

Studying Communication Networks in Appalachian Kentucky Community Development Planning Processes

Eileen Markham Lewandowski

Prestonsburg Community College & University of Kentucky

eileen.lewandowski@kctcs.net

Abstract

Census data and Appalachian Regional Commission designation as distressed counties indicate Appalachian Kentucky is deep in poverty. This 'poverty of place' and the region's pattern of out-migration provide obstacles to economic development. Based in the theoretical connections between communication, communities and community or economic development, the study considers both technological (traditional) and alternative views of community development. Evaluating communication in support of community development requires the use of social network analysis (SNA) to develop models describing communication and social networks of participants in local planning. Participant descriptions of their networks become data, which may be translated into matrices and graphed using SNA methodology. Such study evaluates 'community development' planning processes, their horizontal and dialogical communication, and the participative (inclusive) nature of the networks.

Clinton's Appalachian Summit, held August 12-13, 1999 in Ashland, KY and Huntington, WV, along with his recent visits to Hazard and London, KY, brought attention to economic development of depressed regions within the U.S., including Appalachia. This study reviews the theoretical connections between communication, community and community development, looking at technological (traditional) and alternative viewpoints in order to explain how they impact community development planning processes.

Communication, community and community development

Early communication research took a societal view -- the worldview at its inception. When one teaches that communication is only received and decoded in relation to the fields of experience the speaker and listener hold in common, s/he is speaking about how we learn our language and culture, as well as the way in which we come to possess them in common. Hence early research in communication is related to sociological hypotheses about connections between communication and community. John Dewey [1] says,

Society not only continues to exist by transmission, by communication, but it may fairly be said to exist in transmission, in communication. There is more than a verbal tie between the words common, community, and communication. Men live in a community in virtue of the things they have in common, and communication is the way in which they come to possess things in common.

His view of communication was as an outgrowth of empathy and social foresight. He saw the reforming potential of media, expecting the media to disperse shared symbols, experiences, and language links.

When Lazarsfeld (and others) [2] began experimental study of communication in the 1930s, it was assumed that the audience for messages was passive (pp. 565-6). This belief predated the "social science" model of inquiry. Propaganda was injected into the individual collectively -- the mass audience watched the film -- and results were expected to integrate each of the individuals into society (social engineering) or perform a common activity. Most call this approach the magic (or silver) bullet theory, alluding to the lone ranger - an early radio hero. The communication message (of the film, advertisement, or other vehicle) was likened to a bullet, shot by the source of the message, through the media to the receiver of the message.

The American Soldier and other studies of World War II helped develop and refine communication research methods. The 1940 political campaign study looked to opinion leaders and a 2-step flow as an alternative to the magic bullet. This marked a turn toward a more pluralistic view. In Katz & Lazarsfeld [3], media campaign research was described as either a new dawn for democracy or instrument of evil (as interpreted by the bullet theory), then considered a medium in which intervening variables (exposure, medium, content, and predisposition) could join with the two-stage model. Discussion of a primary group re-emerged in a later view of the Hawthorne Studies and The American Soldier when scholars looked at interviews of participants and retroduced the two step flow or group effect.

Lazarsfeld's work measured media's effect(s) on audiences. Some suspect that he and other Columbia School researchers set up the magic bullet as a straw man to present their view that media effects are more limited than originally thought.

When Patterson & McClure [4] wrote The Unseeing Eye, the expectation was that television news-casting, political commentary, and paid political advertising had extensive effects on voter behavior. Scholars conducted much research regarding factors that persuade individuals to change their behavior or thinking. Instead of finding what was expected, they learned that (1) television news and commentary had no influence on voters' views of the candidates or understanding of the issues, (2) political commercials don't overcome predilections about the candidates and parties, and (3) commercials furnish more serious information on the issues than either news or commentary does.

This experiment changed the focus of research because its results presented a different social reality in which the voter/television viewer could not be seen as passive, but as a person who already had views that he/she might not wish to change. Hence, later experiments have focused more on something we might term either a pro-effects or a differential effects approach.

One of the effects found in Stephenson's [5] study is based in information theory. It looks at the individual newspaper reader and contends that news reading is a play-like activity and that playing is fun. Stephenson says that because the newspaper reader is secluded, he is working at the individual, not societal level. He sees the individual using the newspaper for pleasure, an early "uses and gratifications" approach. This author notes that radio and television use, including watching videos at home, are also highly individual (and, hopefully, pleasurable) activities. Hence, his claims could be generalized to those areas.

Each step away from that view of a "mass society and magic bullet" was in accordance with what the scientists developing the new methodologies of the communication field learned and believed. After the magic (or silver) bullet theory of mass communication was discarded [4], debate continued regarding such notions as individual versus societal use [3, 6, 7], along with intermediation or a two step flow [8,9].

A technological view

Social Science Research. Reading Carey's [10] analysis of Dewey provides another set of unique and different insights. Carey's explanation of Dewey's writing regarding the two distinct views of communication makes it easier for today's reader to understand. Dewey's earlier view -- transmission -- combines a political, economic, and technological notion with a religious one. This top down (one way) model of distribution has similarities to the early assumptions regarding the magic bullet effects of television. Carey says this is the more modern of the views Dewey was discussing. (Perhaps, communication scholars have returned to the earlier view). Carey's discussion of Dewey mentions the early religious movements coinciding with the

founding of European colonies. His view parallels paintings of the New World in which priests are shown converting the natives to Christianity on one side of the cross planted in the sand, while soldiers are flogging the natives for not bringing them enough gold. So, when Carey spoke of colonization as a redemptive act in which the telegraph spread God's world by bringing a uniform image of Protestantism throughout the world, it resonated with research on development communication and the extension model of development.

When Carey discussed the older, ritual notion, he spoke of communication's roots being in a view of community (sharing, participation, association, fellowship, and possession of a shared faith). He indicated that the community maintains (not spreads) society in time through such activities as prayer, chant, ceremony, and newspaper writing/reading (as a ritual like a Mass) in order to portray contending forces in the world. Carey stated that "to study communication is to examine the actual social process wherein significant symbolic forms are created, apprehended, and used" (p. 17). Linking symbolic and semiotic analysis that is so common in today's cultural studies approach to communication, his insight and discussion reconcile much of the analytic framework encountered when studying "mass media and culture" to that in our present endeavor.

Frazier & Graziano [11] (p. 15) say, "The human community is created in and transmitted by communication, "citing Park; while others consider the view Dewey's.

Because the articles by Carey [10], Frazier and Graziano [11], and the book by Czitrom [12] are dated, some consider Dewey's ideas about communication and community an historic note to the study of communication, possibly no longer relevant. Peters' [7] argues the ideas tying communication, community, and democracy have merit.

Communication. Going back to an earlier conception and model of communication, Schramm [13] indicated that its elements: source, encoding, a signal, decoding, and destination describe a mechanical model. This model emulates early communication by semaphore and telegraph, not human communication. His second model depicts the source and encoder in one field of experience, the decoder and destination in another, with an overlap of those fields. This overlapping section of the fields of experience is the site where shared meaning becomes possible.

Schramm's [13] statement, "once coded and sent, a message is quite free of its sender, and what it does is beyond the power of the sender to change (p. 4)" came long before our field's current emphasis on interpersonal, relational, and cultural studies.

Community Development. Paralleling early research, Rogers wrote of efforts to bring innovative agricultural methods into the third (or underdeveloped) world. His

background with the U. S. Department of Agriculture and its Cooperative Extension Service provided this opportunity. The "classical model of information diffusion" [14] was developed based on his comparisons of several hundred funded studies concerning the spread of new agricultural technology measures and other 'material' innovations" [15] (pp.144). The studies reconfirm that farmers talk to farmers. Rogers and Shoemaker explain diffusion of innovations, as "an idea perceived as new by the receiver -- an innovation -- is traced as it spreads through a system [14]." The innovation is usually a technological idea; thus, one can see that past diffusion research fits well with the dominant paradigm's focus on technology and on its top-down communication with the public [16].

When diffusion of innovations is applied to social as well as technical programs, an intermediary Starosta coins "friendly neighborhood designated rhetorician" provides the second step in the flow of information required for attitude change and persuasion, prior to adoption. Rogers [17] claims such opinion leadership is necessary for the diffusion of innovations, then focuses on communication network links [16]. Repudiating much of the methodology implicit in the traditional diffusion of innovations, he shifted focus to the passing of the dominant paradigm. A summary of the shift in Rogers' thinking follows.

Many social scientists, including communication scholars, believed they understood the nature of development and the role of communication in it before Schramm's Mass Media and National Development (1964). Rogers [16] called it the most influential book about communication and development. Schramm's thoughts about the communication process may have incited a revolution. Rogers [16] (pp. 215-217) has described the dominant paradigm, which ruled intellectual definitions and discussions as deriving from certain historical events, such as the industrial revolution, the colonial experience, the quantitative empiricism of North American social science, and the capitalist economic political philosophy.

He cited the industrial revolution because the older view stressed economic growth through industrialization as the key to development. Exploitation of colonies helped the European nations in their socioeconomic transformation. (Many developed nations still have less developed interior regions that act as economic colonies for other parts of the nation, as in the Appalachian coal producing counties and other mineral rich areas.)

Technology is capital-intensive. The modernization of traditional individuals became a priority task of various government agencies, an activity in which the mass media were widely utilized. Capital required for technology was borrowed or controlled by firms in the more industrially advanced nations. Even when the colonies became independent politically, their economic dependence

deepened due to the need for technology and military armaments.

The assumption that people are economic, hence would respond to economic incentives, became motivation for the widespread and large-scale behavior changes required for development to occur. This is where the paradigm broke down. A nationally centered and planned model of development, where the local communities were expected to change because of the provision of information and resources from higher levels, simply did not work. Quality of life wasn't factored into discussion of development until the very late 1960s. Old cultures with warmer intimacy of family life and greater artistic triumphs weren't labeled as "developed" because these factors could not be measured in dollars and cents. This dehumanization -- growth measured in the aggregate or on a per capita basis, letting equality come later -- assumed that development would spread from the areas where it was welcomed to those that lagged.

The old paradigm implied that poverty was equivalent to underdevelopment and that when underdeveloped countries or regions became more like the developed ones, life would improve for everyone. This theory, also called modernization, implied an "individual blame" and may have been ethnocentric in a cultural sense. Rogers cites Myrdal (1968, p. 16) in saying that economists have long been guilty of arriving at general propositions which they claim are valid for every time, place and culture. Some scholars looking at third world development became aware in the late 1960s and early 1970s that such development of traditional societies was a contemporary extension of social Darwinian evolution [16].

An alternative view. A new definition of the causes of underdevelopment was undertaken in international circles during the mid-1970s, which showed the causes as external to developing nations as well as within them. A shift to small technology and sustainable development has ensued [18]. Elements in the new development models are equality of distribution of information, socioeconomic benefits, etc., along with popular participation in self-development planning and execution. This implies decentralization of many such activities to the local level. Self-reliance and emphasis on the potential of local resources are stressed, along with an integration of traditional and modern systems.

This shifts the process of development to one in which mass media of communication no longer play a dominant role in relaying informative and persuasive messages from the government to the public in a downward, hierarchical way. The one way flow of communication of the old paradigm is no longer acceptable. In fact, Rogers says that in the early 1960s, despite considerable research, the role of the mass media in leading to development was mainly assumed rather than proven [16] (p. 227). Concluding, Rogers suggests that self-development is often more

effective than the old model and interpersonal communication networks, more effective than the mass media in promoting change. Recent work, including Rush & Ogan [19] and Carmen [20], indicates that both alternative press and global information networks assist in this process.

Hence, a shift from a one-way to interactive models and from classical diffusion of innovations to study of interpersonal communications networks is minimal requirement for studying communication and development. Carmen's monograph, Communication, education, and empowerment [20] synthesizes many such, including Freire [21], and Fugelsang [22] in this regard. Both the development of local leaders and of methods for local citizens to discuss their problems are addressed in literature regarding development and development communication.

Most recently, communication scholars, including Rogers, have extended this analysis to the particular communication style needed to enhance or empower local community efforts. In Shefner-Rogers, Rao, Rogers, & Wayangankar [23], the authors indicate dialog -- rather than one way communication -- is the key to changing the relationships between the power broker and the common citizen. "How empowering messages are communicated, such as in a dialogic, rather than one-way, style, can itself be an empowering influence. Yet the communication aspects of empowerment remain largely unrecognized and understudied, even by scholars involved in feminist communication, development communication, persuasion and other forms of social change" (p. 322).

Community development methods of the 1990s

Traditional method. The extension model of development reflected the dominant thinking of its day. Like much of the literature in the management and organization theory field, the top down model, wherein the expert or top administrator was expected to make all major decisions [24 - 25], prevailed. This model (called a technical assistance or professional/expert model) is directed mostly from outside the community to be developed. The local community relies on the advice and direction of consultants in such planning development [20, 24-31]. The governmental, educational, or technical 'experts' usually focus their attention on predetermined models for the economic development of the region or diffusion of innovations about technological or scientific agricultural methods. These innovations or improvements are expected to bring in factories and jobs, or improve farmer's yields, reduce sickness, or otherwise "improve" the local community [32-33] (p.525).

The frames of reference for these two expectations rise from the belief that (a) when one has a job, all is well with the world; hence, if there are jobs in the community, the community is developed, or (b) alternatively, the local farmers or health practitioners need to be taught how to

implement new measures to improve crops or prevent disease.

This model of community development intends to improve the physical infrastructure of a community in order to bring in bricks and mortar (buildings), which may provide places of work, especially factories; or improve the knowledge base of the local provider network in service industries. Unfortunately, few jobs brought in through this model pay a living wage to residents of the newly developed community. Moreover, present employees of relocating firms fill supervisory and technical positions, while lower level employees are usually left behind, to be replaced by locals clamoring for work at subsistence wages.

The new model. As in the discussion of communication and community, there has been a shift in the thinking of many, with regard to the most viable model for the development of a community. A contrasting model of community development seeks to improve human, social, or civic infrastructure or increase community capacity building [34]. [This citation represents <http://www.aspeninst.org/rural/ccbnnotes.html>, the website of The Aspen Institute.] In this model for development, local residents get together to figure out what kind of development, if any, might be appropriate to improve the lives of those living in the community.

A review of readings in community development indicates recent theorists lean toward either asset building or participatory action programs [19-20, 23, 26, 33-41]. The former builds on the latter, with the addition of a change in focus from examining what is lacking in the community to what assets it has to determine how best to 'build' the community.

The asset building process is readily explained [38]. Among the assets to be developed are potential leaders, their forays into community groups and policy making, and the networks they form with others within and outside the project.

Participatory action programs have grown in the past several years because scholars in community development have been able to utilize the concepts of participation and empowerment in their work. Looking at the primary foundation of the conceptual framework, Carmen [26] talks about development communication or communication in development situations, saying:

Communication is first and foremost a bridge-building exercise, the foundation of which is trust in people's own ability to cope. People's participation is not something, which can be 'mobilized' or created from the outside. It is based on people's right to decide for themselves (p. 267).

When he defines "development" communication, he replaces what has been termed the "extension model of communication" with a concept of development based on ideas from Freire and Fugelsang. He says, "what communication for rural social development ...will have

to concentrate on is horizontal, dialogical, participatory communication" [26].

Jones & Silva [48] indicate that "problem solving creates the action, community building assures broad ownership..., systems interaction lends direction to the action." Russell L. Ackoff echoes their sentiments, saying:

In planning, process is the most important product. Therefore, effective development planning cannot be done for some by others (p. 195). The proper role of the professional planner is to provide others with information, instruction, motivation, and the resources that can increase the effectiveness with which they plan for themselves. Effective development planning must be participatory. (p. 196).

Toffler uses new terminology, discussing "a new concept - anticipatory democracy - fusing citizen feedback and future consciousness" (p. 248).

Korten [49] (pp. 498-9) writes that while rural people have a great deal to contribute to program design and substantial capacity for learning and change, they also have good reason to be skeptical of the stranger bearing ideas for improving their lives untested in their setting ...such knowledge, crucial to any effort by outsiders to improve the well-being of the rural poor, is possessed by the people, but easily overlooked by planners who have not had - or do not seek - the opportunity to ask.

He concludes by proposing there is need for action based capacity building.

McTaggart [41] specifically uses the term participatory action, saying "If we decide that something is an example of participatory action research, we are suggesting that it is likely to have improved the lives of those who have participated" (p. 169). He says that Kurt Lewin invented the term action research, a "spiral of steps, each composed of planning, acting, observing, and evaluating the result of the action" (p. 170). Two ideas central to his work are group decision & commitment to improvement.

...those affected by planned changes have the primary responsibility for deciding on courses of critically informed action which seem likely to lead to improvement and for evaluating the results of strategies tried out in practice (p. 170).

Power differences and conflict. Participation is problematic where people with differing power, status, influence and facility with language come together. "Mere involvement creates the risk of cooption and exploitation of people in the realization of the plans of others" (p. 171). McTaggart quotes Tandon (1988, p. 13), saying he:

has identified several 'determinants' of authentic participation in research: 1. people's role in setting the agenda of the inquiry, 2. people's participation in the data collection and the analysis, and 3. people's control over the use of outcomes and the whole process.

This seems to imply that the mere presence of such diverse groups as low income community members in the planning process does not necessarily mean that they have been consulted and participated in the process.

One of Lazes' projects reflects this approach. He developed a case study approach to enable a rural Spanish cooperative, which sought advice regarding its future. His work in this situation was more controlled and consultant-like than in his role at Xerox. He administered a directed self study or mutual learning strategy and submitted a document reflecting the study's findings. After this phase, however, the cooperative board and membership discussed, edited, and revised the report to suit its needs prior to its publication [33]. The second step involved the community buy in process.

Participatory action research is not the same as those kinds of research which involve researchers from the academy doing research on people - making the people into objects of research. McTaggart [41] (p. 171) continues saying Habermas (1972, 1974) indicated that while neither empirical-analytic nor interpretive research are emancipatory, both can create the illusion of participation. The author separates theoreticians' research from development of and by the community, joining Habermas in maintaining the former research methods are an intervention in the sense discussed, even if those doing the research are committed to participatory action research.

Participatory action research is concerned simultaneously with changing both individuals and the culture of the groups, institutions, and societies to which they belong.... ...Not impositions; individuals and groups agree to work together to change themselves, individually and collectively [41], (p.172).

McTaggart places emphasis on "changing and studying discourse, practice, and social organization: the distribution of power" (p. 172), focusing on patterns of language use and interaction.

The individual is an actor, but his or her acts are framed and understood in a social context of interaction; changing social action usually requires also changing the ways others interact with us (p. 173). Participatory action research establishes self-critical communities of people participating and collaborating in all phases of the research process: the planning, the action, the observation, and the reflection. It aims to build communities of people committed to enlightening themselves about the relationship between circumstance, action, and consequence in their own situation and emancipating themselves from the institutional and personal constraints which limit their power to live their own legitimate educational and social values (p. 176). ...Participatory action research is a political process because it involves people in making changes together that will also affect others (p. 177).

Management consultants are using participatory action. Lazes took a facilitator rather than consultant role in working with Xerox reprographic division [33].

A further theoretical concern is the connection with power and influence within each of the planning models. The externally driven, traditional planning process model tends to isolate some potentially interested citizens, precluding their involvement in or communication regarding the community development process, while the grass roots citizen planning model encourages cohesion and inclusiveness [50-51]. Examples of the latter model include the mothers clubs at Oryu Li in Korea [17], the women dairy farmers in India [23], and the video network project in Indonesia in support of birth control [47]. This empowerment grew out of the changes in the communication patterns of the existing leaders, who were willing to broaden the leadership base in allowing women and other less included folks to participate in the process of development. This allowed incorporation of some new ideas and values in the decision making process, bringing more productive workers and innovative methods into the system and enhancing the local economic situation.

Other theorists and practitioners working with this mode of development include Putnam, Leonardi, and Nanetti [52-53]. They and the Floras suggest that by empowering local citizens to make decisions for themselves regarding the future of their community, those citizens take ownership of the plans, which result from those decisions. Whether the plans result in success or failure, they are produced by shared decision making. This approach is more likely to generate economic activities with broader and more diverse positive impacts on the local economy than more traditional approaches. The keys to its success are inclusion and diversity.

Local social networks. A crucial aspect of this 'social infrastructure' approach is the construction of social networks. These relationships, built in the community by the people who have been born, educated, and socialized into participation in the fabric of community life, become the basis for trust upon which the community members are able to capitalize by joining together and planning for the future. People who are related to one another are physical neighbors, have attended the same schools, played on the same teams, and worshiped together, etc. already share networks based on this prior history [54]. These networks tie the members of the community and its organizations together, as well as link the community and its organizations to other communities and their resources. The links between the members of the community are forged by the communication, which has taken place among members, as in Shefner-Rogers "dialog". Of interest especially are two types of communication - interpersonal communication, both that within the community and between community members and others outside the community, as well as organizational communication, both among organizations within the

community and that between local organizations within the community and others outside the community.

Current research on community considers the ties between the members critical to community decision making and planning efforts. Using 'structural analysis' to study networks enables scholars to depict the actual links, ties, or connections between the members of a community. Wellman, Ryan, Leighton, Coleman, Krackhardt, and Borgatti [54-58], among others, have developed and now utilize graph theory and matrix algebra to summarize both survey and archival data verifying existence of such networks and depict their structure both statistically and visually.

Those who study social networks have investigated local community (and, sometimes, economic) development. Early investigators include Gaunt [61], Nylander [62], and Sharp [44]. Gaunt's city and regional planning study intended looking at the structure of the communication process used within human services planning. While he termed the focus "structure of communication processes", he investigated how and when citizen participation was permitted in the planning process -- (a) informing the public about the plan, (b) asking for public review after the plans are developed, or (c) actual interaction of local citizens with those doing the planning. The use of the word 'permitted' gives a clue to the agency dominance of the planning process.

In the Nylander sociological study, the author found two separate networks of leaders in the rural Mississippi delta communities with large minority group populations. The control of decision making resided in members of one racial group, preventing resolution of community problems.

Sharp's sociological study examines how the structure of individual and organizational interaction within a community influences community action. (Its abstract says:

the findings support a structural approach to the interactional community and confirm that social capital [the structure and character of individual interaction] and social infrastructure [the structure of group-level interaction patterns] influence community action patterns.)

These three recent studies, coupled with more than 20 years of prior discussion of social network analysis combine to make speculation about the usefulness of this process in describing the structure and patterns of interaction among participants in the planning for community development.

Local situation. Distressed Appalachian counties currently face drastic situations -- the impending death of the major industry, geographic isolation, inadequate education, lack of physical infrastructure and investment capital, out-migration, as well as natural resource and extractive mineral dependency. While local, regional, and state government have tried to augment federal and

philanthropic investment to remedy local needs, Johnson's War on Poverty and other efforts have provided little lasting change [63].

Contrasting approaches to community development are being utilized in the struggle to move such "colonial" areas into congruence with the surrounding prosperity. They will be studied through examining two distinct ongoing community development planning processes in a single county at the present time.

Such study seeks answers to questions about the actual process through which a community seeks to (1) address its problems and (2) implement such change by resolving those situations, which the local residents seek to address. Each community is free to decide which problems (if any) should be addressed and how to proceed to make changes. The author is currently engaged in a comparative case study, seeking evidence of the three kinds of communication Carmen [26] (p. 270) says are minimal requirements for development to be considered community development – horizontal, dialogical, and participative are utilized, while including all those from the community, who wish to participate.

Communication networks

The model of community development, which grew concurrently with the "diffusion of innovations" relied on a mathematical basis [64] or SMCR - source, message, channel, receiver - model for the communication of information [13], the participatory model grows out of a more refined conception of communication. As summarized in Anderson & Ross [65], who agree with Stamp & Knapp [66] on this issue:

For interactional participants, the most important aspect of intentionality may not be what an encoder really wants to accomplish with a particular message or what attributions a decoder makes about the message, but how the interactants in the relationship ultimately negotiate the two perspectives' (p. 296).

Communication, therefore, is ... a useful label for what happens when participants aren't fully aware of their intentions at all, but are aware of the relationship with one another.

This negotiation of a shared perception between the two participants in an interaction is communication. The communication is the link between the participants. It forms the relationship or bond that ties them together in a dyad, triad, or larger network. That network may represent a couple, a family, a small group of friends, colleagues at work, neighbors, those who have read the same book, or attended the same function.

Utilizing this network conception of communication as a linkage or connection between individuals, it is possible to generate graphs, which represent the connections between individuals from simple matrix charts, which

represent the presence or absence of some known or reported relationship between any two persons. This provides a way to verify the possibility of communicating or reaching from one individual to another. A path links one person to others in the network.

Uses of networks

Historical uses. Lack of success with the old diffusion of innovations concept led Rogers to identify a new way to represent the process of development [67]. This new frame of reference requires identifying, examining and utilizing the social networks of the communities where development is taking place. When local participants were less than enthusiastic about trying modern birth control methods in rural Korea, Rogers and his colleagues discovered that, when the local matriarchy adopted and supported a change, their network followed along. In the research project at Oryu Li, the village mother's club - a network of local women -- assisted in encouraging the acceptance of family planning. This initiated efforts toward community development and resulted in financial progress for the community. The book, explaining this process of development, begins with a qualitative frame of reference, using mainly observation and notes regarding the women's network and contacts, then generates graphs of the network produced using NEGOPY for analysis [67]. This early foray into a network framework for an international development initiative led many to search for ways to study the networks with tools more easily handled than were available at the time.

In network analysis, the basic data are derived from information about the individuals who are involved, as well as the identification of other individuals in the system, with whom each of them communicates. A solution to any network analysis problem requires that we discover certain properties of the communication structure linking members of the system composed of the aggregate of the individual respondents. Communication structure is the arrangement of the elements that can be recognized in the patterned communication flows or other relationships among the members within the system [67] (p. 71). The individuals are represented as points on a graph produced by mapping the matrices that represent their relationships. Such inquiry, based on a convergence model of communication, tends to be holistic - instead of focusing mainly on individual attributes or effects - because it considers the communication and ties of each member in the network, including some who may not be initially defined as participants. The focus is on the relationships; it studies the relationships between the two or more people, depicted as a tie or line linking the two points representing each node (person or organization), instead of the attributes of the individuals.

Local networks. In applying the concepts of network analysis to local situations, it is important to specify what kind of relationships will be utilized to depict the structure. For example, in looking at two separate community development planning processes taking place in a rural Appalachian county at this time, the research process will require defining the boundaries of each of the networks studied to include all those individuals and organizations participating in the planning processes [68]. Because the two networks exist in one rural county, geography and other local realities may provide bridges between the two networks through one or more member individuals or organizations. The two networks will be compared as whole systems, in which the members of each of the planning groups are linked to others within each individual network. Additionally, it may be appropriate to look at the ego networks of some or all of the individuals participating, which may include ties with members of the planning process as well as other individual and organizational ties from within and outside the local county.

The complexity of the links or ties between persons who have lived in a relatively isolated geographic region will portray multiple layers of social connections pre-existing the inception of the planning processes, including such ties as kinship, working together, belonging to the same organizations and churches, attending the same schools, etc. These thickly woven bonds may contribute to close ties, which could enhance or impede resolution of local problems [69-71]. Portraying these ties, hence, becomes particularly important in this research. Comparison of the planning networks to the pre-existing social networks as well as those additional social ties, which develop during the planning process, will be augmented with a view of such ego networks as seems appropriate.

Measuring the participation in planning for community development will include such questions as centrality - a measure of the individual's connection to others, peripherality - which indicates being cut off or distant from others in the network [72], one way versus dialogic communication [23], and control of access to information [72]. The methodology used today in social network analysis has been useful in studying kinship patterns, community structure, interlocking directorates, etc.

To put it into perspective, two kinds of data are utilized by social scientists: first - attribute data, including attitudes, opinions, and behaviors, through which properties or qualities or characteristics of individuals or groups are studied using a kind of variable analysis to discuss the values of particular variables. The second kind of data is relational data, which includes contacts, ties, and connections. These ties can include group meetings and attachments. The relations are not properties of agents, but represent systems of agents,

connecting pairs into larger relational systems or expressing the linkages between the agents [73].

Scott claims the lineage of social network analysis has roots in gestalt theory and field theory as well as sociometry, group dynamics and graph theory. He indicates that if we start with structural-functional anthropology, such names as Warner, Mayo, Gluckman, Homans, Barnes, Bott, Nadel, the Harvard structuralists and Mitchell converge in the new area we call social network analysis. Scott points to the breakthrough of a well-developed methodology of Social Network Analysis in 1960, beginning with Harrison White at Harvard.

The 1930s work of Jacob Moreno [74] brought the terms sociogram and sociometrics into use. Those simple diagrams of connections between people are generated from survey or interview data participants in the networks provide. The matrices and graphs produced, along with statistical information similarly generated by social network analytical computer software make it possible to analyze and interpret patterns of communication within the networks identified by the participants.

Those investigating communication network activity are, thus, enabled to describe the process through which the community determines its future development and make recommendations for adjustments in the process.

The author believes that newer forms of three dimensional computer models, which are being developed by those whose research interests include graph drawing, efficient graph algorithms, algorithm engineering, combinatorial optimization (for example - Ulrik Brandes from the University of Konstanz) will better enable social scientists to depict the complex networks of local persons working in such community development planning processes.

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