BUSINESS SCHOOL

Course Study Guide

2014

Centre for Business Network Analysis Summer School

Doing Research with SNA: Tools, Theories, and Applications

Contents

1. Welcome

Dear Participants,

Welcome to the course *Doing Research with SNA: Tools, Theories, and Applications*.

This course is aimed at researchers and post-graduate students who are new to the field of Social Network Analysis (SNA), and would like to better understand whether and how they can use it to enhance their research programmes. Participants are not assumed to have any previous knowledge of SNA, or of any analytical or statistical software.

The goal of the course is to provide attendees with insight into how SNA can be used in scholarly practice in social sciences, politics, management, economics and neighbouring disciplines. It introduces participants to essential SNA concepts and theories, and gives them confidence in using key tools and techniques in practice, using specialist software (primarily Ucinet/Netdraw and to a lesser extent, Gephi and Netlogo). It also includes elements of quantitative and qualitative research design, focusing on how SNA can be successfully integrated into a research project, paper, or dissertation, alone or in combination with other tools of analysis.

The schedule includes two Parts, a more introductory one (Part I, 2-6 June) and an intermediate/advanced one (Part II, 9-11 June). You can choose to attend the unaccredited version of the course (Part I only) or the accredited version (both parts). If you choose the accredited version, there is a graded assessment at the end.

Each part comprises one or more of five components: 1) Theory, 2) Data and Methods, 3) Applications, 4) Exercises, 5) Research Design.

We look forward to meeting you in Hamilton House and hope you will find the course interesting and useful.

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2. Introduction to the Course

2.1 Aims

This course addresses the needs of researchers and post-graduate students who are new to the field of Social Network Analysis (SNA), and aim to understand whether and how they can use it to enhance their research programmes. All social science and other backgrounds are welcome, and participants are assumed to have no previous knowledge of SNA, or of any analytical or statistical software. The course provide attendees with a general overview of the field of SNA, and insight into how it can be used in scholarly practice in the social, economic and managerial disciplines.

2.2 Learning Outcomes

On attending Part I of this course, you will be able to:

- Demonstrate knowledge of the key principles, approaches and achievements of SNA
- Understand network data type, source and format
- Compute and interpret network metrics to analyse network data
- Visualise network data
- Use network analysis software
- Relate SNA and classical social science theories and methods

On completing both Part I and Part II of this course successfully, you will also be able to:

- Develop network-oriented research questions
- Design data collection approaches for network data
- Understand basic modelling principles for network data
- Integrate a network component into a research project

2.3 Learning and teaching activities

- *Lectures*, where the main theories will be discussed and presented.
- *Tutorials* will provide attendees with knowledge of the key principles, approaches and achievements of social network analysis; and experience in the use of network analysis and data visualisation tools, techniques, and software. Participants will use computers/laptops to practise the use of relevant social network analysis software.
- *Guest presentations*: confirmed SNA researchers will present solutions to handle research design issues in SNA. Though they will refer to actual and accomplished research projects, their talks will not be structured as standard scientific paper presentations: rather, they will focus on the backstage so to speak, and discuss their initial idea, how they made it amenable to SNA analysis, how they collected their data and built their datasets, what solutions they found to the problems they encountered. They will 'tell the story' behind their papers, giving attendees a concrete sense of what it means to do research in SNA.
- *Self-study* with structured materials provided in class.

3. Contact Details

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4. Course Content and Design

Each part of the course includes one or more of five components: 1) Theory, 2) Data and Methods, 3) Applications, 4) Exercises, 5) Research Design.

- *Theory* introduces fundamental principles of SNA: their grounding in social theories, and their potential applications, ranging from the study of online networking and the Internet to more traditional forms of social interactions such as those occurring in the family, school, workplace or business environment. Participants are shown how the network perspective places emphasis on inter-individual relationships rather than individual attributes, thereby requiring a major change of mindset relative to standard social science approaches. The theory part also includes presentation of well-known applications of SNA and milestones in the literature, to show how a network perspective has illuminated aspects of society that could not be easily understood otherwise. In Part II, theoretical problems and open questions will be discussed. All theoretical presentations are accompanied by examples and case studies.
- The more technical *Data and Methods* covers type, structure and format of network data; approaches to data collection, in quantitative, qualitative and mixed-methods perspective; metrics and measures of network structure; and in Part II, some statistical inference tools and models for network data.
- *Applications* allow participants to reflect on concrete research problems and solutions adopted in actual research projects.
- In the *Exercises,* attendees will learn how to apply the notions learned in the Data and Methods parts of the lectures to training datasets, using primarily UCINET/Netdraw, and secondarily Gephi and Netlogo.
- *Research Design* emphasizes how a research project can meaningfully integrate an SNA component, and how it should be adapted to do so successfully. In particular, attention is drawn to the development of network-oriented research questions, as well as the design of network data collection, and their integration in qualitative and quantitative approaches.

4.1 Activity

Week beginning		Session Title and Description
2-June-14		Welcome and Introduction
	Theory	What is SNA, and what it is used for; what is a network - introduction to graph theory; online and face-to-face networks
	Data and Methods	Data types: personal and whole networks; interpreting the size and structure of personal networks
	Research design	Data collection for personal networks
	Exercises	Opening a network data file in UCINET, and visualising it in Netdraw A graphical personal network data collection exercise
	Applications	How many friends do you have?
3-June-14	Theory	The network perspective: local and global structure
	Data and Methods	Data formats (node / edgelists and adjacency matrices; directed and undirected ties; binary and valued ties; one and two-mode networks); data visualisation (basics)
	Research design	Data collection more generally: surveys with name generators/interpreters; rosters; archives; data from the Internet
	Exercises	Writing data files; importing data files into UCINET; visualising networks with Netdraw; matching node attributes and tie data
	Guest speaker	TBA
4-June-14	Theory	Connectedness and cohesion; strong ties and weak ties Small worlds
	Data and Methods	Some network metrics (density, connectivity, distance, diameter, APL)
	Exercises	Calculating basic network metrics in UCINET
	Applications	Are weak ties really strong?
5-June-14	Theory	Activity, power and status through the lens of centrality concepts in networks
	Data and Methods	Centrality measures; centralisation
	Exercises	Calculating centrality in UCINET; visualising actors' centrality in Netdraw.
	Guest speaker	TBA
6-June-14	Theory	Social capital and social networks Communities
	Research design	Mapping and analysing web networks
	Data and Methods	Detecting communities, subgroups and clusters in networks Modularity
	Exercises	Detecting subgroups and clusters with UCINET
	Applications	Job markets: do contacts really help?
9-June-14	Theory	Selection, homophily and segregation
	Data and Methods	Measures of homophily: the E-I index Testing hypotheses with network data

	Exercises	Simulating selection with Netlogo Calculating homophily with UCINET
	Applications	Distinguishing segregation, homophily and opportunity
10-June-14	Theory	Social Influence, diffusion and innovation through networks
	Data and Methods	Regression models with networks as independent variables
	Research design	Qualitative and mixed-methods research designs with networks
	Exercises	Simulating diffusion with Netlogo
	Applications	Is obesity transmitted through networks?
11-June-14	Data and Methods	Regression models for networks as dependent variables: ERGM, Siena
	Exercises	An alternative software for social network analysis: Gephi
		Participants' presentations

4.2 Suggested Reading

Every session will bring together contents from a combination of different sources. Specific information about the reading lists associated with each session will be provided in class.

However, the following can be used as general background readings for the course:

Reference
Christina Prell. Social Network Analysis: History, Theory and Methodology. London: SAGE, 2011
Thomas W. Valente. Social Networks and Health: Models, Methods and Applications. Oxford: Oxford University Press, 2010
Marina Hennig, Ulrik Brandes, Jürgen Pfeffer, Ines Mergel Studying Social Networks: A Guide to Empirical Research Campus-Verlag, 2012

5. Assessment

Element of assessment	Description	Weight (%)	Pass mark	Due date
Course project (preliminary proposal)	Class presentation (with submission of slides and any accompanying material), on last day of course	30	50%	11 June 2014 (during class time)
Course project (final)	Submission of essay, one month after end of course	70	50%	11 July 2014, 3pm

If you choose the accredited version of the course (Parts I and II), you will be assessed at the end. You will be asked to design a research project on a topic of your choice, integrating a social networks component. You will first present your preliminary idea in class on the very last day of the course (11 June): you should outline the type and source of data to be used, the analysis to be performed, the purposes and expected contribution of the study. You will receive formative feedback, and your contribution will be assessed based on soundness and interest of the idea as well as on quality of presentation. You will use the feedback received in class to further develop your proposal, and submit it (electronically) in the form of an essay one month later. The proposal's expected length is about 3000 words. It should present your project in more detail and possibly provide the results of a pilot study.

Marking Criteria	Weight (%):
Focus Does the project set up a clear research question to address? Does it stay within and fulfil the topic parameters?	20
Synthesis Does the project indicate good understanding of the relevant literature? Does it bring together existing knowledge in a meaningful manner?	30
Soundness Do the research design and the methods chosen address the research question? Do they fit with the literature? Are they practically doable?	30
Clarity of structure Is the presentation / essay well organised and logically constructed to achieve synthesis while being mindful of the needs of the audience?	10
Mechanical Soundness (Essay only) Is the essay clearly written, spell checked and grammatically sound and referenced appropriately?	10
Mechanical Soundness (Presentation only) Are the slides visually well-presented, clearly written, and sufficiently synthetic to attract the attention of the public? Is the oral presentation clear and engaging? Are questions from the audience answered appropriately?	10