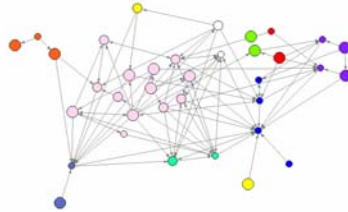


Theories and Methods for Understanding Human Social Networks



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Introduction to social networks

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The imperative to study social networks: an example from sociology

Following a review of the impact of “accidents” and “luck” on the actual functioning of society:

“These findings force us to ask whether the stuff of social action is, in fact, waiting to be discovered in the network of interstices that exist outside the normative constructs and the attribute breakdowns of our everyday categories”

White, Boorman & Breiger (1976), *American Journal of Sociology*

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Introduction to social networks

Who is studying social networks?

Why are social networks important?

How do networks fit with conceptualisations of the social world?

What is distinctive about the study of social networks?

How has the field been described?

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Who is interested in social networks?

Anthropology

Kinship systems
Networks and social structures

Psychology

Interpersonal, group and intergroup processes
Socially-situated cognition

Sociology and demography

The structure of opportunity, status attainment and social networks
Embeddedness of economic ties and the social bases and structure of markets

Epidemiology, Social Medicine, Public Health

Social capital, social support and physical and mental health
Social contact and infectious diseases
Sexual contact, needle-sharing and blood-borne infections
Social influence and health promotion

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Who? 2

Political Science

- Influence networks and elites
- Policy networks
- Coalition formation

Economics and Finance

- Labour markets and informal networks
- Interactivity and complexity in economic and financial systems
- Interfirm relationships
- Markets and networks

Management and organisational studies

- Intraorganisational networks and organisational effectiveness
- Interorganisational networks, organisational fields and organisational effectiveness
- Interlocking directorates
- Organisational design
- Knowledge management (distributed knowledge systems)

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Who? 3

Linguistics

- Sociolinguistics

Geography and Urban Planning

- Networks and *social* space and place

Computer Science

- Analogue with computer networks, internet, WWW
- Communication networks
- Challenging computational problems

Mathematics and Statistics

- Challenging mathematical and statistical problems

Physics

- Complexity
- Universal laws

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Who? 4

Interdisciplinary research

Most importantly, social networks are often of interest in interdisciplinary settings, and networks are often seen as providing important links between disciplines

For example:

- Sociology and psychology (structure and agency)
- Sociology and geography (social and geographical space)
- Sociology and epidemiology (social epidemiology)
- Psychology and management (organisational behaviour)
- Etc....

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Why are networks important?

For understanding action in relation to its social context

network ties link actors to each other as well as to groups, cultural resources, neighbourhoods, communities

networks structure opportunities and constraints

For understanding social dynamics

social action is *interactive*: one person's action changes the context for those to whom they are connected

To understand the cumulation of local processes into population level outcomes (the "micro-macro" problem)

The structure of networks and the dynamics of local processes are critical to understanding how locally interactive, context-dependent actions cumulate into outcomes at higher levels (eg communities, populations)

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Where do networks fit in more general conceptualisations of the social world?

The social world:

involves *multiple types of entities at multiple levels*

people, groups, organisations, cultural symbols, beliefs, geographical locations

is highly *relational*

it is made up of links among these entities (eg Emirbayer, 1997)

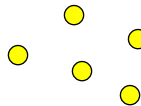
Social structure: regularities in multi-mode relational forms within and across levels

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A simplified multi-layered framework

Social units

individuals
groups
...

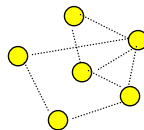


For example:

Interactions between social units depend on proximity through ties

Ties among social units

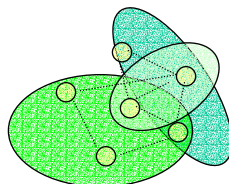
person-to-person
person-to-group
...



Interactions between ties depend on proximity through settings

Settings

geographical
sociocultural
...



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What is distinctive about the study of social networks?

It is a *relational* enterprise (Emirbayer, 1997)

And hence a *cross-level* enterprise, for example:

Persons and ties (social networks)

Persons and groups (affiliation networks)

Organisations and interorganisational ties (interorganisational networks)

As a result, we need *quantitative and qualitative methods attuned to relational entities*

Observations are not independent (e.g., see Abbott, 1997, on the “variables revolution”)

Categorisation is not sufficient

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What is a network tie?

“A **social tie** exists in, and only in, a relation between actors which *catenates*, that is entails (some) compound relation through other such ties of those actors. ... Thus it is subject to, and known to be subject to, the hegemonic pressures of others engaged in the social construction of that network” (White, 1998)

Network ties are inherently **social** and **locally interactive**

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How has the field been described?

Borgatti and Foster (2003): typology of organisational network studies

Classification by topic:

Social capital

Network organisations

Joint ventures and inter-firm alliances

Social cognition

Embeddedness

Board interlocks

Knowledge management

Group processes

Borgatti and Foster classify network studies according to:

Networks as cause or consequence

Individual and group outcomes seen as a consequence of network structure, versus

Network structure seen as a consequence of individual and group properties

Level of analysis

Individual, dyadic, triadic, or higher level subgroup, group, organisation, etc

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Consequences of networks

Classify studies in which networks are explanatory according to focus on:

Explanation of actor-level variation *versus* actor-level similarity

Explanation in terms of topology (structure) *versus* connections (flows)

Variation

Similarity

Topology

Structural capital

e.g. power of Medici
(Padgett & Ansell, 1993)

Environmental shaping

e.g. attitudes determined by
structural role

Connections

Social access to resources

e.g. social capital and
health

Contagion

e.g. attitudes determined by
diffusion

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How has the field been described? 2

Emirbayer & Goodwin, American Journal of Sociology, 1994

Distinguish three explanatory forms in network case studies:

Structuralist determinism

Neglects agency, culture and normative commitments

Structuralist instrumentalism

Narrow conception of agency; cultural and normative commitments neglected

Structuralist constructionism

Most successful conceptualisation of agency and the impact of normative commitments, but falls short in dealing with complex interactions among culture, agency and social structure

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Some Examples:

1. The Rise of Cosimo de' Medici

Padgett & Ansell (1993):

The puzzle of Cosimo: “totally contrary to Machiavelli’s portrait in *The Prince* of effective leaders as decisive and goal oriented, eyewitness accounts describe Cosimo de’ Medici as an indecipherable sphinx”

“to understand state-building ... one needs to penetrate beneath the veneer of formal institutions and apparently clear goals, down to the relational substratum of people’s actual lives”

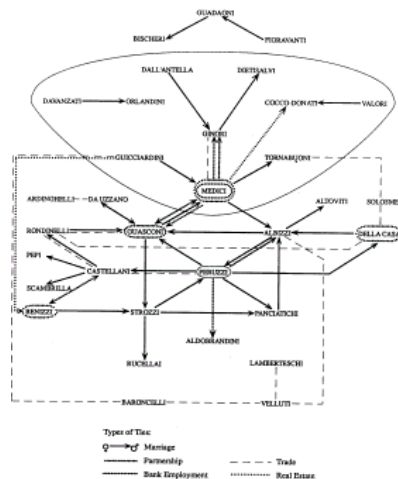
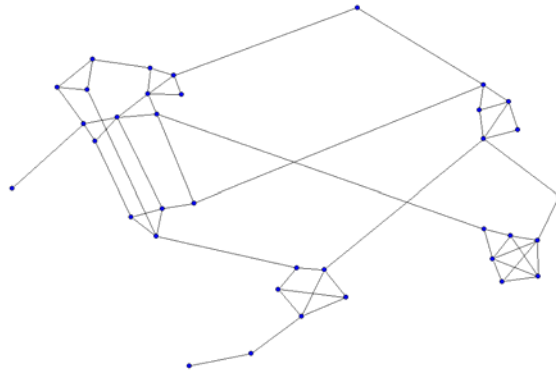


FIG. 2a.—Marriage and economic blockmodel structure (92 elite families)

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2. Ronald Burt (in press): *Brokerage and Closure: an introduction to social capital*

Informal relations tend to form relatively dense *clusters* separated by *structural holes*. People whose networks *bridge* the holes are *brokers*



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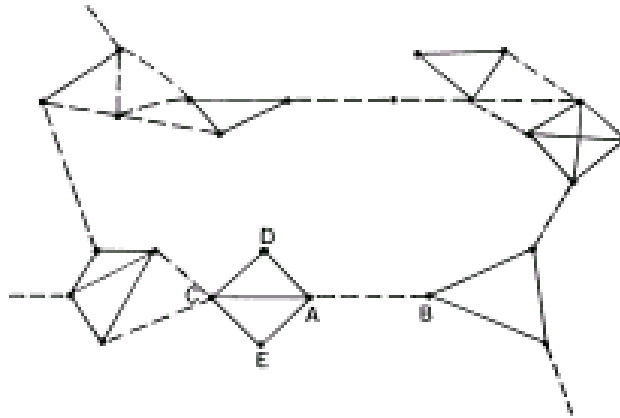
Ronald Burt on Brokerage and Closure, *continued*

Burt provides evidence that across a range of organizations:

1. Brokers do better: they get more positive individual and team evaluations, higher compensation, faster promotion
2. Brokers do better because of improved vision – they are at greater risk of having creative ideas and/or of seeing how to implement ideas
3. Network clustering reinforces the *status quo*, and amplifies strong relations to extremes of trust and distrust, deepening structural holes
4. Network clustering around the bridges creates reputation pressures that encourage the trust and collaboration needed to deliver the value of brokerage

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3. The strength of weak ties (Granovetter, 1973): Weak ties (eg A to B) are likely to be *bridge* ties



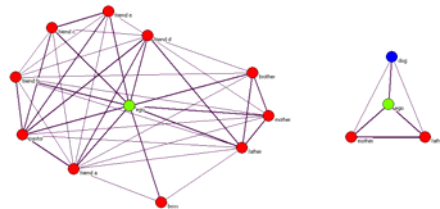
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Social capital and health

Mental health

Psychiatric diagnosis and hospitalisation are associated with

- Fewer strong tie partners
- Less dense local networks
- Fewer interaction settings
- Fewer weak tie partners



Physical health

Odds of becoming ill when exposed to cold virus depend on network diversity (controlling for prior exposure etc)

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Some key theoretical, methodological and empirical challenges

How are network ties best conceptualised and what is the process by which ties evolve?

What *exactly* is the process by which network ties shape individual beliefs and actions?

Can we explain/model the dynamics of network evolution and the co-evolution of networks and individual beliefs and actions?

What are the processes by which new social and cultural forms emerge (eg groups, settings, markets, stereotypes) and how can we model such processes?

Can we use our knowledge of network processes to construct a social science of intervention in complex network-based systems?

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