Social Network Research in Health and Sociology (wfsp2200)

This course builds upon the introductory wfsp2102, "Introduction to Medical Sociology-wfsp2102," focusing on training students in utilizing social network research for analyzing health and social issues. Participants will gain insights into social network research (SNR), practice social network analysis in the context of health and sociology, and comprehend how SNR contributes to public health and sociology.

Learning Outcomes

- Understand key relational challenges in current medical sociology.
- Analyze health or social issues using social network research.
- Design and collection of social network data.
- Use R-igraph for exploring and analyzing social graphs.
- Present a paper in social network analysis.

Contents

- Introduction to Medical Sociology and the Relevance of Social Network Analysis
- Key Concepts in Social Network Analysis
- Design of Social Network Analysis
- Exploring the Network: Graphs
- Power and Social Capital: Centrality, Effective Size, and Homophily
- Groups and Social Cohesion: Components, Cliques, and Communities
- Small World and Topology

Agenda (Monday, 4 pm - 7 pm, computing room)

- Lecture 1 (5/2/24): Introduction to medical sociology, network research, R-igraph, data management, planning
- Lecture 2 (12/2): Design of social network research, matrices transformation, questionnaire content, egonetwork design, essay instructions
- Lecture 3 (19/2): Graph exploration, netdraw, importing egonet data into R-igraph
- Lecture 4 (26/2): Ego-level metrics
- Lecture 5 (4/3): Groups, communities, and classification methods
- Lecture 6 (11/3): Network-level metrics, results exploration, and analysis
- Lecture 7 (18/3): Assignment and evaluation

Course is taking place in the Computing room “Colloque Anapath”, Louvain-en-Woluwe. Oral examination will take place in the lecture office, Clos Chappelle aux Champs 30, Room A562, Fifth Floor**.** Students select a time slot on the Moodle schedule related to the exam.

Teaching Activities
- Lecture
- R-igraph practice
- Weekly student briefings on their essays
- Weekly assignments

Evaluation and essay

Assessment for this course is divided into two components: an essay, accounting for 50%, and weekly assignments, also contributing to 50% of the overall grade. The oral examination is dedicated to discussing your essay in relation to the course content. The primary objective of the essay is to immerse the student in the practical aspects of social network research. In this task, students must demonstrate their ability to formulate a

research question aligned with existing literature, design an effective method, collect and/or analyze data, and draw meaningful conclusions about the relevance of their work. While collaboration in pairs is allowed, it is not mandatory. The essay follows a structured outline encompassing the following elements: introduction (issue, literature review, research question); method (population, setting, sample, who-what-when; measures); results (descriptive stats, exploratory graphs; statistical analysis; topology of your networks); discussion-conclusion (main findings; consistency with the literature; limits; conclusion). The assessment of the essay is based on five criteria: relevance of the research question; effectiveness of data collection (even if using secondary sources); quality of graph exploration; appropriateness of data analysis; conclusion and reflexivity. The essay has a maximum length of 6 pages (excluding references, appendices, and Table of Contents) and should be uploaded on Moodle no later than May 20th, along with the accompanying data file to ensure checks for plagiarism and data trustworthiness.

Every lecture has short time slot when students might explain their project, seek clarification, raise questions, and receive technical advice related to their essays.

Students have the option to select datasets made available by the lecturer or from external sources. Examples of available datasets include the SILNE study of adolescent behaviors, Morpheus egonetwork study of patients with mental illness, EGONET study of patients with mental illness, the article 107 study, COVID-19 tracing datasets, and faculty of public 2-mode networks. Additionally, students may explore social network repositories such as https://networkrepository.com/

Alternatively, students interested in conducting their own network survey can approach the lecturer.

File and matrices manipulations

From 2023 onwards, the course uses the R-igraph package. Given the technical nature of social network analysis, particularly file and matrices manipulations in R, it is emphasized that time is required for data preparation, transformation, and conversion across different formats. Starting early in the process is strongly recommended for increased effectiveness. A cautionary note is provided against commencing these tasks only after the lectures conclude. For those focusing on egonetworks, Chapter 4 of the Nick Crossley book "Social Network Analysis for Ego-nets," Sage 2015, is highly recommended and available online.

References

The lectures are very much inspired by Text books n°4 , 7, 12 and 13.

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2. Centola, D. (2011). "An experimental study of homophily in the adoption of health behavior." Science **334**(6060): 1269-1272.
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4. Crossley Nick, Bellotti E, et al. Social Network analysis for ego-nets. Sage, Thousand Oaks, 2015. Ebook disponible sur https://dial.uclouvain.be/ebook/object/ebook%3A154140
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10. Provan, K. G., et al. (2005). "The Use of Network Analysis to Strengthen Community Partnerships." Public Administration Review **65**(5): 603-613.

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16. Bogatti S, Everett M, Johnson J, Analyzing social networks, Sage, 2013.

Other Web ressources:

- Igraph for social network analysis: see the excellent material of Katerine Ognyanova on https://kateto.net/netscix2016.html
- The book of Kolaczyk is also available on moodle.
- Social network scientist have set up repositories to disseminate and facilitate access to network datasets. See for example https://networkrepository.com/