UC Irvine
Structure and Dynamics

Title
Network Perspectives on Communities

Permalink

Journal

Author
Wolfe, Alvin W

Publication Date
2006-09-08

DOI

Asked to write on the application of network perspectives to communities, I thought that would be simple enough. No problem! My work for fifty-some years focused largely on communities (e.g., Wolfe 1961), except for my forays into studying the networks of multinational companies in the African mineral industry (Wolfe 1963, 1977). As far as network perspective is concerned, I have always, since the 1960s anyway (e.g. Wolfe 1968, 1970), viewed everything as a network. Every community is itself a network.

Ah, but it turned out to be more difficult than I had imagined. People who write about "community" nowadays use the term in a wide variety of ways. The "little communities" that Redfield (1960) wrote about have very little in common with the present-day "community of nations, the community of Jamaica Plain, the gay community, the IBM community, the Catholic Community, the Yale Community, the African American community, the 'virtual' community of cyberspace," all mentioned by Robert Putnam (2000). Do urban villagers raise children differently than do rural villagers? What kind of village does it take to raise a child? Is this talk about a global village to be taken seriously? In 2003, a group of 33 "children's doctors, research scientists, and mental health and youth service professionals" prepared a report with the title "Hardwired to Connect: The New Scientific Case for Authoritative Communities." They introduced the concept "authoritative communities" in the hope that it would "help youth service professionals, policy makers, and the entire (U.S.) society do a better job of addressing the crisis . . . (they saw) . . . in the deteriorating mental and behavioral health of U.S. children" (Commission on Children at Risk 2003:5).

Some scholars and practitioners have drifted toward the view that a community is composed entirely or at least very largely of the personal networks of the individuals who are members of the community. That seems to me an inadequate view in that it suggests that a community so defined is nothing more than the sum of the personal networks that make it up. Not only is the whole community more than the sum of those parts, but also, the structure of a community must include not only those direct interpersonal relations but also the relations among the clusters and groups and corporate entities that interact in and about this whole.

I am not one to tell other scholars how they should think or what terms they should use. Still, if knowledge about these matters is to accumulate, as it should in science, we must be able to compare findings among various studies. Comparison requires some clarification about what communities might be, or, put differently, about what social formations might be appropriately labeled communities.

On Defining Communities

The editors of the *Encyclopedia of Community: From the Village to the Virtual World* (Christiansen and Levinson 2003) tell us that Robert Putnam's book, *Bowling Alone* (2000) was by far the work most cited by the hundreds of authors of articles in their four-volume encyclopedia. Carrying the subtitle "The Collapse and Revival of American Community," *Bowling Alone* (2000) should be a good source in which a curious student might look to find a definition of community.

It turns out Putnam is quite cavalier about a definition: "Community means different things to different people. We speak of the community of nations, the community of

Jamaica Plain, the gay community, the IBM community, the Catholic Community, the Yale Community, the African American community, the 'virtual' community of cyberspace, and so on. Each of us derives some sense of belonging from among the various communities to which we might in principle belong. For most of us, our deepest sense of belonging is to our most intimate social networks, especially family and friends. Beyond that perimeter lie work, church, neighborhood, civic life, and an assortment of other 'weak ties' that constitute our personal stock of social capital" (2000:273). He also stated, "Sometimes 'Social Capital,' like its conceptual cousin 'community,' sounds warm and cuddly" (2000:21). His point, however, was not simply that community is loosely defined, but that there is a multivalent nature to the consequences of interpersonal ties despite their association with intimacy and reciprocity and sense of community.

Still lacking an "authoritative" definition, why not turn to the Encyclopedia itself – that is, the four-volume *Encyclopedia of Community* (2003)? It begins: "Community is a concept, an experience, and a central part of being human" (p. xxxi). That sounds important, but what is it? Editors Karen Christensen and David Levinson continue: "We explore hundreds of different communities, the human webs that provide essential feelings of connectedness, belonging, and meaning. Communities are indeed the core and essence of humanity, around which everything else is woven or spun" (p. xxxi).

That characterization of the subject of the Encyclopedia is certainly appropriate to the purposes of this paper on the application of network perspectives on communities. Nine hundred pages later, Barry Wellman, one of the hundreds of authors in the encyclopedia, stated this network issue with considerable more clarity: "Those who study network communities treat communities as embedded in social networks rather than in places. Traditionally, analysts have looked for community by asking if neighborhoods are sociable, are supportive and provide social identity. Communities began to be studied as social networks when urbanists realized that many neighborhoods were not thick with community ties, and that many community ties extended beyond the neighborhood. This led to a shift in perspective, especially among sociologists, from thinking about community in place (neighborhoods) to thinking about it in relationships (networks)" (p. 983).

Years ago, anthropologists and sociologists seemed to be more concerned with defining community not only more in terms of location but also more in terms of a level of integration in society. There was a time, from the 1940s and well into the 1960s, when the local community was the recognized social unit that sociologists and anthropologists studied. And for good reason.

Ralph Linton, in his 1936 masterpiece "*The Study of Man*," argued that there are only two social units that appear to be as old as the human species itself – the "basic family group" and the "local group, an aggregation of families." The latter "served as the starting point for the development of all the current types of combined political and territorial units such as tribes and nations" (1936:209).

Linton lamented that social scientists had paid much more attention to the family than to that form he called the local group. "This focusing of interest upon the family may have been due in part to the European culture pattern of extreme interest in everything connected with mating and reproduction and to the greater variety of the social institutions which have been evolved from the family" (1936:209). He goes on to say, "Local groups, on the other hand, are as familiar to us as any social institution of universal occurrence can

be. They are, or at least have been until very recent times, as characteristic of European societies as of any others. They are still the basis of most of our political organization even though they are losing some of their former importance as functional social units. Moreover, their qualities are so much the same everywhere in the world that these qualities can be studied almost as effectively fifty miles from any large city as in the wilds of Australia" (1936:209-210).

Linton states explicitly that "an understanding of the local group is vitally necessary to the understanding of any social system" (1936:210). Partly because they have not sufficiently been studied, "There is not even any general agreement on a term for localized, socially integrated groups of fairly constant membership. They have been variously referred to as hordes, villages, and bands. Horde at once brings to mind the promiscuous hordes posited by the evolutionary sociologists as the starting point for the development of all social institutions or, worse yet, an unorganized mass of savages. Village suggests permanent habitations and settled life" (1936:210).

While Linton, for purposes of his discussion in 1936, settled on the term band because it carried the fewest connotations for the average individual, I settle on the term community for purposes of our discussion here. We are discussing essentially local social formations at levels of scale somewhere between that of family or household and that of state, nation, or society.

With that change of gloss, substituting "community" or "local community" for "band," what Linton said seventy years ago, in 1936, still makes a lot of sense. We need to hear it:

"In spite of its superficial differences from one culture to another, the [local community] is the most constant of all social phenomena and, in many respects, the most uniform. It lies at the very foundation of all existing political and social systems. Its disintegration is one of the most revolutionary results of the rise of modern civilization. With the present ease of travel and communication, both rural and urban local groups are losing their old qualities as closely integrated, self-conscious social units. As a result the patterns of government and social control which have been evolved through thousands of years of band living are becoming increasingly unworkable.…. The modern city, with its multiplicity of organizations of every conceivable sort, presents the picture of a mass of individuals who have lost their bands and who are trying, in uncertain and fumbling fashion, to find some substitute. New types of grouping based on congeniality, business association, or community of interest are springing up on all sides, but nothing has so far appeared which seems capable of taking over the primary functions of the local group as these relate to individuals. Membership in the Rotary Club is not an adequate substitute for friendly neighbors.

"Although the disintegration of local groups in our society may progress even further than it has, the author [Linton] is inclined to regard [the disintegration] as a transitory phenomenon. The sudden rise of the machine and of applied science has shattered Western civilization and reduced Western society to something approaching chaos. However, unless all past experience is at fault, the society will once more reduce itself to order. What the new order will be no one can forecast, but the potentialities of the local group both for the control of individuals and for

the satisfaction of their psychological needs are so great that it seems unlikely that this unit will be dispensed with" (Linton 1936:229-230).

After Ralph Linton wrote those words, sociologists and anthropologists gave much more attention to this local level of social integration, and, in fact, developed an entire field called "community studies." Anthropologists had for decades been doing ethnographic work in communities and of communities but they usually thought of them and sold them as studies of societies. Forced to name a genuine community study, many anthropologists would think immediately of Walter Goldschmidt's work in the 1930s of a California farm community, published as *As You Sow* (1947). Sociologists will think first of *Middletown* (Lynd 1929) and of *Yankee City* (Warner 1941, 1942) and of so many community studies that came out of the "Chicago School" of sociology. None of us should ignore the work of Conrad Arensberg and Solon Kimball, especially, *Family and Community in Ireland* (1940). Rural sociologists, in particular, developed the genre of community studies to a high art, or should I say science. All of this came after Linton's strong statement about the crucial importance of local communities for homo sapiens.

In a 1944 chapter entitled "Techniques of Community Study and Analysis as Applied to Modern Civilization," Carl Taylor emphasized the importance of defining community:

"An attempt to close the gaps in rural community research demands first a clear conception of what is meant by the term 'rural community.' Cultural anthropologists have constructed concepts as bases for their studies of simple societies. Sociologists have created dogmas which they think are useful concepts by means of which to see the integrating factors, or common denominators, in complex societies. Each of these makes its contribution but none is adequate to the task at hand. Rural sociologists, because they could literally see rural communities in terms of geography and internal patterns of relationships, have gone about analyzing these things as objects of research without an adequate conceptual framework. They have known that the geographic rural community is not a society but apparently have not clearly seen that, to the persons living in these geographic areas, society, almost in its entirety, comes to them through participation in structures, functions, and attitudes, all of which are resident and operative in the local community" (1944:435-436).

In words that are appropriate still today, Taylor argues that the task of analyzing a community requires a whole group of techniques: Mapping of geographic zones, analyzing attitudes, statistical techniques relating to time and space variations, participant observation to reveal the meaning of significant personal and social experiences.

Speaking of "modern rural man," Taylor says, "The science that would analyze him and his community must be as multiplex as his life" (1944:437). "Since the community is where his activities and thoughts occur and since it is an identifiable geographic area which contains all the major institutions, agencies, and instruments of communication through which his contacts flow, it furnishes the laboratory in which to study his society" (1944:437). Without using the word "network" Taylor nonetheless points to its crucial aspects in saying that the student of community needs to collect "information on the form,

nature, and extent of social participation, including formal and informal groupings, leadership, visiting relationships and the like…" (1944:438).

On Varieties of Communities

Considering our topic, network perspectives of structures pertaining to communities, we have now become convinced that communities include a wide range of social formations, generally local systems of fairly densely connected persons in households and organizations, systems on a scale somewhere between those domestic households themselves and the wider society – the state or nation. Within this context, several authors have attempted to identify the diagnostic features of different types of communities.

Arensberg: Types of American Communities

Conrad Arensberg (1955) argues that, for each regional cultural variation, there is a type of community. As a specific case of his much more general argument, Arensberg outlines several types of American communities. He found that although it had become traditional to use local communities as samples or microcosms of culture, there had been no independent treatment of whether there was correspondence between specific types of American communities and types of American cultures or subcultures. He set himself the task to discover what sorts of communities are distinguishable in the United States and how these sorts reflect American culture or cultures.

Arensberg saw communities as basic units of organization and transmission within a culture. "They provide for human beings and their cultural adaptation to nature the basic minimum personnel and the basic minimum of social relations through which survival is assured and the content of culture can be passed on to the next generation. Already pan-animal as ecological units, communities are panhuman as transmission units for human culture. It is their function in keeping alive the basic inventory of traits and institutions of the minimal personnel of each kind for which culture provides a role and upon which high-culture specialization and acceptance can be built that makes human communities into cell-like repeated units of organization within human societies and cultures" (1955:1143).

For Arensberg, "There will be an American community, at least in pattern discernible above accidents of function, size, location, etc., for every American culture. Indeed, conversely, for as many types of communities as we can distinguish from the record there will be so many cultures upon the American scene" (1955:1144).

In order to make his comparisons among American communities, Arensberg chose to develop models that might have some universal application. Arensberg summarizes his "common terms of description" as follows:

"Thus the models we shall need for American communities must rest on the common terms of description which serve for all others. . . . The following are the variable comparative terms which apply to all human and animal communities, out of which our models can be built:

(1) Individuals (persons or animals)

(2) Spaces (territory, position, movement)

(3) Times (schedules, calendars, time-series)

(4) Functions (for individual and group life)

(5) Structure and Process" (Arensberg 1955, 1146).

"Communities are, of course, collectivities or 'social systems' of specific individuals. These have identities, and in description we select some and not others, and specify who is member, to be observed, and who is not. Once identified they can be counted, located, followed. Further, they can be described for the attributes we, observers, select or they, the observed, distinguish: age, sex, color, size, occupation, class, ethnicity, sect, etc. In dealing with human beings and their cultures we learned long ago to treat as significant those categorical attributes which the members of the community and culture inform us they discriminate and to connect these with behavior and organization" (1955:1146).

"Communities occupy and use space and its contents, have territories the individuals exploit, create boundaries. They use such space and "environment" differentially…. Thereby they produce settlement patterns, land use and property distributions, assembly points and dispersal zones with tracks between, segregations of sex, age, class, occupation, rank, etc., and the things of each of these. … Obviously intricate connections interlace population and space use" (1955:1146).

Much more easily now than when Arensberg wrote, we can deal with some of these structural complexities, placement of individuals with respect to their relations over time in multidimensional ways that were not available to him. We also can more realistically deal with space issues, because we are accustomed now, through graph theory and network analysis, to know that adjacency, closeness, and distance, even geodesic distance, do not necessarily entail geographic space. Arensberg seems to have had a "network perspective on communities," but that perspective was not then as nearly realizable as it is now.

"Tables of functions performed for persons and for groups, then, are quite necessary tools for analysis of this unit of organization and continuity in cultural transmission in man, just as they are for physiologists of cells, organs, and organisms. But they are no more so than the maps and time charts we have already cited" (1955:1147-1148)

Under the rubric of "Structure and Process" Arensberg says: "A model for a community, then … must put all these things together. It will represent, and help us explore, the characteristic minimal organization of the bearers of a culture in time and space. How will we put these things together; What devices will best represent them and the whole they make? Trial will tell. We cannot predict in advance, in the abstract. Devices for representing empirical structure and process must be invented, searched out of many prior human experiences, tried and fitted to reality again and again" (1955:1148).

From this perspective, Arensberg convincingly identifies five "types" of American communities: New England town; Southern county; Crossroads hamlet and main street town; Mill town and factory city; Metropolitan mass communication city.

Arensberg, in one brief paper (1955), tried to document for the United States a perception that he felt was emerging from comparative ethnological research wherever community studies have been carried out:

"For every American regional (sub-)culture that we can distinguish in American society and civilization, a particular form of the community is to be found. The ones we have spelled out here, each one quite different according to the measures that

6

serve for all communities, are, as they have been often treated by novelists and historians, quite viable microcosms of the cultures whose *florebat* [fluorescence] they graced: the New England town, the southern county, the open-country neighborhood and crossroads hamlet of the Atlantic region, the frontier and the Appalachians, the Main Street "service-center," . . . the Mormon village, the mill town, the metropolitan conglomeration" (1955:1160).

Redfield: Distinguishing characteristics of "little" communities

During the same period when Conrad Arensberg was developing his somewhat structural models of American communities, anthropologist Robert Redfield (1960), independently, was giving thought to how best we could describe "little" communities. What he came up with is certainly relevant to our concern about a network perspective on communities.

Redfield points out, as others have as well, that anthropologists and "empirical sociologists" have done most of their field work in little communities – in villages, small towns, and urban neighborhoods.

> "What, then, do we mean more particularly by a little community? I put forward, first, the quality of distinctiveness: where the community begins and where it ends is apparent. The distinctiveness is apparent to the outside observer and is expressed in the group-consciousness of the people of the community" (Redfield 1960:4).

He emphasizes his concern with the "smallness" of community, but our interest here is more in the concept of "community" itself, whether large or small. He himself cited "urban neighborhoods" as, if not typical, at least included. He also states that the communities he discusses are homogeneous and "slow-changing." The little community tends to provide for all or most of the activities and needs of the people in it (of course that would be true of an urban neighborhood only in a secondary sense). And the little community is a "cradle-to-the-grave arrangement" (1960:4).

In Redfield's view, the qualities of distinctiveness, smallness, homogeneity, and all-providing self-sufficiency characterize in different degrees a type of human community that he was writing about under the rubric of "little community." His interest, in the book by that name, was in the little community as a whole, as an ecological system, as a social structure, as a typical biography, as a kind of person, as an outlook on life, as a history, as a community within communities, and as a combination of opposites, as a whole and parts. The "network perspective" that I think he used is most obvious when he discusses social structure in terms of "whole and parts."

"Loosely Organized" social structures and "Atomistic Societies"

In that same period during which community studies played such a prominent role in anthropology and empirical sociology, some scholars were entertaining discussions about the lack of strong institutions at the level of communities. I note especially, a group studying North American Indian societies and cultures (Barnouw 1961, 1974, Hickerson 1967) and another group studying Southeast Asian societies and cultures (Embree 1950, Hans-Dieter Evers 1969).

Some used the phrase "atomistic society" in these discussions. Strangely, there seems to have been no communication between the set of scholars focusing on Southeast Asia and those focusing on indigenous North America. Late in that game, Victor Barnouw attempted to clarify the concept: "The term 'atomism' in my usage refers to a loose form of social organization in which corporate organization and political authority are weak. Ruth Benedict lectured on this concept in courses at Columbia University in the 1940s; it is briefly discussed in her posthumously published lecture notes [Maslow and Honigmann 1970]" (Barnouw 1974:419).

With regard to Southeast Asia, the atomistic social structure idea seems to have begun with John Embree who used the phrase "loosely structured social system" (1950). He may well have been exposed to Ruth Benedict's views, for he refers to her 1943 mimeographed document entitled "Thai Culture and Behavior." Both Embree and Benedict evaluated the degree to which individual behavior was influenced by membership in local communities by making comparisons with Japan. For example: "The local group in Japan, the hamlet, has a clear-cut social unity with special ceremonies for entry and exit and a whole series of rights and obligations for its members. Each man must sooner or later assume the responsibility of being the representative of the local group, each must assist on occasions of hamlet cooperation such as road building or funeral preparations. In Thailand the hamlet also has its own identity and its members also have rights and duties, but they are not clearly defined and not strictly enforced. Exchange systems are less clear cut" (Embree 1950, as reprinted in Evers 1969).

What is remarkable to us now about these discussions is how much they would have benefited from using a formal network model. We know that in both of these culture areas (North America and Southeast Asia) little emphasis was put on local institutional organizations. But the scholars lacked ways of measuring that, and even lacked good terminology for talking about it. It was not until Brian Foster (1980) wrote about networks in Thai communities that network models were introduced into the discussion of Southeast Asia. To my knowledge, network structures never were introduced into discussions of the North American woodlands Indians such as the Ojibwa or Chippewa, discussed so extensively by Victor Barnouw (1974) and the others cited above. There was considerable discussion in those days (1950-1970) about societies that seemed to have minimal local community organizations, that is, minimally stable systems between the household level and the whole "society" but networks *per se* were not introduced in the discussion.

Wellman, and others, on Communities Lost, Saved, and Liberated

In an important chapter entitled "Networks as Personal Communities," Barry Wellman, Peter J. Carrington and Alan Hall look at "the ways in which networks of informal relations fit persons and households into social structures" (1988:131). As they studied a residential area of central Toronto labeled East York, they looked for the traditional community identifiers, e.g., "neighbors chatting on front porches, friends relaxing on street corners, cousins gathering for Sunday dinners, and storekeepers retailing local gossip" (1988: 130). When they "found few signs of active neighborhood life," they did not immediately draw the conclusion that community life had vanished in the densely-populated city. Instead, they argue that community ties in East York were still robust, but were just represented in ways that were not apparent.

Until the 1960s, scholars were divided into three groups regarding the transformations in community life resulting from large-scale social changes. Some asserted that community had been "lost," because "individuals had become isolated atoms in a 'mass society' – dependent on large bureaucracies for care and control" (Wellman et. al. 1988: 134). Contrary to this belief, other scholars maintained the "Community Saved" argument, evident by "abundant" and "strong" neighborhood and kinship groups that "acted as buffers against the large-scale forces, filled gaps in contemporary social systems by providing flexible, low-cost aid, and provided secure bases from which residents could powerfully engage the outside world" (p. 134).

Wellman et al. point out the faults of the two dichotomous views: that both arguments defined community as a "solidary," "local," and "kinship-like" group, and disregarded "widespread preindustrial individualism, exploitation, cleavage, and mobility." Going beyond the traditional short-distance community ties, some scholars find "Liberated" community, which is comprised of relationships beyond local areas, made available by cheap and convenient transportation and communication services.

Using a network model, the authors find that despite the empty streets, East Yorkers still maintained community ties in small clusters – "through meetings in private homes and on the telephone" – "and not in large, palpable bodies gathering in public squares, cafes, and meeting halls." Through the strands of ties and networks, the East Yorkers got and expected to get "companionship," "emotional aid," and "small services" both in daily life and in crisis (Wellman et. al. 1988: 163). The authors identified three functions of these networks: First, the networks provide havens: a sense of being wanted and belonging, and readily available companionship. Second, they provide many "band-aids": emotional aid and small services to help East Yorkers cope with the stresses and strains of their current structural locations. Third, the outward linkages of network provide the East Yorkers with ladders to change their situations (jobs, houses, spouses) and levers (animal welfare, local politics, food additives) to change the world (Wellman et. al. 1988: 174-175).

In conclusion, Wellman et al. argue that the East Yorkers' ties and networks could not be explained with any single model: Lost, Saved, or Liberated. Their personal networks do not conform to the Lost model, but some community patterns fit with the Saved model (e.g., women maintain close local relations with kin and men with workmates), and some patterns correspond to the Liberated model (e.g. several middle-class men use coworker ties to climb up the occupational ladder). Although the traditional densely knit solidarities are far and few, East Yorkers have managed to maintain their networks and community ties and seem to be satisfied with the support and reciprocity from them.

While none would doubt the existence of those personal support networks – "networks and community ties" – that Wellman and his colleagues describe in Toronto and that others have described for other cities, one might question whether those social formations are really communities at all. R. B. Driskell and L. Lyon (2002) address this question directly in "Are Virtual Communities True Communities?" They certainly do not conform to the criteria that define communities in most non-urban places in the world. They are not what Redfield was referring to by his phrase "urban neighborhoods," nor, I think, the communities that Herbert Gans (1962) found populated by "Urban Villagers." Do not these networks of personal communities really form another kind of social entity that deserves special consideration or categorization in its own right? These networks that serve

primarily the personal ends of individuals and households are indeed social phenomena that lie on the scale between the level of families or households and the level of nations or states, but perhaps they are not communities at all. They may be something akin to the network "action sets" described by Adrian Mayer (1966) and Whitten and Wolfe (1973).

What is a community?

Clearly, definition remains a problem with both scientific and practical ramifications. Scientifically, Carl Taylor's comments of 1944 are still relevant. As was pointed out earlier, without using the word "network," Taylor said that one who would study community needs to collect "information on the form, nature, and extent of social participation, including formal and informal groupings, leadership, visiting relationships and the like…" (p.438). It is clear that Taylor, and others of his time were already thinking of networks but did not have the techniques or concepts to put their thoughts into action. While they may not have been perfectly consistent, it seems that many sociologists and anthropologists of that period were not guilty of the charge often leveled at them, that they saw communities as clearly bounded, solidary entities.

Practically, the concept "community" really needs to be defined because it is used in many situations where what it means has real consequences. Federal Environmental Laws and Regulations give communities standing, but are very unclear as to what they might be (John Stone 2000). The Federal Magnuson Act includes important references to "fishing-dependent communities," and regulations are implemented somehow, but nobody has defined what that means (Yu Huang 2003). In Florida, privatization of child welfare is touted as "community based," but the system is structured through contracts from the Department of Children and Families at the state level to corporate service providers with no mechanisms for control at the local level, as described in documents on the web site of the Florida Health and Humans Services Board, Inc. http://www.fhhsb.org.

In 1999, in the preface to *Networks in the Global Village*, Barry Wellman wrote that communities are far-flung social networks and not neighborhood solidarities. That, of course, is not a definition but an important characterization that puts the emphasis on relationships rather than location.

> "The thrust of social network analysis has been to reconnect the study of individuals to the relationships and structures of relationships in which they are embedded…. The trick has been to conceive of community as an egocentric network, a 'personal community,' rather than as a neighborhood" (Wellman 1999:xiv).

He continues: "The social network approach enables the authors in this book to study community without necessarily assuming that all communities are local solidarities. They do so by defining community as personal community, a person's set of ties with friends and relatives, neighbors and workmates (1999:xiv-xv).

Wellman identifies a "Community Question" that has two parts: One part asks how the structure of large-scale social systems affects the composition, structure, and contents of interpersonal ties within them. The other asks how community networks (these egocentric personal communities or action sets) affect the nature of the large-scale systems in which they are embedded.

I don't feel comfortable defining community in that way. It is as if all social phenomena other than those egocentric networks are not a part of the "community" but exist only as non-community, parts of "large-scale social systems."

I prefer, rather, to envision a whole complex social system as being organized in levels, from a household/family level, upward through a hierarchy of levels, to the national (nation-state) and even beyond that to supranational (above-state) levels. Somewhere among those levels we should be able to identify a structure – even a loose cluster or set of nodes, a set of interlocking circles, a set of equivalent nodes – that is doing what Linton said there would always be a need for, making that connection between the immediate biological realities of humanity and the longer term historical continuity of human institutions. That complex whole, the structured set of phenomena, is what I would call community. The individuals and their apparently egocentric relations are obviously crucial to the relations at all levels, but there is more to the relations among the higher-level formations than just the interpersonal egocentric relations of individuals. Thus, those egocentric sets, while necessary to a community as well as to the individuals, are not in themselves the community.

I have absolutely no criticism of Wellman's statement that the "Community Question stands at a crucial nexus between societal and interpersonal social systems," and that it "juxtaposes the problem of the structural integration of a social system and the interpersonal means by which the members of this social system have access to scarce resources" (1999:3). That inclusive system, not just the interpersonal system, is what I would call the community.

It is a kind of reductionism to put so much emphasis on individual interpersonal relations when one is trying to understand a community, a society, or other macro-system. We don't come to understand the biological human being by studying only the relations among the cells. Rather, we study the relations among cells in various structures, such as organs. The organs are variously related to one another even though those depend also on inter-cell relations. We will not understand human societies or the social systems of our entire species if we focus on the interpersonal relations among six billion individuals without taking into account the various structures at intermediate and even global levels.

Network Perspective on Communities

To see a community as a network, a first step might well be to collect data on egocentric networks and collate them. The next step should be to recognize the structuring provided when several individuals belong to the same groups. A network perspective on communities – or on structures relating to communities – includes seeing those groups both as networks of the individuals composing them and as nodes related to each other through their common members. Such "affiliation networks" are a little more complex than being just the sum of the personal networks.

The nodes of an affiliation network are not all of one kind, they include both persons and groups. This in itself is complicated enough, but it gets more complex when we recognize that the groups are themselves quite varied both structurally (internal relationships among their members and relationships with other groups and with other kinds of nodes) and functionally (what they do for their members and what they do with

respect to persons and groups external to themselves). Edward Laumann and his associates, Galaskiewicz and Marsden, (1978) discussed such complications in "Community Structure as Interorganizational Linkages."

We know these human social networks are almost never "naturally" bounded. At the margins of every egocentric network, relations tend to shade off by degrees rather than being definitely on or off. Adding groups into the sets of relations we are considering does not make the matter of definition any easier. But we can set criteria for recognizing "boundaries," and there may be some regularities that will be discovered as "natural" seams or tears or gaps between segments of the whole seen in network perspective.

A conceptual distinction between Cosmopolitans and Locals, used by Robert K. Merton (1957) with reference to community leadership and by Alvin Gouldner (1957) in an analysis of roles in organizations, could be helpful in showing how the network perspective helps us to recognize a community as some kind of whole without its being an impenetrably bounded entity.

Take two persons who share a number of close, supportive, ties of the kind that Wellman tends to call "community ties" – kinship, frequency of communication by phone or email. They also are common members of a number of groups, working in the same university, serving together on a children's services advisory board, etc. Those two persons, along with other persons similarly connected, would have other ties of different strengths, some in common, some not so. All the ties that collectively define the community are not necessarily what Wellman calls "community" ties. Despite some different ties they have, they are connected in enough ways that we would have no difficulty identifying them as belonging to the same community, and then defining that community in terms of those many common connections including other persons and other groups as well. No perfect boundaries, but sufficient to recognize the "community" system.

Suppose one of those original persons had a brother with whom he is closely tied in terms of kinship and common boyhood experiences and continuing frequent, supportive, communication. But the brothers live far apart physically, and most of the current affiliations of the younger brother are not shared with the original person. Most of the brother's support network, intimate ties with a number of persons, are not directly linked to the original person. While he provides a strong connection between his own network segment and that of his brother, he is in a different community.

Historically, some ties between different communities have been getting stronger over the years, due to increases in velocity of travel and increases in telecommunications, etc., blurring the boundaries between such network segments and therefore the boundaries between communities.

Each community can be seen as a fairly complex cluster in a larger network. When the gap or seam between the two communities is bridged with numerous ties, the two clusters will, at some point depending on the criteria we choose, be effectively merged. Then what had been two communities will become one. For such a determination, I recommend analysis something like that which Freeman developed in "On Measuring Systematic Integration" (1978), or perhaps something like that used in cultural consensus theory (Romney, Weller and Batchelder 1986).

The network perspective, especially in its graph theoretical aspects, uses "distance" in a different way so that it is no longer tied to geographic space, even though it might be labeled "geodesic." It is important to note that network distances need have very little relation to geographic distances. A "local structure" may include nodes that are not physically close in geographic space. This is an aspect of the "network perspective" of which one must occasionally be reminded.

The identification of gaps or seams between segments or clusters within the larger network brings us to another structural analytic procedure that is applicable to our topic of network perspective on community. Ronald Burt deals with this sort of situation using the concepts of structural equivalence and structural holes (1982, 1992, 2001). Within a community seen as a network, there are sets of nodes (whether the nodes be persons or groups) that have the same or similar relations with others.

The nodes of such a set, whether they are tied to each other or not, are said to have structural equivalence. This is an important thing to know, whether the "local" ties of a set of persons and groups are equivalent. Recall that in network analysis, "local" doesn't have to mean geographical propinquity. But as one observes the current scene, that is still the most likely scenario. Obviously, people or groups who are physically adjacent have a common environment and some degree of common experience, both of which contribute to our conception of community.

Burt goes on to concern himself with the redundancy of ties that the condition of structural equivalence implies. "Structural hole" is the term Burt uses to refer to structural locations where there are few ties between denser segments of a network. Such places would be what I have above called seams or gaps. For me those terms, seams or gaps, evoke a more realistic image of the situation than the term "hole." In any event, Burt (2001) makes the point that while the conventional wisdom seems to have it that dense networks with high redundancy characteristic of cohesive or structurally equivalent sets indicate high social capital, a good argument can be made that the "structural holes" – areas of sparser connections – actually increase social capital by providing the opportunity for competitive advantage. He brings the two seemingly opposing propositions together in a "productive" way, saying that "while brokerage across structural holes is the source of added value, closure can be critical to realizing the value buried in the structural holes" (2001:52).

If it is not obvious to the reader that structural equivalence and structural holes are crucial to understanding the network aspects of communities, that may be in part because community is not a concept that Burt uses, except quite metaphorically. For example: "Groups can be distinguished on many criteria. I have in mind the two network criteria that define information redundancy (cohesion and structural equivalence), but it is just as well to have in mind a more routine group: a family, a team, a neighborhood, or some broader community such as an industry" (2001:47). I cannot find an instance where Burt talks about a whole community in the sense that we have been thinking of it. Whatever his conception of community, I believe Burt, like me, would see it as a network, a complex network identifiable through application of network criteria.

Beyond structural equivalence is another kind of equivalence that is perhaps even more important to understanding the network structure of communities. It is called "regular equivalence" (White and Reitz 1983; Borgatti and Everett 1992; Doreian 1999). Regular

equivalence is even less dependent on physical or geographical propinquity, but is, in my opinion, crucial to understanding community as a complex network.

The more complex the system of actors, the less does structural equivalence alone, with its local focus, tells us about the whole. Borgatti and Everett put it this way: "The concepts of structural, automorphic, and regular equivalence are listed in order of increasing generalization: Any pair of nodes that is structurally equivalent is also necessarily automorphically and regularly equivalent, and any pair of automorphically equivalent nodes is also regularly equivalent" (1992:4). Regular equivalencies reveal more general structures beyond the "local" ones found with structural equivalence. As Patrick Doreian puts it, "At a conceptual level, regular equivalence may be more useful than structural equivalence in representing roles and role structures. For each equivalence, a position is occupied by equivalent actors" (1999:p.7). Where the networks are complex – and in any communities, networks are complex – regular equivalence can reveal structures within and between communities.

The regular equivalence algorithm identifies a sort of "pure" structure of relationships with considerable independence from the substantive content of the relationships.

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 apparent to the participants or to outside observers.

I have used techniques of this kind to try to find the structure of a network of six hundred agencies and organizations, some public and some private, that serve children and families in a multi-county area. In that study, funded by National Science Foundation, Grant No. BNS-9023383, 1991-1993, the question for me was whether analysis of their patterns of relationships could identify subsets of organizations that are assignable to different levels of integration, community level being among them. Can some organizations be said to operate primarily at the highest level – state or national – others primarily at the lowest level – perhaps "neighborhood" – and others operating in subsystems somewhere between – in what we might identify as the community levels in the sense that we have been using community in this paper?

Sorting the Subsystems

In the 1990s, I collected data on the relations among hundreds of organizations serving children and families in the several counties of the Tampa Bay area, administrative relations, relations based on common clientele, and fiscal relations. The analysis I will speak of here is based on one 577 X 577 adjacency matrix that summarized those complex data, recognizing only whether or not there was a relation between each pair, and ignoring both the type and strength of those relations. Geodesic distances were calculated for those 166,176 pairs, as were centralities, both closeness and betweenness for each of the 577 nodes.

Regular equivalence coefficients were calculated for all pairs. Then, multi-dimensional scaling coefficients were calculated for the matrix of REGE coefficients. Applying hierarchical cluster analysis (HCA) to the MDS coefficients, the nodes were

sorted into cluster/blocks, paying attention to the proportion of ties within each block and the proportion of ties between each pair of blocks, etc. Due to limitations of the equipment and programs available to me in 1995, I had to do each of these steps, I won't say "by hand," but not as efficiently as it might be done today.

Application of HCA to the MDS coordinates produced a list of the 577 organizations, associating each with the cluster numbers with which each was associated. The distribution of those 577 nodes was then plotted with each node being labeled with its cluster number. Figure 1 shows that distribution. A first division into three sets is clearly visible with the naked eye. There is a top set (a cluster of nodes) all bearing the label 6, a middle set of clusters of nodes bearing the labels 1, 2, 3, and 4, and a bottom set of clusters of nodes bearing the labels 5, 7, and 8.

Before going on, I should mention that the one outlying node labeled 9 at the very bottom of the figure is the result of an error, my failure to remove that one organization when I removed others that, like this one, had only one tie to the rest of the network. Instead of dealing with 577 nodes, I should have been dealing with only 576.

The distribution of all the organizations shown in Figure 1 is based on the complex patterns of relations among them. The distribution is, it seems, indicative of differential participation in subsystems at different levels of integration. The organizations in Cluster 6 may operate predominantly in a wider-scale subsystem in terms of both area and function. The others, while still participating in the whole, may operate predominantly in subsystems that are narrower in range and lower on the scale of levels of integration. In Figure 1, one does not see all 577 nodes in this figure because 177 of them are "hidden" behind others in this two-dimensional representation of a multi-dimensional distribution.
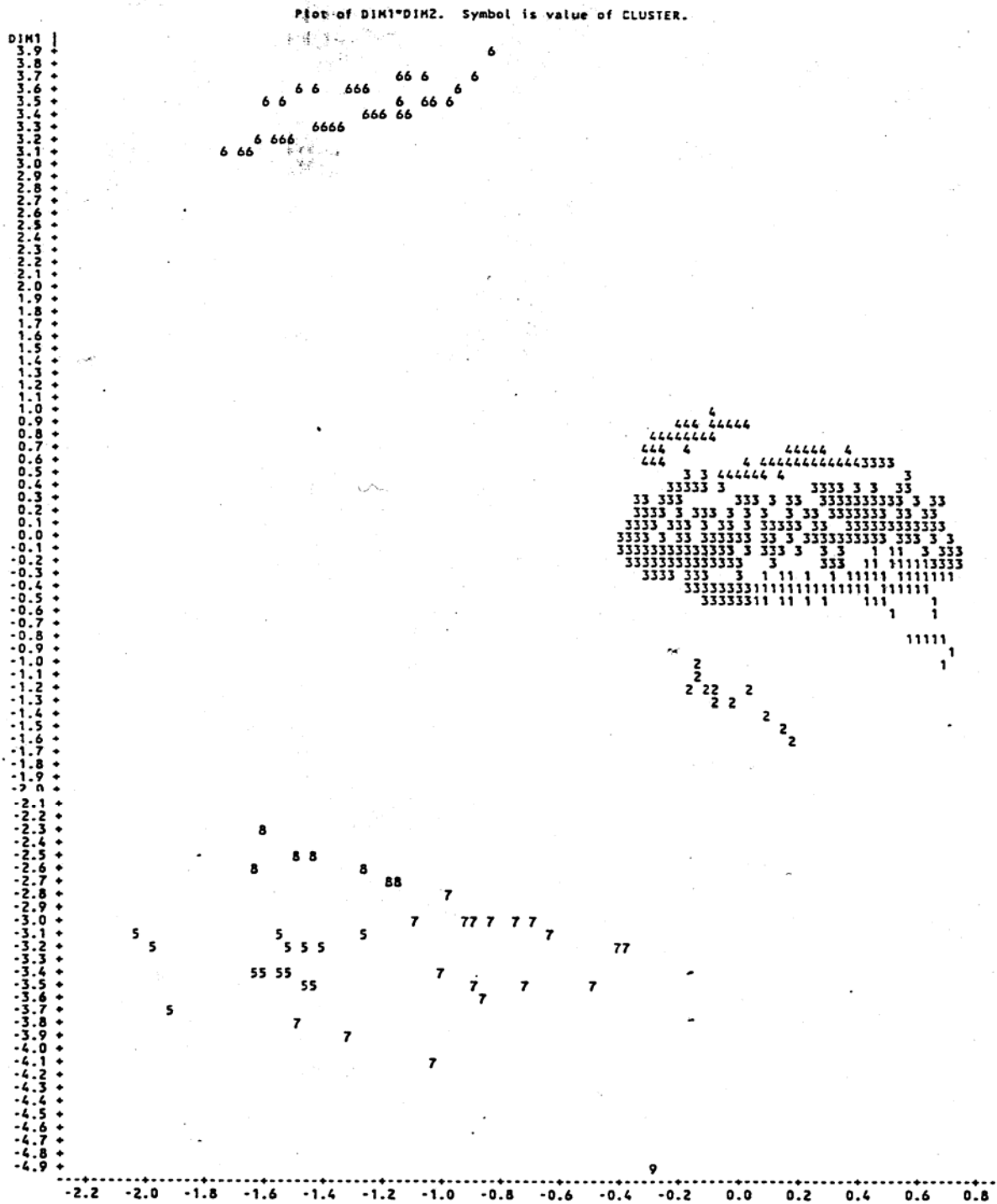
Figure 1. Distribution of 577 organizations based on regular equivalence coefficients. Node labels represent membership in one of eight sets based on regular equivalence. [The node labeled 9 at -4.9 and -0.3 is an input error, that node should have been removed prior to the analysis, and there should have been only 576 nodes.]

Hierarchical cluster analysis (HCA) permits one to identify clusters within clusters at different levels of hierarchy. Figure 1 reveals just two of those levels – one being the three-cluster "solution," that which is visually obvious, the other being the 8-level solution indicated by labels 1-8 on the nodes. Figures 2 and 3 will use a third level of analysis which I call the 16-level solution. The relations among these levels are described in Table 1.

Table 1: Hierarchical Nesting of Clusters		
3-cluster perspective.	8-cluster perspective	16-cluster perspective
High level, wide coverage, red in figures 2 and 3.	Red-F	Red-F10
		Red-F11
Mid level, medium coverage, yellow in figures 2 and 3.	Yellow-D	Yellow-D04
	Yellow-A	Yellow-A01
		Yellow-A09
	Yellow-C	Yellow-C03
		Yellow-C05
		Yellow-C06
		Yellow-C07
	Yellow-B	Yellow-B02
Low level, narrow coverage, green in figures 2 and 3.	Green-G	Green-G12
		Green-G13
		Green-G16
	Green-H	Green-H14
	Green-E	Green-E08
		Green-E15

Figure 2 shows a view of the structure of the 577-node set of organizations serving children and families in the Tampa Bay Area, seen as sixteen clusters/blocks, distributed according to the regular equivalence coefficients of the individual nodes that are included in each of the regular equivalence sets. Remember that the clusters are based, not on cohesiveness, but on regular equivalence (having similar relations with others that are themselves equivalent).
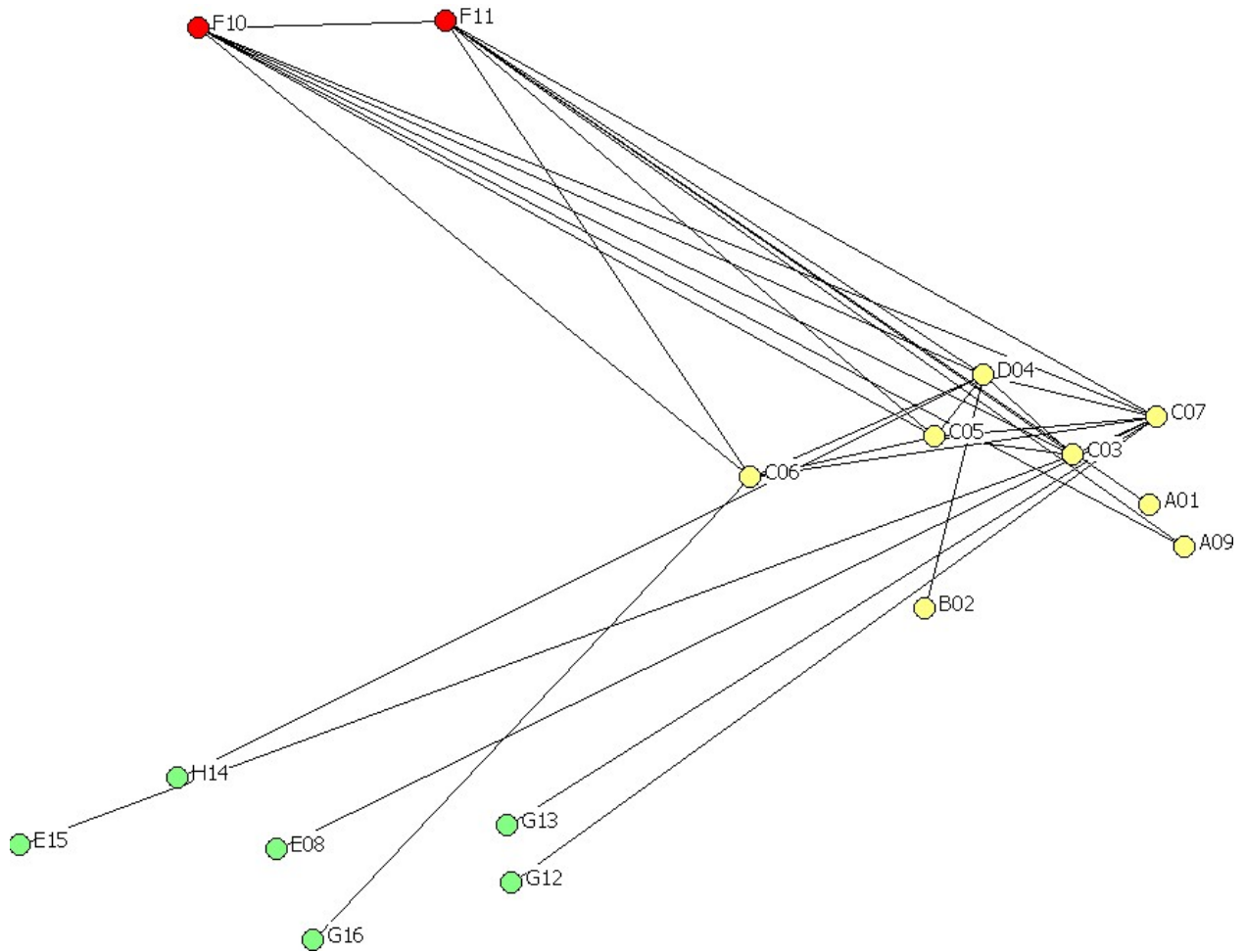
Figure 2. Distribution of sixteen clusters/blocks roughly according to regular equivalence coefficients of the nodes that make up the sets.

The findings thus far permit me to retain some optimism about my hypothesis that regular equivalence will sort out the subsystems at various levels of integration. Even though the hypothesis has not been tested formally, I think we have come a long way from seeing these 577 organizations randomly related in an almost chaotic network of relations to seeing considerable order in 16, 8, or 3 blocks made up of clusters of somewhat equivalent nodes.

Looking at these figures as representing a view of the structure of communities from a network perspective, one must remember that the 577 organizations represented by these 16 nodes are actually composed of thousands of persons carrying out the missions of the hundreds of organizations – and, of course, that each node itself represents a set of organizations. Within each cluster are many connections that are not shown as lines. The lines that do show represent the fact that there are some relations among organizations in clusters at the different levels.

How does this structural view relate to the real community? Think of the lower block or set of six green nodes in Figure 2 as representing the community-based organizations most directly serving the thousands of families living in the local

communities of the Tampa Bay Area. Then the eight yellow nodes represent eight sets of organizations whose staff help to organize and support the organizations that directly serve the communities. Finally the two red nodes at the top of Figure 2 represent the sets of agencies whose staff members represent the larger society, the State of Florida, national child welfare agencies, the "health system," and so forth. In terms of the "local versus cosmopolitan" dichotomy mentioned earlier, the organizations involved in the bottom blocks are like the locals, whereas those in the top blocks tend to be cosmopolitan, those in the middle blocks acting in their communities with connections both upward in the cosmopolitan direction and downward in the local direction.

Among the organizations in the top block are the several District Offices of the State Department of Health and Rehabilitative Services, the predominant arms of the State reaching into the local communities. In that cluster also are the Associated Marine Institutes and Stepping Stone, Inc., juvenile training centers that serve a wide area, not limited even to this multi-county region, and All Children's Hospital, which, although located in St. Petersburg in Pinellas County, has a very broad service area as a regional hospital. Another is Florida Sheriffs Youth Ranch, which also serves a wide area, essentially the whole state. The Juvenile Welfare Board of Pinellas County is not so much a local service agency as it is a planning and evaluation institution, some of whose members are named by the Governor of the State, and its purview includes a wide range of planning for child welfare, not direct service. In a similar situation are Hillsborough County Head Start, Pinellas County Social Services, Hillsborough County Department of Children's Services, and the YMCA.

In the middle range of clusters or blocks we find the large majority of agencies that provide direct services to children and families in the several communities within the Tampa Bay Area: municipal departments of parks and recreation, children's service centers, Big Brothers/Big Sisters, family service centers, family resource centers, family support centers, runaway centers, Women-Infants-Children (WIC) Office, Boy Scouts, Boys and Girls Clubs, Child and Family Developmental Services, Child Care Facilities Advisory Board, Children's Medical Services, Easter Seals Rehab Center, family group homes, family protection teams, Foster Parents Association, MacDonald Training Center, Mary Martha House, Parents Without Partners, developmental day care centers, women's resource centers, and many others.

In the bottom range of clusters or blocks we find organizations less focused on children, such as local hospitals – Horizon Hospital, Mease Hospital, Morton Plant Hospital, and Tampa Community Health Center – and such as adult institutions – AARP, Abilities Inc., Private Industry Council, American Cancer Society, Artists Unlimited, Deaf Service Center, Thomason Adult Centers, and Dunedin Community Center, Lowry Park Zoo, etc.

My interpretation of the results is that there are three reasonably recognizable regular equivalence sets that appear to represent roughly three different levels of integration. Figure 3, in which each node represents a set of "equivalent" organizations, shows that when you plot them roughly according to the cohesive distances between blocks (rather than the coefficients of equivalence as in Figure 2) the network takes on the shape of roughly concentric circles around a "core" if you will.

Both of these visualizations are important to seeing "community" and its social environment in a network perspective.
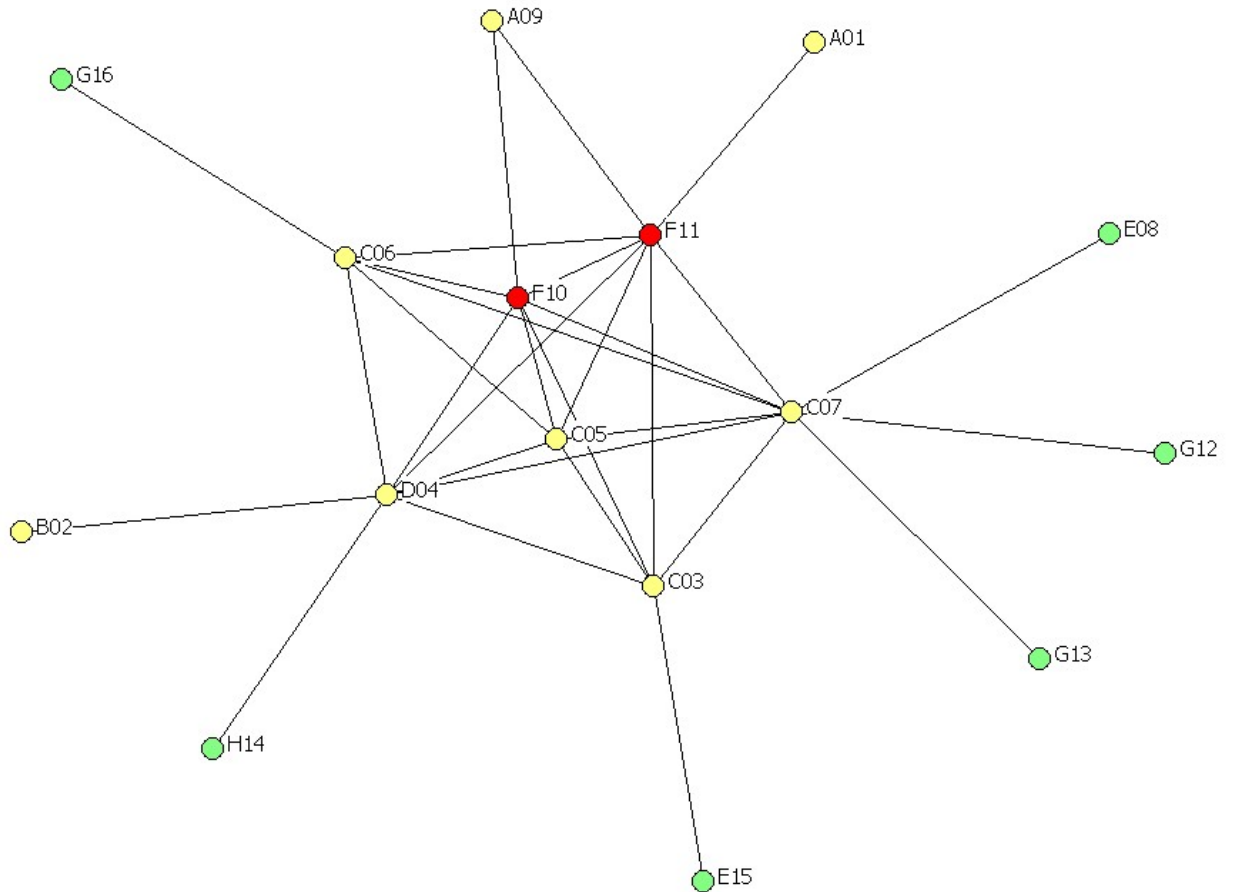

Figure 3. Network of the 16 Clusters/Blocks of 576 Agencies in the Tampa Bay Area. The lines represent whether there are linkages between organizations in the different clusters.

More sophisticated approaches to the analysis of the hierarchy of nested sub-networks are being developed currently by scholars studying complex systems. I mention particularly two threads here.

One of those threads is expressed in the work of M. Girvan and E. J. Newman (2002). It is based on the idea that cohesive clusters with relatively strong ties within each are connected by weaker ties to form wider systems in a hierarchical structure, and that the identification of levels in such a system is facilitated by removing nodes successively to discover the structure.

The other thread is expressed in the work of Douglas R. White and several colleagues using a graph theoretical basis with deeper roots but recently laid out clearly by White and Harary in 2001 under the title "The Cohesiveness of Blocks in Social Networks:

Node Connectivity and Conditional Density" (White and Harary 2001). White and his associates, Moody, Owen-Smith and Powell, are developing and testing what they call Predictive Social Cohesion Theory (Moody and White 2003, White, Owen-Smith, Moody and Powell 2004).

While neither approach has been demonstrated on any system quite so complex as the kinds of social systems that we have concerned ourselves with in this article – "whole" communities embedded in "whole" societies – there is no doubt that they are making enormous advances technically and theoretically. I will very briefly summarize Girvan and Newman first, and then examine the approach of White and his colleagues in which I see more promise, perhaps because it is more rooted in my own discipline of anthropology.

Girvan and Newman clearly are thinking of these complex networks in both social and biological hierarchies as I tend to do. "It is a matter of common experience," they say, "that such networks seem to have communities in them: subsets of vertices within which vertex-vertex connections are dense, but between which connections are less dense" (2002:7821). They elaborate parenthetically, "Certainly it is possible that the communities themselves also join together to form metacommunities, and that those metacommunities are themselves joined together, and so on in a hierarchical fashion" (7821). They propose a method for detecting such community structure and then they apply it to the study of a number of different social and biological networks. They state their algorithm simply in four steps:

1. Calculate the betweenness for all edges in the network.

2. Remove the edge with the highest betweenness.

3. Recalculate the betweenness for all edges affected by the removal.

4. Repeat from step 2 until no edges remain.

Girvan and Newman are encouraged by the success of their method in identifying hierarchically ordered communities in relative simple data sets such as that in Zachary's (1977) Karate Club study and in the network formed by American college football competition. They admit, however, that it is not yet feasible to use on networks of greater scale. "Perhaps," they state, "the basic principles of our approach – focusing on the boundaries of communities rather than their cores, and making use of edge betweenness – can be incorporated into a modified method that scales more favorably with network size" (p. 7826).

The other thread is, I believe, further along, and, as I said, more rooted in anthropology. In an article entitled "Structural Cohesion and Embeddedness: A Hierarchical Concept of Social Groups," Douglas R. White and his coauthor James Moody link social cohesion and social embeddedness "by developing a concept of structural cohesion based on network node connectivity" (2003). Then the structural dimension of embeddedness is defined through the hierarchical nesting of these cohesive structures.

This theoretical effort was built upon earlier ethnographic studies, notable among which are "Class, Property and Structural Endogamy: Visualizing Networked Histories" (Brudner and White 1997), and "Kinship, Property Transmission, and Stratification in Javanese Villages" (White and Schweizer 1998). The groundwork was thus laid for the next step by White and his colleagues that resulted in the publication entitled "Networks, Fields and Organizations: Micro-Dynamics, Scale and Cohesive Embeddings" (White, Owen-

Smith, Moody and Powell 2004). Even more recently, White and Johansen present analyses of this kind in more detail in *Network Analysis and Ethnographic Problems: Process Models of a Turkish Nomad Clan* (2005). One brief quote suggests the relevance of this work for our concern of how any given community is a network embedded in a network of networks: "Networks are open systems in which boundedness is a relative phenomenon, not a matter of self-contained local systems" (White and Johansen 2005:64).

Although White and his colleagues seldom use the term "community" just as I use it in this paper, their general approach fits well my own conception of community as being a subsystem identifiable at some level within a complex hierarchically structured network system. These new techniques for network analysis open up new possibilities for us to better understand communities.

A community is certainly much more than a set of relations among individuals. In network perspective a community network is a set of levels including not only direct interpersonal relations but also relations among the clusters and groups and corporate entities making it up. At the same time, hierarchically above a community are the interacting components of wider systems, whether they be tribes, regions, states, and/or supranational systems. We may not yet be defining and describing community in network terms, but we are beginning to see how it can be done.

References Cited

Anderson J N and Keyes C F. Perspectives on loosely organized social structures. *The Journal of Asian Studies* 1970;9(2):415-419.

Arensberg C M and Kimball S T. *Family and Community in Ireland.* Cambridge, MA; 1940.

Arensberg C M. American communities. *American Anthropologist* 1955;57(6):1143-1152.

Barnouw V. Chippewa social atomism. *American Anthropologist* 1961;63:1006-1013.

---. On Lieberman's use of the concept of atomism [Comment on 'Atomism and mobility among underclass Chippewas and whites' by L Lieberman [with a reply by L Lieberman]. *Human Organization* 1974;33(4):418-21.

Borgatti S P and Everett M G. Notions of Position in Social Network Analysis. In Peter Marsden ed. *Sociological Methodology* 1992;1-35.

Borgatti SP Everett M G and Freeman L C. Ucinet for Windows: Software for Social Network Analysis. Harvard MA: Analytic Technologies. 2002.

Brudner L and White D R. Class property and structural endogamy: Visualizing networked histories. *Theory and Society* 1997;25:161-208.

Burt R S. *Toward a structural theory of action: Network models of social structure perception and action.* New York: Academic Press. 1982.

---. Structural Holes: *The Social structure of Competition.* Cambridge: Harvard University Press. 1992.

---. Structural holes versus network closure as social capital In Lin N et al eds. *Social Capital: Theory and Research.* New York: Aldine De Gruyter. 2001.

Christiansen K and Levinson D, eds, *Encyclopedia of Community: From the Village to the Virtual World.* Thousand Oaks CA: Sage Publications. 2003.

Commission on Children at Risk. *Hardwired to Connect: The new scientific case for authoritative communities.* New York NY: Institute for American Values. 2003.

Doreian P. An intuitive introduction to blockmodeling with examples. *BMS Bulletin de Methodologie Sociologique* 1999;61(Jan):5-34.

Driskell R B and Lyon L. Are virtual communities true communities? *City & Community* 2002;1: 373-390.

Embree J. Thailand: A loosely structured social system. *American Anthropologist* 1950;52:181-193

Evers H-D ed. *Loosely Structured Social Systems: Thailand in Perspective* (Cultural Report Series No 17). New Haven: Yale University (Southeast Asia Studies). 1969.

Foster B L. Minority traders in Thai village social networks *Ethnic Groups – New York* 1980;2(3):221-240

Freeman L C. On measuring systematic integration *Connections* 1978;2(1):13-14.

Gans H J. Urbanism and suburbanism as ways of life. In Rose AM ed. *Human Behavior and Social Processes An Interactionist Approach*. Boston MA: Houghton Mifflin. 1962.

Goldschmidt W. *As you sow.* New York Harcourt Brace. 1947.

Gouldner A. Cosmopolitans and Locals: Toward an Analysis of Latent Social Roles *Administrative Science Quarterly* 1957;2(3):281-306.

Hickerson H. The feast of the dead among the seventeenth century Algonkians of the upper Great Lakes *American Anthropologist* 1967;62:81-107.

Huang Y. *Fishing-Dependent Communities on the Gulf Coast of Florida: Their Identification Recent Decline and Present Resilience*. Master's Thesis University of South Florida. 2003.

Krackhardt D, Blythe J, and McGrath C. Krackplot 3.0: An improved network drawing program. *Connections* 1994;17(2):53-55.

Laumann E O, Galaskiewicz J and Marsden P. Community structure as interorganizational linkages. *Annual Review of Sociology* 1978;4:455-484.

Linton R. *The Study of Man.* New York: Appleton-Century-Crofts. 1936.

Lynch O M. *Culture and Community in Europe: Essays in Honor of Conrad M Arensberg.* Delhi India: Hindustan Publication Corp. 1984.

Lynd R S and Lynd H M. *Middletown: a study in American culture.* New York Harcourt Brace and Company. 1929.

Maslow A H and Honigmann J J. Synergy: Some notes of Ruth Benedict *American Anthropologist* 1970;72:320-33

Mayer A C. The significance of quasi-groups in the study of complex societies In Banton M, ed. *The Social Anthropology of Complex Societies*. ASA Monograph no 4 New York: Praeger. 1966.

Merton R K. *Social Theory and Social Structure.* Glencoe, IL: Free Press. 1957.

Moody J and White D R. Structural cohesion and embeddedness: A hierarchical concept of social groups. *American Sociological Review* 2003;68(1):103-27

Putnam R. *Bowling Alone: The Collapse and Revival of American Community.* New York: Simon and Schuster. 2000.

Redfield R. *The Little Community and Peasant Society and Culture* Chicago: University of Chicago Press. 1960.

Reitz K P and White D R. Rethinking the role concept: Homomorphisms in social networks. In Freeman LC, White DR, and Romney AK, eds. *Research Methods in Social Network Analysis.* Fairfax Va: George Mason University Press. 1989: 429-488.

Romney A K, Weller S C and Batchelder W H. Culture as consensus: A theory of culture and informant accuracy. *American Anthropologist* 1986;88(2):313-338.

Stone J V. Public participation in environmental management: seeking participatory equity through ethnographic inquiry Doctoral Dissertation University of South Florida. 2000.

Taylor C. Techniques of Community Study and Analysis as Applied to Modern Civilized Societies In Linton R., ed. *The Science of Man in the World Crisis.* New York: Columbia University Press 1945:416-441.

Warner W L and Lunt P S. *The Social Life of a Modern Community.* New Haven: Yale University Press. 1941.

Warner W L and Lunt P S. *The Status System of a Modern Community.* New Haven: Yale University Press. 1942.

Wellman B ed. *Networks in the Global Village: Life in Contemporary Communities.* Boulder CO: Westview Press. 1999.

Wellman B and Berkowitz S D, eds. *Social Structures: A Network Approach* Greenwich Conn: JAI Press (Ablex Edition). 1988 (1997).

Wellman B, Carrington P J and Hall A. Networks as Personal Communities In Wellman B and Berkowitz S D eds. *Social Structures: A Network Approach.* Greenwich, CN: JAI Press (Ablex Edition) 1988.

White D R. Ties Weak and Strong. In Christensen K and Levinson D eds. *Encyclopedia of Community.* Thousand Oaks CA: Sage Reference. 2003;4:1376-1379.

---. Ring cohesion in marriage and social networks. In Degenne A, ed. Social Networks, Special issue, *Mathématiques informatique et sciences humaines.* Journal of the Ecole des Hautes Etudes en Science Sociales Paris. 2005.

White D R. and Harary F. The Cohesiveness of Blocks in Social Networks: Node Connectivity and Conditional Density. *Sociological Methodology* 2001;31:305-359.

White D R and Johansen U C. *Network Analysis and Ethnographic Problems: Process Models of a Turkish Nomad Clan.* Lanham MD: Lexington Books. 2005.

White D R, Owen-Smith J, Moody J and Powell, W W. Networks Fields and Organizations: Micro-Dynamics Scale and Cohesive Embeddings *Computational & Mathematical Organization Theory* Special Issue CMOT 2004:168-AL.

White D R and Reitz, K. Graph and semigroup homomorphisms on networks of relations *Social Networks* 1983;5(2):193-234.

Whitten N A and Wolfe A W. "Network Analysis" In Honigmann J ed. *Handbook of Social and Cultural Anthropology.* Chicago: Rand-McNally 1973: 717-746.

Wolfe A W. *In the Ngombe Tradition: Continuity and Change in the Congo.* Evanston: Northwestern University Press. 1961.

---. The African Mineral Industry: Evolution of a Supranational Level of Integration *Social Problems* 1963;11(2):153-164.

---. On structural comparisons of networks. *Canadian Review of Sociology and Anthropology* 1970;7(4):226-244.

---. The supranational organization of production. *Current Anthropology* 1977;18(4):615-636

---. Connecting the dots without forgetting the circles. *Connections* 2005;26(2):107-119.

Wolfe A W., Lex B W and Yancey W L. *The Soulard Area: Adaptations by Urban White Families to Poverty.* St. Louis: The Social Science Institute Washington University 1968.

Zachary W W. An information flow model of conflict and fission in small groups *Journal of Anthropological Research* 1977;33(4):452-473.