Social Network Analysis Concepts and Definitions
Social Network Analysis Workshop for NonProfits

CONCEPTS AND DEFINITIONS IN SOCIAL NETWORK ANALYSIS

Adjacency Matrix – Tabular data showing which nodes connect to which, the matrix may include weights or 0/1

Affiliation Network – degree of co-membership, co-participation in events or projects creates inferred linkages, 2-mode

Asymmetry – most relationships are not balanced, as authority, esteem, status, position often prevent parallel results

Centrality – the importance of an actor (node) in the network due to its position, surrounding density

Degree – number of links entering a node or leaving a node (same both ways if unidirectional link, count once), usually a relatively high *indegree* in a bi-directional network indicates a popular node

Bonding Tie – link that connects subgroup members to one another, increasing group cohesiveness

Betweenness Centrality – broker between two distinct actors along a bridging tie, otherwise unlinked

Bridging Tie – link that connects what would otherwise be an isolate to the rest of the network

Closeness Centrality – distance between one node and all other nodes, sum of inverted distances, central

Bonding Tie – homophily-based connections, those connections based on having things in common, clique

Eigenvector Centrality – measure of the importance (centrality) of the ties, as well as, their density

Beta – factor in calculating Eigenvector Centrality; if negative, indicates worse to be connected

Eccentricity – measure of how much the network deviates from a balanced, central, dense hub-spoke type random structure

Characteristic (actor attribute) – an attribute of a node or link that can be used as a dependent (explanatory) variable explaining network formation or an independent variable caused by the structure of the network

Cohesion – strength of clique to exclusion of other groups and connections

Community (clique, subgroup) – subgroup in the network measured by its members mutual proximity to one another,

n-clique – clique less than X hops away used to determine cohesive subgroup from others when not all ties closed

k-core – directed ties of different n until network breaks apart to better define whole network, region, k-core

Clustering Coefficient – a measure of how well-defined communities / cliques are within a network with limited bridging

Cumulative Advantage (Preferential Attachment) – Newcomers tend to connect to already well-connected

Density – measure of how well actors are tied to one another through multiple, redundant paths

Digraph – network representation of node/link structure with bi-directional links

Directed Network – both incoming and outgoing links are represented to indicate a flow in a particular direction

Dyad – two nodes and their link(s), two actors and the connection(s) between them, uni/bi-directional, multiple link types

Emergent Property – a property derived from the network itself, "the whole is greater than the sum of its parts"

Ego Network – focus ego and to all others (alters) of the type of connection being analyzed that the ego connects

Equivalence – *structural* equivalence if two nodes ties match exactly, *regular* equivalence if nodes same relative position

Event Relation – temporary relationship that can change linking two nodes, such as *who bought a house from who*

Giant Component – the largest collection of *strongly connected* nodes that can all be reached from one another

Homophily – actors prefer having relations with similar types, measures that shared attributes increases chance link

Hops – how far apart two nodes are in a network by the shortest path between then

Information Diffusion – how network structure effects the ability of info or other flows to traverse the network

Incoming – a uni-directional link going into a node in a *directed* network, *indegree* measure the number incoming

Incident Matrix – Tabular data showing which nodes connect to which case or event to develop *affiliation network*

CONCEPTS AND DEFINITIONS IN SOCIAL NETWORK ANALYSIS *(Continued)*

Isolate – a node not connected to any other nodes by any links (edges), a disconnected (untied) node

l – in network equations and measures, lowercase l usually represents the *number of links (lines)*

Lamda – measure of proportion of ties in subgroup to ties outside subgroup, often innovators bridge disciplines more

Modularity – weak vs. strong clique-forming tendencies in network / degree of subgrouping vs. uniform density

N – in network equations and measures, N represents the *number of nodes*

Network Boundary – clear distinction describing what is included in the network and what is not (friends at work)

Network Layout – methods SNA software uses to better diagram closely linked and those with less connectivity

Network Maturity – a measure of the stage of robust network development

Network Node (vertex, actor, entity, site) – the points of analysis in the network, although individuals are common unit of analysis, you may also consider groups, species, firms, sectors, countries, research article references, and more

Network Link (tie, edge, arc, relation, bond, connection, senders/receivers) – the path between two network nodes

Network Weaver Intentional agent of change that purposefully and systematically applies SNA principles to hasten network maturity

Multiplexity – sharing more than one kind of tie together, such as boss and personal friend, husband, and business partner

Outgoing – a uni-directional link leaving a node in a *directed* network, *outdegree* measures the number outgoing

Path Length – average number of hops to move information through the network taking no node or link twice

Peripheral Actor – if embedded in own cliques around edges, can shift power from central actor

Preferential attachment – links determined by node characteristics ("rich get richer")

Resilience – if some nodes or links are knocked out, how well can the network continue to function

Shortest Path – average shortest path is number of hops on average it takes between a pair of nodes

Social Network Analysis – theory and methods to analyze connections and interactions between entities to understand structure, and how characteristics of the entities and interactions affect the structure, and to measure network features and how they change over space, time, and other influences

Star Graph – graph showing which nodes fall between others, the closest node to all others

State Relation – relatively permanent relationship between nodes represented by arcs, such as familial ties

Triad – three actors with all arcs between them, three nodes with both bi-directional links connecting all three together

Triad closure bias – *a friend of yours is a friend of mine*, network turns inwards and direct links to pool of included

Walk– number of links that occur between two nodes taking any path, the *shortest path* includes the fewest *hops*

Weighted Path – assigning a link a relative strength based on the number of transactions, time together, ranking,etc.

Undirected Network – nodes represent connections (links or not), not flows going in any particular direction

CONCEPTS IN BASIC SOCIOLOGY

Beliefs – views about what is true "all men created equal", idea or viewpoint held in common that influences course of action chosen

Values – matter of preference "what's best?", Concept of what is desirable, proper, beautiful, good, or right that guides behavior

Norms – expected pattern of behavior, an unwritten social rule, most evident when broken, that directs behavior in a specific situation

Sanctions – positive and negative rewards for behavior, formal and informal social controls to gain conformity with social norms

Culture – institutional constructs above shared by a group, often described in terms of a specific country or region

Organization -- A group organized for a purpose as a named entity with documented rules and positions

Institution – set of organizing principles governing social relationships of one type (education, economics, family, religion)
can also be defined as self-organizing principles used to *run* society or
a structure or mechanism of enforcing behavior to conform to shared community practice

Status – interactive positions you occupy in society, often in a hierarchical structure to get work done (family, company)

Role – a set of expectations society places while one is exercising a particular position (status): mother or CEO

Social Paradigm – a window / perspective from which to understand certain aspects of social behavior

Interactionist - Society is composed of interactions among people (families, friendships, organizations)

Functionalist - Social life is structured into statuses, which play roles, which define your allowable actions

Conflict - Unequal distributions lead to competitive struggle, people break rules and rules themselves change

Labeling Theory – people tend to become similar to others with similar ascribed and achieved statuses, leads to classification

