Theoretical Perspectives

6. Social networks

http://users.ox.ac.uk/~sfos0060/SociologicalTheory.shtml
Introduction

• Social integration: one component is density of interaction (or density of networks)
  • this can be measured at individual level: Q. how often do you invite friends for dinner? (Putnam 2000)
  • and aggregated over social units
• Social networks: what matters is network structure, not reducible to individual attributes
  • individual may be unaware of this structure
(i) relationships among individuals: friendship, contact


Redrawn by Martin Grandjean: girls in white, boys in orange
Mobile phone calls:
over 18 weeks
7m subscribers
20% of country
(Onnela et al. 2007)

aggregate call duration in minutes
(ii) individual affiliation with other entities

(Breiger 1974)

- relationships among individuals affiliated with the same entity (e.g. coauthors of a scientific article; directors on the board of a company)
- relationships among entities sharing the same individual (e.g. articles with the same author; companies sharing the same director …)
Characteristics of networks

- Networks (not just social) have ‘short global path lengths, high local clustering, and skewed degree distributions’ (Watts 2004)
- Degree distribution
  - e.g Instagram followers: median 150; maximum 143 million
- Local clustering
- Global path lengths …
Milgram’s (1967) experiment: ask someone in Omaha NE to forward a letter to stockbroker in Boston MA

- supposedly average 5.9 steps to get there (popularized as “six degrees of separation”)
- most letters lost (78/96), most subjects close!
- email replication: 5-7 steps median, only 1.5% reach (Dodds, Muhamad, & Watts 2003)

Mathematically, random bridges dramatically reduce global path length

![Diagram showing regular, small-world, and random network topologies]
I. Clustering and integration

- Network analysis can define one component of Durkheim’s integration (different from density of ties)
- ‘A group’s structural cohesion is equal to the minimum number of actors who, if removed from the group, would disconnect the group’ (Moody and White 2003)
Students in American high schools: the deeper a student was nested within cohesive friendship blocks, the more he/she identified with the school.
Directionality

- **Strong embeddedness**: A => B and B => A (Grannis 2009)
- 124 U.S. sociology departments producing PhDs, connected by hiring
  - more cycles (1–6) of strong embeddedness = greater prestige
  - core at 6th level:
2. Bridging and advantage

- e.g. James and Robert have the same number of connections, but Robert also bridges clusters (Burt 2005)
- Burt demonstrates that managers who span “structural holes” have better performance evaluations, higher pay, better ideas
  - a bridge/broker has competitive advantage (Burt calls this “social capital”)
  - note difference from collective definition (e.g. Putnam’s)
Bridges tend to be weak

• ‘the stronger the tie between A and B, the larger the proportion of individuals … to whom they will both be tied’ (Granovetter 1973)
  • if A spends time with B, and B spends time with C, then A and C will tend to spend time together
  • if A likes B, and B likes C, then A and C will tend to like each other
=> information tends to flow through weak ties
  • professionals get jobs through acquaintances rather than friends (Granovetter 1973)
• Caveat: tradeoff between network diversity and channel bandwidth (Aral & Van Alstyne 2011)

As the Diversity-Bandwidth Tradeoff Increases: Constrained-High Bandwidth Ties Are Preferred

E[A] = 2 < E[B] = 4

B’s greater bandwidth overwhelms A’s advantage of bridging pools of novel information.
Bridges and collective action

- Paul Revere famous for his midnight ride in 1775, warning militias in Lexington and Concord that British troops were coming
  - simply due to chance or personality?
- Han (2009) reconstructs social networks of pre-revolutionary Boston using membership of five organizations
- Revere (and Joseph Warren) span different social groups
  - occupation is important: silversmith (doctor)
1762
St. Andrews Lodge ($N = 53$)

1766
Loyal Nine ($N = 10$)

1771
North End Caucus ($N = 60$)

1773
Long Room Club ($N = 17$)

1774
Boston Committee of Correspondence ($N = 21$)
PR and JW connect ‘middling sort’ (e.g. St Andrew’s Lodge, G1) with elite (e.g. North End Caucus, G3)
3. Explaining networks

If action is explained by social networks, what explains the network?

- **Homophily**: ‘a tendency for friendships to form between those who are alike in some designated respect’ (Lazarsfeld & Merton 1954)—relative frequency; individual preference

- **Triadic closure** (Heider 1946)
  - balanced triads:
    - my friend’s friend is my friend                      +  +  +
    - my friend’s enemy is my enemy                      +  -  -
  - unbalanced triads:
    - my friend’s enemy is my friend                    +  -  +
    - my enemy’s enemy is my enemy                      -  -  -
  - network evolves towards greater balance
Adolescent sexual networks (Bearman, Moody, & Stovel 2004)

- don’t have sex with your ex partner’s current partner’s ex partner!

- Implications for controlling STDs: break giant component

- Macro <=> micro
conflict
image of social order
harmony
individual
locus of explanation
situation
macro
naturalistic
interpretive
epistemology
network analysis
Summary

• Social structure can be analyzed as a social network, constituted by individuals (or by organizations linked through individuals)
  • network cannot be derived from the aggregated attributes of individuals
• Networks consist of
  • dense clusters (=> lecture 5)
  • bridged by a few weak ties
    • providing individual advantage and facilitating collective action
Questions

• Can social networks explain how individuals can overcome the problem of collective action?
• How useful is it to theorize “society” as a series of overlapping social networks?
• Why are ‘weak ties’ so important in social networks?
References

Paul Lazarsfeld and Robert Merton, ‘Friendship as a social process’, *Freedom and Control in Modern Society* (1954)
Mark Granovetter, ‘The Strength of Weak Ties’, *AJS* 78 (1973)
Peter Sheridan Dodds, Roby Muhamad, & Duncan J. Watts, ‘An Experimental Study of Search in Global Social Networks’, *Science* 301 (2003)