Social Network Analysis: A New Tool For Understanding Individual and Family Functioning

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SOCIAL NETWORK ANALYSIS: A NEW TOOL FOR UNDERSTANDING
INDIVIDUAL AND FAMILY FUNCTIONING*

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ABSTRACT
    During the last decade, social work, along with the other helping profes-
sions, has moved toward conceptualizing practice within a social systems frame-
work. Intrapsychic variables are still important but, increasingly, the emphasis
is on the clients' intimate social network as both cause and solution of a wide
range of social problems. It is now widely believed that clients' well-being is
enhanced when system functioning is enhanced (Gitterman and Germain, 1976).
    Most of what social workers know about social systems theory comes from the
sociological literature, particularly the social action system of Talcott Parsons.
Although this orientation has great heuristic value for social work practice, it
has been limited in its ability to generate new practice theory because of its
high level of generality. For social workers, like sociologists before them,
Parsonian systems theory has proved so difficult to operationalize that the
hoped-for linkages and the anticipated development of new theory from the general
theory have not materialized (Pfouts and Galinsky, 1976).
    The authors believe that an important movement towards clarification of
system properties and relationships is currently under way in the form of social
network analysis. In recent years, a number of researchers from a variety of
disciplines have explored the use of social networks and the specific properties
of those networks as a means of operationalizing and expanding upon our intuitive
understanding of the importance of social bonds. The result of this effort is a
growing body of knowledge which draws not only upon systems theory but also upon
previous research in other areas such as kinship, support systems, adaptation to
stress, organizational theory, and information exchange.

The Meaning of Social Network
    The concept of a social network was first employed by the anthropologist
J. A. Barnes in his pioneering study of a Norwegian island parrish (Barnes, 1954).
In defining network, Barnes said:
    Each person is, as it were, in touch with a number of people, some of whom
    are directly in touch with each other and some of whom are not. . . . I find
    it convenient to talk of a social field of this kind as a network. The image

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I have is of a set of points, some of which are joined by lines. The points of the image are people, or sometimes groups, and the lines indicate which people interact with each other. We can, of course, think of the whole of social life generating a network of this kind. (Barnes, 1954:43)

The concept of social network lies somewhere between the sociological emphasis on group and the social anthropological emphasis on social structure. Crucial for our purposes, however, is the fact that these complex images of the chains of persons with whom a given person interacts have measurable structural characteristics. Network analysis follows these interactions so that the unit of analysis in network research becomes not individual behavior nor even the dyadic linkages but, rather, the social context in which the individual behaviors and dyadic linkages occur. The model cuts across the domains of politics, kinship, and formal groups to look specifically at the series of linkages which may form a basis for the mobilization of people for specific purposes in certain situations (Whitten and Wolf, 1973:720).

Types of Network Analysis

Various researchers have employed the concept of network analysis for a wide variety of purposes. A comprehensive attempt at outlining these usages has been made by Sarason and his colleagues (Sarason et al., 1977).

1. One major grouping includes those authors who have studied the effects of different types of network structure on the behavior of individuals. In this type of research, network structure is conceptualized as an independent variable. Elizabeth Bott initiated this research approach in her landmark study (1957) of 20 English families. Bott found that the degree of segregation in the marital roles assumed by married couples varied with the "connectedness" or "knit" of the network. Tightly connected, closely knit networks, in which there are many relationships among the component units independent of the central person, in this case husband or wife, were associated with a greater degree of separateness in the marital role functions of the couple. On the other hand, married couples whose combined networks were loosely knit and less connected tended to demonstrate similar role functions.

2. Network structure has also been cited as a key factor in differentiating families at risk from those families who appear to be well-functioning. Garbarino (1977) found the absence of an adequate structure (social network) for the provision of feedback and support to be one of the necessary conditions for child abuse in families. He noted the degree of reciprocity of network contacts as particularly crucial. Wahler et al. (1977) found mothers in high-risk families, as opposed to low-risk families, to have networks virtually void of friends, with a majority of network contacts initiated by others.

3. Another focus of research has related network structure to help-seeking behavior, especially looking at the proportion of friends versus kin composing the network. McKinlay (1973) found that utilizers of health-care facilities tended to rely more on networks composed of friends and neighbors than did under-utilizers, who relied more on networks composed of relatives. Similarly, Salloway and Dillon (1973) found that individuals with larger family (as opposed to friend) networks had far greater delays in utilizing health-care services. Hammer (1963), focusing on slightly different structural variables, found that more tightly connected networks were highly correlated with hospitalization for psychiatric symptoms.

4. <u>Social network structure is also related to the ability to handle stress and crisis.</u> Finalyson (1976) found better outcomes for heart patients whose wives acknowledged a wider range of network support, while Nuckolls et al. (1972) found a relationship between "social resources" and lack of complications in pregnancy. Tolsdorf (1976) found important structural differences in the networks of a matched sample of psychiatric and medical patients, with those of the psychiatric patients being more sparse and utilized less frequently. A sophisticated extension of this viewpoint is the study of networks as they relate to various life stages. Walker et al. (1977) discussed the role of social networks in bereavement and offered evidence suggesting the need for different types of networks for the widow, depending on the stage of the crisis. While a small, dense network may be most effective in providing initial support, such a network is unlikely to meet needs for additional social contacts or information later on. Lowenthal and Haven (1968) described the importance of certain types of network relationships in the health adaptation of the elderly, particularly the presence of one intimate relationship or confidante.

5. <u>Network structure has been shown to have an important influence on individual behavior in the area of the diffusion of information.</u> A number of authors have pointed to the utility of loosely knit networks with a low degree of connectedness for finding out about important resources (Craven and Wellman, 1973; Granovetter, 1973; Lee, 1969; Travers and Milgram, 1969).

6. <u>Still another area of research analysis is an assessment of the influence that individuals have on the interpersonal environment surrounding them.</u> In this case, social conditions are seen as independent variables affecting network characteristics (Gottlieb, 1975; Kaplan et al., 1977; Murphy, 1976). Network is thus used as a dependent variable in this research approach.

7. <u>Finally, some important work, of particular interest to clinicians, has been done in the area of recognizing natural helping networks as an alternative means of service provision.</u> While not our focus here, it is a practice application of network theory which offers definite promise to social work, and it has been spoken to most eloquently in the writings of Collins and Pancoast (1976). Another application is that employed by a growing group of practitioners who utilize "network therapy" as a method for working with troubled families (Gatti and Colman, 1976; Speck and Rueveni, 1969). One of the leading proponents of this modality, Ross Speck, encourages the involvement of all network members in the event of a crisis in the life of any one member.

Social Network Components

The wide array of literature suggesting the relationship between network structure and individual functioning becomes meaningful in light of our ability to systematically assess specific network components. These components may be divided into structural (anchorage, range, density, and reachability) and interactional (content, intensity, directedness, and frequency) characteristics (Mitchell, 1969).

Structural Characteristics

Anchorage refers to some specified individual whose behavior the observer wishes to interpret (Mitchell, 1969:12). Networks are social interaction systems centered on a person or a coalition of persons. This central person or group is generally referred to as "ego."

Range refers to the number of persons included in the network. At one extreme are theorists such as Barnes (1969) who see a network as unbounded, including an unlimited number of persons, so that everyone in the social universe is in the network as a result of a constant series of linkages. At the other extreme is the set of definitions employed by more applied authors who have used such limiting criteria as the number of people with whom ego has contact at least once a month, or the number of people who are considered "important" to ego (Brim, 1974; Luikhart, 1977). A bridge between these two viewpoints is offered by Boissevain (1968) who outlined three different levels of range, seen as concentric circles which center on ego. The first consists of those persons, whether friends or relatives, with whom ego is on closest terms, and is referred to as the "intimate" network; the second is composed of people known less well and relied on less heavily, referred to as the "effective" network; the third is composed of people whom ego does not know but whom he could reach through members of his intimate or extended network. The first two categories are finite, while the third is unbounded and infinite.

Density refers to the degree to which individual members of a client network are in touch with other members and ultimately speaks to the question of how tightly knit a particular network might be. Density appears to be most crucial in determining network impact (Bott, 1957; Granovetter, 1973; Hammer, 1968; Walker et al., 1977; Wellman et al., 1973). A convenient measure for density is provided by looking at the number of linkages in the network divided by the number of possible linkages. The formula for computing density is

$$\frac{a}{n(n-1)2}$$

where a is the number of linkages and n is the network size (Tolsdorf, 1976).

Reachability refers to the ease with which ego is able to contact another network member. This may be a function of actual physical distance, or it may be an artifact of the situation in which ego knows one network member only through another member. For social workers, reachability has particular meaning in relation to the availability of network members for mobilization in specific problem situations. A close and important tie that is 600 miles away may or may not be adequate support in an ongoing stressful living experience.

Interactional Characteristics

Content refers to the meanings which persons in a network attribute to their relationships. Mitchell (1969) spoke in terms of the purposes for which links are established. Content is frequently delineated by differentiating ties based on such factors as kinship, friendship, neighborhood association, professional help, and occupation. Another approach focuses more closely on the specific function of network ties, ranging from economic assistance to categories of support, advice, and feedback. Kapferer (1969) distinguished these two conceptualizations by the terms "relationship content" and "exchange content." In addition to describing the nature of the network ties, content is discussed with reference to whether a linkage contains only one content area (uniplex) or more than one content area (multiplex). Multiplex relationships are believed to be more influential and important for the focal person (Boissevain, 1974). The proportion of multiplex relationships is determined by dividing the number of multiplex relationships by the total number of network ties (Tolsdorf, 1976).

Intensity or strength of a link in a personal network refers to the extent to which the individual experiences obligations or feels free to exercise the rights implied in linkage with another person. Kapferer (1969) noted that some relationships are intense because of multiplexity in content (e.g., friendship), while others are intense and uniplex because of moral values with which they are invested (e.g., kin ties). Nonetheless, especially in network relationships based on affection and consensus, rather than kinship obligation, higher multiplexity is indicative of individuals finding it worthwhile to maintain more than one kind of link with one another.

Directedness addresses the question of whether or not network relationships are reciprocal. Asymmetrical relationships may be indicative of status differences, and this has important implications for the effectiveness of a particular link. Tolsdorf (1976) outlined this phenomenon most graphically in his finding that psychiatric patients, compared to a control group of medical patients, received many more functions than they provided. Wahler et al. (1977) showed similar findings with high-risk families.

Frequency refers to the number of contacts among people within a network. While a high frequency of contact does not necessarily imply high intensity among linkages, some minimum criterion of frequency is often employed in an effort to determine the size of a personal network.

The Present State of Social Network Research

Because social network analysis is still in an early stage of development, many theoretical and methodological problems remain unresolved. A major difficulty lies in the multitude of conceptualizations of network characteristics and the variety of techniques used in measuring them. Network analysis is only now beginning to move out of its infancy of definitional confusion and idiosyncratic, ex post facto interpretations of data into a stage of greater theoretical clarity and standardized techniques of analyzing and comparing networks. It is an encouraging sign that researchers from a number of countries and a wide range of disciplines, including social work, have recently formed their own informational network with a bulletin entitled Connections, in which research in progress is reported and discussed, and a journal entitled Social Networks, both of which are published at the University of Toronto.

There are essentially two methods used to represent social networks on paper. The first, a graph, is a picture of a network, using points on a page to represent the units and lines to represent the links. The second, a matrix, uses corresponding columns and rows to represent each member of the network. As network analysis has become more sophisticated, matrices are increasingly being used for mathematical analysis (Doreian, 1974).

It appears likely that as social network theory continues to mature, the relatively simple methods of network analysis that are now widely used will be increasingly supplemented by more rigorous diagraph analysis. Currently, concepts and methods taken from graph theory and other branches of topology are proving to be very useful, particularly in analyzing those network components that are of interest to both mathematicians and social network theorists (e.g., reachability).

At the present time, social network research is in a state of flux and nobody can foresee the extent to which the promise it seems to hold will be fulfilled.

Perhaps the most exciting aspect of this new approach for social work faculty and students is the possibility that what is now a relatively primitive method may develop into a powerful source of social work knowledge about interventive strategies with troubled individuals and families.

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