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Social Network Analysis

Focus on Methods
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Social network analysis (SNA) is an emerging perspective in social research. Conventional quantitative methods assume sample members are independent. SNA assumes its actors are interdependent, analysing the effects those relationships produce. This enables a more thorough exploration of how social interactions are formed, developed and influence others. The relationship between actors means conventional statistical methods cannot be applied.

SNA is not, in itself, a methodology or a theory. Rather, it is a toolkit for constructing and analysing research questions concerning relationships between actors or the flows of resources through a network. Network analysis is underpinned by an assumption that a relationship between two nodes (people, companies, countries etc.) influences the formation and utilisation of linkages to others. The saying “a friend of a friend is a friend”, or “a friend of an enemy is an ally”, implies our perception of strangers can be influenced by their relationships to those around us. Similarly, someone could be a regular theatre-goer despite holding no interest in plays simply to accompany their partner. A company might decide not to sell their products to one firm to avoid upsetting a client who is their rival. A schoolchild might join the hockey team because their friends are on it. In the real world decisions are not solely egoistic but based on our position within our social structure. SNA enables those outside influences to be explored.

Types of Network

Networks can be devised around almost any possible links and actors. We can analyse, for instance, who communicates with whom, the levels of trading between nations and how strongly connected individuals’ friends are to each other. Ties can be either a dichotomy (present or missing) or a numerical value.

Networks can contain one-mode of actors where all can link with each other, such as co-authoring patterns within a

department, or two-modes which cannot link to their own type, such as which academics publish in which journals.

Egonets measure ties between those linked to a single actor, such as knowing which people we e-mail who also email each other.

How does SNA work?
There are various measures which enable us to make sense of network data:

Centrality **-** We can identify central positions of nodes in terms of their closeness to others, betweenness in linking other actors and eigenvector importance. From this we can understand how the flows of resources are controlled and utilised.

Homophily and reciprocity **-** We can understand how links are formed, maintained and broken by analysing the longitudinal development of networks.

Structural holes **-** Actors in strategic positions linking two otherwise unconnected elements of a network can be identified, as well as weaknesses in structures.

Clusters and cliques **-** SNA can identify groupings and clusters within a network. It can also examine linkages between those cliques and identify leadership roles within them.

Structural equivalence **-** Disconnected nodes which perform the same roles within a network, or have access to the same resources, can be identified to understand their common characteristics.

Are there any limitations?
The largest difficulty of SNA is obtaining reliable data. As SNA studies interdependence, missing data can cause fundamental problems. Network data needs to be collected as secondary datasets are usually insufficient for analysing other research questions. Also, the tools, whilst easy to use, derive from a different paradigm to conventional statistical analysis, often requiring more qualitative-type analysis of numbers rather than producing probabilities.

Key software
Pajek provides a simple yet effective introduction to SNA, enabling statistics and sociograms to be produced.

Ucinet offers a greater depth for more sophisticated analysis.

Siena and Pnet enable longitudinal data to identify alterations to networks and predict the processes which create those changes.

To learn more
A good, thorough introduction to SNA can be found in Social Network Analysis: A Handbook by John Scott (2000; Sage, 2nd edition).

There are three specialist journals containing empirical and methodological studies: Social Networks; Connections; and the Journal of Social Structure.

The International Network for Social Network Analysts (INSNA) contains many useful links on their website http://www.insna.org

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