Network Thinking in Peace and Conflict Studies

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Abstract

Developments in mathematics and social theory and in techniques of communication and computation have brought network analysis to a state where it can be practically applied over a broad spectrum. Surprisingly, this mode of analysis has not been adopted by practitioners and scholars of peace and conflict studies to the extent that it ought to be. Examples of types of analysis that could have important applications are given, using network concepts such centrality, structural equivalence, and regular equivalence.

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Abstract

Developments in mathematics and social theory and in techniques of communication and computation have brought network analysis to a state where it can be practically applied over a broad spectrum. Surprisingly, this mode of analysis has not been adopted by practitioners and scholars of peace and conflict studies to the extent that it ought to be. Examples of types of analysis that could have important applications are given, using network concepts such centrality, structural equivalence, and regular equivalence.

Although the Millennium did not bring the predicted interruption of global electronic networks that might have resulted in widespread chaos, the year 2001 brought to the attention of the public – Americans especially, but the rest of the world as well – a festering international conflict that is expressed more through complex networks of ideologically driven persons all over the world than through actions of nation-states vis-à-vis one another. It is a kind of international conflict that is *inter-national* only in its scope and span.

The structure of the movement often referred to as the *al qaeda* network is not necessarily unique. Nor is that structure so new as it is often portrayed. Anthropologists have seen it before and called it to our attention.

In the 1960s and 1970s, anthropologists Virginia Hine and Luther Gerlach studied the kinds of organizations that were developing in the intensification of efforts by the powerless in nations around the world to organize themselves to effect structural change. When people organize *themselves* to change some aspect of society in popular movements such as the ecology movement and the black power movement -- two of the movements that they studied – a non-bureaucratic form of organizational structure seemed to emerge as very effective (Gerlach and Hine, 1974). Such organizations are not limited by state or national borders.

In a summarizing paper entitled "The Basic paradigm of a future sociocultural system," Virginia Hine wrote: "We called the type of structure we were observing a 'segmented polycephalous network'" While her title

referred to a *future sociocultural system,* she recognized that the structural model itself was not new, for she wrote, "The most penetrating insight into the true nature of this emergent supranational level of social organization has come from anthropologist Alvin Wolfe who began to catch the outlines of it during his study of the mining industry in South Africa"(1977, p.21). My description of the network of the mining industry was published fourteen years earlier (Wolfe, 1963) and then put in a theoretical context later (Wolfe, 1977).

Anthropologists have been studying decentralized, "acephalous," social systems for many decades, and in the culturally relativistic perspective of anthropology, their worth is obvious. Radcliffe-Brown marveled at the aboriginal Australian system that made it relatively easy for a person from a great distance to find his appropriate place among people who would be strangers if they did not share an ideology that cut across territorial barriers in many ways to give each person recognizable status. Anthropologists, more than economists and political scientists, were ready to see this "new" kind of organization as it evolved in our own "modern" systems.

After observing how the mining industry dominated the southern half of Africa during the 1960s when the Winds of Change were expected to bring freedom from colonial control, I wrote:

> I found the mineral extraction industry of southern Africa to be organized in an intricate system based more on overlapping membership of a variety of groups than on a bureaucratic centralization of administrative power. The network binds groups that are different both structurally and functionally, some business corporations, some states, some families, in a modern supranational structure that is more than just international. ...The several hundred mining companies operating in southern Africa are integrated through a series of relationships that focus on some of the larger among them. ...Then, in a variety of ways these corporations are linked to governments (Wolfe, 1963, pp. 153-54).

I saw how states (territorially bounded, bureaucratically organized corporations) were weakened relative to companies that were able to operate above the level at which states ordinarily have sovereignty, and I illustrated my reports on the process with data from the nonferrous metals industries that operated in what are now Zaire, Zambia, Zimbabwe, and Angola, but were largely controlled from Belgium, Great Britain, the Republic of South

Africa, and the United States, controlled *from* them, not *by* those nation-states (Wolfe, 1977).

Those observations were for me not only illustrative of ways of managing potential conflict among companies and states at a very high level of organization but also of even more general processes by which new social phenomena are generated. Previously existing units and subunits, in the course of adjustment and adaptation to changing circumstances, change their relations with one another and are, sometimes, newly integrated in a novel manner such that new units or subunits are generated.

In a 1967 chapter, "Alternatives to War," Margaret Mead wrote, "One of the principal contributions of anthropology should be to distill from our available treasure house of small and unusual social models -- many of them outside the single narrow and steadily converging mainstream of 'civilization' -- new combinations and new forms that will release us from our historically limited imaginations" (Mead, 1967:225). I was pleased to see her cite my analysis of that supranational system as identifying an emerging form of acephalous control, against which rebellion and revolt are very nearly impossible (Mead, 1967:225).

In the forty-some years since that early recognition of the importance of network models to the understanding of the processes of globalization and the evolution of new supranational structures, network analysts in many disciplines – especially sociology and organizational sciences – have made great progress in developing methods and theory for studying large and complex networks (Burt and Minor, 1983; Freeman, White, and Romney, 1989; Marsden and Lin, 1982; Mizruchi and Schwartz, 1987; Wasserman and Faust, 1994; Wasserman and Galaskiewicz, 1994; Wolfe, 1978). Unfortunately, practitioners and scholars of peace and conflict resolution have not picked up these wonderfully enlightening concepts and mathematical and computational methods to the extent that they should have.

The networks or matrices that are the basis of the evolving supranational system are not beyond our understanding. In a 1996 book, *Anthropological Contributions to Conflict Resolution*, Wolfe and Yang argued that network analyses should play an important role in our understanding of not only this newly developing global system but of conflict situations of smaller scale as well.

Now, eight years later, we dare to hope that network analysis might help develop methods to resolve some of the inherent conflicts that are causing so much anguish globally. Radical fundamentalist Muslim movements fit precisely the model that Virginia Hine (1977) had called a Segmented Polycephalous (Idea) Network (SP[I]N). Globalization of

outsourcing through networks of multinational corporations could well be seen as that kind of movement as well, the motivating "Idea" being an almost absolute faith in the Market.

In 1996, I wrote:

> Increased public awareness of network concepts creates a demand for their application to the solution of human problems, and network studies have now developed to the point where network scholars can respond to that demand. Network analysis helps us to understand social processes in complex systems and it can help us specifically to locate potential conflicts, provide early warning of barriers to communication and of developing bottlenecks in resource allocation (Wolfe, 1996, pp 7-8).

Network analysis begins by conceptualizing all social situations in terms of nodes and their connections, persons and relationships, groups and relationships. From this perspective, all systems are networks, but networks have varying characteristics, and that variation is all-important.

Bruce Kapferer's (1969) analysis of a dispute that arose among workers in a mining operation in Zambia, is an early example of the application of a network model to conflicts and disputes. He found that the way an initial dispute between two persons is defined and the way it develops are much influenced by the multiplex ties the original disputants have with others and the ties of those others with one another.

Kapferer's data were reanalyzed by Patrick Doreian (1974, 1981) who showed first how certain tools of matrix algebra made it possible to demonstrate how the connectivity properties of the network were important for understanding the social mobilization that took place (Doreian, 1974), and later showed how a then-new kind of analysis (Q-analysis) could go beyond direct connectivity to identify structural conditions that either permit or prohibit "traffic" which quite strictly affects the mobilization of support by disputants (Doreian, 1981).

Another early simple but elegant example of the application of a network model to understanding conflict is Wayne Zachary's study, "An Information Flow Model of Conflict and Fission in Small Groups" (1977). Zachary found he could have predicted quite precisely which side of a developing dispute some forty members of a network would fall on simply by knowing a little about their previous relationships with one another.

It has been shown that several distinct forms of centrality in networks can have quite different consequences. These different kinds of centrality are highly relevant to problems of conflict and resolution, for they relate directly to power and autonomy. One distinction is between closeness centrality and betweenness centrality. Not only can any given network or system be characterized as exhibiting specified degrees of closeness or betweenness, but also the analyst can specify an index of closeness centrality and an index of betweenness centrality for each individual node in a network that to the casual observer appears without any regularity.

While the several indices of centrality are highly intercorrelated, their distinctiveness may be crucial for understanding or manipulating the network. For individual nodes, high closeness centrality implies autonomy, independence from control by others. Betweenness centrality, on the other hand, implies power, potential for control of others (Freeman, 1978; Freeman, Roeder, and Mulholland, 1979). With such implications, it is clear that these formal network characteristics, which can apply to all kinds of organizations, are crucial to management, administration, and the resolution of conflict. It should be well worth the added analytical effort to be able to specify indices of dependence, autonomy, and power among persons, offices, or organizations within any system, from that of a small group to one at a supranational or global level.

Network analysis now permits us to measure the degree to which clustering is exhibited in any system of relationships. We can also identify sets of nodes that, whether they are themselves connected or not, have equivalent positions in a complex network. Such equivalence analysis and its several measures are useful in finding "structural holes" in a network, with implications for strategic action by participants. Ronald Burt develops these ideas with special focus on competitive advantage in several publications (Burt, 1982, 1992, 2001).

Even beyond that, analysis of the patterns of relationships among persons or corporations or other nodes in a large complex network can tell us the degree to which that network has a hierarchical structure even if this is not at all apparent to the participants or to outside observers. David Smith and Douglas White applied a type of analysis called "regular equivalence" to the complex set of trade relationships among nations to discover the structure of the "world-economy" and the positions of particular countries in it. Their findings "generally conform to the theoretical expectations of the world-system perspective" in that there seems to be a hierarchy from "core" countries that have very widespread relations with many others down to peripheral countries whose involvement in international trade is much more

restricted (Smith and White, 1992). Analyses of such global networks, especially if they can take into account multinational corporations as well as nations, can be improved to the point where they may be very useful in helping us to understand and resolve conflicts that arise between the "haves" and the "have-nots."

I have myself used that technique to find the structure of a network of six hundred agencies and organizations, mixed public and private, that serve children and families in a multi-county area. My interpretation of the results is that there are three distinct clusters that appear to represent three different levels of integration. Figure 1, in which each node represents a set of "equivalent" organizations, shows that the network takes on the shape of roughly concentric circles around the "core" if you will (Wolfe, 2004).
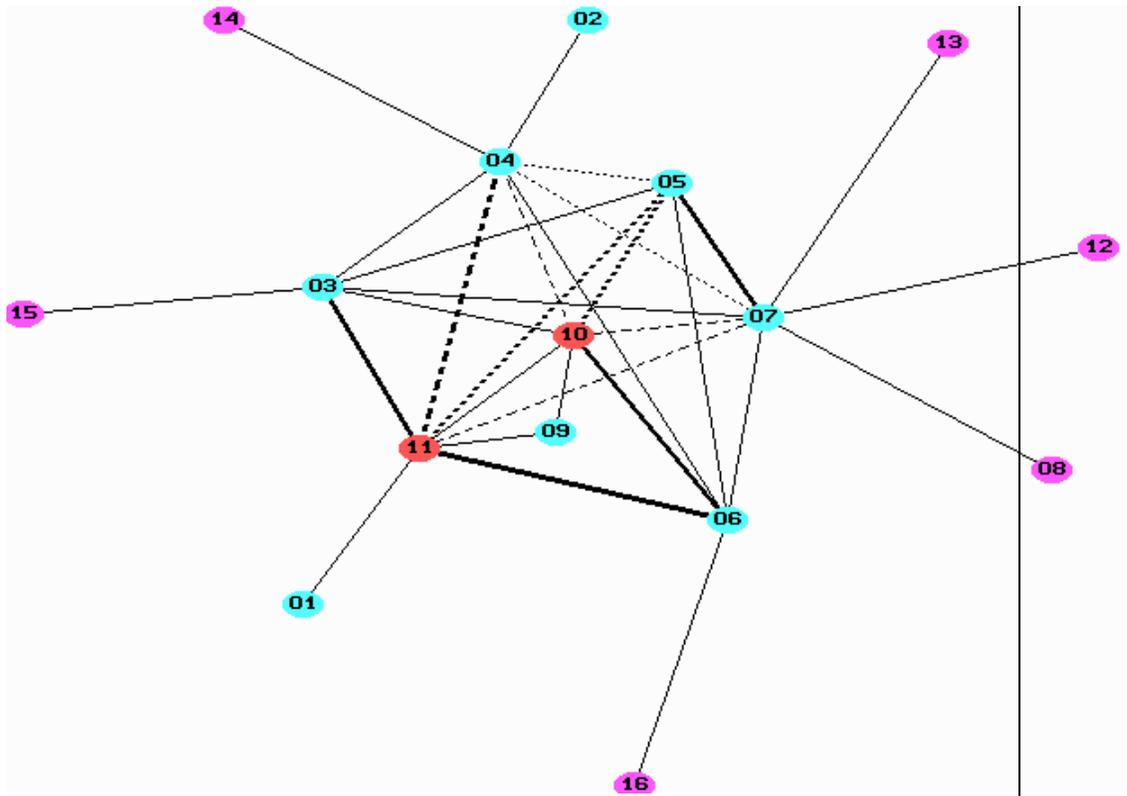

Figure 1. Network of the Clusters of 600 Agencies in the Tampa Bay Area.

I do not know of any other kind of analysis that can so effectively determine so much about complex social systems. What could be more important for a program of conflict prevention or a program of conflict

resolution than to know the degrees to which particular portions of a total system are, or are becoming, relatively isolated from the rest?

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