Social Networks

POLI 1OOF

Course Background

- Welcome to POLI 100F, Social Networks! In this course, we'll examine the many ways in which social networks impact a wide range of human behaviors.

- We'll look at how the structure of social networks mediates the diffusion of information in human societies, and we'll examine the role that social networks play in the transmission of social norms and in eliciting or discouraging prosocial behavior.

- In the first half of the course, we'll learn the tools of social network analysis, and we'll read about recent findings in network science.

- In the second half of the course, you'll use these tools to plan and write up a research proposal for studying some particular social network.

Course Plan

- **8/1 – Course introduction, student polls**
- 8/3 – Network analysis: basics
- 8/8 – Network analysis: static networks
- 8/10 – Network analysis: dynamic networks
- 8/15 – Social norms: diffusion
- 8/17 – Social norms: planned change
- 8/22 – Political networks
- 8/24 – Political networks
- 8/29 – Network theory
- 8/31 – Network theory, review

Evaluation

- Here's how your **final grade** will be calculated:

- Problem Set #1 - 30% [due Week 2]

- Problem Set #2 - 30% [due Week 3]

- Research proposal - 40% [due Week 5; no final exam]

- **Attendance** at lecture is not required, but it is recommended because you'll have the opportunity to ask questions. All lectures will be **recorded** and posted on the corresponding Canvas page.

- Poll: "Let's get to know each other!"

Required Text

- There's only one **required text** for the course, and it's in stock at the UCSD bookstore and available on Amazon for less than $20.

  Nicholas A. Christakis and James H. Fowler. 2011. Connected: How Your Friends' Friends' Friends Affect Everything You Feel Think and Do. New York: Little Brown, ISBN: 9780316036139.
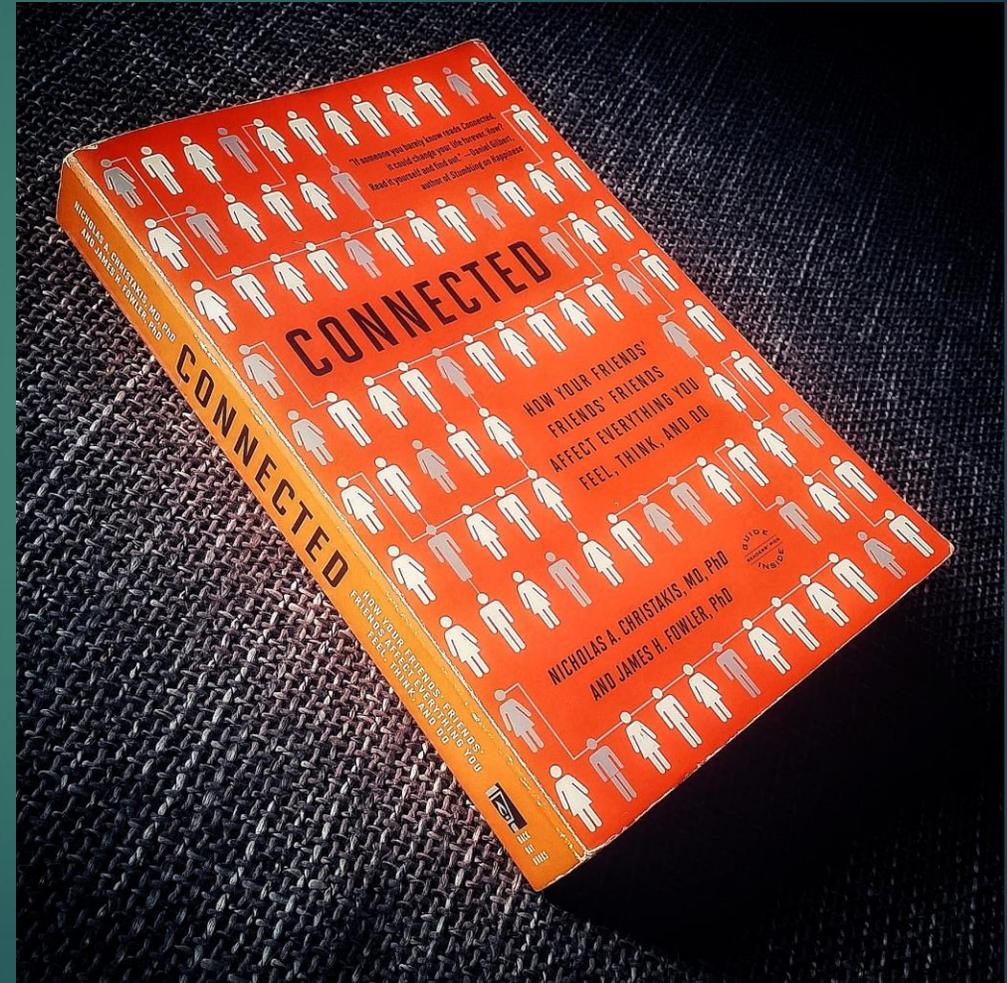
Office hours

- I'll be holding **office hours** on Wednesdays from 9-11am. You can sign up at the course Canvas page ("Start Here").
    - If that time's inconvenient or if all the slots are full, we can set something up by appointment. Message me on Canvas or email me at mdraper@ucsd.edu.

What are social networks?

▶ Networks capture the pattern of interactions between the parts of a system.

▶ Social networks are networks involving people.

▶ "[A] social network is a set of actors, or other entities, and a set or sets of relations defined on them" (Knoke & Yang).
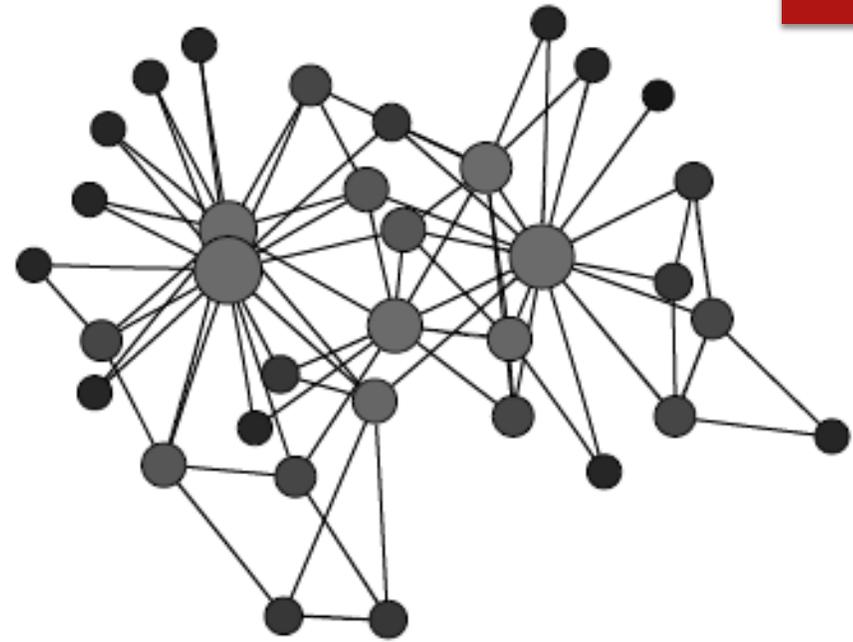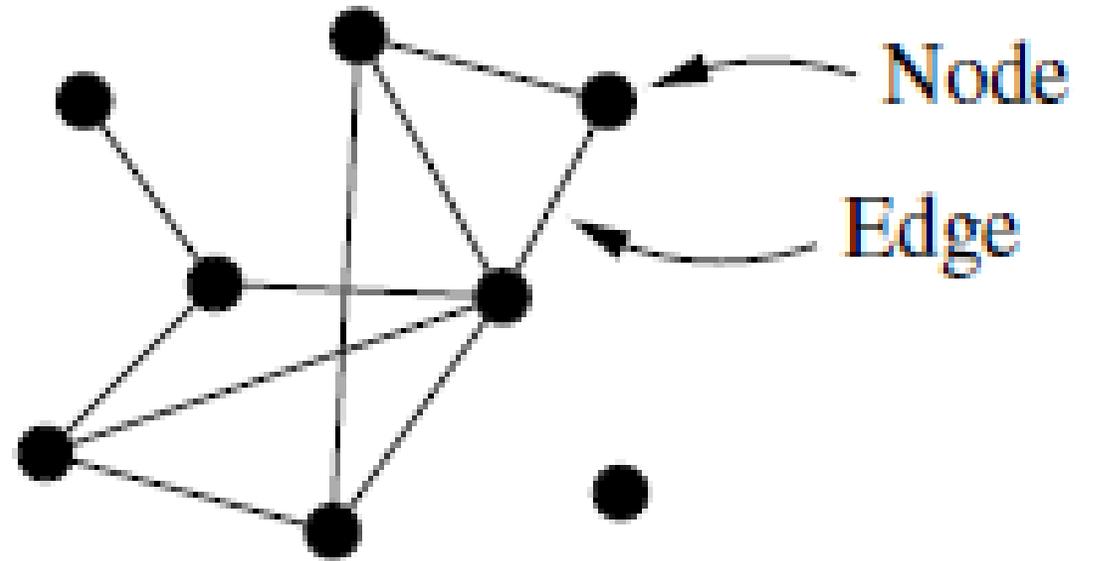

Figure 1.2: Friendship network between members of a club. This social network from a study conducted in the 1970s shows the pattern of friendships between the members of a karate club at an American university. The data were collected and published by Zachary [479].

What are social networks?

- We can call these actors **nodes**, and the relations connecting them **edges**.
  - Nodes are also sometimes called "vertices."
  - Edges are also sometimes called "links"

A small network composed of eight nodes and ten edges.

What are social networks?

- In social networks, nodes represent people, and edges represent social connections (broadly defined).
  - The arrangement of the nodes and edges in graphical space is arbitrary.
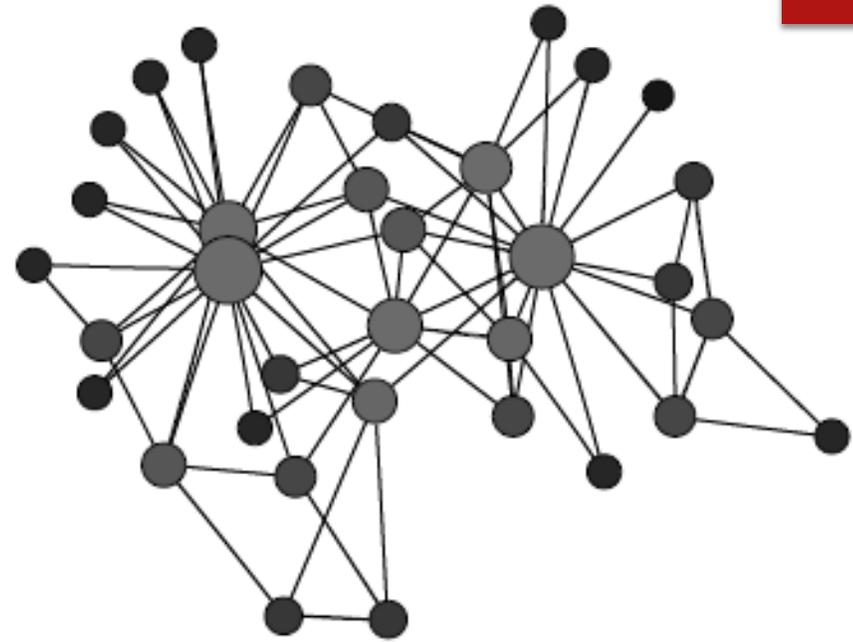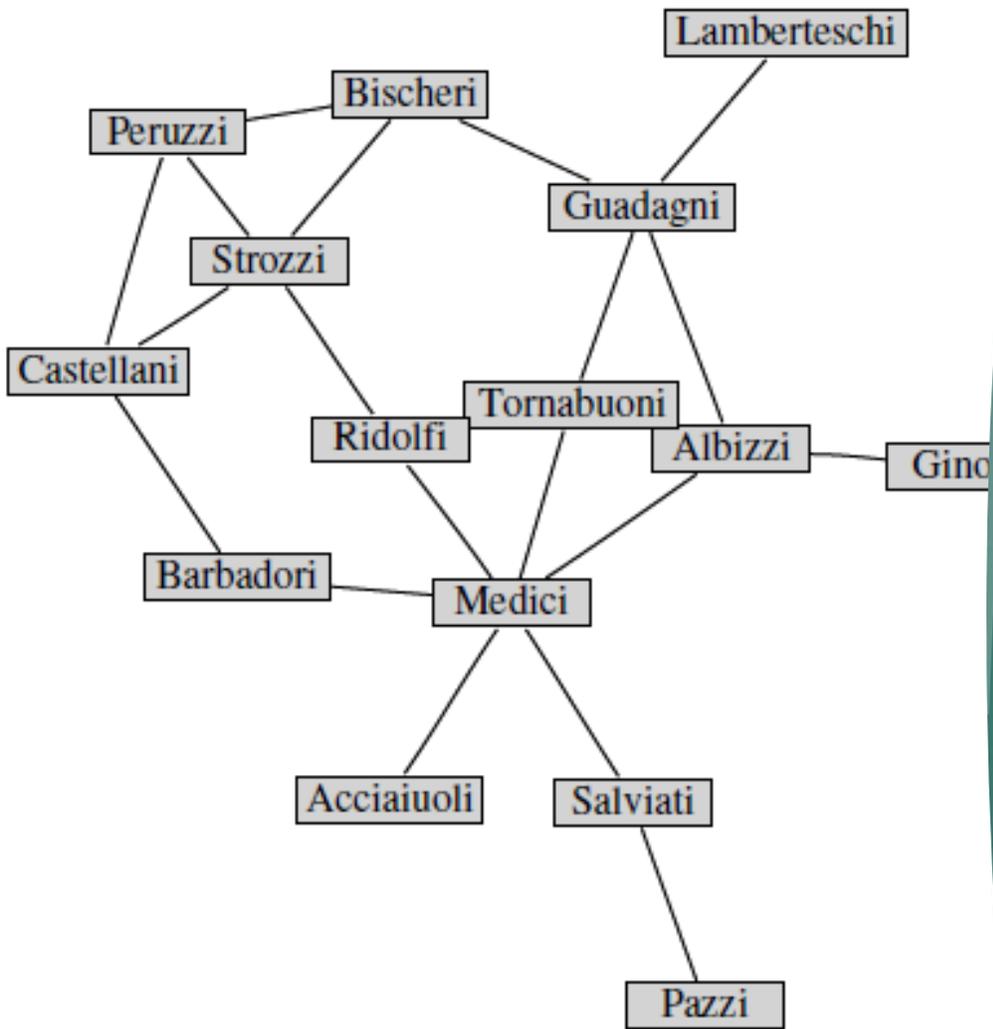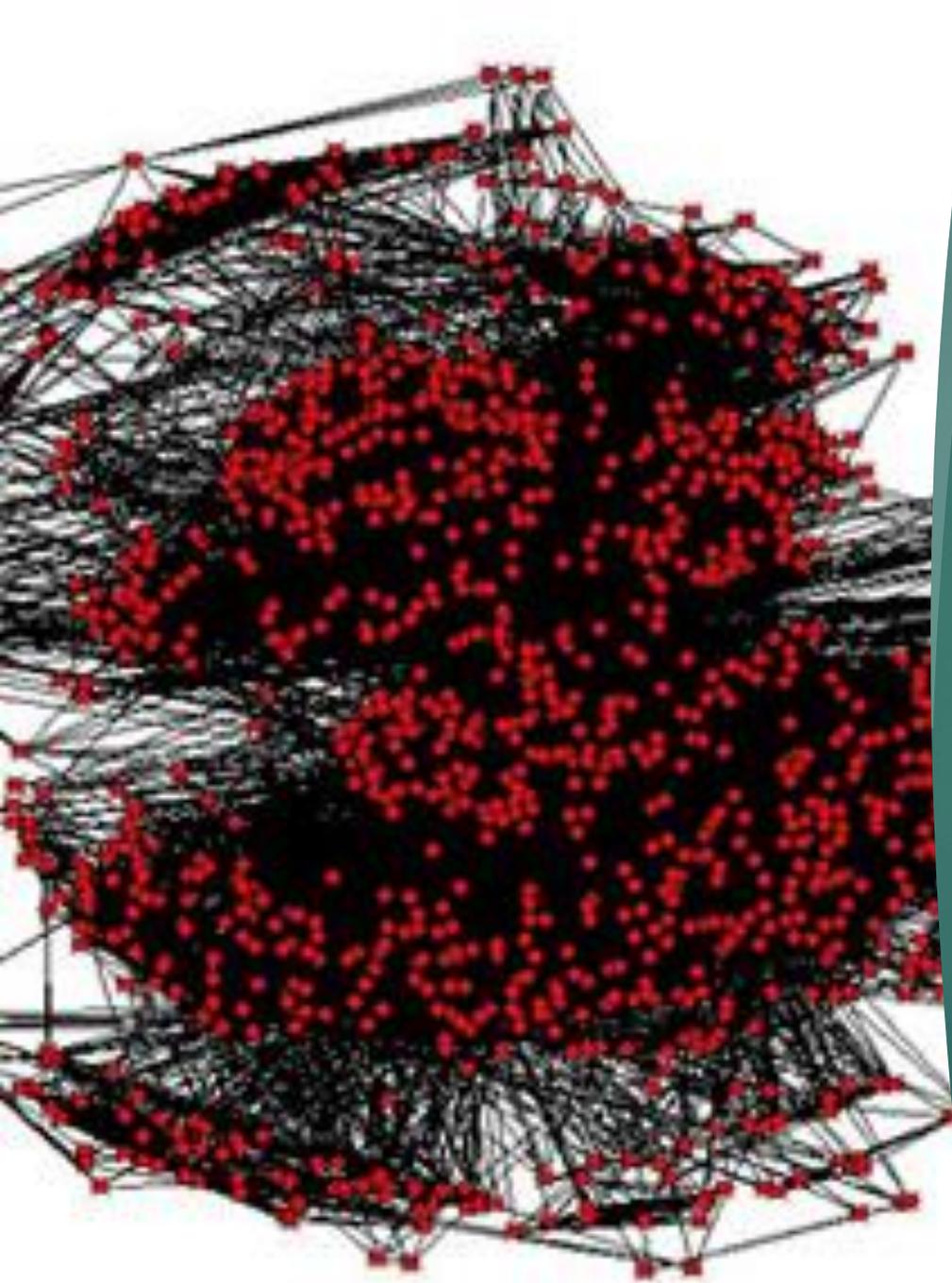

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Figure 4.3: Intermarriage network of the ruling famil[ies] of Florence in the fifteen century. In this network th[e] nodes represent families and the edges represent ties [of] marriage between them. After Padgett and Ansell [377].

Why study social networks?

▶ Recall that an **edge** is defined as the relation connecting two **nodes**.

▶ Because we can define edges in many different ways, we can use the tools of social network analysis to look at lots of different questions:

  ▶ Friendships, professional relationships, exchanges of value, communication patterns, romantic or sexual relationships, and many others.

  ▶ See *Connected*, Ch. 1.

Why study social networks?

- The choices available to us when we decide to model a network include:
  - How to think about the nodes:
    - Just people?
    - People and something else? [Multi-modal]
  - How to understand the links:
    - What do they represent?
    - Diffusion of information, disease?
    - Are they uni-directional (directed)?
      - Ex: Twitter, snail mail
    - Or bi-directional (undirected)?
      - Ex: Facebook, marriage

Abstraction

▶ When we represent a network (graphically or with a matrix), we're abstracting from reality and creating a simplified representation of the connection patterns. This is called a **topology**.

▶ The features we choose to represent depend on the question(s) we're asking. This means that our model is only "right" or "wrong" with respect to some purpose.

▶ When we're evaluating a network, we should ask: "what features of reality do we think matter to produce the effect we're interested in studying?"

An interdisciplinary field

- Social network theory and analysis receive contributions from a wide variety of fields:
  - Sociology
  - Communication
  - Mathematics
  - Political Science
  - Computer Science
  - Biology
  - Economics
- This means that key concepts often have several different names (ex: line, edge, link).

Big results from small building blocks

- Over the next three class sessions, we're going to be learning the tools of network analysis.

- This is mainly going to consist of **vocabulary** and **concepts**.

  - Triangles, degrees, communities, clusters, centrality, graphs, homophily, geodesic distance, transitivity, clique, bridge, hub, pendant, isolate, ties, triadic closure, small world, etc.

- A lot of the concepts seem (and are!) simple.

  - But take them seriously, and make sure you can apply them.

- The simple concepts interact in complex ways.

  - This yields a complex and (often) fairly accurate picture of reality.

  - But let's remember that it's a picture, not reality itself.