechanism that underlines the collaborative patterns through cyber threat information transfer across the sector. We use survey data on institutions and organisations to identify the distinctive collaboration patterns that characterise the higher education sector. Our preliminary findings show that stakeholders with high in-degree centrality are more likely to share timely threat intelligence that would aid HEIs remediate threats in a proactive and preventive manner. Furthermore, interorganisational collaborative networks are highly clustered. We extend the quantitative analysis with insights from qualitative interviews that allows us to elaborate a deep understanding of the social nature of this sector: human, governance and organisational factors and the perception about collaboration.

Our preliminary findings have key practical implications for the community as it allows managers to make strategic decisions based on the ability to structure their networks in terms of with whom they are connected to – in order to improve interorganisational collaboration among educational institutions. It allows policy makers to account for broad patterns of relationship and to foster collaborative practices in the sector to build cyber resilience and to improve the preparedness of the HEIs against the cyber threats they face.

Keywords

Collaboration Networks, Threat Intelligence Sharing, Stakeholder Maps, Survey Data

The Biomes of the Innovation Ecosystem: an analysis of co-authorship in the scientific production of Web of Science and Scopus

Cristiane Ferreira de Souza Araújo, Paulo Vanderlei Cassanego Júnior, Carla Schwengber ten Caten and Miguel Angelo Pereira Araújo

Abstract

Innovation ecosystems are supra-business entities that aim to create and capture value from collaborative innovation activities (Adner, 2017; Jacobides et al., 2018), which include the participation of companies, universities, non-profit organizations, media, communities and governments, is an example of collaboration and cooperation between different society segments (Hu & Li, 2013; Oskam et al., 2020; Gomes et al., 2018; Tsujimoto et al., 2018). Furthermore, innovation ecosystems promote the co-evolution of innovation groups and environments, connecting and transmitting material, energy and information flow (Li et al., 2014; Sun et al., 2021).

Thus, considering the subject's relevance and assuming the theme's emergence, we defined the research objective to analyze the scientific production on the subject, understanding the social relations established in the co-authorship of scientific articles as a preponderant factor in the segmentation and dissemination of the themes. Thus, the research question arises: How is the co-authorship network constituted in the scientific production on innovation ecosystems, according to the Web of Science and Scopus and what are the implications of these relationships in the theme's dissemination?

Tagliacozzo (1977) emphasizes the importance of identifying the interrelationships of the elements that make up a network of publications so that it is possible to trace the influence of one body of publications over another.

Sociometry (Moreno, 1992) does adopt as a research method, with a quantitative (Richardson, 2012) and descriptive (Gil, 2010) approach. To analyze the data, we used social network analysis (Recuero et al., 2015).

We analyzed 915 scientific articles, obtaining a social network of co-authorship formed by 1864 authors interconnected by 3016 edges. When analyzing the density metric, it does say that out of 100% of the possible connections, 0.001% are adequate. The modularity metric resulted in a value equal to 0.988, distinguishing 499 clusters.

We concluded that the authors who have the most significant number of direct connections in academic production on innovation ecosystems are Jin Chen (Tsinghua University/China), followed by Collet Dandara (University of Cape Town/South Africa), and Ambroise Wonkan (University of Cape Town/South Africa) with 17 connections each.

As for the degree of authority, the author Nirmal Sahay (Indian Institute of Management/India) is in the first position with a degree of 0.3075. Regarding the degree of intermediation, Maribel Guerrero (University Deusto/Spain) appears in 1st place, with degree 57.

Anamika Dey has the most prominent hub (Grassroots Innovations Network/India), with a grade of 0.3919.

In general, we understand that the studied network constitutes a heterogeneous set of scientific production, reflecting structural holes in the network. Several groups continue to share the same information due to the absence of connections with other isolated groups. We noticed that, although the authors work on the same theme, many of them work in isolation, especially when considering the network's density, that is, the number of links between actors and the number of high clusters (groupings of actors in the network representing co-authorship relationships, information sharing and approaches used).

Keywords

Co-Authorship Networks, Innovation Ecosystems Networks, Social Network Analysis

Reviewing energy justice literature: A co-authorship network analysis

Yutong Si

Abstract

The burgeoning energy justice scholarship highlights the importance of social justice concerns in energy transitions. This study is an initial attempt utilizing social network analysis (SNA) to provide insights on the patterns of scientific collaboration in the energy justice research community. The bibliographic data were obtained from Web of Science (1975-2021), including the information of 192 journal articles which contain “energy justice” in article titles. Based on the linear regression quadratic assignment procedure (LR-QAP) on the undirected and unweighted network of authors, we find that pairs of authors who share the same country (i.e., where an author’s institution/affiliation is located) are significantly more likely to collaborate with each other. In addition, according to actor-level centrality measures, Heffron, R.J., Sovacool, B.K., McCauley, D., and Jenkins, K.E.H. are the most collaborative authors (i.e., based on degree centrality), while also having the shortest communication path with other researchers in the co-authorship network (i.e., based on closeness centrality). Jenkins, K.E.H. appears to be a leading person bridging and connecting researchers (i.e., based on betweenness centrality). These four influential authors are all within the largest component (63 nodes) of the network. This review calls for more research collaboration across different countries in the energy justice research community, which can result in more comparative studies, especially the ones exploring energy justice issues between developing and developed countries. In addition, since authors within different components or subgroups may adopt distinct theoretical perspectives, this paper also suggests the need for more interdisciplinary and diverse collaboration among energy justice researchers.

Keywords

Energy Justice, Co-Authorship Network Analysis, Literature Review, Scientific Collaboration Patterns

Detecting communities in agricultural innovation networks

Juan S. Jimenez-Carrasco, Roberto Rendon-Medel, Julio Diaz-Jose and J.Reyes Altamirano-Cardenas

Abstract

The importance of farmers' relationships and attributes for the adoption of new practices in agriculture is recognised. However, in a country as diverse as Mexico, agricultural extension programmes are implemented in a uniform way and without considering this diversity of contexts and issues. Social Network Analysis (SNA) allows for the identification of patterns that emerge as part of the complexity of relationships and attributes that each farmer has in different territories. Therefore, SNA is a useful tool to promote differentiated strategies in agricultural extension. The aim of this work was to detect communities in agricultural innovation networks using attribute and relationship ranking methods for improving the adoption of agricultural practices. We analysed learning network data from 2,801 maize farmers in the Centre of Mexico, within a national extension process, in two years of observation (2017 and 2018). We used k-means cluster analysis for community formation, in combination with network indicators such as density, degree, homophily, radiality and integration. We detected three farming communities that were classified by their average grain maize yields as low (1.2 t/ha), medium (3.2 t/ha) and high (5.2 t/ha). We found significant differences $P > 0.05$ from year to year in the three farming communities for their attributes and relationships. The high yielding farmers' community reported higher increases in the number of actors (26% more nodes), higher information flows (26% more density) and higher number of sources consulted from one year to the next, implying that they are more dynamic farmers who contrast information with different actors, compared to the other farmers' communities. In addition, different patterns of adoption of practices were found among farming communities. The findings suggest that the use of social network analysis in agricultural extension services is of utmost importance and can have applications for decision making by detecting relational patterns in communities and promoting new technology dissemination alternatives based on the different contexts in which farmers live.

Keywords

Social Networks Analysis, Innovation Networks, Agricultural Sustainability, Rural Extension

Interrogating the Organizational Complexity of Digital Transformation Through a Multi-Level Network Perspective

Mylène Struijk, Spyros Angelopoulos and Carol Ou

Abstract

Organizations need to keep up with emerging digital technologies to remain competitive. Such technologies can provide stakeholders with new and improved ways to communicate and interact, thereby having the potential to radically change the way an organization operates. Hence, organizations increasingly engage in digital transformation (DT) endeavours, aiming to implement combinations of digital technologies and improve organizational performance. Such endeavours require changes in many organizational aspects, including strategy making, processes, and value creation paths. The inter-organizational and inter-personal networks of stakeholders are a crucial element during DT endeavours, since they become more complex, and the multiple levels of communication and interactivity become harder to manage. We set out to understand how and when the various stages of DT endeavours influence the complexity of organizational networks, and vice versa. With the aim to explore the entanglement of organizational network dynamics and DT endeavours, we conduct a longitudinal study at a multinational military command (AirTrans), which coordinates the air operations of seven European nations and is currently in the process of DT. AirTrans handles the cargo and human transport, air-to-air refuelling, and aeromedical evacuations of the various participating nations; it operates 24/7/365 from 13 bases, performs an average of 60 missions per day, and manages 60% of all military air transport assets in Europe. Apart from the participating nations, the stakeholders of AirTrans include military broker agencies, hospitals, regulatory agencies, as well as humanitarian agencies. We use a multi-level perspective to explore the dynamics of inter-organizational and inter-personal networks amongst the multiple stakeholders during the various stages of the DT endeavour to understand how the organizational network evolves, and how it affects the DT endeavour. We construct the longitudinal inter-personal network at AirTrans and utilize longitudinal organizational data of the AirTrans operations to construct the inter-organizational networks, covering participating nations and the other stakeholders during the various stages of the DT endeavour. Our work sheds light onto the relation between the various levels of organizational networks and the various stages of the DT endeavour, and provide insights on how organizational networks affect the DT endeavour and vice versa, enabling the design of DT strategies by incorporating networked interventions.

Keywords

Organizational Complexity, Digital Transformation, Multi-Level Networks

"How do I do it?" Working Across Boundaries in Social Work Interorganisational Practice

Antonio Samà and Francesca Falcone

Abstract

The research presented is part of "Constructions of Parenting on Insecure Grounds: What Role for Social Work? (COPING)", an Italian research project (PRIN) funded by the Italian Ministry for Universities. The scope of the project is to explore how parents - on insecure grounds (in general) and in forced migration (in particular) - represent their parenthood as well as to explore social workers' representation and tensions of the same role (Fargion, 2014). Furthermore, the research aims at exploring how social workers working with these users can be supported both in terms of developing their skills and abilities and the delivery of services and interventions (Falcone, 2021).

The overall question guiding the research is "identifying, across social, cultural and professional boundaries the strength and weakness of social work with forced migration parents". To address this question an empirical research has been carried out in four stages: feasibility study; engaging social workers; engaging forced migrated parents, analysis, and discussion.

Several methods within the qualitative paradigm were used at different stages of the research. In the first stage a feasibility study allowed to map the field, to identify the network of service provision and to build relations with the main stakeholders in a region in South Italy. In the second stage 18 social workers (working nationally, at the least for the last three years, with parents in forced migration in the public agencies and third sector organisations) were interviewed using a semi structured questionnaire. In the second stage in-deep interviews were conducted with 50 parents (refugees who had competed the process of asylum seeking at the least in the last three years, who live across Italy) with a personal experience of forced migration. One of the criteria is being a parent of children between 3 and 15 year old.

The Grounded Theory is driving the stage of data analysis.

The initial results show the difficulties but at the same time the possibilities of working across a series of boundaries. Social workers and parents share the limits of understanding across cultural boundaries. Social workers experience, at the same time, the challenges of working across discipline, professional and organisational boundaries. Interprofessional and interorganisational work takes particular emphasis and it challenges established skills and practice when operating in complex networks.

The initial conclusions of this research are: a) the needs of the parents with an experience of forced migration can be met by service not very much different from those for native parents but at the same time by specific service that are aware of this parenthood as "a transition in the transition"; b) in order to support social workers working in this area specific methodological, educational and organisational approaches need to be designed and developed.

This paper advocates that the latter issues can benefit from engaging with most recent developments in Management and Organisational Studies (MOS) from the complexity theory applied to organisations (particularly the notion of Complex Adaptive Systems) and from the studies on collaboration.

Keywords

Complex Adaptive Systems (CAAS), Interorganisational Work, Interoganisational Dynamics, Social Work Practice, Networking Skills

Technological Trajectories and Organizational Change: The Case of the Textile Industry

Jakob Hoffmann and Johannes Glückler

Abstract

A transition towards a more climate friendly and sustainable global economy implies technological and potentially organizational change for many established industries. This also holds for the textile industry, which – next to apparel and footwear – also includes industrial and technical textiles and is so far heavily based on fossil feedstocks for many synthetic fiber applications. We here address the technological change forming the basis of the transition from crude oil-based to biobased and closed-loop textile production processes which manifests along the textile value chain. We utilize citation networks among patents and methods from main path analysis to trace different technological trajectories and their regional and organizational embeddedness. Based on this representation we investigate how technological change induces organizational change through market entry of newcomers or strategic realignment of incumbents.

Keywords

Technology, Industry Organization, Patents, Citation Networks, Main Path Analysis

Research project on the evolution and affiliation to multipartner alliances in the airline industry

Marco Castiglioni and Jennifer Medina-Zamora

Abstract

This abstract serves us to present one of the projects in which the network research group of the Faculty of Economic and Business Sciences of the University of Seville is working at present. Our research group is interested in the evolution of inteorganizational networks, the development of competitive advantages (through cooperation) and the management of network resources (appropriation and mobilization).

The project that we present in this conference studies the evolution of the network structure of the airline industry, over 20 years (1996-2016) using a Stochastic Actor-Oriented Models (SAOM) approach. This industry is characterized by a high tendency of companies to cooperate at dyadic level through different types of strategic alliances (dyadic alliances). Additionally, multipartner competing alliances in the form of constellations of companies are present in this industry, which can determine a second level of cooperation. Indeed, airlines may decide to form strategic alliances with other actors in the network (first level of cooperation) and may additionally try to join a constellation, a collective organizational association that engages its multiple members in multilateral value-chain activities (second level of cooperation). These airline constellations are very important in this industry, as they have marked the evolution of the competition in the last 20 years.

The main objective of our project is to study the microdynamics underpinning the evolution of these company constellations. This will bring us closer to understand the processes that determine the affiliation of airlines to these multipartner organizations, as well as their permanence in them or exit from them. In order to determine the drivers of network evolutions we will use actor attributes (company characteristics) as well as dyadic variables (previous alliances between companies, company characteristics and geographical proximity, etc.).

Keywords

Organizational Network, Network Evolution, Microdynamics

Does the Social Network Analysis recognize the development in a territory?

Vincenzo Mini

Abstract

Let's start with another question: Will improvements in information technology eliminate face-to-face interactions and make cities obsolete? The answer, at the beginning of the last century, was that surely some face-to-face relationships would be conducted electronically. On the other hand, it has been argued that technological innovations can still involve face-to-face interactions. Conclusions still relevant. More recently, an additional incentive factor to keep cities efficient has been introduced, the need for frequent contacts, with challenges for city modeling as existing models did not take this need into account. Cities, particularly affected by a development linked to intangible, creative cities, in which the demand for face-to-face interactions, especially non-coded ones, has increased and it was the distinctive trait that led to a development that felt "in the air" . This question is more difficult in "large" territories, where the opportunities for meeting and, why not, for confrontation were highly codified, bogged down by customs.

Returning to the question in the title, the role of face-to-face interaction is certainly present in growth and economic development, even in an accessory but always usable way. The research, in various academic fields, had investigated the relationship between them connoting it with implicit assumptions such as; the shorter distance, which facilitated face-to-face interaction, led to the ease of knowledge exchange, an innovation that triggered local growth. However, the frequency of such interactions was not taken into consideration. Subsequently introduced and considered as a decision-making variable in the objective function of innovation, it has led to underline its importance, also linking it to geographical distance.

The question, which comes to our aid in our current perspective, is: "What role and importance exactly do face-to-face interactions play in driving innovation?". To answer this and other related questions, the author proposes a new model that explicitly links knowledge sharing activities created by dedicated hubs and localized innovative activities. He points out that the model produces theoretical results that are broadly consistent with orthodox neoclassical urban economic models of localization and also with much of the theoretical and empirical literature on the geography of innovation and assumes that greater direct contact between individuals and firms is positively related to levels of innovation. However, he warns that this positivity does not have, from the literature, a shareable warning, clear and univocal mechanisms. Furthermore, he observes that the intensity and frequency of face-to-face interactions are different between production realities, differently pervaded by innovations, while ascertaining that this can be facilitated by geographical proximity. He concludes, to be emphasized at this juncture, that the frequency of interactions poses challenges for the modeling of the city since existing models do not take them into account.

In conclusion, since Social Network Analysis is based on the methodologically supported collection, processing and analysis of relational data, we believe it is possible to answer the question in the title in the affirmative.

Keywords

Buzz, Face-To-Face, Development, Cities, Territories

Horizontal governance networks of poverty: the case of Milan and Turin

Marco Ferracci, Germana Scepi, Maria Spano and Michelangelo Misuraca

Abstract

The spread of covid-19 has pointed out the importance of territorial responses in Italian welfare system and has highlighted some territorial differences in poverty structure and in strategies of local containment (Saraceno et al 2020; Bagnasco 1977). Urban dimension of poverty represents an important theme of the next future and it is important to develop strategies of analysis according to the process of welfare territorialization (Bifulco 2015). This paper aims to analyze different strategies of territorial responses by horizontal governance networks of poverty. In particular, we discuss the case of two Italian cities: Milan and Turin. We try to study their behavior during the pandemic in 2020: what kind of responses these cities carried out, the capacity of local actors, and what kind of resources these used to contain the unexpected pandemic event. The choice of these two realities is motivated both by their importance in the Italian economic scenario and by their

similar structure of urban poverty. The local responses are collected by Milano Aiuta and Torino Solidale. Milano Aiuta and Torino Solidale are created during the first lockdown by the promotion of municipality involving pre-existent local networks of actors. The aim is to help people and families by offering some services (i.e. old assistance, phycological support), food distribution and monetary support. Following a mixed-methods research approach (Amaturo & Punziano 2016), we collected data of different nature: quantitative data from secondary sources (deliberations, municipal acts, journals, scientific articles) and qualitative by interviews at key informants. A Social network analysis (SNA) tool (Borgatti et al 2013) is used

for analyzing these data and their relationships. We consider as attribute the variables: sex, kind of organization, covered position into the organization by individuals, kind of organization -laical or religious-. The paper discusses the features of the two networks and realities, focusing on equalities and differences,

and the processes of implementation including the different phases that were carried out. We will show both the innovative features included in the two projects and the relationship between municipal and private actors.

Keywords

Horizontal Governance, Urban Poverty, Covid-19, Social Network Analysis

Predictive Analytics in Urban Studies: Indices of Social Stress and Well-Being

Maria Pilgun

Abstract

The presentation submits the results of research on the development of predictive analytics methods in urban studies, and also approaches for constructing neural network models for analyzing the social media users' perception based on their digital footprints.

The material for the study was data from social networks, micro-blogs, blogs, in-stant messengers, forums, reviews, videos dedicated on road construction in Moscow.

Using a model based on the neural network paradigm of using neural-like elements with temporal summation of signals (the so-called corticomorphic associative memory), the topic structure of the database and the results of summarization were analyzed, which made it possible to extract explicit information. On the other hand, such a network representation of the text made it possible to isolate and interpret the semantic network in the form of a set of interrelated concepts. With the help of the semantic network, implicatures, semantic accents that are most important for actors were analyzed and rated.

Analysis of the dynamics of indices of social stress and well-being made it possible to identify conflictogenic digital zones and main causes of conflicts, to determine the level of social stress, to predict the growth directions of identified conflicts and to develop recommendations to neutralize the situation.

Keywords

Predictive, Analytics, Neural, Network, Technologies

Decentering the center-periphery approach to the global art field

Julia Perczel and Balazs Vedres

Abstract

Numerous changes occurred in the art world since the start of the post-Cold War period that rendered the national art fields into a global structure, functioning through a joint logic, shared practices and novel hierarchies. The number of galleries, museums and exhibitions multiplied, a global network of biennales and a global art market emerged, artists started to enact international career, world-wide artist rankings launched, and the notion of contemporary art emerged step-by-step transforming the discourse towards a global and postcolonial perspective.

The dominant line of research, embedded in the tradition of (cultural) world system analysis conceptualizes the structure of this global art field by focusing on the power-relations among its various territorial units (transnational regions, countries, cities) emerging in distinctive dimensions of the global cultural economy. While focusing on macro-level building blocks of the global, this line of research paid comparatively little systemic attention to structural positions emerging through micro and meso level agencies in this social sphere.

Another important line of research models the structure and dynamics of the global from the other direction and focuses on characteristic interactions among individual agents and the so emerging relational socio-structure of the field. Yet, research usually remains within national setting and generalizes findings for the field treating the empirical case as a pars pro toto. Omitting to consider the geopolitical realm of individual agency, however, not only poses issues regarding generalizability amidst the strong global core-periphery structure proven by the prior line of research, but also misses out on the possibility of examining in a fine-grained sense how the geopolitical context of individual agency contributes to sewing the fabric of the global.

In our research we integrate the two approaches in one empirical investigation. We build a framework which incorporates the interdependent layers of the macro-, meso- and micro-levels of agency while conceptualizing the structure of the global art field. Considering the era between 1990-2018, our dataset comprises the exhibition career of 3,409 artists from the Central-East European region through 103,783 exhibition events and 39,513 unique exhibitions held at 9,241 venues in 2,159 cities and 112 countries. First, utilizing the well-established moving-window technique we model the dynamic structure of the field through building co-exhibition networks of venues. Then, we compare artistic careers on these networks to connect the structure and the trajectories it enables with the functioning of consecration in the field. Results show that such a complex structure enables multiple routes for artists while navigating the field and we find strong evidence of a pattern which is relatively independent of the center-periphery dimension of the global and which makes artistic trajectories especially appealing for dominant actors while they enact consecration.

Keywords

Globalization, Center-Periphery, Network, Career Patterns, Art

Complementary ties and different meanings in interregional co-patenting and co-publishing

Lin Zou and Robert Panitz

Abstract

Drawing on patenting and publication data and based on 25 interviews in equipment manufacturing in three economically distinct regions of the Yangtze River Economic Belt in China, we explore the structure and meaning of inter-regional knowledge creation networks. Concretely, we demonstrate that co-patenting and co-publication create knowledge related and structural complementariness which increase the connectivity and reach of knowledge creation processes of firms and universities. By accounting for different inter-regional and structural contexts, we find behind the same type of ties different intentions, meanings, and knowledge activities. E.g. co-patenting and co-publishing relationships of firms and universities in economic core regions seek to secure access to global future key technologies, Scientific and economic actors in economically less developed regions, on the other hand, use such relationships as access points to existing technology knowledge. In contrast, knowledge co-creation activities of actors in "sub-core regions" follow the requirements of their partners in inter-regional value chains.

In sum, we demonstrate the empirical and theoretical value of a contextualized view on inter-regional knowledge creation networks. The empirical findings support the critique against a universal understanding of specific type of ties and offer a clearer understanding about the function of co-patenting and co-publication as instruments to acquire, to develop and to share technological and scientific knowledge.

Keywords

Patent Networks, Publication Networks, Inter-Regional Networks, Knowledge Co-Creation

Relational assessment of urban landscape. The case study of Bogotá Centre

Dolly Cristina Palacio Tamayo and Amparo De Urbina Gonzalez

Abstract

This proposal identifies the most important urban settings from a set of visitors, taking advantage of the information that they reported daily to Panoramio -a Big Data source- between 2007 and 2014. This platform, which was consulted through Google Earth until 2016. It was dedicated to displaying photographs of places or landscapes that the same users recorded and georeferenced based on their experiences in the territory. Accessing to this source allowed the construction of a proposal for the valuation of urban heritage taking into account the urban landscape from the of humanistic geography point of view, recognizing what the subject perceives of their environment, urban settings based on photographs that they share.

From a database with 6060 photos taken by 1079 users in the center of Bogotá, and after a series of methodological decisions, it was possible to identify 129 scenarios visited by 538 individuals. These 129 scenarios constitute the input for the analysis, which display the socio-spatial structure that exists between them. Interactions between scenarios is established from the number of individuals who coincide in photographing them. The more photographs a scenario has received, the more central it results in this structure. Not only because of the number of photographs, but also, because of the relationship established with the other scenarios in cooccurrence.

To visualize the centrality patterns of the set of scenarios, the nodal degree centrality was used. This centrality degree is assumed in this exercise as an empirical assessment indicator that shows how the system is ordered. This relational data is not crossed by any personal or technical criteria, it emerges from the analysis as a result of the nature of the interaction of the photographers -individuals- with the places. The graphing and visualization of networks as well as the degree centrality indicators were represented running the UCINET program (Borgatti, Everett, & Freeman, 2002). On the other hand, the degree centrality indicators were linked as an attribute to the georeferenced scenarios in ArcGIS, in order to make these centralities visible in the territory.

This approach and partial conclusions are part of a doctoral project in Social Studies at the University of Externado de Colombia -Faculty of Social and Human Sciences-. This research work aims to develop a methodology for assessing the historic center of Bogotá, understood as urban heritage, addressing the social dimension. Within the Thesis committee of this research developed by Amparo De Urbina is Dr. Dolly Cristina Palacio Tamayo, both co-authors of this proposal.

Keywords

Assessment, Urban Heritage, Social Network Analysis, Geographic Information System, Bogota

Redes comunitarias del agua en bordes urbano-rurales. El caso de Bogotá.

Dolly Cristina Palacio Tamayo and Rafael Germán Hurtado Heredia

Abstract

Mantener el agua y los sistemas ecológicos y sociales asociados, es un problema de todos. Los acueductos rurales manejados por sus habitantes, mediante Asociaciones de Usuarios, que aquí llamaremos Acueductos Comunitarios -AC, en Colombia, son más de 15.000. Ellos comparten sus fuentes con las demandas urbanas. Los AC se componen de elementos ecológicos, técnicos, sociales y administrativos, donde el liderazgo y el conocimiento acumulado de las personas con vínculos territoriales son relevantes y constituyen una memoria social de la capacidad colectiva que ostentan como actores importantes para la sostenibilidad del territorio. No obstante, los AC no emergen solos, ni pueden ser eficaces en sus objetivos y menos lograr sostenibilidad ambiental y territorial, sin la acción conjunta con otros actores humanos y no humanos. Las relaciones sociales con las fuentes naturales, las instituciones gubernamentales y no gubernamentales y la academia, a distintas escalas y con diferentes competencias y funciones, son indispensables para mantener su funcionamiento. En este estudio mostramos, cómo los habitantes de un territorio rural, de donde Bogotá capta el agua para casi 2 millones de habitantes, han construido, desarrollado y sostenido la gestión del sus AC, a partir de acciones conjuntas que tienen propiedades materiales y simbólicas.

Con el fin de dar cuenta de ello, en el marco de un proyecto financiado por Colciencias, recogimos relatos temáticos de 13 líderes de 10 AC, orientados por un diálogo de confianza, haciendo hincapié en la trayectoria de los actores implicados en la gestión y las interacciones que hicieron parte de los procesos de diseño, implementación y gestión de un AC, desde su origen en 1980. Así mismo, analizamos el archivo de contratos para el acompañamiento a los AC de la Dirección de Gestión Comunitaria de la Empresa de Acueducto de Bogotá, período: 2006-2015. Se sistematizaron los relatos y el archivo en líneas de tiempo y matrices de dos modos aplicando series de tiempo y medidas de centralidad propios del Análisis de Redes Sociales – ARS.

Del análisis se reconocen más de 53 actores que emergen de la acción conjunta de los AC, así como se refleja la participación de 899 personas y 247 organizaciones. Así como se representa en dioramas la participación de los de actores no humanos en los procesos de diseño, implementación y gestión de los AC. En particular se evidencia que la participación de las personas muestra una distribución de probabilidad acumulativa complementaria, una ley de potencia y un proceso de organización crítico. Es decir, se evidencia la configuración de un núcleo que moviliza el proceso. En síntesis, estas acciones conjuntas construyen vínculos que conforman topologías y centralidades que se van densificando en el tiempo y el espacio, a la vez que se consolida un núcleo. Con ello argumentamos que este proceso es una construcción social, a partir de redes de práctica y aprendizaje de la gestión colaborativa del agua, cuya importancia es mantener un tejido social y socioambiental permanente, cuya existencia asegura la sostenibilidad del territorio que depende de las fuentes de agua que lo nutren.

Keywords

Agua, Redes Comunitarias, Borde Urbano Rural, Bogotá

Siempre conectados: interacciones y formas de inclusión social y digital de los jóvenes en el contexto del confinamiento por la pandemia de COVID-19.

Alejandro García-Macías, Paulina Guzmán and Ana Laura Flores

Abstract

La ponencia describe la metodología y los resultados preliminares de un proyecto cuyo objetivo consistió en analizar los efectos del confinamiento y el distanciamiento sociales producto de la pandemia del virus SARS-COV2 (COVID-19) en las relaciones interpersonales de los jóvenes y en el conjunto de sus actividades sociales anteriormente habituales.

Para ello se realizó un estudio de redes personales a una muestra de jóvenes universitarios (N=190) de nueve entidades federativas del Centro Occidente de México: Aguascalientes, Colima, Guanajuato, Jalisco, Michoacán, Nayarit, Querétaro, San Luis Potosí y Zacatecas, a través de una entrevista autoadministrada en línea con el apoyo del software EgoWeb 2.0. Para la elicitación de las redes se utilizó un generador de nombres con tres posibilidades de inclusión de contactos: disfrute en la convivencia, discusión de temas importantes y haber tenido contacto permanente a través de cualquier medio durante la pandemia, por razones de escuela, trabajo, familia, etc.

Los resultados preliminares dan cuenta de las formas en que se realizaron diversas actividades sociales de los informantes en el marco del distanciamiento social, tanto en forma presencial como tecnológicamente mediada, incluyendo las de tipo educativo, deportivo, entretenimiento, cultural, convivencia familiar, entre otras.

Los hallazgos confirman el papel central que desempeñaron las Tecnologías de la Información y la Comunicación (Tic's) para favorecer formas de inclusión de naturaleza digital que permitieron el mantenimiento de las interacciones con los miembros de sus círculos sociales. Se encontraron además limitaciones diferenciadas de la actividad interpersonal conforme a diferentes tipos de relaciones con los contactos (familia, amigos, compañeros de trabajo o escuela, etc.) o intensidades de proximidad relacional.

Finalmente, se presenta y discute la propuesta metodológica para la segunda fase del estudio, en la que se propone analizar los cambios en los perfiles relacionales y de actividad social de los informantes, una vez que inicie el retorno generalizado a las actividades presenciales en las instituciones de educación superior.

Keywords

Inclusión Social Y Digital, Jóvenes, Pandemia

Redes personales de apoyo social en cuidadores de personas con demencia durante la pandemia por Covid-19: un proyecto con EgoWeb

Rosario Fernández, Abraham Delgado Diego, Aroa Delgado Uría, Alejandro García-Macías, Carmen Ortego-Maté and Carmen Sarabia-Cobo

Abstract

La demencia es una de las principales causas de discapacidad y dependencia entre las personas mayores en todo el mundo con un impacto físico, psicológico, social y económico no solo en las personas que la padecen, sino también en sus familias, la sociedad en su conjunto y en sus cuidadores. Diferentes trabajos han mostrado elementos que actúan como predictores significativos de la sobrecarga del cuidador como el aislamiento social o la calidad de las relaciones entre otros. El Global Action Plan on the Public Health Response to Dementia 2017-2025, y el Plan Integral de Alzhéimer y otras demencias (2019-2023), contemplan entre sus áreas de actuación el apoyo a los cuidadores de personas con demencia con el objetivo principal de satisfacer sus necesidades y evitar que disminuya su salud física, mental y su bienestar social. Además de las estrategias de apoyo formal, los recursos personales de apoyo o las redes de apoyo informal del cuidador, pueden ayudar a hacer frente a la carga de los cuidados, mejorar su calidad de vida y actuar como mediador a lo largo del proceso del estrés del cuidador.

En los últimos meses, el brote mundial del nuevo virus COVID-19, ha tenido un impacto significativo en la prestación sanitaria de los sistemas formales de salud, así como en las relaciones personales a través del distanciamiento físico y social. Durante este tiempo de confinamiento, los cuidadores han tenido que modificar las rutinas con sus familiares debido a las medidas de distanciamiento físico y no está claro en qué medida esta nueva situación ha repercutido en la experiencia y necesidades de los cuidadores informales, así como en la provisión de apoyo social de su entorno personal. Este proyecto, tiene como objetivo el estudio desde un enfoque mixto, de la dimensión comunitaria de los recursos de apoyo en cuidadores de personas con demencia no institucionalizadas, así como el impacto que ha supuesto la pandemia por COVID-19 en el apoyo, el desempeño del cuidado, así como las consecuencias en la salud y sobrecarga del cuidador. El estudio se realizará en la comunidad autónoma de Cantabria (España) en la que en el año 2020 existían 5.390 personas con demencia, 3.530 de ellas en domicilio. Dada la situación sanitaria, la recogida de datos se realizará vía telefónica y/o virtual. Se realizarán entrevistas cualitativas semi-estructuradas, y el estudio de la sobrecarga a través del cuestionario Zarit. El estudio de las redes personales de apoyo se realizará con el software EgoWeb a través de un cuestionario diseñado ad-hoc de acuerdo con los objetivos de la investigación.

En los resultados se espera conocer la relación entre los indicadores de estructura y composición de la red personal con la sobrecarga, así como la experiencia del cuidado y la variación en los recursos personales de apoyo debido a la pandemia.

Keywords

Cuidador, Redes Personales, Apoyo Social, Demencia, COVID-19

Modeling the dynamics of egocentric social-interaction networks

Timon Elmer, Marijtje van Duijn, Nilam Ram and Laura Bringmann

Abstract

Social interactions within one's social network are a fundamental part of everyday life. Despite the advancements in (ambulatory assessment) methods to measure social interactions in daily life, there is a lack of statistical methods that facilitate the modeling of the dynamics in such egocentric social-interaction networks. This presentation forwards a statistical model combining methods from survival analysis and social network analysis to model the propensity for individuals to interact with certain interaction partners – informed by previous interaction dynamics and individual attributes (e.g., affect). Using the iSAHIB dataset (N = 150) in which social interactions (T = 64,112) and affect dynamics were measured using event-contingent experience sampling methods (Ram et al., 2014), we illustrate how survival models can advance the understanding of social-interaction dynamics in daily life.

Keywords

Ego-Networks, Network Dynamics, Ambulatory Assessment, Experience Sampling, Affect, Psychology

The social support of older adults during the first wave of coronavirus epidemic in Slovenia

Marjan Cugmas, Anuška Ferligoj, Tina Kogovšek and Zenel Batagelj

Abstract

Measures for preventing the spread of SARS-CoV-2 coronavirus in the first wave of the epidemic have significantly impacted the availability of aid sources. The lockdown might affect the elderly population even more since many are heavily dependent on the help of others and, at the same time, more vulnerable in the event of coronavirus infection. Specific forms of formal assistance at home are available to the elderly, but informal sources of help (social support) are essential. Furthermore, adequate social support is crucial in maintaining physical and mental health. Hence, the present study addresses the emergence of different social support network types among the elderly living at home during the first wave of the coronavirus epidemic. As part of the survey, a representative and probabilistic sample of people over 64 years old was collected between 25 April and 4 May 2020. In the online survey, respondents listed and described the persons they turn to for various kinds of help (socializing, emotional support, instrumental support). The ego-centred networks were formed based on these data and analyzed by clustering of symbolic data. The obtained clusters are mostly consistent with those obtained within the earlier studies. Regarding the accessibility of social support, the results show that more than half of the elderly have sufficient social support networks, but the share of people without any social support is high.

Keywords

COVID-19, Social Support, Ego-Centric Network, Network Clustering

Analyzing ego networks through a hierarchical clustering approach for mixed data

Elvira Pelle and Roberta Pappadà

Abstract

In recent years, the analysis of ego networks has attracted a great attention and found application in many areas of the social sciences. Several studies have pointed out the crucial role played by network characteristics (such as size and composition) in the study of social relationships and their impact on many aspects of everyday life (e.g., social support, well-being, health, and mobility). In this context, the identification of network typologies has become a crucial task and a powerful tool to capture aspects of the social space or personal community in which people are embedded. Along this direction, clustering methods have been exploited to identify and characterize existent types of ego networks.

In this work, we propose a distance-based clustering procedure to identify groups of similar ego networks, which are described by a small number of compositional variables. The proposed approach is motivated by the empirical study of ego networks of contacts extracted from the latest edition of “Family and Social Subjects" (FSS) Survey conducted by the Italian National Statistical Institute in 2016. In particular, we focus on elderly respondents living alone, which can be regarded as a vulnerable category, with the aim to describe their network of contacts. As the FSS Survey is not specifically oriented to network analysis, its major limitation consists in the lack of information on alter-alter ties. Coping with these limitations, we first mine relational information in FSS data in order to derive the ego networks of respondents. Then, we develop a clustering procedure in the hierarchical framework to identify a partition of ego networks according to their composition.

The proposed approach has the main advantage to be particularly suitable when the involved variables are heterogeneous, in both range and type, which can easily happen if ego networks are derived from secondary data, rather than using ad-hoc designs. We discuss the choice of a suitable dissimilarity metric and the issue of the selection of the number of clusters. The prototypical units---one for each cluster---resulting from the proposed method, enhance the cluster interpretation.

Results on the analysis of ego networks for the elderly people show the suitability of the proposed procedure to investigate the existing patterns in egocentric data, especially when the data are defined over heterogeneous attributes concerning the network composition, making our approach applicable to various surveys.

Keywords

Ego Network, Clustering, Prototype, Mixed-Type Data

Transport geography network development mechanism in Waterfront area - taking An'Xin County as an example

Chaoqun Wang and Jie He

Abstract

Water village settlements' distribution and evolution pattern are affected by complex mechanisms. With the rapid development of China's land transportation facilities, to develop a sound road system and integrat into the regional transportation network has become an inevitable trend for the transformation of water villages. The paper studies the evolution mechanism of land transportation in Anxin County, where 50% of the territory is land and 50% of the ecological lake Baiyangdian, located in Xiong'an District, has the dual meaning of politics and ecology. Creatively applies the urban road network analysis method to county-level analysis, reproducing the formation process of the land transportation system and the changes of the village transportation centrality of the water villages. Combined with the centrality of transportation and its own development, we construct a comprehensive index to evaluate the development conditions for land transportation in the village. Found that: (1) The modern roads in Anxin County did not integrate well with the water body, which led to the decline of the land traffic conditions of the water village; (2) Baoxin and Xuxin highways and the surrounding Gaobao roads all contributed to the centrality of the surrounding village traffic. effect. However, the Rongli line does not greatly improve the overall centrality; (3) Anxin County has high overall centrality but not local centrality; villages and central areas adjacent to water bodies around the county Villages along the Baoxin Highway and the north-south border have high traffic centrality. (4) villages in Laohetou Town and Liulizhuang Town have a high comprehensive index. (5) The production parameters of this study can be used to provide a reference for dividing village types in the construction of land transport network.

Keywords

Water, Settlements, Geography Network

Terminal ownership structures and equity ties in the Italian port system: a Stochastic Actor Oriented Model

Marcella De Martino, Alfonso Morvillo and Giuseppe Giordano

Abstract

Terminals are strategic assets in ports, as junction node between the "sea" and "land" phases along the logistics supply chain. Thanks to the privatization and deregulation of the port industry, these strategic assets have increasingly attracted the interest of global players, who aim to consolidate their market position through horizontal and vertical integration processes. Furthermore, the industry has witnessed an increase of equity cooperative agreements, and specifically equity joint ventures (EJVs), for sustaining investments in new terminals and entering new foreign markets. This large number of partnerships generates complex relationships network and companies try to be engaged in new partnerships for facing international competition. However, the competitive and cooperative relationships between competing neighbouring terminal containers deserve attention from port authorities both at intra-port and inter-port competition. Joint ventures are hybrid forms of organization between a pure market and hierarchy, and they are often discussed under concepts of strategic alliance and inter-organisational relationships, dyadic or network-like arrangements. An interesting research stream drawing on network literature views equity venture as a stand-alone entity, seeking to maximize its own performance. It offers important insights on the EJV's impacts on the domestic market. Adopting this perspective, the objective of the paper is to analyse new partnerships formation in the Italian container terminal industry as expression of coopetitive strategies performed by terminal operating company (TOC). To this end, TOC can be interpreted as ego-network according to the network approach, where links between the ego and alters are equity ties. These reticular equity structures express different organizational behaviours and relational patterns (horizontal and vertical integration processes). From the methodological point of view, the study applies the Stochastic Actor Oriented Model, shedding light on the new ties' formation and network structure of container terminals in three waves (2011, 2015 and 2019) in terms of: size (number of equity ties), density (propensity to build equity ties) and business' partners (homophily and heterophily). This perspective of analysis favours the understanding of strategic choices of TOCs as well as their power and dominant position in the industry, at national level. It thus provides relevant information to policy makers as it highlights network centrality measurement and TOC's attitude to build supply chain relationships. Results show that the Italian container terminal industry is characterized by leading positions of a few players that have increased the number of equity ties in pursuing coopetitive strategies. These issues are of crucial importance and deserve attention from the Port Authorities with reference to the terminals' concession policy and competition in the market.

Keywords

Terminal Network Structure, Equity Tie, Coopetitive Strategy, Power And Control, Port Competitiveness, Stochastic Actor Oriented Model

Moving from maritime supply chains to a maritime supply network

Thierry Vanelslander and Christa Sys

Abstract

In the past two decades, the focus of research has evolved from actor to maritime supply chain thinking. Due to the fast-changing and increasingly volatile global environment (changed supply and demand patterns), however, existing maritime supply chains are no longer optimal, that is, the most efficient and the cheapest. As a consequence, further integration of the maritime supply chain(s) is the subject of a general discussion. The added value of this paper is to identify the bottlenecks and explore strategies for preventing and overcoming them as well as to describe how actors involved in a maritime ecosystem (controlled by both internal and external factors) can benefit from economies of scale, scope, and density. It proceeds in three steps. First, it provides an overview of the remaining key issues and how to handle them. Second, the chapter considers three perspectives (industry, policy, and management perspectives) in order to reshape the maritime supply chain. Third, this paper puts forward some scenarios on how the industry should evolve from bilateral partner collaboration (one-to-one collaboration) to multi-country maritime supply network (many-to-many collaboration).

With respect to key issues, linked with the domain “shipping”, two main challenges come to the forefront: a lack of data and regulatory issues. Second, the remaining challenges in shipping (collecting data, creating regulation) also emerge in the domain “ports”. Third, data (e.g., slow integration of digitalization of administrative formalities for shortsea shipping) and regulatory issues also prevent integration within the domain “hinterland”.

With regard to the considered perspectives, the industry perspective refers to the actors operating in this industry as well as the (rapidly evolving) market developments (e.g., ICT technologies) and dynamics. With a view to maritime ecosystem development, integration with other actors, both vertically and horizontally in chains, is particularly necessary. Forwarders and logistics service providers can benefit from the elimination of nonvalue adding activities such as typing over data from different sources, which frees up more quality time for dealing with customers and exceptions. The second perspective to approach a network focuses on the rationales and aspects of policy. Following remaining challenges are identified: regulation, data, and legal issues. The third perspective refers to regulatory and compliance strategies by management. Given technological changes, geopolitical challenges, volatile fuel prices, and environmental issues, companies need to adapt themselves with adequate strategies (i.e., mitigating risk and adhering to rules set by government authorities).

With respect to the scenarios of how the (transport) industry should evolve to a maritime supply network, this will usually involve innovative technology (collaborating on shared platforms, AI, AR, ML) but also focusing on the people aspect of collaboration. Two clear scenarios can be distinguished: a minimum and maximum scenario. In between, a range of different scenarios can be worked out, depending on the scope (local versus global initiatives), evolution/adaptation of technology (AI, AR, ML), integration with other transport modes (hinterland operators, air transport), and required skills.

Keywords

Maritime Supply Chain, Maritime Ecosystem, Data Sharing

Handling Missing Attribute Data

Robert Krause, Mark Huisman and Anna Iashina

Abstract

While several advances in the field of handling missing link data have been made over the past decade, missing attribute data is still either disregarded (i.e., removed), handled with simple methods (e.g., mean imputation), or treated separately from the network.

In this presentation, we will present several options for handling missing nodal attribute data, taking into account network structures as well as the hypothesized network processes.

The proposed methods make use of (B)ERGMs and SAOMs and are adaptable to other models (e.g., ERNMs). They can be used for multiple imputation of missing links and attributes (BERGM, SAOM) and augmented estimation (BERGM).

Keywords

Ergm, Bergm, Saom, Missing Data

How to determine the appropriate number of nearest neighbours for treating the missing data?

Anja Žnidaršič, Anuška Ferligoj and Patrick Doreian

Abstract

Published research typically analyses complete network data, or treated as complete by discarding missing data. The latter is far from ideal because all networks are prone to having incomplete data, regardless of the source of gathered network data or the nature of the network relations. In social network analysis, most of the data is still collected through surveys which are especially prone to actor non-response.

Actor non-response takes the form of having no outgoing ties for actors refusing to respond. In a matrix representation of a network, this shows up as whole row of unknown values for each non-respondent. One too frequently selected option is to use only complete data, deleting non-respondents are deleted from the network. This implies disregarding incoming ties to non-respondents. But when the network position or centrality of actors is important, the unreported ties have to be treated properly.

One of the best treatments in case of actor non-response is the k-nearest neighbours approach. The algorithm searches for the k nearest actors according to their incoming ties and then computes the outgoing ties of the non-respondent as the median of the outgoing ties of the selected nearest neighbours. Prior research has shown the effectiveness of this strategy. Here, we attempt to determine the appropriate number of the nearest neighbours used to impute missing ties. We ask, for example, is it better to use for example three nearest neighbours or just the closest one?

Simulation results based on several real networks are presented. The impact of network treatments on different network characteristics and measures (e.g. centrality) as well as partition obtained by different blockmodeling approaches are investigated.

Keywords

Missing Network Data, Actor Non-Response, K-Nearest Neighbours, Imputations, Actor Positions, Centrality

Online collaborative networks: A study on the antecedents of collaboration in a virtual innovation community

Guido Conaldi, Riccardo De Vita, Stefano Ghinoi and Dawn Marie Foster

Abstract

Collaboration enables the sharing amongst individuals of resources and knowledge required to innovate. In recent years processes of collaborative innovation have increasingly developed in virtual spaces, because of the advancement in the use of online technologies and the much increased need for distance work. The importance of these spaces for supporting innovation has been widely explored in the literature, however it is still unclear what underlying mechanisms foster cooperation in them. Virtual spaces are capable to overcome physical and geographical barriers, pushing us to redefining proximity as a multidimensional concept. At the same time online collaboration events still over time embed individuals in a network of collaboration ties that has been shown to significantly influence future collaboration. We investigate collaboration events in a virtual innovation community and we model the influence of proximity on the likelihood of collaboration between individuals. We use relational event models to allow for the network structure formed by collaboration events over time to be directly modelled, together with variables capturing multiple proximity dimensions and other control variables. Our results show that different measures of proximity have different effects on collaboration: geographical proximity does not have a direct impact on collaboration once the relational structure of collaboration is accounted for. Organizational features defined by institutional and organizational proximity do instead significantly affect collaboration. Cognitive and social proximity do also significantly, and positively, affect collaboration, but these relationships show a u-shaped curve, i.e., further increases in cognitive or social proximity have diminishing returns over time.

Keywords

Team Dynamics, Subgrouping, Faultlines, Network Dynamics

Trust in Virtual Teams: an empirical investigation of social networks during the Covid-19 pandemic

Nicola Capolupo, Amelia Rainone and Paola Adinolfi

Abstract

One of the major controversies generated by the concept of social capital concerns the relationship between social networks and trust. This binomial becomes indissoluble to understand the spark of human relationships. Trust ties represent the fundamental hub to understand the effective functioning of human relations within a social network. Nevertheless, what happens when it is fully translated into a virtual context? This contribution presents an empirical investigation of trust building within Virtual Teams (VTs) during the current Covid-19 pandemic, outlining the concept in its theoretical and analytical dimensions. After a preliminary introduction of the topic and an explorative literature review, a virtual focus group conducted on the students of a Master's degree of the University of Salerno will be conducted, addressing the trust relationships during the Covid-19 emergency in total absence of FtF communication. Empirical data resulting from the social network analysis will be extracted and compared to the variables that influenced the emersion of links, with reference to density and centrality of the social network. Furthermore, to compare and understand how the bonds of trust and esteem have evolved in the VT, two months later the same questionnaire will be administered to the same sample of students, which results will be discussed.

Keywords

Virtual Teams, Social Network Analysis, Higher Education, Training, Organization, Higher Education Organization

Structural resilience and recovery of a criminal network after disruption: a simulation study

Tomáš Diviák

Abstract

Disrupting criminal networks is one of the main promises of applying social network analysis in criminology and criminal investigation. Several studies have investigated resilience of criminal networks and the effect of various types of disruption, such as the removal of central actors or actors with specific skills, on their structure. However, the research has only recently started to acknowledge the fact that criminal networks typically tend to recover after a disruption. The response of actors involved in criminal networks and the recovery the network structure is especially important considering the fact that interventions against criminal networks may trigger negative unintended consequences in the form of strengthening the networks' cohesion. This study contributes to this recent stream of research by using a real-world street gang network as a basis for simulating the effect of disruption and subsequent recovery on its structure.

The study follows a four stage design. The first stage consists of the descriptive analysis which maps the structure and cohesion of the network. The network is well-connected, decentralized, and cohesive with short geodesic distances between actors and considerable clustering.

In the second stage, the relational mechanisms operating in this network are identified using stationary stochastic actor-based model. The model specification includes endogenous structural mechanisms (preferential attachment, triadic closure, brokerage) as well as mechanisms related to actors' attributes (homophily on age, ethnicity, and rank; activity of previously arrested and imprisoned actors). The model reveals positive and significant effect of triadic closure, preferential attachment, and homophily on age and ethnicity, whereas brokerage is found to have a negative effect on tie formation in the network.

In the third stage, disruption techniques based on centrality (highest as well as lowest degree and betweenness) and gang hierarchy are applied to the network. Removing the most central actors and the highest ranking actors have comparable and the largest immediate impact on the structure of the network, whereas removing even high numbers of the marginal actors leaves the network relatively intact.

The last part of the study simulates the response of actors to disruption by either reinforcing the trust-enhancing mechanisms (increasing closure or homophily) or the risk-reducing mechanisms (decreasing preferential attachment or increasing brokerage) by increasing or decreasing the parameter estimates from the actor-based model. Subsequently, the effect of these types of recovery on average geodesic distances and connectedness of the network is assessed. Preliminary results indicate that increasing triadic closure results in shorter geodesic distances in the scenario where 11 most marginal actors are removed compared to the scenario of removing the most central actor.

Methodological and ethical ramifications of this approach are discussed at the end.

Keywords

Criminal Networks, Stochastic Actor-Oriented Models, Simulations, Interventions, Network Mechanisms

Thriving in the dark: Structural attributes of corrupt network resilience

Sarah Gordon

Abstract

Open any newspaper today and one is bound to be inundated with scandals across a wide array of contexts. Often, when a scandal breaks, the first question we ask is, “How did they get away with it for so long?” This question is difficult to answer. Preliminary research suggests misconduct is often a multi-layered phenomenon in which multiple network actors collaborate to create, operate, and maintain a corrupt network system. Yet there is clearly significant variance as to how successfully these “dark” networks conceal and perpetuate misconduct or corruption. What accounts for this variation? This paper analyzes the structural characteristics of several types of dark networks across contexts and over time. In revealing how dark networks are organized, this paper helps identify patterns to better target the structural systems that enable ongoing misconduct and corruption to thrive.

Using a network-based approach, this paper explores the structural properties of three unique longitudinal datasets to illuminate why some corrupt networks survive over time. I leverage data collected on over 50 years of police records illuminating intricate police misconduct networks in a large Midwestern city; online cybercrime and extremist forums including over 100 million posts made from over four million actors across 26 different networks; and terrorist networks linked to over 1,500 federal terrorism-related court cases, to reveal compelling typologies that help demonstrate, across contexts, key structural characteristics of dark networks. I examine network centralization, cohesion, fragmentation, and efficiency, to demonstrate the tensions between efficacy (performance) and survival (longevity) in a covert-network context. I also explore which network properties support resilience and durability, versus decay and collapse. In highlighting structural patterns across contexts, this paper both contributes to organizational literatures and enriches policy perspectives, and adds to a growing body of research that will better equip scholars and policy makers alike to anticipate, identify, disrupt, and dismantle corrupt networks.

Keywords

Dark Networks, Covert Networks, Network Resilience, Cybercrime, Corruption, Terrorism

Social network and Cyberbullying: How Computer Mediated Communication changes the meaning and outcomes of juvenile deviance

Diana Salzano and Igor Scognamiglio

Abstract

Most of the literature existing about bullying and cyberbullying has a psychological, pedagogical, legal and criminological matrix, but the Sociology of Communication, that more specifically deals with the media and their implication, can offer a new and peculiar investigation perspective through a comparative analysis of the two phenomena. Indeed, despite both bullying and cyberbullying consist of deviant, violent and pathological behaviors, they are however, in the first instance, different forms of communication: the former face to face, the latter online, and according to a fundamental intuition of McLuhan (1964), when the "medium changes, the message changes". This means that each communication medium implies a particular brainframe that «frames» the contents conveyed, giving them a specific meaning. Thus, the violent and deviant behaviors carried out offline are other than those implemented on social network sites. The Computer Mediated Communication (CMC), in fact, by allowing anonymity, encourages the processes of "deindividuation and polarization of behaviors" (Kiesler et alii 1984), in general, and of violent ones, in particular. Internet can help cyberbullies to catalyze and amplify their violent impulses and lends itself to increasing their visibility and their capacity for emotional contagion. The rhetoric of digital natives (Prensky 2001) can be dangerous because it removes the responsibility of significant adults to a function of guidance and digital education towards minors. Teaching the media, however, does not only mean preparing digital education programs but dealing with the "grammar and syntax" of young people's emotions. The emotional education and behavioral ethics are, in fact, something different from mere digital literacy.

The purpose of the theoretical contribution is to analyze how the Computer Mediated Communication transforms the meaning and the consequences of the juvenile deviant behaviors. The topics highlighted in the paper are:

- The relation between the theoretical models of the Computer Mediated
- Communication (CMC) and the juvenile deviant behaviors
- The different forms of cyberbullying present on social network sites
- The condition of the cyberbullying victims
- The digital literacy and the "emotional skills" as preventive strategies
- The need of a digital education.

Keywords

Cyberbullying, Computer Mediated Communication, Digital Education.

Institutional Dynamics in the Global FDI Network: Examining The Co-evolution of Institutions and FDI with Stochastic Actor-Oriented Modelling

Martin Olsson and Axel Norgren

Abstract
This thesis addresses the relationship between institutions and foreign direct investments (FDI). While the issue of how institutions attract FDI (selection) is quite well-researched, the empirical evidence for institutions spreading through FDI (influence) is more ambiguous. We argue that past studies have neglected issues of endogeneity and interdependence in their modelling. We amend these issues by using a Stochastic Actor-Oriented network model which allows for interdependent and endogenous processes. The thesis also addresses the mechanisms governing the general relation between FDI and institutions and what these can tell us about institutional change and the process of globalisation. The model provides no evidence that FDI helps to spread institutions from home to host countries, but it does provide evidence that the selection effect can be an important dynamic between FDI and a certain set of institutions. Finally, we argue that FDI does not seem to be a contributory factor to institutional convergence.

Keywords
Institutions, Foreign Direct Investment, FDI, Economic Development, Social Network Analysis, Stochastic Actor-Oriented Modelling, Institutional Convergence

A network approach to action situations governing social-ecological systems: a case study of the Indonesian palm oil industry

Yanhua Shi, Christian Kimmich and Christina Prell

Abstract

Network analysis in various fields of study is getting more and more prominent in addressing environmental problems. Such networks include social networks made of social ties among a set of actors, ecological networks consisting of flows among natural entities, as well as social-ecological networks concerning metabolic exchange between human and natural entities. Meanwhile, derived from the Institutional Analysis and Development framework, a network approach has emerged as a powerful analytical tool capturing polycentrism and complexity of multi-level social-ecological system governance challenges. According to our knowledge, no conceptual work combining social network analysis and networks of action situations based on an empirical case study has been done in the field yet. Hence, we aim to fill this gap by developing an interdisciplinary network approach combining the two methods. This analytical framework aspires not only to capture the actions made by actors in multiple interdependent situations over distant ecological systems, but also to identify the structural and functional patterns of the network based on well-developed analytical toolkits. Here, nodes are identified as actors and organizations, linked to relevant action situations through institutions, such as private regulation programs, legislations, trade negotiations/treaties, etc. The network analysis covers the networks of each situation with nuance, as well as the network of the whole sets of situations across spatial and temporal scales. The conceptual work is supported by a case study of persistent deforestation threat in the Indonesian palm oil industry, providing a descriptive and analytical overview of the full spectrum (political, social, biophysical) of the dynamics behind the phenomenon of palm oil production and consumption patterns and their sustainability implications. Relevant data is derived through the existing literature and stakeholder interviews. The analytical tool developed in this paper provides a theoretical basis intended for further validation by future empirical studies.

Keywords

Environmental Governance, Social Network Analysis, Network Of Action Situation, Global Value Chain

Mapping the Establishment: British Elites and their Institutional Affiliations

Tom Mills and Matthias Schlögl

Abstract

Large scale studies of elite networks have mostly been applied to the corporate sector where structured data amenable to network analysis is more readily available. Studies examining the key question of how elites are networked across business, politics, civil society and culture, meanwhile, remain mostly small scale and qualitative. This research examines cross-sector intra-elite cohesion in the United Kingdom using data from 'Who's Who', a substantive and indispensable source of biographical information on over 30,000 British elites. Using a combination of Named-entity Recognition and Natural Language Processing techniques, it produces a graph database from the 'Who's Who' entries, with individual entrants linked to institutions by roles held over particular time periods. Using K-Core decomposition of this large affiliation network, it undertakes a prosopographic analysis (based on common background and affiliations) of the key decision makers in British politics, business and the 'third sector' and identifies the central institutions that bind together the core of the British 'Establishment'.

Keywords

Elites, Establishment, Prosopography, Affiliation Networks, NER, NLP

Networking the Best Workplace: An Empirical Study of Employment Culture Connecting Top Places to Work with Social and Solidarity Economy Practice

Theodoros Katerinakis and Georgia Passali

Abstract

People Management is experiencing challenges prior the pandemic while dealing with the “present and future of work”. On the other hand, the cooperative sector framed as Social and Solidarity Economy is in a challenging position to meet competition. The current study introduces network components that connect cooperative principles with best workplace values. A network is a group of relationships. Two important indicators of network structure are network density and network centrality. Empirical studies tend to find that one or the other is the better explanatory variable for certain aspects of behavior in the business world.

The practice of “Best Workplace” investigates how conventional legal entities got creative in caring for people, deepened their commitment to community, and courageously connected in new ways. The World’s Best have set themselves up for business success even as they have accelerated the movement toward a better future, in which all organizations become great places to work for all. Such mindset elevates the practice in terms of Hofstede’s concept of culture , "the programming of the human mind”, for employees and management.

The current study examines interconnections between SEE and conventional economy using the field of employment relations to present aspects of good practice for HRM. SEE paradigm is the basic theoretical framework for its concern and sensitivity around “social enterprise operators”, as a sustainable approach. This framework is selectively projected in conventional economy with the principles of work quality and personnel evaluation (from lower staff to upper management and vice versa), adopted by companies as good practice. A typical comparative reference framework is the “Best Workplace” practice, investigated in depth for its similarities with international cooperative (ICA) principles and other theories about SEE. The effects identified in the way the practice is applied but also in the perception of stakeholders in the conventional economy, are investigated and evaluated using the dynamics of SEE and its perspective in the future. Thus, indicators determine relations, either position-based or event-based or attribution-based. Indicators are identifiers and metrics that describe similarities, social relations, interactions, and flows. Beyond measurement, indicators could be defined by the phenomenon of interest, by actors’ environments and circumstances, their cohesiveness or using relations as contexts of other relations.

The research part of this paper explains two real-life focus groups of the past months, in a market affected by the pandemic. The first focus group engaged personnel members of a public traded legal entity of reference (Best workplace finalist) and the second one called members of a collective union entity who are also employees of companies that embrace the “Best Place to Work” practices. Analysis and interpretation of the findings of the empirical process is conducted through descriptive tabulation and interactions with the theoretical framework of Ostrom, Gibson-Graham, Best Workplace evaluation reports, but also the ICA cooperative principles. The scope of influence of SEE over conventional entrepreneurship is highlighted in the field of labor relations, while providing evaluation criteria of “where to work” in network terms.

Keywords

Best Workplace, Centrality, Social And Solidarity Economy, Human Resources Management

Groups of stand-up comedians in Russia: structure and their influence on career growth

Darya Tsukanova and Nadia Buzina

Abstract

Stand-up in Russia is a relatively young fast-growing industry. In less than 10 years, stand-up comedy has become an attractive career path and social elevator for many members of the social and age group of young people. While the number of stand-up venues is growing algebraically, the number of aspiring comedians dreaming of contracts with TV stations and residencies at top clubs is increasing exponentially. Nevertheless, not everyone achieves the title of popular stand-up comedian.

Stand-up comedians communicate in a single community (one large network) and, at the same time, they are divided into small groups of closely related participants. We analyze in-depth interviews and social media data to focus on the impact of a comedian's involvement in a group on the development of his career. Using qualitative and quantitative methods of a network analysis approach, we show how and why such groups form. We focus on how the groups relate to each other (based on indicators of resources, fame, mediocrity, and appeal to young comedians). The main result of our research is a statement of understanding of how inclusion in a group affects the career development of a stand-up comedians.

Keywords

Stand-Up Comedy, Collaboration Networks, Career, Professional Organizations, Mixed Methods

Friendships within social networks of a student community : A Longitudinal Structural Study

Mickael Glaudel

Abstract

Our study focuses on the evolution of social networks of student friendships and the role of homophily in establishing affinity ties. Such social networks are likely to facilitate successful educational and professional careers. Indeed, the social resources embedded in these networks constitute social capital (Coleman, 1988; Burt, 1992; Lin, 1995) which can be useful for their professional insertion (Forsé, 1997; Flap, 2002). It is well known that homophily is one of the main phenomena that facilitates the establishment of social relationships between individuals with similar socio-demographic attributes and lifestyles. Over the course of study time, these relationships evolve, break down, re-establish themselves and transform relational networks according to a dynamic where more heterophilic affinity choices emerge.

In order to appreciate this relational dynamic, our study examines during 9 months the social interactions of a hundred professionals returning to university (MIT) for a one year course, with various ethnic origins, parental status and geographical origins. Based on three longitudinal relational databases (Aharony et al., 2011), we perform SAOM statistical modelling (Snijders, 2001) of three uniplex and multiplex longitudinal social networks, constructed from questionnaires of friendships, phone interactions and spatial proximities within and outside the university campus. Through a structural analysis, we explore the weight of various socio-demographic attributes (gender, ethnicity, parental status) as well as the influence of key structural factors that characterise the dynamics of connectivity between individuals.

Beyond the influence of homophily due to socio-demographic attributes, our results show that the weight of structural factors of intermediarity, transitivity and differential matching clearly emerge in the dynamics of the social relationships observed. These results converge with several works carried out in sociology of social networks (Mc Pherson et al., 2001). For freshmen, homophily may facilitates access to resources held by similar peers, such as information, advices, money lending or emotional support. However, the social resources of similar individuals tend to be homogeneous and redundant from one homophilic relationship to another. Over time, individual's investment in relationships with dissimilar peers may be of more interest depending on the goals pursued. For example, varied resources may appeared usefull for long-term goals such as finding a job. Our results confirm that specific structural positions, in particular that of gatekeeper, facilitate a dynamic evolution from homophilic pairings to more heterophilic relationships. This type of connectivity within social friendship networks allows for going beyond a clique of similar peers and opens up opportunities to access relational resources that may be useful for a lifetime.

Keywords

Multiplex Longitudinal Social Networks, Structural Analysis, Friendships, Homophily

Social Networks of Meaning and Communication

Jan Fuhse

Abstract

The poster will present my forthcoming book (OUP, October 2021) that offers a theory of social networks as patterns of meaning in the process of communication. It gives an overview of the book and presents some highlights from various chapters.

Book abstract:

Social structures can be fruitfully studies as networks of social relationships. These should not be conceptualized, and examined, as stable, a-cultural patterns of ties. Building on relational sociology around Harrison White, the book examines the interplay of social networks and meaning. Social relationships consist of dynamic bundles of expectations about the behavior between particular actors. These expectations come out of the process of communication, and they make for the regularity and predictability of communication, reducing its inherent uncertainty. Like all social structures, relationships and networks are made of expectations that guide social process, but that continuously change as the result of these processes. Building on Niklas Luhmann, the events in networks can fruitfully be conceptualized as communication, processing of meaning between actors (rather than emanating from them). Communication draws on a variety of cultural forms to define and negotiate the relationships between actors: relationship frames like “love” and “friendship” prescribe the kinds of interaction appropriate for types of tie; social categories like ethnicity and gender guide the interaction within and between categories of actors; and collective and corporate actors form on the basis of cultural models like “company”, “bureaucracy”, “street gang”, or “social movement”. Such cultural models are diffused in systems of education and in the mass media, but they also develop institutionalize in communication, with existing patterns of interaction and relationships serving as models for others. Social groups are semi-institutionalized social patterns, with a strong social boundary separating their members from the social environment.

Keywords

Communication, Culture, Ethnic Category, Gender, Group, Institution, Meaning, Relational Sociology, Role, Social Network

Biased Voter model: How persuasive a small group can be?

Christos Charalambous, Agnieszka Czaplicka, Raul Toral and Maxi San Miguel

Abstract

We study the voter model dynamics in the presence of confidence and bias. We assume two types of voters. Unbiased voters (UV) whose confidence is independent of the state of the voter and biased voters (BV) whose confidence is biased towards a common fixed preferred state. We study the problem analytically on the complete graph using mean field theory and on an Erdos-Renyi (ER) random network topology using the pair approximation, where we assume that the network topology is independent of the type of voters. We verify our analytical results through numerical simulations. We find that for the case of a random initial setup, and for sufficiently large number of voters N,
the time to consensus increases proportionally to log(N)/rv, with r the fraction of biased voters and v the bias of the voters. Finally, we study this model on a biased-dependent topology. We examine two distinct, global average-degree preserving strategies (model I (MI) and model II (MII)) to obtain such biased-dependent random topologies starting from the biased-independent random topology case as the initial setup. In MI we find that if we simply vary the average number of links among the two types of voters (BV-UV), no significant effect was observed. Instead, in MII,
increasing the average number of links among only biased voters (BV-BV) at the expense of that of only unbiased voters (UV-UV), while keeping everything else constant, resulted in a significant decrease in the average time to consensus in the group. Hence, persuasiveness of the biased group depends on how well its members are connected among each other, compared to how well the members of the unbiased group are connected among each other.

Keywords

Voter Model, Sociophysics, Opinion Dynamics, Consensus Time, Biased Voters, Voter-Dependent Topology

The Radicalisation Thought Collective

Tom Mills, Narzanin Massoumi and David Miller

Abstract

This research uses bibliometric network analysis to analyse the emergence and growth of a community of authors developing and applying the concept of 'radicalisation' in academic research. Despite having been widely criticised by scholars for serious conceptual ambiguity (Alonso et al., 2008; Schmid, 2013; Young et al., 2013; Sedgwick, 2010), this term underpins counter-terrorism policies in the US, the EU and beyond, and policy makers are now able to draw on a large body of academic/scientific work and 'grey literature' across disciplines. Using bibliometric data from Scopus and Web of Science, we analyse patterns of academic production on radicalisation since 2000 and produce networks of authors, sources, keywords and citations. This allows us to trace the formation over time of what we, adopting a classic term from the sociology of science, refer to the radicalisation thought collective (Fleck, 1979). We analyse its structure at the time of data extraction and identify key authors, texts and journals, as well as distinct disciplinary and thematic clusters. We demonstrate the centrality of a number of authors and journals from the broader world of terrorism studies around which the network coheres, and making use of Scopus's 'secondary documents' function, are also able to examine the role of extra-academic actors and interests in the development of the 'thought collective'.

Keywords

Radicalisation, Thought Collectives, Academic And Scientific Networks, Bibliometric Networks, Citation Networks, Co-Authorship Networks, Grey Literature

Bibliometric analysis of co-authorship collaboration network on Machine Learning

Lorena Saliaj and Eugenia Nissi

Abstract

Our paper analyzes 10 years of scientific collaboration in publications on Machine Learning for Time Series forecasting. We analyzed the bibliographic collections present on Scopus, the largest database of abstracts, citations of literature and quality web sources. This study focuses on quantitative methods for exploring and analyzing co-authorship network in the field of Machine Learning for Time Series Forecasting, through a bibliometric analysis. Scientific collaborations networks are a characteristic of recent academic research. Nowadays, researches are no longer independent actors, but they collaborate to bring together multidisciplinary knowledge in common fields. Our analysis is based on the observed structure of co-author network. It is widely used as a powerful tool to evaluate collaboration trends and identify leading authors and institutions. This study includes a general view of collaborations patterns, the visualization of the co-authorship network, average number of authors per manuscript, institutions collaborating on each manuscript, number of citations per manuscript, countries involved in each manuscript, core authors for each network, as well as the authors' productivity.

Keywords

Co-Authorship, Bibliometrics, Social Network Analysis, Collaboration Network

Perspective matters: Comparing gossip reports from senders, receivers, and targets

Anni Hong, Károly Takács and Nynke Niezink

Abstract

Gossip is prevalent among children and adults alike and can incur a lasting negative impact. A better understanding of gossip would enable educators to develop effective interventions and promote the well-being of students. Gossip inherently involves three actors: the sender, the receiver, and the target. Most gossip studies focus on the sender-receiver relation, while targets or sender-receiver-target relationships are overlooked. Moreover, no research has dealt with the discrepancy in the different perspectives on gossip (i.e. if the sender confessed to having gossiped to the receiver about the target, does the receiver agree with it? Does the target perceive it?). In this poster, we explore the perspectives of all three gossip actors based on data from 37 Hungarian primary school classrooms (n = 1133) in two waves (age 13-14). We found that senders and targets largely disagree with each other on who gossiped about whom and that they both disagree with the receivers on who are the senders/targets of gossip. We found consistently that the receivers agree with the targets more than the senders on who the senders are. There is some evidence, though less consistent, that the receivers agree with the senders more than the targets on who the targets are. Additionally, we explore the change in actors' perception of gossip over a one-year period. The observed disagreements in the perception of gossip between actors warrant careful consideration by future researchers of the desired gossip measurement.

Keywords

Gossip, Network Perception, Multiplex Networks

Bayesian spatio-network models for adolescent health behaviours

George Gerogiannis, Mark Tranmer, Duncan Lee and Thomas Valente

Abstract

The use of alcohol, tobacco, and marijuana among adolescents are major public health concerns, and a number of epidemiological studies have been conducted to understand the drivers of these individual health behaviours. However, there is no literature that jointly models these health behaviours with the aim of understanding the relative importances of individual factors, friendship effects and spatial effects in determining the prevalence of alcohol, tobacco and marijuana use among adolescents. To address this gap in the literature we propose a novel multivariate spatio-network model for jointly modelling all three of these behaviours, with inference conducted in a Bayesian setting using Markov chain Monte Carlo simulation. The model is motivated by survey data from 5 schools in Los Angeles, California, and the results indicate the important roles that individual factors and friendship networks play in driving the uptake of these health behaviours.

Keywords

Social Network Analysis, Bayesian Modelling, Multilevel Models, Multivariate Health Behaviour, Adolescent Health

World imageries as constructed by the media. Socio-semantic network analyses of Greek and Hungarian online press contents

Gábor Jelenfi, Nikos Fokas and Róbert Tardos

Abstract

The presentation aims to outline the design and some findings of a comparative media analysis on the texts of Greek and Hungarian daily papers between 2004 and 2016. The period covered by the study witnessed two global shocks following the 2008 financial crisis and the 2015 migration influx in Europe. Our research program approached how public opinion was impacted by this critical period in the two countries taking advantage of survey techniques and text analyses as well. Both lines were based on socio-semantic network methodology and a joint conceptual framework of dimensions of national and supranational stereotypes. The analysis embraced outlines of in-group and out-group imageries and configurations of types of skills and knowledge styles. By targeting the processes of frame building processes as observed in mainstream press contents, the present poster highlights the media aspects of the research.

Our presentation displays on the one hand text mining results on how crisis phenomena were represented in the press corpora under study. The ups and downs of crisis perception are shown in a detailed temporal sequence for the two-two daily newspapers exhibiting various sides of the political spectrum papers from both country-cases. The computer-based content analysis extended, furthermore, to a broader thematic range embracing a more complete set of topics outside the crisis phenomena. Our quantitative methods involved both deductive (such as a list of categories composed by criteria of relevance) and inductive procedures (such as a “word-bag” technique) in an iterative manner.

Adopting the core assumption of distributional semantics and approaching the meaning of a word by its links with adjacent words, our study cumulated a time-series statistical database for a network-like elaboration of words and concepts. Thereby the configurations of various activity domains were outlined. Such semantic networks build on the co-occurrence of certain topics in a given text unit. In a bipartite network approach, the media analysis included countries and ethnic groups and various activity domains as properties typically attached to them. The compilation of joint occurrences in distinct articles resulted in two-mode (nation/domain) cultural matrices for our media analyses. Our research keywords, from the other aspect, included six nations (Americans, Arabs, Greeks, Germans, Hungarians, and Russians) also employed in our survey. Binary two-mode matrices are analyzed directly by considering both modes simultaneously. The comparison is based on visual clustering and graph analytical tools.

The results for the Greek media agree with the survey findings inasmuch the domestic reports cultivated a positively shaded theme structure (like culture, tourism, traditions, science, etc.) for the whole period covered, differently from the conflict-laden outer topics. The thematic profile of the domestic focus of the Hungarian online press is close to the Greek media self-portrait. Following 2008, somewhat more pronounced isolation is observed regarding its thematic emphases.

Keywords

Socio-Semantic Network, In-Group/Out-Group Images, Text Mining, Media Analysis, Crisis Effects, Comparative Study

Opinion mining analysis on vaccine-related tweets: an integrated approach between sentiment analysis and social network analysis

Motahhareh Nadimi and Domenico De Stefano

Abstract

Abstract: In this work, we present the usage of sentiment analysis combined with social network analysis on tweet-reply and reply-reply chains of discussion about Pfizer and AstraZeneca vaccine on the Twitter platform. We propose a two-steps approach to derive labelled networks expressing the spread of opinions on the chosen topics.

In the first step, we adopt a different natural language processing algorithms to determine the sentiment of both the original tweets (with respect to the trending topic) and the sign of the replies connecting to the original tweet. In particular, we consider a multi-class text classification which goal is to predict probabilities of a text belonging to positive, negative or neutral labels. For the text classification modelling, we use Glove word embeddings as well as deep learning methods such as Bidirectional Long short-term memory (BI LSTM) and Convolutional Neural Network (CNN) and Bidirectional Encoder Representations from Transformers (BERT), which is a method of pre-training language representations that is used for language modelling. We Fine-Tune BERT for Text Classification with Tensor Flow Hub which is a repository of trained machine learning models ready for fine-tuning. In the second step, we obtain a number of labelled networks that are compared and modelled in order to analyze how polarized concepts spread, what are the characteristics of the labelled tweet-reply/reply-reply chains and if there are differences in terms of the opinion spreading structure with respect to the two vaccines under analysis.

Keywords

Sentiment Analysis, Social Network Analysis, Ergms Modelling

Space-filling sampling approach on different networks structures

Emiliano del Gobbo

Abstract

Social Media platforms have been extensively investigated to understand users' behaviour and attitudes. The digital nature of those virtual platforms allows tracking with high precision a huge quantity of data about users' interactions and relationships. These relational data can be exploited to detect communities in cyberspace and analyse users' sentiment and opinions. Relational data are typically shaped as graphs, and the common hypothesis is that of homophily, meaning that more interconnected nodes are more likely to have similar attributes or states. This assumption can be exploited using several Machine Learning techniques to classify all nodes of the networks according to some features and to achieve complete knowledge of the network status. In particular, Graph Semi-Supervised Machine Learning techniques are promising for predicting the unknown labels on a network. Starting from a small labelled training dataset, these algorithms allow labelling all nodes in the network, taking advantage of unlabelled nodes' relational information. Label Propagation is an interesting example of semi-supervised algorithms, leveraging on the propagation of the training labelled nodes on the rest of the network. The main issue with such methods relies on the features of the sampled training nodes: nodes must be well spread on the network to maximise the potentials of these algorithms. To address this issue, we propose a space-filling sampling algorithm able to draw a well-spread sample, and therefore to minimise the required sample size of the training set - usually a task involving massive human work - and maximising the classification performance. The algorithm is based on a simulated annealing procedure where the objective function is related to the distance between the sampled node subset and its complement. However, the network shape can be different according to the topic and subject of study and can be affected by the specific social platform peculiarities. Discussions on a specific divisive topic tend to generate more well-separated inner-connected communities than discussions about brands and products. Network heterogeneity is a challenging problem in finding the most appropriate approach that fits the specific graph structure. On Twitter, the famous microblogging social networks, at least six network structures can be identified: Polarised crowd, Tight crowd, Brand Clusters, Community Clusters, Broadcast Networks and Support Networks. This study aims to evaluate the performance of the proposed space-filling sampling approach for collective classification through label propagation on different network structures.

Keywords

Networks Sampling, Semisupervised Classification, Space Filling Designs, Social Networks

(Re)thinking Ethics and Moral Behaviors as Complex Contagions: A Qualitative Content Analysis of Networks in The Good Place

Pooja Ichplani

Abstract

Michael Schur's "The Good Place" (2016-2020) is fantasy-comedy series that revolves around a group of deceased humans who are (mistakenly) rewarded to live in the "good" place for their afterlives despite having scored negatively for their somewhat, if not extreme, moral behaviors during their life on Earth and showcases their journey as they collectively learn and internalize moral behaviors.

Using Damon Centola's (2018) theoretical framework of complex contagions, which posits that collective behavior spreads through social interaction, this paper explores the underlying mechanisms that influence spread of ethical and moral behaviors in the web series. In this context, the study assumed ethics and moral behaviors as complex contagions, and the "good" place as the setting, wherein roles and relationships were analyzed to understand the spread of ethical ideas within the group. Particularly, relationships were understood in terms of social support, reciprocity or complementarity of roles (i.e., active/mutual, or passive/one-way), homophily (or similarity) between characters, and types. Additionally, social roles were also analyzed to understand their positions in the whole network. To this end, a qualitative content analysis was used as the primary method to understand the mechanisms that foster change in moral behaviors, while a qualitative social network analysis was interspersed to substantiate the emergent themes by exploring the social roles of and social relationships between the characters. The paper also visualizes the transaction of ethics and moral behavior between key social actors of The Good Place by mapping a sociometric network. Finally, it proposes potentially relevant practical applications for prison-based rehabilitation interventions highlighting its parallels with the social setting of the "good" place.

Undergirding the importance of social support, the study establishes that providing people with right kind of social capital within a conducive social setting in their networks makes them more likely to be receptive about morality. On the other hand, absence of it limits their capacity for choice as they face challenges – the most significant reason why the humans were able to make "better" decisions in the "good" place but not during their life on earth.

The current research is an instrumental addition to the literature at the intersection of media, society, and moral philosophy. It not only studies media content to understand how group dynamics function in The Good Place, but also extends its social applications by presenting a novel, contextualized and nuanced perspective on the importance of networks in the spread of ethics and moral behaviors.

Keywords

Complex Contagions, Content Analysis, Moral Behaviors, Sociometric Network, The Good Place

Emergence and diffusion of trends in social networks. Study of a network of influencers on the Instagram platform.

Julie Levy

Abstract

The process of spreading innovations has been studied for over 40 years. One of the most popular adoption models is described by Rogers in his book, Diffusion of Innovations (Sherry & Gibson, 2002). Not everyone adopts an innovation or idea at the same pace ; some people are more apt to adopt the innovation than other. This research work focuses on the diffusion of fashion trends in social networks by studying a network of influencers on the Instagram platform. The main objectives of this research are to find out which accounts are the fastest adopters of trends and which accounts spread them the best. The data used was collected by Heuritech, a French company specialized in image analysis and trend prediction for the luxury and fashion industries. They first collected data about each account (number of followers, followings, location, gender, trends posted...) and then the links between each of them. This study adapt the five following adopters categories defined by Rogers (2002) : innovators, early adopters, early majority, late majority and laggards. Then this work studies the level of influence of each account by analysing their personal networks. One of the main results is the positive link between innovation and influence in the studied network.

Keywords

Diffusion Of Innovations, Modelling Social Influence, Ego-Networks

Scaling limits for parking on Frozen Erdős–Rényi Cayley trees with heavy tails

Andrej Srakar

Abstract

In a recent contribution, Contat and Curien (2021) study parking problem on uniform rooted Cayley tree with n vertices and m cars arriving sequentially, independently, and uniformly on its vertices. In a previous contribution, Lackner and Panholzer (2016) established a phase transition for this process when m ≈ n/2. Contat and Curien couple this model with a variant of the classical Erdős–Rényi random graph process which enables describing the phase transition for the size of the components of parked cars using a ("frozen") modification of the multiplicative coalescent. Contat and Curien show the scaling limit convergence towards the growth-fragmentation trees canonically associated to the 3/2-stable process that appeared previously in the study of random planar maps (Zolotarev, 1986). Yet, their scaling limits unraveled are common to models as long as the degree distribution and the car arrivals have a sufficiently light tail. We study their novel model in the presence of group arrival of cars with heavy tail, and derive the appropriate metric space scaling limits, following Conchon-Kerjan and Goldschmidt (2020), Bhamidi, van der Hofstad and Sen (2018) and Broutin, Duquesne and Wang (2018), with also comparing the behaviour of the extended tree parking approach to more commonly studied Bienaymé–Galton–Watson trees. In an application, we show the performance of the approach on the well-known car parking lot dataset (CARPK) of Hsieh, Lin and Hsu (2017).

Keywords

Parking Problem, Cayley Trees, Erdős–Rényi Random Graph Process, Frozen Erdős–Rényi, Heavy Tails, CARPK Dataset