SOCI 3102: Social Networks and Social Capital

Department of Sociology
The Chinese University of Hong Kong
ELB 303, Wed 9:30 - 11:15 a.m.
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Contact Information

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Course Description

Social network is one of the fastest growing sub-areas within the discipline of sociology. The science of social networks focuses on measuring, modeling, and understanding the different ways that people are connected to one another. This is one of the only sub-areas of sociology that has a body of theory accompanied by a distinct methodology. SNA (Social Network Analysis) is not just about analytic techniques. Many years of social network studies have extensively represented rich sociological theory traditions such as structuralism, interactionism, and relational perspectives. This course is designed to provide students with the opportunity to (1) Understand basic network concepts and theories, (2) Use social-scientific terminology to describe patterns of structure and change observed in networks, (3) Understand and be capable of using measures based on graph theory and matrix algebra to analyze and describe social networks, (4) Understand the way that social network concepts, theory, and measures can be applied to shed light on a wide variety of phenomena across different fields of study in the social sciences and beyond.

Assessment and Grading

The grade for the course will be calculated as a weighted average of the following components:

Participation	30%
Three Tutorial problem sets	30%
Final Project	40%

- **Participation (30%)**

  - To attend or skip is an adult's decision—you take your responsibility for what you do. To ensure your compliance in the lecture, there will be *random in-class polls* (齊點名) displaying easy questions with respect to class materials and check your attendance.
  - There will be at least **5** times of polls, each taking up 6%. Missing each will cost you **6%**.

- **Tutorial problem sets** (10% X 3 = total **30%**)

- There will be **3 tutorials**, each is 1.5- to 2-hour long. Each will help you build up your final project.

  - Tutorial 1: install R, R studio, install certain network packages; review and application of basic network concepts – week 4
    - Problem set 1 **due a week after the tutorial, 5 pm**

  - Tutorial 2: basic & data manipulation in R, building network graphs – week 6
    - Problem set 2 **due a week after the tutorial, 5 pm**

  - Tutorial 3: more on network graphs and basic network statistics in R – week 8
    - Problem set 3 **due a week after the tutorial, 5 pm**

- The problem sets are open book and you are allowed to discuss with peers and the tutor, but you must not submit identical work to others', otherwise it would be deemed as plagiarism.
- You can find the details in the guide at the end.

Final Project (40%)
- Based on the three problem sets, you will bring knowledge together in a capstone final project.
- Find a celebrity/public figure/historical figure that you like, go to his/her/their Wikipedia page and find 10 people associated to him/her/them. In an Excel file, build their
  - o Relationship type
  - o Relationship Strength
  - o Directions of relationship
- Import to R, build network figure, calculate centrality, transitivity and cohesion of your network. Interpret them in a paragraph following your network figure.
- You can find the details in the guide at the end.
- It will be due 2 weeks after the last lecture date, **on May 1ˢᵗ, 11:59 pm.**
- Paste the graph to a word document on top of your essay, scan the essay on veriguide, and upload the veriguide receipt to blackboard.

Grading

Letter Grade	Point %
A: Outstanding performance on all learning outcomes.	95-100%
A- : Generally outstanding performance on all (or almost all) learning outcomes.	90-94%

B: Substantial performance on all learning outcomes, OR high performance on some learning outcomes which compensates for less satisfactory performance on others, resulting in overall substantial performance.	80-89%
C: Satisfactory performance on the majority of learning outcomes, possibly with a few weaknesses.	70-79%
D: Barely satisfactory performance on a number of learning outcomes.	60-69%
F: Unsatisfactory performance on a number of learning outcomes, OR failure to meet specified assessment requirement.	< 60%

Academic Honesty

Please keep in mind the university's policy on academic honesty. Plagiarism will not be tolerated in the term paper and assignments. The ideas and language should be your own, and any outside sources must be clearly and properly cited. There are severe consequences if you commit any acts of academic dishonesty. In addition to the department's policy and guidelines for citations, please refer to the university-level disciplinary guidelines and procedures. The Faculty of Social Science has also compiled a handout to alert students of the importance of academic honesty and the consequences of violating the University's Rules. To this end, the mid-term (three-page essay) and the final project (one-page essay with a network figure) should be submitted via VeriGuide.

Other Class Logistics

- Lecture slides will be uploaded to the course Blackboard **before class.**

Schedule and Reading

1. intro

2. basic concepts I

3. basic concepts II

4. dyads and triads

5. centrality (problem set 1 due)

6. weak ties and structural holes

7. social capital (problem set 2 due)

8. segmentation and cohesion

9. small world (problem set 3 due)

10. diffusion and influence

11. scientific networks

12. networks and history

13. future agenda, discussion of the final project

Required Book

    Kadushin, Charles. 2012. *Understanding Social Networks: Theories, Concepts, and Findings*. Oxford
        University Press.

Recommended Books

    Wasserman, Stanley and Katherine Faust. 1994. *Social Network Analysis: Methods and Applications*.
        Cambridge University Press.

    Light, Ryan and James Moody (eds.). 2021. *The Oxford Handbook of Social Networks.* Oxford University
        Press. – Available online in CUHK library.

Readings are subject to minor changes throughout the semester.
Denotes required reading

Week 1 (Jan 10). Course Introduction

*Kadushin Ch. 5, 12

Week 2 & 3 (Jan 17, Jan 24). Basic concepts I & II

*Hanneman, Robert and Mark Riddle. 2005. Introduction to Social Network Methods. Chapters 3, 5.
http://faculty.ucr.edu/~hanneman/nettext/C3_Graphs.html
http://faculty.ucr.edu/~hanneman/nettext/C5_%20Matrices.html

Week 4 (Jan 31). Dyads and Triads

*Kadushin Ch. 2

*Schaefer, David R., John M. Light, Richard A. Fabes, Laura D. Hanish, and Carol Lynn Martin.
"Fundamental principles of network formation among preschool children." *Social Networks* 32, no. 1
(2010): 61-71.

Chase, Ivan D. "Social process and hierarchy formation in small groups: a comparative perspective."
American Sociological Review (1980): 905-924.

Week 5 (Feb 7). Centrality

*Kadushin Ch. 3

*Faris, Robert, and Diane Felmlee. "Status struggles: Network centrality and gender segregation in same-and cross-gender aggression." *American Sociological Review* 76, no. 1 (2011): 48-73.

Borgatti, Stephen P. 2005. "Centrality and Network Flow." *Social Networks* 27 (1): 55–71.

Christakis, Nicholas A. and James H. Fowler. 2010. "Social Network Sensors for Early Detection of Contagious Outbreaks." *PLoS ONE* 5(9):e12948.

Week 6 (Feb 21). Weak Ties and Structural Holes

*Kadushin Ch. 3

*Granovetter, Mark S. 1973. "The Strength of Weak Ties." *American Journal of Sociology* 78(6):1360.

Bian, Yanjie. 1997. "Bringing Strong Ties Back in: Indirect Ties, Network Bridges, and Job Searches in China." *American Sociological Review* 62(3):366–85.

Small, Mario Luis. "Weak ties and the core discussion network: Why people regularly discuss important matters with unimportant alters." *Social Networks* 35, no. 3 (2013): 470-483.

Week 7 (Feb 28). Social Capital

*Kadushin Ch. 10.

*Lin, Nan. 1999. "Building a network theory of social capital." *Connections*. 22(1), 28- 51.

*Coleman, James S. 1988. "Social Capital in the Creation of Human Capital." *American Journal of Sociology* 94(s1):S95–120.

Burt, Ronald S. and Katarzyna Burzynska. 2017. "Chinese Entrepreneurs, Social Networks, and Guanxi." *Management and Organization Review* 13(2):221–60.

Week 8 (Mar 13). Segmentation and Cohesion

*Kadushin Ch 4

*Moody, James and Douglas R. White. 2003. "Structural Cohesion and Embeddedness: A Hierarchical Concept of Social Groups." *American Sociological Review* 68(1):103–27.

Burdick-Will, Julia, Jeffrey A. Grigg, Kiara Millay Nerenberg, and Faith Connolly. "Socially-structured mobility networks and school segregation dynamics: The role of emergent consideration sets." *American Sociological Review* 85, no. 4 (2020): 675-708.

Week 9 (Mar 20). Small World

* Kadushin Ch. 8.

*Uzzi, Brian, and Jarrett Spiro. "Collaboration and creativity: The small world problem." *American Journal of Sociology* 111, no. 2 (2005): 447-504.

Watts, Duncan J. "Networks, dynamics, and the small-world phenomenon." *American Journal of Sociology* 105, no. 2 (1999): 493-527.

Week 10 (Mar 27). Diffusion and Influence

* Kadushin Ch. 9.

*Kreager, Derek A. & Dana L. Haynie. 2011. "Dangerous Liaisons? Dating and Drinking Diffusion in Adolescent Peer Networks" *American Sociological Review* 76: 737-763

Hartvigsen, G., J. M. Dresch, A. L. Zielinski, A. J. Macula, and C. C. Leary. "Network structure, and vaccination strategy and effort interact to affect the dynamics of influenza epidemics." *Journal of theoretical biology* 246, no. 2 (2007): 205-213.

Week 11 (Apr 3). Networks and Science

* Hofstra, Bas, Vivek V. Kulkarni, Sebastian Munoz-Najar Galvez, Bryan He, Dan Jurafsky, and Daniel A. McFarland. "The diversity–innovation paradox in science." *Proceedings of the National Academy of Sciences* 117, no. 17 (2020): 9284-9291.

* Wu, Lingfei, Dashun Wang, and James A. Evans. "Large teams develop and small teams disrupt science and technology." *Nature* 566, no. 7744 (2019): 378-382.

Gerow, Aaron, Yuening Hu, Jordan Boyd-Graber, David M. Blei, and James A. Evans. "Measuring discursive influence across scholarship." *Proceedings of the national academy of sciences* 115, no. 13 (2018): 3308-3313.

Week 12 (Apr 10). Networks and History

* P Bearman, R Faris, J Moody. "Blocking the future: New solutions for old problems in historical social science." *Social Science History* 23 (4), 501-533.

* E Erikson, P Bearman. "Malfeasance and the foundations for global trade: The structure of English trade in the East Indies, 1601–1833." *American Journal of Sociology*. 2006. 112 (1), 195-230

Week 13 (Apr 17). Review and Guidance on Final Project

Guide to Final Project

Goal

Learn and demonstrate how to turn a real-world case into an analytical R network dataset.

Steps

- Find a celebrity that you like, go to his/her/their Wikipedia page and find 10 people associated to him/her/them. In R, build their
    - o Relationship type (nodes use different colors)
    - o Relationship Strength (edges use different weights/widths)
    - o Directions of relationship (directed/undirected)
- Let R calculate **centrality, transitivity and cohesion** of your network. Interpret them in a paragraph following your network figure.

To sum up, in your writeup, you need to include
  (1) The celebrity's name, and the Wikipedia page link
  (2) A list of 10 friends/relatives/colleagues/etc related to the celebrity, based on this Wikipedia page
  (3) An Excel file that contains these 10 people's relationship type, relationship strength, and directions of relationship to the focal celebrity
  (4) Read this Excel file into R, and use what we have learned so far to calculate the three statistics.
  (5) Write about what these three statistics mean, in a way understandable to humans.

Evaluation Criteria

The final products include (1) exported **R markdown notebook** as pdf file, at the end of it, there needs to be **a graph, and three values corresponding to the three statistics** – all **directly shown** in your notebook (30%), and (2) a single-spaced, within-one-page **write-up** (10%) that interprets the network features of this figure, using the statistics we learned in class.

Guide to Tutorial Problem Sets

First problem set

- Question and answer format assignment.
- This problem set contains 3 questions. Based on a real life scenario, you will be asked to generate networks in the format of matrices and reveal a feature from the networks.
- The first and the second questions each takes up 40%, and the last takes up 20%.

Second problem set

- The output of this problem set is a R-generated network graph
- The data will be provided by your tutor. You only need to operate on the data and do not need to collect your own data.
- Notice that to avoid free-riders or plagiarism, everyone will be provided a sample of a bigger dataset to work with: that means in the end your graphs will all look different.
  - **If two submissions show the exact same graph, that means you two are in trouble.**
- To achieve that you need to be able to
  - input a network matrix in R
  - use R package *igraph* to convert your matrix to a *igraph* object
  - then use default plot function or ggplot function to plot this igraph object

Third problem set

- Practice the calculation of key network statistics
  - Centrality
  - Transitivity
  - Cohesion
- Interpret the meaning of these statistics in real-world contexts.