

SOCIAL NETWORK ANALYSIS. [This entry comprises two articles: Definition and History and Concepts, Applications, and Methods.]

Definition and History

Social network analysis is an interdisciplinary behavioral science specialty. It is grounded in the observation that social actors are interdependent and that the links among them have important consequences for every individual. For example, links among actors permit the flow of material goods, information, affect, power, influence, social support, and social control. They provide individuals with opportunities and, at the same time, potential constraints on their behavior.

Social network analysis involves theorizing, model building and empirical research focused on uncovering the patterning of links among actors. It is concerned also with uncovering the antecedents and consequences of recurrent patterns. Its roots can be found in the work of a psychiatrist, J. L. Moreno (*Who Shall Survive?*, 1934), who introduced the approach called sociometry, and that of A. R. Radcliffe-Brown, a British

social anthropologist, in a series of lectures in 1937 (A *Natural Science of Society*, 1945).

The development of social network analysis was fostered by the work of psychologist Alex Bavelas, who founded the Group Networks Laboratory at the Massachusetts Institute of Technology in 1948. Bavelas began with an intuitive notion—that the structural arrangement of ties linking members of a task-oriented group may have consequences for their productivity and morale. He proposed (1948) that the relevant structural feature was centrality, and specified centrality in exact formal terms.

This concern with clarification has characterized the social network approach from the very start. Its main concern has been to clarify traditional intuitive ideas by specifying them in formal terms. For example, quite early, two of Bavelas's students, R. D. Luce and A. D. Perry (1949), took the intuitive idea of social group and gave it a precise definition as a graph theoretic entity called a clique. At the same time, a French anthropologist, Claude Levi-Strauss (1949/1969), began with informal notions of kinship and specified a mathematical model designed to make their structural properties explicit. And another psychologist, Anatol Rapoport (1949), focused on natural populations in which some, but not all, individuals were directly linked by social ties. He produced a probability-based model of the process of information flow through such populations.

Through the 1950s and 1960s these were all separate and distinct research initiatives. They grew and attracted adherents but were not tied together. In the 1970s, new developments in discrete mathematics, particularly in graph theory, provided the tools for the construction of more general structural models. And at the same time, the growth of computer power and speed permitted the analysis of the kinds of complex relational data sets that network research generates. So at that time, partly as a consequence of these refinements, the earlier strands were knit together and the special field of social network analysis emerged.

Since that time, the social network analytic perspective has been productively applied to the study of occupational mobility, the impact of urbanization on individuals, the world political and economic system, community decision-making, social support, community, group problem-solving, diffusion, corporate interlocking, belief systems, social cognition, markets, sociology of science, exchange and power, consensus and social influence, and coalition formation (Wasserman & Faust, 1994, pp. 5-6). Additional applications include primate studies, computer-mediated communication, intra- and interorganizational structure, and marketing (Wasserman & Galaskiewicz, 1994). And finally, social network research has increasingly focused on the study of health and illness, particularly AIDS. (In 1995 a spe-

cial issue of the journal *Social Networks* [17:163-343] was edited by Alden Klovdahl and devoted entirely to network studies of HIV/AIDS.)

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