Identifying Opinion Leaders by Using Social Network Analysis: A Synthesis of Opinion Leadership Data Collection Methods and Instruments

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This dissertation titled

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Identifying opinion leaders for an opinion leadership intervention is critical in order to determine whether or not the diffusion of innovations succeeds; however, there have been few studies that provided a synthetic guideline for researchers to consult in identifying opinion leaders. Based on this necessity, the purpose of this dissertation was to provide a synthesis of the ways to identify opinion leaders by using methods of social network analysis. In particular, this study synthesized communication network data collection methods to identify opinion leaders by using social network analysis and demonstrated how social network data is practically collected in different social systems.

Based on the purpose of the study and background knowledge about identifying opinion leaders by using social network analysis, this dissertation posed two prime research questions: “What are the characteristics of each opinion leadership data collection method used to identify opinion leaders?” and “How is a social network data constructed by using opinion leadership instruments in opinion leadership research?” Each prime question has three sub-questions.

In terms of synthesizing characteristics of social network data collection methods, this dissertation categorized five methods–sociometric, informants’ rating, snowball, observation, and self-designating methods–through a literature review of opinion
leadership studies. In addition, this dissertation presented two empirical studies to demonstrate the procedure of how social network data could be constructed as the second prime research question asked. The first empirical study was to identify opinion leaders within Pennsylvania’s juvenile justice system and the other was to identify opinion leaders within fourteen Indian agricultural villages. Both studies were formative studies for purposive diffusion projects. Related to further methodological development of social network analysis to identify opinion leaders within a social system, some suggestions were offered.

Approved:_______________________________________________________

Anita C. James
Associate Professor of Communication Studies
Our Father, who art in heaven,
Hallowed be thy Name.
Thy kingdom come.
Thy will be done,
On Earth as it is in heaven.
Give us this day our daily bread.
And forgive us our trespasses,
As we forgive those who trespass against us.
And lead us not into temptation,
But deliver us from evil.
For thine is the kingdom,
And the power,
And the glory,
For ever.
Amen.

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Chapter One

Introduction

Background of Study

Seat belt use was mandated in 1984 for the first time in the U.S. (Houston & Richardson, 2006). For the twenty years between 1983 and 2003, even though the seat belt use rate in some states increased significantly, e.g., 95% in the state of Washington, the law was still not substantially effective in other states, e.g., New Hampshire with 50% compliance. From the policy makers and public administrators’ standpoints, what could be done to help lay people realize the importance of seat belt use for their own safety and get them to voluntarily fasten their seat belts whenever they drove their car?

In contrast, the adoption rate of mobile phones has increased sharply all over the world in a relatively short period of time. The number of mobile phone users went from almost none to a half billion people across all countries (International Telecommunication Union, 2002). According to *Electronic News* (Mar. 6, 2006), the skyrocketing adoption rate has continued in the new millennium; mobile phone sales in the U.S. grew 21% in 2005. Why did widespread adoption of this particular telecommunication device take less time all over the world than the adoption period of seat belt use? According to Rogers (2003), the different rates of adoption vary by five characteristics of innovations which are perceived by individuals.

The five perceived attributes of innovations consist of:
1. Relative advantage—the degree to which an innovation is perceived as better than the idea it supersedes. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption will be.

2. Compatibility—the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters. An idea that is incompatible with the values and norms of a social system will not be adopted as rapidly as an innovation that is compatible.

3. Complexity—the degree to which an innovation is perceived as difficult to understand and use. Some innovations are readily comprehended by most members of a social system; others are more complicated and are adopted more slowly.

4. Triability—the degree to which an innovation may be experimented with on a limited basis. New ideas that can be tried on the installment plan will generally be adopted more quickly than innovations that are not divisible.

5. Observability—the degree to which the results of an innovation are visible to others. The easier it is for individuals to see the results of an innovation, the more likely they are to adopt. (Rogers, 2003, pp. 15-16)

Even though these five attributes are important in the adoption rate of innovations, these attributes are uncontrollable because they are innate in innovations; therefore, the diffusion of innovations often depends on the strategies that seek to accelerate the diffusion of those innovations in a social system. As a prominent and effective diffusion
strategy, the use of opinion leaders has been studied by scholars in fields such as anthropology, sociology, communication, and business. One problem of using the opinion leadership diffusion strategy in practice is that the methods of identifying opinion leaders have not been synthesized and organized for change agents who intend to use the strategy to diffuse their innovations. The purpose of this dissertation is rooted in the necessity of synthesizing and organizing social network methods of identifying opinion leaders so that researchers and practitioners can be helped by this methodological synthesis when designing an opinion leadership strategy and attempting to diffuse an innovation in a social system.

Opinion leadership refers to “the degree to which an individual is able to influence other individuals’ attitudes or overt behavior informally in a desired way with relative frequency” (Rogers, 2003, p. 27), and opinion leaders are “those individuals to whom others turn for advice and information” (Rogers, 1961, p. 9). In the diffusion process, opinion leaders are not necessarily innovators, but more evaluators whose judgments are trusted by their followers (Becker, 1970a, 1970b; Coleman, Katz, & Menzel, 1966; Greer, 1988; Soumerai et al., 1998). One of the most distinctive features of the opinion leadership method as a diffusion method is the use of informal and interpersonal communication, rather than formal and other means of communication, such as media. The significance of informal and interpersonal communication in the diffusion of innovations have been empirically proved and theoretically supported by several studies (e.g., Beal & Bohlen, 1955; Booth & Knox, 1967; Casciaro & Lobo, 2005; Hägerstrand, 1967; Johnson et al., 1996; Katz, Levine, & Hamilton, 1963; Ryan &
Gross, 1943; Rogers, 2003; Valente, 1995; Valente & Davis, 1999; Valente & Rogers, 1995; Van Den Ban, 1964). As a classic diffusion study, Van Den Ban (1964) also highlighted the importance of informal and interpersonal communication in the diffusion process through his research on diffusion of new farming methods among Dutch farmers in the Netherlands. His study showed a clear comparison to the two-step flow of communication hypothesis which more heavily emphasized media influence.

The two-step flow of communication hypothesis was introduced by Lazarsfeld, Berelson, and Gaudet in *The People's Choice* (1948) and recognized as the conventional wisdom in opinion leadership studies. The two-step flow theory posited “ideas often from flow from radio and print to the opinion leaders and from them to the less active sections of the population” (p. 151). However, Van Den Ban’s (1964) study on the diffusion of new farming methods showed that farmers’ decision-making during the adoption process was determined more by their personal contacts with opinion leaders, even though mass media functioned as a source of new knowledge.

Supporting the importance of interpersonal communication in adopting an innovation, Van Den Ban (1964) concluded his research with the following findings:

1. The adoption of a new idea usually takes quite a long time, certainly in the case of methods which imply many changes in related spheres.
2. Mass media are major agents in arousing the interest in new methods early in the adoption process, but during a later stage personal contacts are especially
influential in the decision to adopt a new method. Basically, this process is the same for opinion leaders and for their followers.

3. The first persons to adopt a new idea make intensive use of all sources which can provide reliable information about the idea including mass media as well as personal contacts with qualified informants.

4. Often these innovators and early adopters are also the opinion leaders of their groups, but the relationship between pioneering and opinion leadership is much closer in progressive than in traditional groups.

5. Problems, about which more information is badly needed, will often make people turn for advice to the best informed people in the community. These are usually people of a high social status.

6. On most new ideas, however, people will not feel an urgent need for information. In this case, people will get their information personally through casual conversations, mainly with people of about the same social status. (pp. 248-249)

Based on these results, it can be argued that opinion leaders more substantially affect lay peoples’ final decision making to bring about behavioral change, while mass media provide new information and affect people’s perceptual change. Rogers (1961, 2003) also supports this result, arguing that interpersonal contact is more important than media in individuals’ adoption of innovations (2003, p. 305) and, therefore, opinion leaders can be referred to as “adoption leaders” (1961, p. 10). This importance of opinion
leaders as more substantial and direct influentials in the diffusion process provides the
theoretical perspective of this dissertation (Booth & Knox, 1967; Van Den Ban, 1964;
Rogers, 2003). Accordingly, this dissertation excludes media effects from consideration,
but focuses on the opinion leadership strategies proposing a substantial and voluntary
behavioral change. Based on this perspective, this dissertation specifically aims at
synthesizing and organizing the methods of identifying opinion leaders which are initial
considerations in designing and conducting an opinion leadership strategy.

To identify opinion leaders, one may use conventional characteristics of opinion
leaders which have been generalized through several studies asking who opinion leaders
are in a social system and how opinion leaders are distinguished from others (e.g.
Bhandari et al., 2003; Carlson, 1964; Feder & Savastano, 2006; Schuster et al., 2006).
From the early study of opinion leadership, Katz (1957) explained that opinion leaders
could be distinguished from others in terms of three criteria: 1) “who one is”–the
personification of certain values, 2) “what one knows”–competence, and 3) “whom one
knows”–strategic social location. More specifically, through decades of studies, Rogers
(2003, pp. 316-318) identified seven generalizable characteristics of opinion leaders:

1. Opinion leaders have greater exposure to mass media than their followers.
2. Opinion leaders are more cosmopolite than their followers.
3. Opinion leaders have greater contact with change agents than their followers.
4. Opinion leaders have greater social participation than their followers.
5. Opinion leaders have higher socioeconomic status than their followers.
6. Opinion leaders are more innovative than their followers.

7. When a social system’s norms favor change, opinion leaders are more innovative, but when the system’s norms do not favor change, opinion leaders are not especially innovative.

In another comprehensive study, Weimann (1994) synthesized attributes of opinion leaders by the categories of personal traits/personality attributes, social attributes, and socio-demographic attributes. These are (p. 89):

1) Personal attributes
   a) Innovativeness
   b) Individuation combined with social conformity
   c) Knowledgeability, familiarity, and interest in subject/domain
   d) Cosmopoliteness
   e) Personal involvement or enduring involvement

2) Social attributes
   a) Gregariousness
   b) Social activity
   c) Centrality in social networks
   d) Social accessibility
   e) Social recognition
   f) Credibility
3) Socio-demographic attributes
   a) Profiles change according to domains
   b) Within domains profiles change across cultures and societies
   c) Within domains and society, profiles change over time
   d) Tendency to similarity of influential/influence profiles

Even though these normative and overarching attributes of opinion leaders give researchers a general sense of who opinion leaders are, it is difficult for one to actually identify opinion leaders in a social system with these general attributes because all social systems have their own particularity and uniqueness. Researchers or practitioners who want to use opinion leaders for diffusion purposes and simultaneously consider the uniqueness of each social system, should first determine how opinion leaders can be identified among people in the system, rather than who the opinion leaders are based on the general attributes. This identification of opinion leaders requires a meticulous analysis of social systems. Since opinion leaders influence their followers by personal contacts, the analysis of the communication networks in a social system is a crucial task in identifying opinion leaders.

In terms of the use of opinion leaders in a social network, Borgatti (2006) provided three examples of using the key players. First, in a public health context, opinion leaders who have higher network centrality values can be employed
“when a health agency needs to select a small set of population members to use as seeds for the diffusion of practices or attitudes that promote health, such as using bleach to clean needles in a population of drug additions” (p. 22).

Second, in an organizational context, opinion leaders would be needed “when management wants to implement a change initiative and needs to get a small set of informal leaders” (p. 22). In a military or criminal justice context as the final example, opinion leaders can be used “when one needs to select an efficient set of actors to surveil, to turn (as into double-agent), or to feed misinformation to” (p. 22). These cases illustrate the occasions when people look for opinion leaders who have crucial positions that help to accelerate the diffusion of innovations. Related to the significance of identifying opinion leaders in a communication network, this dissertation focuses on social network analysis and synthesizes its methodologies to identify opinion leaders in various organizational and social systems.

Social Networks and Opinion Leadership

Radcliffe-Brown (1940) described social structure as a network of actually existing social relationships. Katz (1966) explained social network as the set of persons who can get in touch with each other. Developing these early definitions, Mitchell (1969) provided a more detailed explanation of a social network as “specific set of linkages among a defined set of persons, with the additional property that characteristics of these linkages as a whole may be used to interpret the social behavior of the persons involved”
From these concepts of a social network, Rogers and Kincaid (1981) developed the idea of a communication network as “interconnected individuals who are linked by patterned communication flow” (p. 346) and ‘social network’ is used synonymously with ‘interpersonal network’ in their work.

Social network studies have been undertaken in various fields with subjects including, representatively, diffusion and adoption of innovations, community elite decision making, social support, group problem solving, cognition and social perception, consensus and social influence, and the world political and economic system (Wasserman & Faust, 1994). The most distinctive difference between social network studies and non-network studies is that social network studies deal with the relationships between ideas and information among units. In the communication field, as Rogers and Kincaid did, researchers have mainly investigated networks of communicative action and information diffusion. Monge and Contractor’s (2003) book, *Theories of Communication Networks*, presented a wide range of issues related to communicative networks. Specifically, the topics that have been studied with social networks in communication include community health (Dorsey, Scherer, & Real, 1999; Hass & Stafford, 1998; Tardy & Hale, 1998); cognitive personal relationship network (Baxter, Dun, & Sahlstín, 2001; Kim & Stiff, 1991; Morgan, 1986; Parks, 1977); ethnic group/Intercultural networks (Gao & Gudykunst, 1995; Yum, 1983); family communication (Acock & Hurlbert, 1990; Boulay & Valente, 2005; Cate, Levin, & Richmond, 2002; Hass & Stafford; 1998; Magdol, 2000); instructional communication (Haythornthwaite, 2000; Russo & Koesten, 2005; Scharf & Hertz-Lazarowitz, 2003); small group communication (Poole et al., 2004);
social capital (Beaudoin & Thorson, 1994); social network and internet (Haythornthwaite, 2000, 2005); social network and new technology /new media (Gotzenbrucker, 2004; Henderson, Taylor, & Thomson, 2002); social network in organizations (Feeley & Barnett, 1997; McPhee, 1986; Wing & More, 2005); social support (Bass & Stein, 1997; Uehara, 1994); women and gender (Klein, 2004); and communication among scientists (Dearing, 1995).

In terms of identifying opinion leaders in an organizational or social system, social network analysis has its unique advantages, distinguished from other methods. The first advantage is that social network analysis scrutinizes relationships with the *directions* and *strength* of the relationships. Since social network analysis, as a method to analyze patterns of interpersonal communication, is based on the data indicating ‘who talks to whom’ or ‘who influences whom’ (Valente, 1995), the directions of communication among people in a social system are clearly revealed in the data construction procedure. In addition, the most commonly used indicator to measure the strength of a communicative relationship in studies identifying opinion leaders is *frequency* of communication.

The second advantage of social network analysis is that it generates various *social network maps* showing communicative relationships among members of a social system. Currently, many social network analyses use computer software, which are specially designed for network analysis, and the software generates many types of network maps depending on the purpose of the study. The social network maps show not only the direction of the relationships, but also their strength. This visualization enables
researchers to easily analyze the social structure so even non-professionals can understand what the research tries to explain. Opinion leaders in a social system also can often be identified in the map.

Third, social network analysis provides very realistic, rather than probabilistic results. In terms of methodology, social network analysis is based on a non-probabilistic method as opposed to statistical analysis using probabilistic methods. The most distinctive feature of social network data is that the data are constructed not by random selection of a sample from a population, but by contacting most of, or even all of, a population in a social group or by using members of a very specific targeted group of people. Therefore, data for social network analysis are constructed by non-mediated interpersonal communication. Based on this feature, social network analysis provides more accurate and realistic analyses.

Fourth, social network analysis is progressively manipulative and able to create several virtual scenarios based on assumed or expected changes in relationships. For instance, how does a social network change by inclusion of new members or exclusion of existing members? How does it change by disconnecting the relationship between individual A and individual B? Social network analysis produces different results and maps responding to such possible changes and, furthermore, these various analyses help to predict structural transformation of a social system. Methodologically, this procedure of inclusion and exclusion for predicting seems to be very similar to adding and dropping variables in a multiple regression.
Fifth, based on the advantages mentioned above, social network analysis is a strongly persuasive and attractive option for change agents looking for a method to diffuse innovations. Opinion leadership intervention, which is initiated by social network analysis, may be highly likely to be chosen by the change agents as a method to diffuse their innovations. Since even people who do not know much about scientific methods can understand a social structure more clearly with social network maps, and the maps visualize those in the center of communication relations, a change agent is likely to be persuaded by the understandability and clarity of results of social network analysis. In addition, the change agent can easily identify the opinion leaders who could help the change agent to diffuse an innovation.

Research Questions and Methods of Synthesizing Opinion Leadership Data Collection Methods and Instruments

Social network analysis has many advantages in identifying opinion leaders in a social system, as explained in the previous section; however, in order to use a social network method effectively to identify opinion leaders, researchers should carefully consider how the method can be used for their research. Related to this, this dissertation presents keys to use social network analysis to identify opinion leaders, based on the literature review of previous studies. Having that general purpose, the specific purposes of this dissertation are to explain five data collection methods to construct opinion leadership data (sociometric, informants’ rating, snowball, observation, and self-
designating methods) and strategically examine opinion leadership instruments used in studies that employed social network analysis to identifying opinion leaders.

This dissertation primarily focuses on two issues in synthesizing the social network data collection methods. The first issue is characteristics of each data collection method (sociometric, informants’ rating, snowball, observation, and self-designating methods) in constructing opinion leadership data, and the other is how to actually use social network data collection methods and their instruments to identify opinion leaders for empirical opinion leadership studies. Based on these issues, the research questions of this dissertation are:

1. What are the characteristics of each data collection method to identify opinion leaders?
2. How are social network data constructed when using opinion leadership instruments?

These two questions should be the initial methodological questions for researchers to design and conduct their empirical research to identify opinion leaders by using social network analysis. Although the initial questions are commonly asked for most opinion leadership research, there are no clear guidelines which researchers can consult because there are few clear methodological syntheses in social network studies. This study, therefore, will contribute to building fundamental methodological guidelines for researchers and practitioners who want to identify opinion leaders for their diffusion projects.
In order to synthesize opinion leadership data collection methods and their opinion leadership instruments, this study will consider the specific sub-questions in answering the two primary research questions. Related to the first primary question, “What are the characteristics of each data collection method to identify opinion leaders?,” the sub-questions to be answered are:

RQ1a: What are the most frequently used data collection methods and their instruments in studies that identified opinion leaders and what are the characteristics of the methods?

RQ1b: How have the opinion leadership instruments been studied?

RQ1c: How have researchers used opinion leadership instruments relevant to their research purposes?

Social network analysis has its own strength to visualize the relationship between opinion leaders and their followers through drawing social network maps. Related to this attribute, the first research question and its sub-questions are asked to provide a general overview of opinion leadership data construction methods, including all five data collection methods (sociometric, informants’ rating, snowball, observation, and self-designating methods), whether or not the data are able to be used for a social network map. In other words, even though all of them are methods to identify opinion leaders, not all five data collection methods are able to construct social network data. In answering the first set of questions, this dissertation will also clarify which methods are best able to use social network analysis and draw social network maps.
Related to the second primary question, “How are social network data constructed when using opinion leadership instruments?”, the sub-questions are:

RQ2a: How has population size affected researchers’ decisions in the choice and use of a data collection method?

RQ2b: How have demographic characteristics affected researchers’ decisions in the choice and use of a data collection method?

RQ2c: What are the situational concerns that researchers could face in collecting social network data and what are ways to minimize the risks arising from the concerns?

Coupled with the literature review of opinion leadership studies using social network analysis, the second research question and its sub-questions will be answered with two empirical studies. The first applied study of this research sought to identify opinion leaders in Pennsylvania’s juvenile justice system. This study was funded by the John D. and Catherine T. MacArthur Foundation, and the author has permission from the foundation to use the study for this dissertation. The second applied study sought to identify opinion leaders in the diffusion of e-Choupal in Indian villages. These applied studies will contribute to answering the second set of questions by presenting the procedures of opinion leadership data collection in two different research sites.

Moving on to the purpose of the dissertation, Chapter Two reviews the history of social network analysis and explains its main concepts. The history of social network analysis provides an overarching understanding of how it has been developed and what the major issues in the network analysis have been. In explaining the fundamental
concepts of social network analysis, network centrality measures will be mainly discussed because of the nature of opinion leaders who are in the center of the communication flow. This overview of the history and the centrality measures provide the cornerstone information to understand the use of social network analysis and studies trying to find opinion leaders.

Chapter Three synthesizes and explains five opinion leadership data collection methods. In this chapter, major opinion leadership instruments for each data collection method will be collected and organized in the order of development of opinion leadership studies. For synthesizing opinion leadership instruments, studies from the 1940s to the 2000s were selected using criteria focused on a combination of social network, opinion leadership, and communication in the context of diffusion of innovations. In addition, some representative opinion leadership instruments, which have been duplicated and modified for other studies will be organized by opinion leadership data collection method and presented in Appendices B, C, and D. Coupled with the analysis of the opinion leadership instruments, annotative bibliographies of studies identifying opinion leaders, which are also organized by opinion leadership data collection method, are provided in Appendix H. In this chapter of comprehensive review and synthesis, the first prime question (RQ1) about the characteristics of each opinion leadership data collection method will be discussed with its sub-questions.

Chapter Four demonstrates the procedure of social network data construction in two empirical studies of Pennsylvania’s juvenile justice system networks and Indian farmers’ networks in fourteen villages in India. This demonstration is not only to show
the procedure of social network data construction for researchers and practitioners who want to identify opinion leaders for their diffusion projects having different population sizes and demographic attributes, but also to discuss concerns in collecting opinion leadership data for social network analysis and ways that will minimize the risks of data construction failure. The two studies employed a sociometric data collection method to construct communication network data. This sociometric data collection method and its opinion leadership instruments will be specifically described so that other researchers can follow the methodological procedures for their studies. Based on the demonstration and discussion with the two empirical studies, this chapter will provide answers for the second research questions, “how are social network data constructed when using opinion leadership instruments” (RQ2), and the sub-questions. Finally, Chapter Five is the concluding chapter that summarizes the synthesis of this meta-review. In this chapter, further research agendas for methodological development of opinion leadership instruments will be suggested.

This dissertation will only focus on synthesizing opinion leadership data collection methods and instruments to identify opinion leaders through social network analysis and does not evaluate opinion leadership instruments; therefore, this synthesis will be firmly based on the literature review of opinion leadership studies using social network analysis and the two exemplar empirical studies. In addition, the focus is on identifying opinion leaders through interpersonal communication, excluding the influence of media and computer-mediated communication which are also parts of opinion leadership studies. This work also excludes the use of opinion leadership diffusion
strategies which need to include discussion about attributes of innovations and substantial ways to diffuse an innovation. Even though this dissertation mentions the terms “opinion leadership diffusion strategies” and explains the strategies throughout, the use of the term does not mean that the purpose of this dissertation is about an opinion leadership diffusion strategy. The reason that this dissertation mentions “opinion leadership diffusion strategies” is just to provide the reason why opinion leaders need to be identified. In other words, this dissertation is only to synthesize opinion leadership data collection methods and following instruments to identify opinion leadership through social network analysis, which would be considered in designing opinion leadership diffusion strategy and implementing an innovation in a society. In addition, to provide quantitative results of opinion leadership measures and social network maps, this dissertation used Inflow 3.1, a computer software program for social network analysis.
Chapter Two

A Review of Social Network Studies and the Main Concepts

History of Social Network Analysis

The history of social network analysis goes back to the 1920s. The idea of a social network originated from German psychologist Wolfgang Köhler (1925) and his ‘gestalt’ theory conceptualizing the metaphysical idea that the organized patterns of objects structure an individual’s thoughts and perceptions. During the 1930s, many German psychologists, including gestalt theorists, fled from Nazi Germany and developed their theories in the U.S. (Scott, 2000). As a founder of sociometry, Moreno’s (1934) major contribution to social network analysis was the invention of a means to depict the interpersonal structures of groups. Using the concept of ‘social configurations’, which explained the concrete patterns of interpersonal relations, Moreno conducted several studies about how psychological well-being was related to the social structure.

In Moreno’s work, there is an interesting concept that could be regarded as the origin of the identification of an ‘opinion leader’ in social networks. As one of the most important principal concepts in sociometry, a ‘star’ was identified by having the most frequent nominations from others as the most popular person. For example, individual ‘A’ in Figure 1 is the star receiving the most frequent points from others in the group.
At the same time as Moreno, Lewin (1936) highlighted *space*, emphasizing that group behaviors were determined by the location where social forces were played out. The space, in his idea, is not externally identifiable, but perceived by group members. This perception of space is closely related to symbolic interactionists’ idea of *definition of situation* because symbolic interactionists argue that the definition of situation is socially constructed by group members’ perceptions based on their experiences (Scott, 2000).

In the 1940s, Warner and Lunt (1941, 1942) established several important concepts for social network analysis. Through their extensive Yankee City study, which investigated a New England community (Yankee City/Newburyport, MA) and other studies including black communities in Chicago and the rural South, and a Midwestern community (Jonesville), they identified the ‘clique’ that is “an intimate non-kin group, membership in which may vary in members from two to thirty or more people” (1941, p. 110). In other words, a clique is a set of informal interpersonal relationships among

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*Figure 1.* An example of a “star” in a communication network.
people who share certain group norms. Additionally, they found that a person may be associated with several different cliques and argued that “such overlapping in clique membership spread out into a network of interrelations which integrate almost the entire population of a community in a single vast system of clique relations” (p. 111). This empirical discovery is clearly related to the methods of accelerating diffusion of innovations by using opinion leaders who have overlapping relationships with other cliques.

As another significant study related to social networks, which is applicable to studies of the diffusion of innovations, Heider (1946) postulated the theoretical concept of structural balance. Structural balance involves a triad of relationships that include a person (P), another person (O), and an issue (X). The way to determine whether a relationship is balanced is multiplication of the three relationships indicated by positive (+) and negative (-). If a multiplied value is positive, it means the relationship is harmonious. For instance, if P likes X, and O likes X, structural balance exists only if P likes O. As Lewin noted, the structural balance depends not on actual relationships between two people, but on the perception of how an individual considers others’ relationships—positive or negative. In terms of the importance of perception, social network analysis shares the same foundation with diffusion of innovations because an innovation in diffusion studies means “an idea, practice, or object that is perceived as new by an individual or other unit of adoption” (Rogers, 2003, p. 12).

While social network studies until the 1940s had established the foundational concepts of social network analysis and focused on graphical illustration of network
features, many scholars from the 1950s employed mathematical and statistical methods to investigate social networks. This quantitative research tradition motivated scholars to measure mainly reciprocity, mutuality, balance, and transitivity, using statistics and mathematics (Wasserman & Faust, 1994). Combining these graphical illustration and mathematical methods, Cartwright and Harary (1956) explained types of interpersonal relationships with both graphs and mathematical notations, (+) and (−) signs, indicating the types of relationships between members in a social system.

Coupled with the proliferation of methodological tools, a remarkable theoretical development in the 1950s was achieved by the Department of Social Anthropology at Manchester University, especially by John Barnes, Clyde Mitchell, and Elizabeth Bott (Scott, 2000). In particular, Barnes’ distinction between ‘total network’ and ‘partial network’ was prominent. In this binary notion of networks, partial network refers to individual’s informal network, and the sum of partial networks creates a total network which reflected a social network. These notions of partial network and total network illustrate how community integration is constructed through the linkage of each individual’s imperfect partial relationships.

The 1960s was the period of refining substantial concepts of current social network analysis. The concepts of ‘reciprocity,’ ‘intensity,’ and ‘durability,’ which became the conceptual underpinnings of current social network analysis, were significantly concretized, and those terms were broadly used in social network studies. According to Mitchell (1969), who developed Homans’ (1951) variables (direction, frequency, and duration), those that influence interpersonal relations are: 1) reciprocity,
which was determined by symmetric or asymmetric relationship, means the degree of
transaction between pairs of actors; 2) intensity shows either the strength of interactions
or multiplexity of relationships; 3) durability is measured by how long the relationships
or transactions between people last (pp. 24-29). Mitchell (1969) additionally defined
‘density’ as the completeness of a network, and ‘reachability,’ which explains how easily
ideas, resources, or information are diffused through a network (p. 12). Based on these
corcepts, Mitchell (1969) argued that institutionalized roles and statuses shaped
interpersonal networks, and distinguished networks of interpersonal relations from
structures of institutional relations. This distinction provided a reason why a researcher
should investigate both the personal level of network structure and the institutional (or
organizational) or larger level of networks in order to understand the whole social system.

In particular, Mitchell (1969) emphasized communication as one of the main
cornerstones on which to build interpersonal networks. For Mitchell, the sphere of
network analysis was the pattern of individuals’ interaction which was explained with
‘personal order.’ Personal order is the pattern of “personal links individuals have with a
set of people and the links these people have in turn among themselves” (p. 10).
Interpersonal networks are constructed from the combination of communication, which
functions as a means of transferring information between people, and purposive (or
instrumental) action, which delivers material goods between individuals. Thus, Mitchell’s
point of communication is closely related to the characteristics of opinion leaders who
facilitate communication to transfer information within or between groups.
After Mitchell recognized the importance of communication in social networks, scholars in those fields using social networks, which included psychology, anthropology, and communication, paid more attention to the patterns and functions of communication in social networks. In particular, Rogers employed the idea of social network analysis in his diffusion studies and focused on the role of communication as in constituting social networks. According to Rogers (2003), communication networks are structured by “interconnected individuals who are linked by patterned flows of information” (p. 27).

Focusing on the relationship between diffusion and communication network studies, Valente (2006) explained how innovations diffuse through communication networks using five types of communication network models which had been developed sequentially. The first model, at the beginning period of diffusion studies, presents the importance of interpersonal influence in the diffusion of innovation. The early uses of this model include Ryan and Gross’s (1943) study of farmers’ communication in the adoption of hybrid corn seed, Rogers’ dissertation work (1957) on farmers’ decision making in the adoption of new farming innovation, and Coleman, Katz, and Menzel’s (1966) study of the diffusion of medical innovations. These works are all related to the who-to-whom data which explains communicative relationships in a social system and highlights the importance of interpersonal communication in diffusion process. Rogers and Cartano (1962), who were intrigued by the role of opinion leaders in the diffusion process, initiated the study of opinion leadership measurement at this early stage of communicative network studies.
From the 1970s, structural issues, e.g., “how key bridges or structural characteristics are associated with communication networks and diffusion of innovations” (Valente, 2006, p. 62), became a central topic of discussion. At this stage, the patterns of communication in the diffusion of innovations had been more rigorously formulated through Granovetter’s (1973, 1978) investigation of the importance of weak ties as thresholds in diffusion. In addition, Burt (1987) theorized the structural equivalence which means that an individual more likely imitates the behaviors of others who are in the same position in the network. In the diffusion of innovations, this notion of structural equivalence supports the effectiveness of the peer-to-peer diffusion process. Another important structural model, the concept of small world, was introduced by Travers and Milgram (1969). The concept of “small world” referred to the extent to which, if two people meet even for the first time, they would talk about or seek the link they commonly have, and this makes an initial point that everyone is connected to everyone by such a small number of people’s communication. The concept of small world is very similar to the notion of “six degrees of separation” that argues everyone in the world is no more than six steps away from each individual. These two notions—small world and six degrees of separation—are often used synonymously.

The next stage of theoretical development proceeded from the idea of critical mass. According to Rogers (2003), the critical mass is defined as “the point after which further diffusion becomes self-sustaining,” and “the critical mass occurs at the point at which enough individuals in a system have adopted an innovation so that the innovation’s further rate of adoption becomes self-sustaining” (p. 343). Related to the critical mass,
Gladwell (2000) introduced the notion of “tipping point,” and presented how the diffusion of innovations can be scaled up to a population level and how opinion leaders become stronger influentials in the diffusion process than other communication channels (Valente, 2006).

Based on decades of studies, scholars in the social network field have attempted historical or longitudinal data analyses, such as testing previous assumptions of diffusion in networks (Marsden & Podolny, 1990), replicating existing methods (Valente, 1995), and developing spatial and temporal heterogeneity in networks which all affects the diffusion of innovations (Strang & Tuma, 1993). Furthermore, current diffusion scholars, equipped with social network analysis skills, have more actively participated in communicative intervention programs for social change and social phenomena responding to new policy initiatives or health and social epidemics. As a part of the active participation in social movements, opinion leadership interventions have been more seriously considered among change agents. The formative study which is introduced in the next chapter is a good example of this tendency.

Main Concepts of Social Network Analysis

In order to identify opinion leaders by using social network analysis, the most important and frequently used concept is network centrality. Network centrality measures the structural importance of actors (Borgatti, 2006) and indicates which actors can be regarded as those who are in the center of networks. It has been mainly calculated in
three measures: in and out-degrees, betweenness, and closeness. Following Krebs’ (2001) definitions, each network centrality measures can be explained as:

- Degrees–measure of activity—the number of direct connections a node has.

- Betweenness–measure of control—how much a node controls what flows in the network via the number of geodesics in the network that contain this node.

- Closeness–measure of access—how quickly a node can access all other nodes via a minimum of hops.

In opinion leadership studies, individuals who have higher degrees in one of these three measures are conventionally regarded as those who would be opinion leaders.

In terms of a practical measurement of opinion leadership networks with social network analysis, first, degrees are measured by people’s nomination responding to a question, such as “whom do you talk to when you need to have advice for a new policy?” The more nominations one has from others, the higher in-degree one has. In Figure 2, Bill has the highest in-degree value due to the most frequent nomination from people in group A (circles), and Kim also has the highest in-degree in group B (squares). In terms of out-degree, Scott in group A and Kathy in group B contact more people than other members in their groups, which indicate higher out-degrees.
To identify opinion leaders, most empirical social network studies have focused on finding individuals who have higher in-degree values because it is more likely that lay people seek advice from the individuals who have higher in-degree value and, therefore, the individuals could affect other people’s decision-making. More practically explained, when a change agent wants to diffuse an innovation in group A or B, it would be better that the change agent convince Bill and Kim first about the innovation because they provide advice to others.

Second, betweenness measures who takes the role of a bridge in or between groups (White & Borgatti, 1994). For instance, Jim is not the person who has either the highest in-degree or out-degree value; however, without Jim, groups A and B become disconnected. In other words, Jim fills the role of bridge between two groups and is the gateway of new information for the two groups. In this case, illustrated in Figure 2, Jim

Figure 2. Social network map I.
also has the most structural hole in the network. A structural hole occurs when a person like Jim is the only connection between two groups and, without the person, the two groups become disconnected. Practically and strategically, Jim can control communication between groups A and B.

Third, closeness measures how an individual is directly or indirectly near all other people in a network. Graphically, the individual who has a higher closeness value is the one who has the shortest path to all group members. For instance, in Figure 3, Tom has the most connection in the network and the highest degree centrality value. However, while Sam and Beth have less connection than Tom, they have the highest closeness values because they are the people who can access other people in the network more quickly.

Figure 3. Social network map II. (This figure was made by modification of the map in InFlow’s introductory website: http://www.orgnet.com/sna.html)
Given the three centrality measures—degrees, betweenness, and closeness—what are the means to identify opinion leaders among these three? The fundamental assumption in identifying opinion leaders by using social network analysis is that the optimal selection of opinion leaders depends on the purpose of the study. Since this dissertation focuses on the diffusion of innovations, opinion leaders should be selected for the purpose of diffusing an innovation. In that case, who are the opinion leaders who can accelerate the diffusion of innovations? Borgatti (2006) explains the means to identify key players in a social network with the centrality measures.

In the diffusion of innovations, it is crucial to identify key players who are connected to as many people as possible. In terms of directly reaching as many people as possible, degree centrality is the optimal measure that researchers can check. However, according to Borgatti (2006), if one aims at reaching the most people in a given range of steps, closeness centrality could provide better information to accelerate diffusion of innovations. He explains this with a network map appearing in Figure 4,

… node 4 has the best closeness centrality … However, if one is interested in reaching the most nodes along paths of length 2 or less, node 3 would be a better choice since it can reach 8 nodes in addition to itself while node 4 can only reach 6 nodes (p.24)
In addition, Borgatti (2006) raised the problem related to the structural equivalent. Structural equivalent refers to the extent to which two nodes have a common set of linkages to other nodes in a network, illustrated by node A and B in Figure 5. In this case, if one can choose more than one individual to diffuse an innovation in the network (Everett & Borgatti, 1999), the optimal choice is not the set of A and B that have the highest closeness centrality, but A and C. The reason is D. Both A and B can reach all nodes directly except D; however, in order to reach D, both A and B need two steps going through C, while C can directly reach D. Therefore, if one can choose more than one key player in the network to reach everyone, \{A, C\} or \{B, C\} is better than \{A, B\}.
In summary, three centrality measures, degrees, betweenness, and closeness, can be used depending on the purpose of the investigation. To identify opinion leaders for the diffusion of innovations in a social system, as Borgatti (2006) argued, opinion leaders who are the key players to accelerate diffusion would be not only people who are in the position presenting higher centrality measures, but individuals who are strategically positioned to reach everyone in a given research situation (or condition).

Figure 5. Social network map IV (Source: Borgatti, 2006).
Chapter Three


In designing a study to identify opinion leaders by using social network analysis, one of the initial considerations is the choice and use of a network data collection method. Related to this consideration, this chapter explains five types of opinion leadership data collection methods with the specific instruments used to identify opinion leaders. The methods are: 1) sociometric method, 2) informants’ rating method, 3) snowball method, 4) observation method, and 5) self-designation method. These five opinion leadership data collection methods were categorized by the review of opinion leadership and social network analysis literature.

To aid further discussion, the first section of this chapter provides a brief introduction about the five types of social network data collection methods. From the second section, the first primary research question and its sub-questions are answered with explanations about each social network data collection methods. RQ1a: What are the most frequently used data collection methods and associated instruments in studies that identified opinion leaders and what are the characteristics of method(s)? RQ1b: How have the opinion leadership instruments been studied? RQ1c: How have researchers used opinion leadership instruments relevant to their research purposes? This synthesis of opinion leadership data collection methods covers a diversity of studies in the fields of communicative health intervention, business marketing, education, and new knowledge and policy diffusion.
Five Types of Opinion Leadership Data Collection Method

**Sociometric method**

Sociometric data for social network analysis is constructed by asking questions about communication partners on a topic. Two types of questions, asking about an individual’s communication with others, have been usually employed for the data collection. The first type is when a researcher provides exact categories that respondents consider in answering the question. An example of the first type is, “Please read each paragraph carefully and indicate the name(s) of the physician(s) that best fit each description” (Hiss, MacDonald, & Davis, 1978). The other type of question asks about more general communication, such as “Which two farmers do you talk to most frequently?” (Van Den Ban, 1964). This type of question is based on the idea that opinion leadership is usually constituted by informal communication.

**Informants’ rating method**

The informants’ rating method refers to the data collection process wherein a researcher selects valid informants and the informants figure out opinion leaders in a group of people. In social capital and community development studies, this method is often called the positional-reputational method (Hunter, 1953; O’Brien, Raedeke, & Hassinger, 1998; Trounstine & Christensen, 1982). In this method of identifying opinion leaders, a researcher should select informants who are not members of the research sample group because it is possible that a person who knows the sample group better than others could be one of the opinion leaders.
Snowball method

The general principle of collecting data with the snowball method is simple: A researcher asks a person to nominate another person or other people in his or her communication network, and the researcher asks the same question to those who were nominated (Barendregt, Poel, & Mheen, 2005). The same sampling procedure is repeated in the same manner until the researcher gets a clear structure of the social network.

Observation method

Observation data for social network analysis is constructed by well-trained observers or experts’ observation in their areas. Even though Rogers (2003) said the observation method is rarely used as an opinion leadership measurement, there are some studies demonstrating a high validity of research by using the method.

Self-designating method

The self-designating method is the most direct way to identify opinion leaders with individuals’ self-evaluation. For example, a question used for King and Summers’ (1970) study of opinion leadership is “Do you have the feeling that you are generally regarded by your friends and neighbors as a good source of advice about_____?”

Use of Each Opinion Leadership Data Collection Method

In order to answer the first sub-question of the first research question, “what are the most frequently used opinion leadership data collection method(s)?”, many opinion leadership studies were collected in a communication journal database (ComAbstracts), a portal journal database (EBSCO), and recommendations from scholars who have studied
social network analysis for more than ten years. The selection categories were social network analysis, communication networks, diffusion of innovations, and empirical studies. Only studies that clearly present all these conditions were selected and counted. The result is presented in Appendix A.

Sociometric data collection was the most frequently used method across the fields of studies as shown in Appendix A. Even though other studies used different data collection methods, many of them employed questions that often appear in the sociometric data collection method, such as “Which two farmers do you talk to most frequently?” Each data collection has distinctive characteristics in dealing with the research population and its conditions. This is discussed in the following sections.

A Synthesis of Opinion Leadership Data Collection Methods and the Associated Opinion Leadership Instruments

Related to the first research question and following sub-questions, this section synthesizes the characteristics of five opinion leadership data collection methods and the opinion leadership instruments used in the data collection. In explaining the characteristics of each opinion leadership data collection method (RQ1), three sub-research questions are also discussed: RQ1a: the most frequently used opinion leadership data collection methods and following instruments; RQ1b: the ways the opinion leadership instruments have been studied; and RQ1c: how researchers have used opinion leadership instruments relevant to their research agendas. Since this section is structured by the five opinion leadership data collection methods, the five sub-sections present each
opinion leadership data collection method, responding to the research questions. The foundational opinion leadership instruments are presented in Appendices B, C, and D, arranged by data collection method. Sets of annotated bibliographies of studies identifying opinion leaders, also organized by opinion leadership data collection methods, are provided in Appendix H.

**Sociometric Method**

Directly answering the first sub-question (RQ1a), the sociometric method is the most frequently used opinion leadership data collection method to identify opinion leaders. Even though the sociometric method is used in many fields of studies, this method is mostly found in the studies of communicative health intervention. In the field of communicative health intervention, the studies using a sociometric method of social network data collection to identify opinion leaders include studies 1) to evaluate the effectiveness of opinion leader interventions (Atkins, Graczyk, Frazier, & Abdul-Adil, 2003; Elliott et al., 1997; Gifford et al., 1999; Guadagnoli, 2000; Hodnett et al., 1996; Lomas et al., 1991; Soumerai et al., 1998; Valente et al., 2003) and 2) to examine the validity and effectiveness of the opinion leadership measurement in the medical field (Hiss, MacDonald, & Davis, 1978; Bhandari et al., 2003).

The specific topics of the opinion leadership health intervention studies using a sociometric method to identify opinion leaders are: to evaluate the effectiveness of marketing strategies used to promote research-based nursing care at Ontario’s community hospitals in Canada (Hodnett et al., 1996); to evaluate strategies for implementing surgical practice guidelines in local hospitals (Lomas et al., 1991); to test the
effectiveness of the opinion leadership influences on physician practices (Guadagnoli, 2000); to determine whether trained peer-identified teacher leaders more effectively diffuse a educational information than other teachers (Atkins et al., 2003); to evaluate the effects of opinion leadership intervention for the improvement of cancer pain management in six Minnesota communities (Elliott et al., 1997); to evaluate a guideline-implementation intervention of clinician education by local opinion leaders and performance feedback (Soumerai et al., 1998); to evaluate if the opinion leadership intervention is effective in increasing neurologists’ adherence to specialty society-endorsed practice recommendations (Gifford et al., 1999); to test the effectiveness of peer leader selection strategies and group creation within a school-based tobacco prevention program (Valente et al., 2003); and to examine data emanating from an evaluation of an opinion leadership study to understand opinion leaders (Pereles et al., 2003); and to develop scales of sociometric data collection instruments (Hiss, Macdonald, & Davis, 1978; Bhandari et al., 2003).

In terms of the methodological development of the sociometric data collection instrument, the most frequently referenced opinion leadership instrument in communicative health intervention studies was developed by Hiss et al. (1978). The purpose of this study was “to develop a methodology to quickly and accurately identify educational influentials within community hospitals, and to describe the personal characteristics which distinguish these individuals” (p. 283). The study first identified the characteristics of educational influentials (EIs) by a factor analysis. The factors characterizing EIs are communication, humanism, and knowledge.
In the communication factor, valid items were: 1) they convey information in such a fashion as to provide a learning experience; 2) they express themselves clearly and to the point – provide practical information first and then an explanation or rationale if time allows; 3) they take the time to answer you completely and do not leave you with the feeling that they were too busy to answer your inquiry; and, 4) they enjoy and are willing to share any knowledge they have. In the knowledge factor, the valid items were: 1) they are individuals who like to teach; 2) they are current and up to date and demonstrate a command of medical knowledge; and, 3) they demonstrate a high level of clinical expertise. In the humanism factor, two items were valid: 1) they are “creating” physicians who demonstrate a high level of humanistic concern and 2) they never talk down to you, they treat you as an equal even though it’s clear they are helping you (p. 286). Based on these results, the researchers created an instrument to identify opinion leaders (EIs) in community hospitals. (see Table 8 in Appendix B)

Many studies have used a modification of foundational instrument depending on the purposes of the study. As an example of modification of the Hiss et al. instrument, Wright and colleagues (2004) modified the instrument and applied it to identify educational influentials physicians (EIPs) for colorectal cancer. The study was a formative study for an intervention aiming at transferring blended knowledge to surgeons and pathologists to improve colon cancer care in Ontario, Canada. Based on the attributes of the target group, the wording of the survey was minimally changed from the original Hiss et al. (1978) survey instrument, but some other related questions were added. (see Table 9 in Appendix B for the actual survey questionnaire)
The survey had additional questions asking participating physicians to indicate the place, from a list of sources (medical school, via colleagues, interaction through hospital department, professional medical meeting, informal social gathering, or by working in the same building), where they met their nominees. Respondents were also asked to provide information about the designated positional leaders (e.g., head of department) in the community for the purpose of determining if local EIPs filled these positions. The survey included demographic questions such as age, sex, number of years in practice, and the question about estimated volume of clinical practice that related to colorectal cancer.

As Wright and her colleagues did, the way of manipulating this instrument is mostly changing wording according to the target groups of the studies (Elliott et al., 1997; Gifford et al., 1999; Guadagnoli et al., 2000; Hodnett et al., 1996; Lomas et al., 1991; Soumerai et al., 1998). Most importantly, as the Hiss et al. (1978) instrument and other instruments demonstrated, this sociometric instrument shows the importance of communication as the most significant factor that enables researchers to identify opinion leaders; opinion leaders are more likely to be informative, clear, audience-centered, and educational communicators.

Sociometric data can be also used for studies dealing with the diffusion of new knowledge and practices. Sen (1969) investigated opinion leadership in Indian villages with the following research issues: 1) the socio-demographic, economic, system linkage and social psychological characteristics of opinion leaders and how they differ in these respects from non-leaders; 2) the most essential correlates which will help us predict opinion leadership; 3) the degree of specialization of opinion leadership in Indian villages.
Is there a shift from polymorphic leadership to monomorphic leadership as one moves from more traditional villages to more modern villages?; 4) the role played by village norms in the level of acceptance of new ideas by opinion leaders; and, 5) the structural location of opinion leaders in the village power systems and the degree of homophily between opinion leaders and followers in personal characteristics, friendship ties and power positions.

For that study, Sen used a sociometric method of data collection to identify opinion leaders, asking respondents to name one person who provided advice and information on the research issues. The actual question was: “If you needed advice on problems regarding the following matters, who is the one person in this village you seek advice from first?” (p. 11). If participants answered with an extension agent, such as village level worker, then four more questions were asked: 1) technical problems associated with farming; 2) obtaining credit; 3) health; and, 4) how to get the maximum return for your products. Respondents were encouraged to name an interpersonal source of information rather than extension agents or public health agents because Sen had already obtained information about such agents before conducting his research.

Sociometric data for social network analysis can be also constructed by interviews with a large number of people. Van Den Ban’s (1964) study of Dutch farmers’ adoption of new farming methods presented how to construct sociometric data through interviews. He interviewed approximately one-hundred farmers in three communities, asking three sociometric questions: 1) which two farmers do you ask for advice when you are not sure of the merits of a new farming method?; 2) which two farmers do you consider to be good farmers?; 3) which two farmers do you talk to most frequently? (p. 240). During the
interviews, respondents rated their nominees between a low zero and a high ten. The ratings were averaged to identify opinion leaders in the communities.

Informants’ Rating Method

In studies of communicative health intervention, the informants’ rating method to identify opinion leaders has been used mostly for the purposes of: identifying educational influentials (EIs) to educate hospital staffs and implement a new guideline for new medical practices and therapies in hospital(s) (Hong & Ching, 1990, Seto et al., 1991); examining the influence of peer norms in adopting behavioral changes to reduce risk for HIV infection (Kelly et al., 1991, 1992); purposive creation of opinion leaders for the risk behavior reduction interventions (Kelly et al., 1997a); assessing community-level health interventions to lower the risk of disease (e.g., HIV/AIDS) infection (Kelly et al., 1997b); and developing school based interventions with poor, rural, minority communities (Geiger et al., 1999).

In using the informants’ rating method to collect opinion leadership data, selecting informants often determines the success of the research. For instance, Mancuso (1969) selected informants in his study of purposive creation of opinion leaders for new product introduction. The informants he selected were social leaders including class presidents, secretaries, sports captains, and cheerleaders; however, the result of the study turned to be not successful in identifying opinion leaders and intentionally creating opinion leaders. According to Mancuso, the reason for this failure stemmed from the difficulty of identifying opinion leaders, which means the use of social leaders as informants’ was inappropriate to select opinion leaders (p. 25).
As opposed to Mancuso’s study, Kelly (1991, 1992, 1997a, 1997b) provides many important suggestions in selecting informants in attempts to identify opinion leaders. His choice of an opinion leadership strategy in the intervention that aimed at reducing risky behaviors for HIV infection among gay communities in rural areas was based on the expectation that opinion leaders influence the adoption of behavioral changes caused by the transformation of peer norms. To identify opinion leaders among gay communities, he visited “gay bars,” selected the bartenders as informants, and trained them to figure out who were the opinion leaders among gay people who visited their bars. The selected bartenders were trained to observe social interaction patterns within the bars and made unobtrusive behavioral observations to identify opinion leaders in the gay community.

In selecting valid informants, Lindlof and Taylor (2002) pointed out that informants, first, were usually selected in natural settings of the research sites; natural setting meant “the customary arenas of activity for those being studied (e.g., shopping malls for teens engaged in “hanging out”)” (p. 15). Second, they should be people who are knowledgeable about the culture of the research site. Third, they have more mobility and different roles than those who are observed. Finally, they are more likely to be facile speakers of local language forms and can debrief the researcher on contextualized meanings of the local languages. Fundamentally, these are the categories in selecting informants who help a researcher to conduct his or her research successfully, and the proper selection of informants greatly enhances the validity of the study. Based on these
categories, Kelly’s choice of informants, gay bar bartenders, fits all conditions that were described above.

While Kelly’s study presents a way of using the informants’ rating method in a small research site, Puska and his colleagues (1986) showed another way of using the method and selecting informants for a larger research project. This study analyzed a cardiovascular disease prevention intervention in North Karelia, Finland. The researchers intentionally chose the informants’ rating method in consideration of a large population in the whole county. In order to select and contact informants, the research project staff held an activity together with the county’s heart association in every villages of the area. The heart association staffs, together with their local representatives and the project staffs, selected and interviewed informants in each municipality. Based on these interviews, two opinion leaders were selected for each village.

In this informants’ rating method of identifying opinion leaders, people who could be assumed as opinion leaders should not be selected as informants. Since the criteria for being an informant include a comprehensive understanding of the social system, it could be reasonable to ask if informants are opinion leaders. If so, this may cause failure of identifying key actors in a network analysis and, furthermore, result in distortion of the overall configuration of the network (Song & Miskel, 2005). The results of the Puska et al. study also showed the problem come from the selection of informants.

Puska and his colleagues (1986) studied the systemic use of lay opinion leaders to promote the diffusion of health innovations in North Karelia county (called the North Karelia project). In order to select opinion leaders, they interviewed informants in the
region. However, the report did not clearly explain who the interviewed key persons were and if the key persons could have been opinion leaders in their villages. They just inferred that the criteria of selecting informants was based on knowledge about a target population and comprehension about social networks in the target group. These attributes are not only for informants, but opinion leaders as well. Having information like this, even though they reported as their result that the use of lay opinion leaders was effective to diffuse health innovations, the validity of data is doubtable because it was likely that the informants could be opinion leaders and were eliminated in the selection of opinion leaders. In order to prevent the error resulting from omitting opinion leading informants, researchers should identify if the informants should be included in the group of opinion leaders in their research.

In terms of policy diffusion, a characteristic of opinion leadership studies is that the studies should deal with a wide research area and diverse people; therefore, researchers should pay more attention to any special situations of the research site in designing research. As an example, McGranahan (1984) conducted research to present “a model relating the extra local participation of influentials to small town growth and apply this model in analysis of the distribution of growth in manufacturing and population among small towns in northwestern Wisconsin during the 1970s” (p. 531).

The research sites were 88 small towns in Wisconsin, and the subject group to identify local opinion leaders was the municipal clerks of each town. Since municipal clerks were central to local affairs in the towns, they were more likely to have extensive knowledge of local activities and local actors. In order to enhance the validity of the
research, newly employed municipal clerks were substituted for their immediate predecessors. The data were collected through telephone interviews asking the names of five people who had been most influential in local affairs in the past five to ten years. The clerks were also asked “how often each influential traveled to a metropolitan center for reasons other than shopping—a few times a year or less, about once a month, a few times a month, or extensively” (p. 534).

While McGranahan’s (1984) study gathered data from only municipal clerks, O’Brien, Raedeke, and Hassinger (1998) selected community informants from seven different institutional sectors in a community, including local organizations, public officers or committees, businesses, religious groups, educational organizations, professions, and any other identifier of potential leadership. The purpose of this study was to examine the viability of social networks of opinion leaders in five different communities in Missouri. To identify opinion leaders, first, the list of position-holders in each community was given to informants and they were asked to select 15 leaders. Then, each informant was asked to rank the 15 selected leaders. In aggregating selected names from all informants, leaders who were selected in the top five names were given a score of three; the next five leaders were given a score of two, and the bottom five names were give a score of one.

This study also measured vertical and horizontal networks of leaders. From their explanations:

Vertical ties were identified by the number of state offices leaders held in voluntary associations. Two types of horizontal ties within the community were
identified. The first type of horizontal ties measured the extent to which leaders socialized informally with one another, ate breakfast on a regular basis, and shared a meal in one or the other’s home. The second type of horizontal ties measured the extent to which leaders worked with one another on specific community projects and whether or not they belonged to a community development association. (pp. 114-115)

Snowball Method

In communicative health intervention studies, the snowball method of identifying opinion leaders has been used in studies that examined if the concept of opinion leadership can describe the influence (Leonard-Barton, 1985) and if opinion leaders are effective information sources on the adoption of new medical practices (Ankem, 2003). In addition, Rothenberg et al. (2000) employed the snowball method to examine the feasibility of using social network information for case-finding activities, to determine the nature and role of groups that may be actively involved in transmission, and examine the long-term impact of the pilot effort.

Snowball sampling stems from the ethnographic research tradition. Snowball sampling is more effective in gathering data from “hidden populations,” such as homeless people, prostitutes, drug addicts, and the like (Faugier & Sargeant, 1997; Spreen & Zwaagstra, 1994). These hidden populations often remain marginalized and restricted across many public health care programs, and snowball sampling creates data by tracing each person one-by-one among the hidden populations. The social barriers created by prejudice and discrimination toward such people having low social visibility make it
difficult for researchers to reach the hidden populations, and random sampling methods of data collection are not available in most research dealing with these populations. In this limited situation, the use of nonrandom methods of data collection, such as snowball sampling, have been recognized as an innovative and valid sampling technique to collect data from hidden people (Morrison, 1988).

Another research situation that fits snowball sampling is when people are in a specialized field. For instance, Leonard-Barton (1985) selected as his subject set of people, prosthodontists, who can be regarded as a very specific set of people who work closely with dentists. Since the number of prosthodontists was much smaller than the number of dentists, they worked with several dentists who had the same opinion in the use of gold or other substitutive alloys in teeth restoration treatments. Data construction could be easily initiated by interviews with some dentists in a town and could be extended nationwide through an inductive process. Even though Leonard-Barton used a snowball sampling method for the study covering a wide area, in the organizational communication context, according to Black and Champion (1976), this snowball method is also particularly advantageous “in studying small social organizations such as small businesses or industries … Communication methods can be uncovered and community power and decision making can be studied” (p. 159).

Michiellutte and Beal (1990) used a snowball technique to identify community leadership within a community cancer prevention education program designed for black communities. Initially, they selected ten people who had general knowledge of the leadership in the black community. Among the people, there were seven women who
were former county commissioner, university administrator, minister, president, local chapter of a national minority organization, director of a public health program, and two women well-known for community service activities; and there were three men who were a minister, local media personality, and president of a minority business organization.

Selected individuals were asked to name the people they defined as leaders in the following categories: (1) social/civic, (2) political, (3) religious, (d) business, and (e) less visible (those who work behind scenes). No restriction was given in terms of the number of people and categories of people in naming (see Appendix C). From this data collection, most of the people who were nominated were businessmen.

The snowball method can also be used as a supplemental method to increase the validity of other sampling. In the area of policy diffusion, Song and Miskel (2005) used a snowball method of data collection as a supplementary method in their study assessing policy actors’ influence on state reading policy and comparing the structure of reading policy networks across Alabama, California, Connecticut, Indiana, Maine, Michigan, North Carolina, Texas, and Utah, while the main methods were interviews and archival document review. In creating a list of policy actors, the researchers consulted with informants who had comprehensive knowledge about governmental agencies, interest groups in the state, and other policy related organizations or groups. They used the snowball sampling technique to ensure adequate coverage of the policy domain.

Related to such empirical studies using snowball sampling, Hendricks and Blanken (1992) explains the nature of snowball sampling as the following:
If the aim of the study is primarily explorative, qualitative, and descriptive, snowball sampling offers clear practical advantages in obtaining information on difficult-to-observe phenomena, in particular in areas that involve sensitive, illegal or deviant issues. It provides an efficient and economical way of finding cases that may otherwise be difficult or impossible to locate or contact. In exploring a statistically rare event such as drug abuse, snowball sampling has the potential of producing a rapidly growing database, which would require enormous samples in household or other population surveys. For example, a 1% prevalence rate would require a sample of 10,000 subject to yield 100 subjects who possess the trail under study. (p. 17)

Even though the snowball method is feasible as an alternative data collection method within hidden populations, there are some methodological limitations related to the nonrandomness of data collection. The major methodological disadvantage of snowball sampling results from the fact that researchers cannot use inferential statistical methods because the samples are not randomly selected (Barendregt, Poel, & Mheen, 2005; Black & Champion, 1976; Hendricks & Blanken, 1992). Specifically, nonrandom sampling, which is not based on probability sampling, has difficulty representing an entire population, whereas random sampling designs is rooted in a probabilistic theory, which provides researchers with an inferential power of representation (Hendricks & Blanken, 1992).
For social network studies, snowball sampling could also create some bias in constructing the social network data. Rapoport (1957) explained five specific sources of bias of snowball sampling in social network studies:

1) the social distance between pairs of individuals: clearly, the probability of one individual being connected to the other is some function of the social distance between them;

2) the island model: several subset of individuals may exist, within which the connection probabilities are random, but between which the connection have finite probabilities;

3) overlapping acquaintance circles: although several subsets of individuals exist without any connections between the subsets, the entire population can be connected owing to individuals being members of more than one subset;

4) reflexive bias: a connection from an original individual to a target individual enhances the likelihood of a connection from the target person back to the original person;

5) force field bias: some individuals, because of certain characteristics (for example, popularity), have a greater likelihood of being targeted than others. (pp. 257-277)

Notwithstanding its problems, snowball sampling is often the only feasible method to collect data. Researchers, in a situation where they have to use snowball sampling, need to understand the possible bias with which snowball sampling is associated; therefore, researchers should pay attention to the ways of compensating for the limitations of snowball sampling. Related to the limitations, Barendregt, Poel, and
Mheen (2005) provided several recommendations for researchers using snowball sampling to increase validity of their research: 1) researchers should make the initial sample as large as possible; 2) for studies analyzing the network structure, recruiting the nominated “best friends” would be advisable; and, 3) it is better to provide some financial incentives for respondents who bring nominees to the research team (p. 125).

Observation Method

Even though Rogers (2003) said the observation method is not frequently used to investigate opinion leadership, some of these studies present observation methods of data collection. For instance, using participant observation coupled with ethnographic interview, Macrí, Tagliaventi, and Bertolotti (2000) analyzed the diffusion of a new information system in a small Italian firm. The specific purpose of their study was to analyze “whether the position of early adopters of an innovation in the social network is a predictor of changes in the map of intra-organizational power” (p. 2). In this organization study, participant observations were conducted during the daily working time and the period of observation was one and one-half months before a new information system was introduced to four and one-half months after introduction. The total length of the observations amounted to approximately 2160 hours. In addition, ethnographic interviews were conducted with various informants at the end of the observations. During the observation hours, the researchers took extensive field notes. In order to use social network techniques and draw social network maps, they converted their field notes to actor-by-actor interaction matrices. In the process of converting their filed notes to the
matrices, the researchers built an initial coding (open, axial, selective) of the interactions for general interpretation of the phenomena.

Though a little different from the study conducted by Macrí et al., in using the observation method in the field of communicative health intervention, Puska et al. (1986) presented a participant observation method to select informants for their study assessing the long-term feasibility and impact of the North Karelia project using lay opinion leaders. This study did not use the observation method as a main method of data collection; rather it was used as a supplementary method. As such, an observation method may not be used as a main method of data collection for a study, it could be used as a supplementary or formative method for assisting other methods. In addition, this study indicated that a methodological combination with an observation method could greatly enhance the methodological validity of the research.

Self-Designating Method

The self-designating method has mostly been used for business studies investigating consumer opinion leaderships. One of the distinctive features in consumer opinion leadership research is that the studies are more focused on the instrumental development of the self-designating method; the validity and reliability have been examined over periods of time. Based on the salience of the self-designating method, this section begins with the methodological investigation of business studies using the method.

While the development of other methods relies mostly on the researchers for their research agendas, the self-designating method in the business field is based largely on previous instruments, linked to one another. In addition, most articles having an opinion
leadership instrument reveal their actual questions, which provide a better sense for other scholars to create a clear research design. The development of the self-designating method began with King and Summers’ (1970) use of two questions: 1) “Is opinion leadership generalized? Do opinion leaders in one topic area tend to be opinion leaders in other topic areas?” and 2) “Do opinion leaders tend to overlap more or less across certain combinations of topic areas instead of other combinations of topic areas?” (p. 43). The study explored the overlap of opinion leadership in new product adoption across consumer product categories of packaged foods, household cleansers and detergents, women’s fashions, cosmetics and personal grooming aids, drugs and pharmaceutical products, clothing materials, and large and small appliances.

King and Summers modified the Rogers and Cartano (1962) six-item scale (see Table 10 in Appendix D) which is the foundational instrument in developing the method. Based on this instrument, which had already proved to be valid, reliable, and intuitively appealing, they modified it by simply omitting the word “new” in each of the six questions to remove the bias in favor of innovators, adding an additional question, and changing the order of questions. The added question is Q.3 in Table 11 (Appendix D), which was to create a valid sample of the research agenda. Since Rogers and Cartano’s (1962) study was not a business-related study, King and Summers’ modification of the instrument could be regarded as the foundation of opinion leadership instrumentation in the business field.

Based on the King and Summers’ (1970) instrument, Childers (1986) tested a modified version to increase the validity of the self-designating opinion leadership
instrument. This study tested the reliability and validity of King and Summers’ seven item instrument and found limitations in the internal consistency of the seven items (alpha < .80). Childers revised the instrument with a six-item scale as shown in Table 12 (Appendix D) and found that the revised scale had acceptable internal consistency and reliability, excluding one invalid question.

Flynn, Goldsmith, and Eastman (1996b) conducted another validity test of the self-designating scale in consumer opinion leadership research. For their scale development study, they used opinion leadership about popular rock music and rock music recordings, and 6 items were found as valid items among 11 initial items to be tested. The initial items are constructed by the previous studies of opinion leadership scale, Lazarsfeld, Berelson, and Gaudet (1948), Rogers and Cartano (1962), King and Summers (1970), and Childers (1986), and Flynn et al. (1994). They used the scale from 1 (strongly disagree) to 7 (strongly agree) for measuring each item. Table 13 in Appendix D shows refined items after the validity test.

Goldsmith and De Witt (2003) tested the predictive validity of the scale developed by Flynn, Goldsmith, and Eastman (1996b). Predictive validity refers to “the scale’s ability to predict something it should theoretically be able to predict” (p. 30). Specifically, they examined “the dimensionality, internal consistency, discriminate validity, and predictive validity of a self-report scale for consumer opinion leadership within a specific product field” (p. 28). This study used various consumer products to test the opinion leadership scale and found the results supporting the predictive validity of the scale. In addition, they found that the same scale can be used with different point set,
such as from a seven-point scale to a five-point or vice versa, indicating the degree of agreement/disagreement. As shown in Table 14 (Appendix D), they only switched the names of consumer products from the scale of Flynn, Goldsmith, and Eastman (1996b).

In addition to the opinion leadership scale development, other researchers have applied the opinion scales in studies measuring diverse market phenomena and created a variety of scales combining opinion leadership and other consumer behaviors. First of all, Hirschman (1980b) examined the relationship between the degree of innovativeness and opinion leadership in diffusion of clothing fashions in black ethnic communities. The instruments have two types of questions including fashion innovativeness and opinion leadership questions as shown in Table 15 (Appendix D).

Hirschman’s work became the foundational study investigating racial and sex differences in opinion leadership. For instance, Goldsmith, Stith, and White (1987) studied race and sex differences in self-identified innovativeness and opinion leadership. They used Hirschman’s instrument to measure fashion innovativeness and fashion opinion leadership and revealed that it is not a valid assumption that black consumers are more fashion-conscious, more fashion-innovative, and more likely to be fashion opinion leaders than whites.

Marshall and Gitosudarmo (1995) investigated the characteristics of opinion leaders in eight different cultures—four Western and four Eastern. They used the same opinion leadership measurement as Rogers and Cartano (1962), King and Summers (1970), and Childers (1986), but interpreted it differently. The previous opinion
leadership studies were to identify opinion leaders, but this study interpreted the results as the characteristics of opinion leadership (see Table 16 in Appendix D).

Applying the opinion leadership scale, Goldsmith, Flynn, and Goldsmith (2006) conducted research to identify a specific type of opinion leader in the market, “maven.” This concept of “maven” was initially described in Feick and Price (1987), referring to those who are exposed to a variety of media where they seek out and acquire information about things in general. Even though this is related to media, their scale can be considered the creation of an opinion leader scale because the context of the questions does not have possible media influences (see Table 17 in Appendix D).

In the area of the diffusion of new knowledge, including adoption of technology and practices, one of the foundational studies using self-designating methods is Rogers’ study of the diffusion of agricultural practices in the 1960s. In order to identify opinion leaders, Rogers (1961) initially created a six-item scale (see Table 18 in Appendix D). From this initial scale, he continued the development of the opinion scale through research projects such as Rogers and Cartano (1993) and the life-long synthesis of *Diffusion of Innovations* (2003).

In the area of public opinion and policy diffusion, Troldahl and Van Dam (1965b) introduced a seven-item self-designating opinion leadership scale (see Table 19 in Appendix D). The purpose of their study was to identify public-affairs opinion leaders with a ‘perceived opinion leadership scale.’ Opinion leadership in this study was defined as “respondents’ self-perception of how influential they are” (p. 2). The seven-item scale was developed by the combination of the Decatur study (Katz & Lazarsfeld, 1955) and
the Rogers’ six-item scale (Rogers & Cartano, 1962). Data were constructed by a probability sample of 202 residents of Detroit, and internal consistency of the scale indicated a high reliability. Since this study measured the perception of self, if a respondent saw himself or herself as an influential, no matter if he or her actually was, the score will be high on such an index.

Characteristics of Opinion Leadership Data Collection Methods and Research Purpose

Throughout this chapter, five types of opinion leadership data collection methods (sociometric, self-designating, informants’ rating, snowball, and observation methods) were reviewed and synthesized. Coupled with a general review of each opinion leadership data collection method, this chapter also focused on synthesizing opinion leadership instruments that were specially designed to identify opinion leaders. In each section of the data collection method, the purposes of previous studies were presented to help researchers to choose the best fitting opinion leadership data collection method and following instrument for their research agendas. In addition, available opinion leadership instruments for each data collection method were also presented in Appendices B, C, and D, and sets of annotated bibliographies were provided in Appendix H. Researchers and practitioners who need to identify opinion leaders for their diffusion projects may consult this synthesis. Having the comprehensive understanding of opinion leadership data collection methods, this section focuses more on the relationship between the data collection methods and social network analysis.
The unique characteristic of social network analysis is on its ability to draw social network maps. Network mapping is important because of the relational attribute of social network analysis and the transparency of result. First, the common foundation between communication studies and social network studies is that both emphasize relationships. In identifying opinion leaders, social network analysis requires the relational information: Who is connected with whom? In this regard, among the five data collection methods (sociometric, self-designation, informants’ rating, snowball, and observation), which opinion leadership data collection methods provide the relational information?

Sociometric and snowball data collection have the strongest characteristics that provide the relational information based on their ways of collecting data. Both sociometric and snowball data collection methods and instruments basically ask people to provide names of their opinion leaders, such as “which two farmers do you talk to most frequently?” (Van Den Ban, 1964), and “Who do you look to for new ideas or better ways of doing things concerning juvenile justice in Pennsylvania?” (Kim & Dearing, 2007). By asking these kinds of relational questions, both methods construct data which shows not only directions of communication flow, but also communication structures of social systems. The difference between sociometric and snowball data collection is that, while sociometric data construction relies on peoples’ responses to survey questionnaires, snowball data is constructed by researchers’ direct contact with people, which shows its ethnographic characteristics of data collection.

Informants’ rating and observation data collection methods can be also used to construct relational data which is used to draw social network maps, and these methods
could construct data within a shorter period of time than other methods because a researcher does not have to contact all people at the research site(s). Mostly, the opinion leadership studies using informants’ rating and observation data collection methods have focused on identifying opinion leaders only, rather than relationships among a group of people. However, if a researcher asks informants to provide the association with people who are connected with opinion leaders, the informants who comprehensively understand the social system of their groups can provide the relational information. For both methods, the most important key to success in a social network project depends on the selection of informants’ and observer(s) who comprehensively understand general patterns of communication structure among research subjects. In using the observation data collection method, a researcher can also collect the relational data if the researcher trains observer(s) to report opinion leaders’ contact with other people or people’s contact with opinion leaders.

Yet, data collected by a self-designating method only provides information about research participants themselves. In self-designating methods, the questions are for participants to ask about their own communication with anonymous others, such as “I often persuade other people to buy new products that I like” (Goldsmith & De Witt, 2003) or their self-evaluation “My opinion on rock [fashion; environmentally friendly products] seems not to count with other people” (Flynn, Goldsmith, & Eastman, 1996b). These types of questions are important for business studies investigating consumers’ decisions for purchases which is a more self-oriented decision and individually psychological. Therefore, although a self-designating method may identify opinion
leaders through self-evaluation, it is hard for a researcher or practitioner to use a self-designating method for communication studies and social network studies, which requires relational data.

Based on the nature and characteristics of the opinion leadership data collection methods, a researcher or practitioner can choose a method among sociometric, informants’ rating, snowball, and observation methods to identify opinion leaders in a group of people. After choosing a data collection method, the following consideration is which opinion leadership instrument they use. In creating an opinion leadership instrument, based upon these synthetic understandings of social network analysis and data collection methods, a way of data construction to consider the validity of data would be that a researcher just changes or manipulates some words in an existing instrument according to the research agenda, keeping the structure of the instrument. However, it is testable for further scale development that a researcher combines different instruments of data collection method. In the next chapter, this dissertation will demonstrate ways of constructing opinion leadership scales and collecting data with two secondary data analyses will be illustrated.

Summary

This chapter presented a synthesis of opinion leadership methods and their instruments, based on the review of studies selected by the categories of social network analysis, communication networks, diffusion of innovations, and empirical research. In addition, some of the studies selected were recommended from two scholars and one
consultant who have actively studied social networks for more than ten years. The selected studies were initially organized by their methods of opinion leadership data collection which are sociometric, informants’ rating, snowball, observation, and self-designating methods. Based on the literature review, this chapter explored the first research question through its sub-questions.

The first research question was about the characteristics of each opinion leadership data collection method used to identify opinion leaders. In order to answer this question, three sub-questions were created. The first sub-question was, “what are the most frequently used opinion leadership data collection methods and their instruments in studies that identified opinion leaders and what are the characteristics of the methods?” The answer to this question was presented in section 2, “Use of each opinion leadership data collection method.” To answer this question, the selected studies were counted by their data collection methods of identifying opinion leaders. The result showed that the sociometric data collection method was most frequently used and presented as shown in Appendix A.

The second sub-question focused on how the opinion leadership instruments have been studied, which was presented in section 3, “A synthesis of opinion leadership data collection methods and the associated opinion leadership instruments.” To answer this question, an historical synthesis of methods of opinion leadership data collection and their instruments was performed. As a result, the representative opinion leadership instruments were organized in a chronological order in Appendices B, C, and D.
The last sub-question under the first research question was how researchers have used opinion leadership instruments relevant to their research purposes, which was presented in section 4, “Characteristics of opinion leadership data collection methods and research purpose.” Based on the literature review, the answer for the question was that researchers could choose their data opinion leadership collection methods, depending on the research purpose aiming at identifying either opinion leaders only or opinion leadership plus communication networks in groups. Related to the result, sociometric and snowball methods would be highly usable for studies aiming at identifying both opinion leaders and communication networks.
Chapter Four

Methodological Demonstration of Opinion Leadership Data Collection with Two Empirical Opinion Leadership Studies

In this chapter, two studies are introduced to demonstrate the procedure of social network data construction for researchers and practitioners who want to identify opinion leaders for their diffusion projects having different population sizes and demographic attributes. This chapter also discusses concerns in collecting opinion leadership data for social network analysis and the ways that minimize the risks of data construction failure possibly occurring by the obstacles of opinion leadership data collection. Based on the demonstration and discussion of the two empirical studies, this chapter will provide answers for the second research question, – RQ2: “how are a social network data constructed when using opinion leadership instruments? – and sub-questions, RQ2a: How have population size affected researchers’ decision in the choice and use of a data collection method?; RQ2b: How have demographic characteristics affected researchers’ decisions in the choice and use of a data collection method?; RQ2c: what are the situational concerns that researchers could face in collecting social network data and what are ways to minimize the risks arising from these concerns? (RQ2c).

The first study on communication networks, in Pennsylvania’s juvenile justice system, was conducted by a team effort prior to the writing of this dissertation. This study reveals individual, organizational, and county levels of networks that existed in a uniquely authoritative and complex net of Pennsylvania’s legal systems. Such a legal network has seldom been investigated due to its nature of information security and inaccessibility;
therefore, the social network studies of such legal systems contribute to the development of studies of organizational communication and political communication through unveiling the structure of politically and systematically “hidden populations.” This feature of the legal system also requires a great deal of methodological prudence in revealing individual and organizational networks.

The second study, on communication networks among farmers in 14 agricultural villages in India, exposes the characteristics of Indian farmers’ diffusion networks which also has unique patterns of interpersonal and organizational communication in adopting an innovation. Since this study was conducted in a non-Western country, it raises a question if any cultural element affects social network data collection procedures and results because of unique social traditions and norms? Even though Rogers conducted a number of diffusion studies in non-Western countries, such as Brazil, India, and South Korea, few social network analyses with network mappings, visualizing social structure and diffusion patterns, have been conducted in an international context. In particular, because this Indian community study was conducted in non-urban regions, which is a less westernized area, the results of this study may present unique and traditional network patterns.

Using these two case studies, this dissertation focuses on how opinion leaders can be identified through constructing social network data by using opinion leadership instruments and analyzing the data. In addition, a methodological guideline that helps a researcher choose a social network data collection method is presented.
Opinion Leadership Networks in a Legal Community in Pennsylvania: Diffusion of Models for Change

Summary of the Study

This study aimed at providing formative maps of opinion leaders for purposive diffusion of Models for Change which the John D. and Catherine T. MacArthur Foundation invented. The specific purpose of this project was to identify opinion leaders within the networks through the social network analysis and to demonstrate the social networks of the Pennsylvania juvenile justice system by visualizing the informal structure of juvenile justice stakeholders within the system. In addition, this study was expected to be a formative study for the purposive diffusion of Models for Change by using the identified opinion leaders.

A sociometric method was employed to collect social network data. Initially, a survey was mailed to 698 stakeholders who were engaged in the adoption and implementation of Pennsylvania’s juvenile justice innovations. After two distribution of the survey, there are 212 valid responses (30.37%). The total number of identified stakeholders in data was 382, including individuals on the original mailing list and those who were newly identified from returned surveys. Based on the social network data, three levels of communication network analyses were conducted: individual, organizational, and county levels.

Results from three levels of analyses indicated that informal networks among stakeholders existed and were highly integrated across the state, although the juvenile justice system in Pennsylvania had a formally decentralized structure in general. The
identified informal structure was radial, with a clear center and periphery, implying that information and influence can be rapidly diffused.

Background of the Study: What is *Models for Change*?

The juvenile justice system in the U.S was created in the late 1800s to reform policies related to youthful offenders and provide individualized treatments and services to children in trouble (Juvenile Justice FYI, n.d.; Juvenile Justice Center, 2005). Since the 1990s, states have passed laws that eroded the youth care system and placed young people in criminal court, sentenced harsher sanctions, and incarcerated youth in the adult prison. This trend brought questions and problems related to increased recidivism, reduced educational and employment prospects, and troubling racial disparities. The John D. and Catherine T. MacArthur foundation entered the field of controversy between the juvenile and criminal justice systems with the goal of defending and promoting the juvenile justice system, collaborating with many legal agencies and organizations. As a result of the effort, *Models for Change* was invented to build a working framework for a model juvenile justice system (Juvenile Justice Center, 2005). The framework is rooted in eight principles:

1. *Fundamental fairness:* All system participants—including youthful offenders, their victims, and their families—deserve bias–free treatment.

2. *Recognition of Juvenile–Adult Differences:* They system must take into account that juveniles are fundamentally and developmentally different from adults.
3. **Recognition of Individual Differences:** Juvenile justice decision makers must acknowledge and respond to individual differences in terms of young people’s development, culture, gender, needs, and strengths.

4. **Recognition of potential:** Young offenders have strengths and are capable of positive growth. Giving up on them is costly for society. Investing in them makes sense.

5. **Safety:** Communities and individuals deserve to be and to feel safe.

6. **Personal responsibility:** Young people must be encouraged to accept responsibility for their actions and the consequences of those actions.

7. **Community responsibility:** Communities have an obligation to safeguard the welfare of children and young people, to support them when in need, and to help them to grow into adults.

8. **System responsibility:** The juvenile justice system is a vital part of society’s collective exercise of its responsibility toward young people. It must do its job effectively. (Juvenile Justice Center, 2005)

The MacArthur Foundation initially planted *Models for Change* in the states of Pennsylvania and Illinois and sought a means to diffuse the program. In the course of seeking a means of diffusion of the innovative program, the Foundation decided to examine the practicability of opinion leadership intervention. To examine the possibility of using opinion leaders for diffusing the program, the prior tasks were determining if communication networks exist and if it was possible to identify opinion leaders within the network. The present study employed social network analysis to do these tasks.
Since the state of Pennsylvania is one of the pioneer states where the program was planted, this study decided to investigate if communication networks exist in the Pennsylvania’s juvenile justice system and if opinion leaders in the system could be identified through social network analysis.

Research Conditions and Decision on Data Collection Method: Considering Population Size, Demographic Characteristics, and Others

In designing a social network analysis, choosing a data collection method is one of the most important decisions because it often determines the success of the research. As explained in the previous chapter, there are five data collection methods available for social network analysis: sociometric, snowball, informants’ rating, observation, and self-designating methods. Compared to other methods, sociometric and snowball methods possess more relational characteristics, which also could show the direction of communication flow and structure of social system by asking people to provide names of their opinion leaders. Informants’ rating and observation methods usually take a shorter period of time in collecting data because researchers do not have to contact all research subject(s), and informants or observers are those who can easily identify opinion leaders within their groups, based on their comprehensive knowledge and observation training. The self-designating method only provides for the identification of opinion leaders, but rarely identifies communication networks.

In addition to the general characteristics of each data collection method, the decision on a data collection method for a project requires consideration of features
related to research subjects and situations, which are related to the sub-questions of the second research question:

RQ2a: How has population size affected researchers’ decisions in the choice and use of a data collection method?

RQ2b: How have demographic characteristics affected researchers’ decisions in the choice and use of a data collection method?

RQ2c: What are the situational concerns that researchers could face in collecting social network data and what are ways to minimize the risks arising from these concerns?

The explicit, major features of Pennsylvania’s juvenile justice system project in designing data collection are comprised of: 1) research sites across all the counties in Pennsylvania, 2) highly authoritative legal organizations, and 3) lack of previous information about social networks within the juvenile system. Coupled with these research situations, this project had to consider some specific conditions, including available funding, a limited time of data collection, and a very small number of research assistants. With these explicit research conditions, this project also had to consider some implicit situations related to the demographic characteristics of the research sites.

Demographic characteristics included organization and social characteristics. The fundamental question about the relationship between demographic characteristics and social network data collection is how differences in attitudes, beliefs, values, and behaviors among different groups affect the choice of data collection methods and procedures. In this respect, it was assumed that people who worked in Pennsylvania’s
juvenile justice system would be more reluctant to disclose any information related to their communication and jobs because of the nature of legal system which emphasized information security. Having people who are sensitive to information disclosure, it is suggested that a researcher should be unobtrusive (Catania, McDermott, & Pollack, 1986). Among the five data collection methods for social network analysis, which data collection method could be best fitting method within this research condition?

First of all, the observation method was eliminated because, while this project’s research sites were spread across all counties, an observation method is often used only within a small research site so that an observer could see the communication among people. Second, the informants’ rating method was also eliminated due to lack of previous information about social networks within the juvenile system. It would be very hard to select informant(s) without accurate information and long-term observation of the system. Since the snowball method takes a relatively long period of time to collect data having comprehensive information about entire Pennsylvania’s entire juvenile justice system, this method was not available for this project having a limited time of data collection. The self-designation method usually produces only information about opinion leadership, which would not create communication network data.

Considering all these aspects and limitations of data collection methods, this project chose sociometric data collection which was able to easily gather a large number of people by survey, takes a relatively short period of time and can be completed with a small budget. However, there were some risks in collecting sociometric data by survey. The first risk was if recipients of the survey could accurately understand the questionnaire,
and the second was the survey response rate. Given the research situations and conditions, the sociometric data collection method was regarded as a highly possible data collection method for this project. Related to the two major risks, the project made every effort to minimize the risk as the following sections explain.

Survey Instrument Construction

As explained above, sociometric data could be constructed by a survey method. Particularly, the survey questionnaire for this Pennsylvania juvenile justice project needed to be formatted to identify opinion leaders and to measure the strengths of centrality, asking respondents to list to whom they look for juvenile justice advice. First of all, the most important task in designing an opinion leadership instrument was how the survey could lead people to accurately name their opinion leaders.

In order to create an opinion leadership question aiming at two goals, identifying opinion leaders and visualizing communication networks within the system, first, the literature was reviewed to select the most frequently used opinion leadership instruments (see Appendix A). In addition, three experts’ opinions were gathered from two scholars, who had studied social network analysis for more than fifteen years and had empirical research experience, and one consultant who invented one of the social network software packages. Their consensus was that more general questions are better than specific questions in terms of exposing more substantial communication networks. As a result, a format of opinion leadership instruments was constructed with one question asking their
communication partners or advisors for new ideas concerning juvenile justice in Pennsylvania (see Appendix G for actual format of the instrument used in this project).

Specifically, the instrument asked participants to provide three names and the frequency of communication with each of them. The number of years of working in the juvenile system was also asked as Wright et al. (2004) study and other studies did. The question about the frequency of communication was embedded to measure strength of influence. In addition, a remark for confidentiality of answers was clearly addressed within the survey form. Figure 6 shows the item wording used for the two mailings of survey.

Who do you look to for new ideas or better ways of doing things concerning juvenile justice in Pennsylvania?

1. ____________________________________________________________
   First name   Last name

   Organization: ________________________________________________

   Position: ____________________________________________________

   I communicate with this person:

   5 = daily or more   4 = weekly   3 = monthly   2 = quarterly   1 = yearly

*Figure 6. Survey questionnaire for identifying opinion leaders in the Pennsylvania juvenile justice system.*
Research Procedure

As mentioned above, the purpose of this study was to identify opinion leaders by investigating communication networks of Pennsylvania’s juvenile justice system. This study was conducted through the following steps:


As preparation before initiating substantial work for data collection and analysis, fundamental literature about *Models for Change*, the innovation invented by The MacArthur Foundation, juvenile justice system, and the system in Pennsylvania were reviewed. Since the purpose of the study was not the analysis of the juvenile justice system or the innovation, *Models for Change*, the literature review aimed at understanding the structure of the legal system and juvenile justice system in general.

2. Gathering information about the organizational structure of the Pennsylvania juvenile justice system and key state-level individuals from key informants.

Based on the general understanding of the juvenile justice system and *Models for Change*, information about the organizations in the Pennsylvania juvenile justice system and key state-level individuals from key informants was gathered to identify who were supposed to receive the questionnaires for this project. Key informants who provided such information were program officers of the MacArthur Foundation. Coupled with information from informants, an Internet search was performed to expand the mailing list. As a result, the “Juvenile Court Directory” that contained the most extensive name list in the Pennsylvania juvenile justice system, was found on the website of the Juvenile Court
Judges’ Commission (JCJC), and the names in the directory were added in the master mailing list.

3. Constructed a comprehensive list of 698 individuals at the county level.

The comprehensive list included each individual’s first and last name, organization, organizational position, and mailing addresses, which were sorted by each county in Pennsylvania. During the data refining process, some duplicate names were sorted out because some individuals belonged to multiple organizations and possessed multiple positions, and some names were replaced by new names because of position replacement. Final number of people in the master list after data refining was 698.

4. Tested and trained in the use of the InFlow software program by drafting, revising, and fielding an online survey with members of an Ohio organization.

Many computer programs have been invented and used for social network analysis. The most frequently used program appearing in academic literatures is UCINET; however, even though UCINET includes more functions than others, the program has some limitations. The major difficulty in using UNINET is that a researcher needs to have another program to draw social network maps. In other words, UCINET does not have the network drawing window in it, although many mathematic functions enable researchers to generate measures related to complex theories; thus, UCINET has been mostly used for testing and developing theories.

Compared to UCINET, InFlow has reverse advantages and limitations. InFlow was designed to generate mainly network centrality and is used more in practical fields, such as empirical business studies. In addition, this program includes the function that
draws diverse social network maps, which is the major advantage to using this program and a main difference from UCINET. Since InFlow has less mathematical functions than UCINET, but is simple to use, generates centrality measures, and is able to create social network maps, it was chosen for this project.

5. Merged county-level names with state-level names into a Master List.

This project was planned to analyze data at three levels: individual, organizational, and county level. Based on the master mailing list with individual, organizational, and county levels of information, three levels of data were constructed using InFlow. Since some individuals in the list belonged not to particular counties’ juvenile justice system, but nationwide or state-level organizations, such as divisions of the JCJC and the MacArthur Foundation, the individuals were excluded in data for the county level analysis.

6. Drafted, revised, and mailed pre-notification letter (sent to all respondents).

In an attempt to increase the response rate, there were many ways tested in many fields of studies. In general, the considerations to increase the response rate may be numerous, such as 1) if prenotification should be sent (Chebat & Picard, 1991; Elsinger, Janicki, Stevenson, & Thompson, 1974; House, Gerber, & Michael, 1977; Jolson, 1977; Linsky, 1975; Longworth, 1963; Walder & Burdick, 1977; Yu & Cooper, 1983); 2) if personalization of the cover letter and survey is necessary (Kerin, 1974); 3) if there is any incentive for responding (Larson & Poist, 2004); 4) if the researcher should include stamped return envelopes (Streiff, Dundes, & Spivak, 2001); and, even 5) if the print format should be single-sided or double (Brehaut, Graham, Visentin, & Stiell, 2006). Even though there is controversy between using such strategies or not in terms of increasing the
response rate, this project tried to use as many strategies as possible within the available budget. This project first sent prenotification letters to 698 stakeholders who are involved in the adoption and implementation of juvenile justice innovations in Pennsylvania. The organizational positions of the stakeholders included president judges, juvenile court administrative judges, juvenile court judges, district attorneys, public defenders, chief juvenile probation officers, deputy chief/supervisors, juvenile court masters, children and youth administrators, and detention home administrators. From the prenotification letter, which was the first document sent, all documents delivered to potential respondents had individualized names.

The letter consisted of the messages about the purpose of the study, a guarantee of confidentiality for provided answers, encouragement for participation, and the schedule of mailing the actual questionnaire (see Appendix E for the format of the prenotification). In addition, for all prenotification letters and surveys delivered to the stakeholders, the university’s official letterhead and envelopes were used to demonstrate the authority of academic research. All these efforts were made in an attempt to get a high response rate.

7. Mailed cover letter, questionnaires, and stamped return envelope.

One week after mailing the prenotification letters, sets of cover letter, questionnaires, and stamped return envelopes were sent to potential respondents. Considering the response rate, cover letters were printed on official letterhead, and institutional envelopes were used to mail them out. The content of the cover letter was the same as the prenotification letter except a sentence indicating that the questionnaire was enclosed.
The period of the first survey data collection was for four weeks. Immediately after four weeks of the first data collection was closed, the second wave of data collection was conducted. The same set of questionnaires was mailed again for those who did not respond to the first wave of data collection. There was one difference between the first wave and second wave of data collection in that the cover letter for the second wave had a sentence encouraging participation in the project (see Appendix F for actual cover letter for each wave of data collection).

8. Data were entered into Excel database as surveys were received.

In two waves of survey data collection, questionnaires were returned from 278 stakeholders (145 from the first mailing; 133 more from the second mailing). Of 278 returned surveys, 66 were eliminated from analysis because of invalid answers including refusal of response and unrelated answers to the survey questions. After cleaning the data, usable responses from 212 stakeholders (30.37% response rate) were subjected to analysis about relationships involving 382 out of 825 stakeholders (825 names were made by 650 initial people to whom questionnaires were mailed plus 127 other stakeholders who were newly identified in the 212 valid surveys returned. And, 382 people, who are in the initial mailing list and newly identified in the returned surveys, were subjected for analysis).

9. Data were converted into an InFlow file.

10. Preliminary statistical and graphic results were computed, revised and tested, and recomputed.

Having three levels of data (individual, organizational, and county levels), this study attempted to identify opinion leaders in the Pennsylvania’s juvenile justice system
by analyzing communication network maps and network centrality statistics, using *Inflow*, a social network software program. In addition, demographic information was analyzed by using SPSS.

Results

Having the data gathered from 212 people in Pennsylvania’s juvenile justice system, this study developed data with three levels including the individual, organizational, and state levels. In order to create the organizational and state level data, the initial individual data were aggregated to the level of organizations and counties with which the nominated individuals were associated. More specific identifications of 382 individual units are: 212 survey respondents; 127 people named in returned questionnaires who had not been sent a questionnaire; 43 people named in returned questionnaires who had been sent a questionnaire but did not return a questionnaire.

In terms of individual level analysis, all 825 individual data were subjected to draw a comprehensive social network map which depicts the representativeness of the data. Figure 7 shows the map having all individuals in the final data, and all individuals’ names were substituted by numbers for confidentiality. As shown in the map, many stakeholders are outside of network links. They are those who are either non-respondents of the survey, including refusal of survey participation, or not nominated by others. Figure 7 also shows the communication network is more likely to be nested within a larger juvenile justice network.
Figure 7. Communication networks within Pennsylvania’s juvenile justice system
(Data are about 382 individuals of a possible 825 individuals).
Specifically, there are two ways of identifying opinion leaders. One is based on reading social network maps, and the other is statistical identification. Reading the social map is a very easy way to identify opinion leaders because InFlow locates people who have higher centrality values in the center. Figures 8, 9, and 10 show enlarged and detailed social network maps at each level of analysis of communication networks in the Pennsylvania juvenile justice system. First of all, the individual level of communication network (Figure 8) shows one large network from the center of the map, there are some small networks in the periphery, which indicates a very centralized network. Second, the organizational level (Figure 9) looks simpler than the individual level because the data used at the organizational level were constructed by aggregation of the individual level of data. After aggregation of data by organization, 187 organizations that had more than one connection with other organizations were found within 302 links. Finally, the county level (Figure 10) shows the clearest and simplest networks because there are only 59 nodes which is the number of counties in Pennsylvania.
Figure 8. Individual level of the communication networks within Pennsylvania’s juvenile justice system (382 individuals with 506 links; numbers = individuals).
Figure 9. Organizational level of the communication networks within Pennsylvania’s juvenile justice system (187 organizations with 302 links; numbers = organizations).
Figure 10. County level of the communication networks within Pennsylvania’s juvenile justice system (59 counties with 35 links; numbers = counties).
Even though reading the social maps is a very easy way to identify opinion leaders, this method has some limitations as the size of data increases (in other words, as the number of nodes increases). If the size of data is small, and each node and link are clearly identifiable, opinion leaders are very easily and visually identified by reading social maps, such as Figure 10. However, if there are has a large number of nodes, such as Figure 8, the map becomes very complicated, although the people in the center area have higher centrality values than the periphery. For instance, suppose Figures 8, 9, and 10 are all the same level of analysis, and a change agent wants to identify six opinion leaders to diffuse an innovation. A change agent can easily identify opinion leaders by reading Figure 10 because the links between nodes are clearly visible. The opinion leaders are, as he/she sees, nodes 11, 12, 21, 38, 48, and 50. However, in Figure 8, although it could be possible for a change agent to identify a couple of opinion leaders, it is very hard for the change agent to identify exactly six opinion leaders.

In order to compensate for the limitation of reading social network maps to identify opinion leaders, this study additionally employed statistics of centrality measurements which were shown in Table 1, 2, and 3. As explained in Chapter 2, opinion leaders can be identified by degree, betweenness, and closeness. Among these three network centrality measures, this study focused on the degree centrality because opinion leaders usually have greater participation and social accessibility than others (Rogers, 2003; Weimann, 1994). In other words, opinion leaders have more connections with other people, and the number of connections is measured by the degree of centrality.
At the individual level, there were eleven networks existed as Table 1 showed. The first group (Group A) which is located on the center of the social network map has 337 people in the network, and other groups are much smaller than Group A. It is more likely that opinion leaders are people who have higher degrees in Group A. All social network software can provide individual information with degree values for each person as data were constructed: therefore, a change agent can exactly select people who have higher degree values from the statistical analysis and sort people by the degree value. In addition, since this dissertation deals with methodologies related to identify opinion leaders, analysis of personal information is not necessary. Tables 2 and 3 show network analyses at organizational and county levels. Since data for both levels of analyses are aggregated from the individual level data, the number of nodes is smaller than the analysis of individual networks. The way of identifying opinion leader organizations and counties is the same as the way individual opinion leaders were identified.

Another limitation of this study is, as discussed before, related to the survey response rate. This study only has a 30% of response rate, which could be unrepresentative of the total population. Although the network analysis with returned surveys showed clear networks within the system, the low response rate in a non-probabilistic data collection method is a concern in analysis of such data. In other words, the validity of social network analysis depends heavily on the response rate (Valente et al., 2003).

In order to increase survey response rate, this study conducted the survey with a prenotification letter, the university’s official letterheads and envelopes, and two waves of
mailings. However, such efforts seemed to not be very effective in increasing the response rate and it would be difficult to find the reason for the low response rate without additional studies about the problem. Related to the difficulties in considering the ways to increase survey response rate, this study suggested other ways of survey data collection, rather than considering only the traditional ways of survey data collection method. In particular, using technology, such as data collection by email or Internet survey tools, would be highly considerable in regard to the modern work environment where people often use computers and Internet for their works.
Table 1. Degree of network centrality at individual level.

<table>
<thead>
<tr>
<th>Group</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group Size</td>
<td>337</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Potential Ties</td>
<td>113232</td>
<td>12</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>6</td>
<td>30</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Actual Ties</td>
<td>475</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Density (%)</td>
<td>0</td>
<td>25</td>
<td>25</td>
<td>33</td>
<td>33</td>
<td>33</td>
<td>25</td>
<td>33</td>
<td>17</td>
<td>33</td>
<td>25</td>
</tr>
</tbody>
</table>

| Degree (Out)   | Ave.* | 0.004 | 0.250 | 0.250 | 0.333 | 0.333 | 0.333 | 0.333 | 0.250 | 0.333 | 0.167 | 0.333 | 0.250 |
|                | Cent.* | 0.014 | 1.500 | 1.500 | 2.000 | 2.000 | 2.000 | 2.000 | 1.500 | 2.000 | 1.250 | 2.000 | 0.834 |
| Degree (In)    | Ave.* | 0.004 | 0.250 | 0.250 | 0.333 | 0.333 | 0.333 | 0.333 | 0.250 | 0.333 | 0.167 | 0.333 | 0.250 |
|                | Cent.* | 0.143 | 0.167 | 0.167 | 0.500 | 0.500 | 0.500 | 0.500 | 0.167 | 0.500 | 0.050 | 0.500 | 0.167 |

* Ave.: Average  
* Cent.: Centralization
Table 2. Degree of network centrality at organizational level.

<table>
<thead>
<tr>
<th>Group</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group Size</td>
<td>171</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Potential Ties</td>
<td>29070</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Actual Ties</td>
<td>292</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Density (%)</td>
<td>1</td>
<td>33</td>
<td>33</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>Degree (Out) Ave.*</td>
<td>0.010</td>
<td>0.333</td>
<td>0.333</td>
<td>0.333</td>
<td>0.333</td>
</tr>
<tr>
<td>Cent.*</td>
<td>0.037</td>
<td>2.000</td>
<td>2.000</td>
<td>2.000</td>
<td>2.000</td>
</tr>
<tr>
<td>Degree (In) Ave.*</td>
<td>0.010</td>
<td>0.333</td>
<td>0.333</td>
<td>0.333</td>
<td>0.333</td>
</tr>
<tr>
<td>Cent.*</td>
<td>0.430</td>
<td>0.500</td>
<td>0.500</td>
<td>0.500</td>
<td>0.500</td>
</tr>
</tbody>
</table>

Table 3. Degree of network centrality at county level.

<table>
<thead>
<tr>
<th>Group</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group Size</td>
<td>31</td>
</tr>
<tr>
<td>Potential Ties</td>
<td>930</td>
</tr>
<tr>
<td>Actual Ties</td>
<td>32</td>
</tr>
<tr>
<td>Density (%)</td>
<td>3</td>
</tr>
<tr>
<td>Degree (Out) Ave.*</td>
<td>0.034</td>
</tr>
<tr>
<td>Cent.*</td>
<td>0.070</td>
</tr>
<tr>
<td>Degree (In) Ave.*</td>
<td>0.034</td>
</tr>
<tr>
<td>Cent.*</td>
<td>0.284</td>
</tr>
</tbody>
</table>
Opinion Leadership Networks among Indian Farmers: Diffusion of e-Choupal

Summary of the Study

e-Choual was initially set up by the Indian Tobacco Company (ITC) in 2000, providing farmers information about the latest market prices of crops, a provision to sell crops directly to buyers, and up-to-date information on weather and farming practices through its Internet networks. This study analyzed the role of opinion leadership among the Indian farmers’ communication networks and the use of the opinion leaders to diffuse an innovative information source, e-Choupal. The specific purposes of this study were to identify opinion leaders by using social network analysis and to analyze the attributes of the opinion leaders in the diffusion of e-Choupal in Indian villages.

The research site was the state of Madhya Pradesh in India where e-Choupal centers were initially set up. In the state, the researchers selected 14 villages covered by three e-Choupal centers and focused on individual farmers’ communication networks. Using a sociometric method of social network analysis, 225 Indian farmers’ communication networks were analyzed. As a result, this study found four network groups. From the social network analysis used to identify opinion leaders among 225 people in the 14 villages, salient opinion leaders were identified in the four network groups.

The identified opinion leaders were Sanchalaks, who were selected and trained by ITC and the owner of the house where the e-Choupal system was installed. In terms of diffusion, Sanchalaks were both information sources and influentials on the farmers’
decision to adopt the innovation. This study also discussed important methodological considerations in identifying opinion leaders among Indian farmers.

Background of the Study: What is e-Choupal?

Since Everett M. Rogers (1958) investigated the social network patterns of Iowa farmers in the 1950s to study their influence on the diffusion and adoption of farming innovations, many scholars have examined communicative phenomena from the social diffusion perspective. The social network approach to diffusion has helped frame strategies to accelerate the spread of new information, innovations, policies, and practices in a society. This strategic use of diffusion ideas is called *purposive diffusion* (Singhal & Dearing, 2006).

In order to devise a purposive diffusion strategy, the diffusion planners’ first task is to analyze the attributes of a social system where the strategies would be implemented. In doing so, it is important to map the communication network of the social system to identify the key opinion leaders. The opinion leadership strategy for a purposive diffusion can be understood as a communicative method which uses significant others who can communicate or influence people’s decision to adopt new innovations. Related to this, the specific purposes of the study were to identify opinion leaders by using social network analysis and to analyze the attributes of the opinion leaders in the diffusion of e-Choupal in villages in the state of Madhya Pradesh, India.

The purpose of setting up e-Choupal was to provide farmers information about the latest market prices of crops, a provision to sell crops directly to buyers, and up-to-date information on weather and farming practices through its Internet networks. “Choupal”
means a gathering place in Hindi. Indian farmers come together in a choupal, discuss their farming practices, and share information they have. Developing the idea, e-Choupal stands for the combination of the idea of a gathering place and an electronic market place and was initially set up by the Indian Tobacco Company (ITC) in 2000.

The general purpose of ITC’s e-Choupal initiative was to reform the agricultural market structure of India which has been trapped by low investment, low productivity, weak market orientation, low value addition, low margin, and low risk taking ability (One Choupal, n.d.). Based on these purposes, ITC employed a market-led business model in order to increase the competitiveness of the Indian agricultural industry and prompt high productivity, high incomes, and substantial risk management for Indian farmers. In order to achieve e-Choupal’s goal, the most important task was to introduce a new method of processing agricultural products in the Indian market, which would be a substitution of the old Mandi system.

Mandi in Hindi is a place where farmers sell their products to wholesalers or agents who trade agricultural goods on behalf of large corporations or other wholesalers (Prahalad, 2005; Saran, 2004). Under the old system, farmers sold their crops to the commission agents who resold the crops to larger companies such as ITC. The number of commission agents has always been small, while numerous small scale farmers sold their crops to the commission agents. Because the Mandi was dominated and controlled by the agents, small scale farmers were unable to effectively negotiate the selling price of their crops, and the agents gained at both ends—by lowering their purchasing price from farmers and raising their selling price to large companies (Prahalad, 2005). One of the
fundamental reasons that farmers have been in a weak side in the market was that they could not have access to the latest information about market prices of crops, and had to go to the Mandi to sell their products.

Recognizing the structural problem of the Indian agricultural market, ITC decided to buy crops directly from the farmers through the introduction of e-Choupal. The e-Choupal consists of a computer with multimedia features connected to the Internet by dial-up or via a VAST connection (World Bank, 2003). The e-Choupal center is installed in the house of a Sanchalak who is trained to use the e-Choupal information portal, provide information on prices and other services, such as weather information, insurance policies, and communicate with ITC officials (Bhagat, 2004; Choupal Sagar, 2004; Saran, 2004). Each e-Choupal center covers a cluster of four to six neighboring villages. Between 2000 and 2004, 1800 e-Choupal centers were set up in Madhya Pradesh (the sentinel research state), with 42 hubs, covering over 8000 villages. Overall, by 2005, 5200 e-Choupal centers were set up in 31,000 villages covering six Indian states and reaching some 3.5 million farmers. The organizational set-up of the e-Choupal network at the system level is shown in Figure 11.
Research Conditions and Decision on Data Collection Method: Population Size, Demographic Characteristics, and Others

This study of identifying opinion leaders in communication networks among Indian agricultural villages was designed with information from Sen’s (1968) diffusion study that provided attributes of opinion leaders in the Indian agricultural communities. In Sen’s (1968) study of opinion leadership in India, five common attributes of opinion leaders were found in eight Indian villages:

1) They are fully integrated into the village society as shown by their conformity to village norms;
2) They are recognized power-holders in the community and maintain their status by conventional means;
3) They are sought by followers as opinion leaders because of their authority and competence;
4) They are not innovators; and
5) They maintain links with extra-village systems. (p. 27)

In addition, research conditions included a large research site, no funding, but collaboration with an Indian research institution. The study also purposed investigating both opinion leaders and communication networks within the social system. Considering all these situations, the sociometric method was selected as a method of data collection because of, fundamentally, two reasons: the unique culture of Indian agricultural communities and an attribute of diffusion of innovations.

In the study of Indian opinion leadership and communication networks, even though the study used a sociometric method similar to the study of Pennsylvania’s juvenile justice system, the sample selection was different because their unique traditional and social culture. Two ideas based on Sen’s (1964) study were combined in selecting participants for this study: first, males are decision makers in most occasions; second, social systems in Indian agricultural communities tend to be hierarchical and collectivistic. With these characteristics of population and society, the informants’ rating method could be considered because of low cost and time if respected elders and governmental officials were selected as informants. However, since data collection for this study was assisted by
an Indian research institution, which meant several research assistants were available for
the data collection, the researchers decided to use a sociometric method so the data
included as many people as possible. The hasty choice of the informants’ rating method
without having a formative study of the organizational and social culture could create
threats to the validity of the data, such as threats related to sample selection and maturity.
If it is possible, using a sociometric method is a way to avoid such threats by collecting
data from as many people as possible. In addition, according to diffusion theory, diffusion
of innovations often occurs by informal communication with peers (Rogers, 2003), and
authoritative figures do not always function in diffusion (Bhandari et al., 2003).

Survey Instrument Construction

In terms of survey question(s) asking about opinion leaders, the conventional
survey question asks participants to provide one or several names of people with whom
they talk or from whom they get advice. The survey question for identifying opinion
leaders was designed on the basis of the Hiss et al. (1978). The wording of questions was
slightly changed from the questions in the original Hiss et al. survey instrument to
accommodate a different respondent group with a distinct culture. In addition, since the
study focused more on the opinion leaders’ influence in the adoption of the innovation,
rather than serving as an information source(s), the question was worded accordingly.
The question asked was “after you first heard about e-Choupal, from whom did you first
get more detailed information about e-Choupal?” The question was translated into Hindi,
the local language. In this survey, one participant could nominate only one person.
Additionally, the survey had a diffusion question which asked “From whom did you heard about e-Choupal for the first time?” This question was asked to clarify whether opinion leaders could be information sources in the diffusion process. The survey also included several supplementary questions related to attributes of the innovation and attributes of the diffusion process, such as the local organizational affiliation.

Research Procedure

The present study was part of a large research project on the diffusion of e-Choupal in Indian villages. The research site was the State of Madhya Pradesh in India. This state was the first state where e-Choupal centers were set up (ITC, 2003). In the state, 14 villages covered by three e-Choupal centers were selected as shown in Table 4. This study focused on individual farmers providing 225 survey data in the 14 villages. Only male farmers were surveyed as they tended to be the key decision makers in the household, especially with respect to farming issues.
Table 4. Description of the sample from fourteen villages.

<table>
<thead>
<tr>
<th>e-Choupal Center</th>
<th>Year set-up</th>
<th>Village</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mograram</td>
<td>2000</td>
<td>Mograram</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amajhar</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aladakhedi</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sat Pipiliya</td>
<td>13</td>
</tr>
<tr>
<td>Barkhedanathu</td>
<td>2000</td>
<td>Barkhedanathu</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barkhedikala</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neelbad</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bhilkheda</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bishankhedi</td>
<td>15</td>
</tr>
<tr>
<td>Thumuda</td>
<td>2001</td>
<td>Thumuda</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ratanpur</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Catania</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jamunia</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dodi</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>N=14</td>
<td>N=225</td>
</tr>
</tbody>
</table>

The present study employed a sociometric method to collect social network data. The data were gathered by survey from people who were members of a local community organization in each village. Only males of working age participated in the survey since rural or agricultural areas of India still have the tradition that males are usually decision makers in households.

In the sample population, Sanchalaks were eliminated because they were those who had e-Choupal systems in their houses. This elimination was based on the concern about a sampling bias which is a main threat to the validity of a study (Johnston, Beaton, & Murphy, 2004; Johnston, Beaton, Murphy, & Pike, 2000) because the diffusion of e-
Choupal was one of the assigned task for them from ITC. Therefore, people nominated by Sanchalaks could create a sampling bias.

The participants’ ages ranged from 19 to 87 (Total N=225), and 224 of the 225 men were married. The mean value of the number of people in a households was 8.29 (SD=4.01). In terms of education level, 21 people were illiterate and primary school graduates were the majority (N=80). The mean value of size of farm that each farmers owned was 11.57 acres (SD=10.90).

Results

In analyzing the social network data, the study used InFlow and SPSS. First, InFlow generated network centrality measures and drew a social network map, and then SPSS was used for the statistical analysis.

Who are the opinion leaders?

Based on the results of the social network analysis, 200 individuals pointed out someone whose names were on the survey list, and 25 people provided names that were not in the survey list. From the communication network analysis of individual farmers in 14 villages, this study found four network groups. From the social network analysis to identify opinion leaders among 225 people in the 14 villages, the four network groups having four salient opinion leaders were identified (see Figure 12).
Figure 12. A communication network among Indian farmers.
Group 1 had 59 individuals with 58 ties with only one person (no.=226) who was a Sanchalak; Group 2 (no.=227) had 69 individuals with 68 ties also with only one Sanchalak; Group 3 (no.=228) had 68 individuals with 67 ties with another Sanchalak. Only in group 4, the three ties were not with a Sanchalak, but with someone (no.=225) who is located in the center in their communication network. (see Figure 5 for more detailed social network analysis of the groups.) Apparently, the identified opinion leaders were the three Sanchalaks, who were selected and trained by the ITC and lived where the e-Choupal systems were housed.

Table 5. Communication networks among 14 villages.

<table>
<thead>
<tr>
<th>Group</th>
<th>Group size</th>
<th>Potential Ties</th>
<th>Actual Ties</th>
<th>Density</th>
<th>In-degree Measure (Individual = Value)</th>
<th>Betweenness Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group1</td>
<td>59</td>
<td>3422</td>
<td>58</td>
<td>2</td>
<td>226 = 1</td>
<td>0</td>
</tr>
<tr>
<td>Group2</td>
<td>69</td>
<td>4692</td>
<td>68</td>
<td>1</td>
<td>227 = 1</td>
<td>0</td>
</tr>
<tr>
<td>Group3</td>
<td>68</td>
<td>4556</td>
<td>67</td>
<td>1</td>
<td>228 = 1</td>
<td>0</td>
</tr>
<tr>
<td>Group4</td>
<td>4</td>
<td>12</td>
<td>3</td>
<td>25</td>
<td>225 = 1</td>
<td>0</td>
</tr>
</tbody>
</table>

In terms of the in-degree centrality measure, it was also very obvious that three Sanchalaks were nominated as opinion leaders by other farmers; they provided advice for other farmers to make use of e-Choupal. This result showing the extremely high degree of nomination of Sanchalaks as opinion leaders is unique in comparison with other social network analyses. Usually, other social network analyses with a large scale, such as this
study having 14 villages, generate rather complex network maps and centrality measures. However, in this study, 193 out of 225 people (85.78%) pointed to three Sanchalaks between them as their opinion leaders who were at the center of their network groups. The social network map of Indian farmers in these villages also demonstrated the salience of Sanchalaks in their communication network.

The salience of Sanchalaks as opinion leaders supports the attributes of the Indian agricultural community that Sen’s (1968) study of opinion leadership in India explained with five common attributes of opinion leaders in eight Indian villages: they are fully integrated into the village society as shown by their conformity to village norms; they are recognized power-holders in the community and maintain their status by conventional means; they are sought by followers as opinion leaders because of their authority and competence; they are not innovators; and they maintain links with extra-village systems (p. 27).

The present study also suggests that opinion leadership in a typical agricultural community in the state of Madhya Pradesh reflects the society’s hierarchical structure and people’s respect for authority figures. While many studies conducted in the Western culture have shown the peer-to-peer diffusion (Booth & Knox, 1967; Pereles et al., 2003; Valente et al., 2003), the present study revealed a far more hierarchical diffusion process. This has significant implications for the diffusion of agricultural innovations in Indian agricultural communities.

Another possible reason of the high saliency of Sanchalaks as opinion leaders may be due to the small number of opinion leaders in a large community. While e-Choupal is
now increasingly recognized among Indian farmers, the system still needs to be extended to more centers. In the 14 villages of Madhya Pradesh that were studied, there were only three Sanchalaks. Three Sanchalaks in 14 villages are not enough to perhaps reach the level of critical mass in diffusion. According to Rogers (2003), critical mass is defined as “the point after which further diffusion becomes self-sustaining” (p. 343). Related to this idea of critical mass, the efforts or the use of active strategies to diffuse a new innovation should be continued, until diffusion meets the level of critical mass. On the way to reaching critical mass, innovation users are more interested in the quality of certain goods and services as the number of users increases, which is defined as network externalities (Mahler & Rogers, 1999). Based on this view, ITC needs to set up more e-Choupal centers and realize the key position of Sanchalaks in this endeavor. If ITC neglects these insights, a lack of network externalities would slow the rate of adoption of e-Choupal, and further diffusion would slow down and eventually stop.

Are opinion leaders information sources?

Having the information that Sanchalaks were the opinion leaders, the study also revealed one more diffusion attribute of Indian farmers, “Did the opinion leaders also serve as initial information sources about e-Choupal?” Table 6 shows the two main information sources: other farmers and Sanchalaks. Several farmers noted that they first heard about e-Choupal from a Sanchalak (N=117). An almost equal number of farmers also said they first received information about e-Choupal from their friends and neighboring farmers (N=100). In order to compare these two groups of people, a Chi-square test was
conducted and the test revealed that the observed frequencies are statistically not different between the two groups, $\chi^2(1, N = 217) = 1.332, p = 0.248$.

This study investigated if opinion leaders would take roles of both information sources (Lomas, 1993) and influentials on adoption decisions (Weimann, 1994). Even though the opinion leaders were identified as a major information source on e-Choupal, there were a substantial number of other farmers who were not opinion leaders but were cited as information sources, too. That result revealed that not all people introducing new innovations convince people to adopt the new innovations. This suggests that farmers in Madhya Pradesh, India, feel a need to confirm adoption decisions with opinion leaders, not with those who were the initial source of information about the innovation.

Table 6. Information sources of e-Choupal.

<table>
<thead>
<tr>
<th>Sources</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanchalak</td>
<td>117</td>
<td>52.0</td>
</tr>
<tr>
<td>Other farmers (friends or neighbors)</td>
<td>100</td>
<td>44.4</td>
</tr>
<tr>
<td>ITC officials</td>
<td>3</td>
<td>1.3</td>
</tr>
<tr>
<td>Sarapanch</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Family members</td>
<td>3</td>
<td>1.3</td>
</tr>
<tr>
<td>Wall painting / Brochure</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Total</td>
<td>225</td>
<td>100.0</td>
</tr>
</tbody>
</table>

A reason of this difference between people of information sources and opinion leaders can be sought from previous opinion leadership studies. According to Greer
(1988) and Conroy and Shannon (1995), opinion leaders are evaluators or locally respected colleagues who are trusted judges to determine how new innovations fit their local situations and if the innovations are appropriate in their communities having traditional social norms. In judging the fitness and appropriateness of new innovations, opinion leaders consider more than their followers how the innovations may contribute to the development of their communities (O’Brien, Raedeke, & Hassinger, 1998). In this study, ordinary farmers in India’s Madhya Pradesh state seem to greatly trust the judgment of opinion leaders – the Sanchalaks – who provide some insights about if e-Choupal really fit their needs and enhanced agricultural productivity.

Finally, this study suggests a clear strategy to accelerate the diffusion of e-Choupal in India. Since Sanchalaks were clearly identified as the sole opinion leaders, more Sanchalaks can be cultivated, as Kelly and his colleagues (1997b) argued that opinion leaders can be intentionally created. What are the characteristics of Sanchalaks who serve as opinion leaders in the diffusion of e-Choupal? Our investigation revealed that they are literate, mid-size farmers who have good rapport with community members, and are respected (Chitnis et al., 2007). These attributes of Sanchalaks can be applied to other purposive diffusion projects in Indian villages, such as HIV/AIDS/health campaigns and other developmental projects.

Methodological Comparison of Social Network Data Collection Methods

This chapter demonstrated two empirical studies that attempted to identify opinion leaders within different social systems. Both studies identified opinion leaders by
investigating their communication networks, employing social network analysis. Along with the set of second research questions, these demonstrations presented a way of understanding how social network data are constructed by using opinion leadership instruments in an opinion leadership project (RQ2). Related to the main question, there were three specific sub-questions; RQ2a: How has population size affected researchers’ decisions in the choice and use of a data collection method?; RQ2b: How have demographic characteristics affected researchers’ decisions in the choice and use of a data collection method?; and RQ2c: What are the situational concerns that researchers could faced in collecting social network data and what are ways to minimize the risks arising from the concerns?

Even though the sub-questions were discussed within the context of the two empirical studies, there is a comprehensive table (Table 7) that compares the five data collection methods of social network analysis, helping opinion leadership research design. Table 7 is a synthesis of research conditions that affect researchers’ decisions on choosing a data collection method, including population sizes (RQ2a), demographic characteristics (RQ2b), and others conditions (RQ2c). The table was constructed on the basis of a literature review of the selected studies for this dissertation, which are presented in Appendix H, plus the two empirical studies presented in this chapter.

There were eight categories to be compared with one another: area of research site, characteristics of research group, budget, time, accessibility to population, existence of formative study, existence of informants, and purpose(s) of study. The meanings of the specific categories are:
1. Area of research site
   - Large/Small: Is the area of the research site bigger than one community?

2. Characteristics of research group
   - Professional (Authoritative) / Ordinary: Is the research group professional
     (having authoritative characteristics)?

3. Budget
   - Large / Small: Is the research budget large enough to have several research
     assistants or pay for external informants?

4. Time
   - Long / Short: Is the time allowance for data collection relatively long?

5. Accessibility to population
   - Hard / Easy: Is the population a hard to reach group or a hidden population, such
     as homeless people, prostitutes, drug addicts, HIV/AIDS infected people and the
     like?

6. Existence of Formative Study
   - Exists /Not Exist: Is there any formative study (or comprehensive study) that
     informs or provides information about the characteristics or structure of the social
     system?

7. Existence of informants
   - Exist / Not Exist: Are there informants who can provide crucial information
     about the structure of the social system or who can guide the researcher in
     investigating the social system?
8. Purpose of study

- Opinion Leaders Only / Opinion Leaders and Communication networks: Is the purpose of the study to identify opinion leaders only or both opinion leaders and communication networks?
Table 7. Comparison of Social Network Data Collection Methods by Research Conditions.
(■: Strongly Encouraged, O: Very Possible, Δ: Depending on cases, X: Hard to use)

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Methods</th>
<th>Sociometric</th>
<th>Informants' rating</th>
<th>Snowball</th>
<th>Observation</th>
<th>Self-Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose of Study</strong></td>
<td>OL* only</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td>OL* + Ntw**</td>
<td>□</td>
<td>Δ</td>
<td>O</td>
<td>Δ</td>
<td>X</td>
</tr>
<tr>
<td><strong>Area of Research site</strong></td>
<td>Large</td>
<td>□</td>
<td>Δ</td>
<td>X</td>
<td>X</td>
<td>△</td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>O</td>
<td>O</td>
<td>□</td>
<td>□</td>
<td>O</td>
</tr>
<tr>
<td><strong>Characteristics of group</strong></td>
<td>Authoritative/ Professional</td>
<td>Δ</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>△</td>
</tr>
<tr>
<td></td>
<td>Ordinary</td>
<td>O</td>
<td>O</td>
<td>□</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td><strong>Budget</strong></td>
<td>Large</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>□</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>□</td>
<td>O</td>
<td>X</td>
<td>X</td>
<td>□</td>
</tr>
<tr>
<td><strong>Time</strong></td>
<td>Long</td>
<td>O</td>
<td>O</td>
<td>□</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td>Short</td>
<td>□</td>
<td>□</td>
<td>X</td>
<td>O</td>
<td>□</td>
</tr>
<tr>
<td><strong>Accessibility to research subjects</strong></td>
<td>Hard</td>
<td>Δ</td>
<td>O</td>
<td>□</td>
<td>O</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Easy</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td><strong>Formative Study</strong></td>
<td>Exist</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td>Non-Exist</td>
<td>O</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td><strong>Usability of Informants</strong></td>
<td>Exist</td>
<td>O</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>N/A***</td>
</tr>
<tr>
<td></td>
<td>Non-Exist</td>
<td>O</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>N/A***</td>
</tr>
</tbody>
</table>

* OL: Identifying Opinion Leaders; ** Ntw: Identifying Communication Networks; ***N/A: Not applicable category
As mentioned above, Table 7 was created by review of the selected studies (see Appendix A) and the two empirical studies that were presented in this chapter. As a result of the review:  
1) the sociometric method is strongly encouraged for those studies that investigate both opinion leaders and communication networks, and that have research conditions of a large research area, small budget, and short data collection period;  
2) the informants’ rating method is particularly appropriate for studies having a short period of time and usable informants identified through formative research;  
3) the snowball method shows very clearly when it can and cannot be used. Even though the snowball method, compared to other methods, could provide accurate information about opinion leaders and communication networks in a non-probabilistic study because it requires interviews with people one-by-one, the method may not be usable in the cases that have large area of research site, small budget, short data collection period, and no informants to initiate interviews because the larger the area of the research site, the larger the budget is required to be to employ interviewers and a longer time period is needed to conduct interviews with all research subjects and to combine data; the observation method has very similar characteristics to snowball method; however, in order to use the observation method, a researcher needs to train observers until they fully understand what they have to do and how they observe research subjects in accordance with research purposes, which needs comparably higher research costs;  
5) the self-designation method can be used for studies aiming at identifying only opinion leaders, since this method usually asks only if research subjects regard themselves as opinion leaders among their groups.

In using Table 7 to choose a data collection method, the general rule is if a research condition has an “x” mark under the method category, the method having this “x” mark is
barely usable and would be eliminated first in consideration. After the method(s) having an “x” mark are eliminated, a researcher would consider the rest of the conditions and possible methods in the order of the “Conditions” category on the table. The most critical condition for an opinion leadership network study is the purpose of the study, which is located at the top of the “Conditions” category: Is the research to identify opinion leaders only or both opinion leaders and communication networks? Depending on the answer, a researcher may or may not eliminate the self-designation method. After the first consideration, a researcher would check if any condition of the research has “x” mark(s) under the “Methods” category. If any “x” mark is found, the method would be also eliminated. Basically, the way of choosing a data collection method with Table 7 is an elimination process from all five methods, until the last one method remains in consideration. As an example of using Table 7 to choose a data collection method, this dissertation takes the communication network study of the Pennsylvania juvenile justice system which was presented in this chapter.

First of all, the study of communication networks in the Pennsylvania juvenile justice system aimed to identify both opinion leaders and the structure of communication networks. This purpose eliminated the self-designation method from consideration. Second, the research had a large research area all counties in Pennsylvania. Having this condition, the study eliminated the snowball and observation methods. As a result, there were two methods left in consideration, sociometric and informants’ rating methods. For the rest of the categories of conditions, which are characteristics of group, budget, time, accessibility to research subjects, formative study, and usability of informants, the Pennsylvania study had
two categories having an “x.” Those were “Formative study” and “Usability of informants.” Considering all these, the remaining method in consideration was the sociometric method.

Summary

In Chapter 4, two empirical studies were introduced to demonstrate how social network data could be constructed by opinion leadership instruments, which was the second research question. In addition, the results of the literature review and the empirical studies were synthesized in the course of answering the second research question through its sub-questions. Because population size and demographic characteristics are critical in choosing and using opinion leadership data collection methods, these two elements were specifically explained in the sub-section, “Research conditions and decision of data collection method” on the two empirical studies.

The first sub-question focused on how population size has affected researchers’ decisions in the choice and use of a data collection method. In both studies, which were social networks on the Pennsylvania juvenile justice system and Indian farmers’ networks, the sociometric data collection method was selected to construct the social network data. In terms of population size, both studies had large groups of people across counties or villages.

The second sub-question explored how demographic characteristics have affected researchers’ decisions in the choice and use of a data collection method. Contrary to the situation in the first sub-question, these two studies have different points of consideration in terms of the demographic characteristics of the research subject groups. The study on Pennsylvania’s juvenile justice system primarily considered people’s sensitivity to information disclosure due to the nature of a legal system that emphasized information
security; however, the study on Indian farmers’ networks considered the collectivistic culture of the society and the possible generation gaps in interpersonal communication. Even though the considerations were different, both studies employed the sociometric data collection method.

Including population size and demographic characteristics, the third sub-question asked what situational concerns might researchers face in collecting social network data and what were the ways to minimize risks arising from those concerns. As a method to answer the question, this dissertation reviewed the selected literature and the two empirical studies presented and created a comprehensive answer presented in Table 7 that would also be a guideline for researchers to choose a data collection method to conduct social network analysis. In the course of creating this guideline (Table 7), as Appendix H shows, each study was reviewed by categories of research purpose, place of investigation, data collection procedure of identifying opinion leaders, identified opinion leaders, and other important notes which are worth considering in choosing a method of data collection. Coupled with the literature review, the decisions of data collection methods and procedures of actual data collection in two empirical studies were also considered in constructing the guideline.
Chapter Five
Conclusion and Suggestions for Future Studies

Passive efforts to diffuse an innovation, such as mailing information sheets, are usually not effective (Davis, 1996; Davis, Thomas, Oxman, & Haynes, 1995; Glifford et al, 1999; Greco & Eisenberg, 1993). Interpersonal communication, especially communication with opinion leaders, is one of the most important factors influencing a person’s decision to adopt innovations as opposed to the passive efforts (Hayward et al., 1996; Rogers, 2003). Based on the importance of opinion leaders in the diffusion of innovations, this dissertation focused on the ways of identifying opinion leaders by using social network analysis.

Identifying opinion leaders, for an opinion leadership intervention, is critical in order to determine whether or not the diffusion of innovation succeeds. There have been few studies that provided a synthetic guideline for researchers to consult in identifying opinion leaders. Based on this necessity, the purpose of this dissertation was to provide a synthesis of the ways to identify opinion leaders by using methods of social network analysis. In particular, this study synthesized communication network data collection methods to identify opinion leaders by using social network analysis and demonstrated how social network data was collected in two different social systems.

In social network analysis, three measures have been usually considered as network centrality measures: degree, betweenness, and closeness (Borgatti, 2006; Krebs, 2001), although opinion leaders in most empirical studies have been identified with degree centrality. Degree centrality refers to the number of direct connections a node has (Krebs, 2001). The
higher the number of direct connections a node has, the higher the measure of degree centrality.

Based on the purpose of the study, and background knowledge about identifying opinion leaders by using social network analysis, this dissertation posed two prime research questions, RQ1: “What are the characteristics of each data collection method to identify opinion leaders?,” and RQ2 “How are a social network data constructed when using opinion leadership instruments?” Each prime question has three following sub-questions which are described below.

Under the first prime question, the sub-questions consisted of: RQ1a: What are the most frequently used data collection methods and their instruments in studies that identified opinion leaders and what are the characteristics of the methods?; RQ1b: How have the opinion leadership instruments been studied?; and, RQ1c: How have researchers used opinion leadership instruments relevant to their research purposes? The three sub-questions of the second prime question were RQ2a: How has population size affected researchers’ decisions in the choice and use of a data collection method?; RQ2b: How have demographic characteristics affected researchers’ decisions in the choice and use of a data collection method?; and, RQ2c: What are the expected difficulties that researchers faced in collecting social network data and what are ways to minimize the risks arising from these difficulties?

In terms of synthesizing characteristics of social network data collection methods, this dissertation categorized five methods—sociometric, informants’ rating, snowball, observation, and self-designating methods—through a literature review of opinion leadership studies. The opinion leadership studies were selected through a combination of social network, opinion
leadership, and communication criteria in the context of the diffusion of innovations. Specifically, to answer RQ1 and its sub-questions, this author reviewed selected opinion leadership intervention studies which clearly presented the procedures of their data collection and synthesized the characteristics of five opinion leadership data collection methods. As a part of synthesizing opinion leadership data collection methods, annotated bibliographies of studies identifying opinion leaders were organized by each data collection method in Appendix H. In addition, opinion leadership instruments under each data collection method were also organized and presented in Appendices B, C, and D. In relationship with the research purposes, sociometric and snowball methods simultaneously produce not only information about who opinion leaders are, but also comprehensive communication networks within social systems, while other methods are generally used to identify opinion leaders only.

This author presented two empirical studies to demonstrate the procedure of how social network data could be constructed as asked in RQ2. The first empirical study was to identify opinion leaders within Pennsylvania’s juvenile justice system and the other was to identify opinion leaders within 14 Indian agricultural villages. Both studies were formative studies for purposive diffusion projects. By demonstrating the data collection procedure, this dissertation dealt with population sizes, demographic characteristics of research subjects, and other considerable research conditions which affect the choice of a data collection method and the actual data collection activities. The summary of each data collection method’s strengths and weaknesses paired with each considerable research condition were synthesized and presented in Table 7. This comprehensive table offered suggestions for researchers to
choose and use an opinion leadership data collection method and was constructed on the basis of combining the literature review and two empirical studies which were synthesized through Chapter Three and Chapter Four.

Related to further methodological development of social network analysis to identify opinion leaders within a social system, testing different types of question between specific and general questions is necessary to increase accuracy of methods to identify opinion leaders in different research settings. For instance, to identify opinion leaders within the Pennsylvania juvenile justice system, the study used the question “Who do you look to for new ideas or better ways of doing things concerning juvenile justice in Pennsylvania?” Compared with this question, if the study used “whom do you talk with in your work place?,” which is more general question, would the results be different? Wording is also important in ensuring item response rate and quality of collected data (Vehovar, Lozar, Koren, & Hlebec, 2003). Therefore, tests between specific and general questions are necessary to consider the validity of the data and its analysis.

Second, strategies to increase survey response rates should be considered when a researcher collects data through surveys. Success of social network analysis heavily depends on the response rate (Valente, 2003). Considering the importance of the response rate, the study of Pennsylvania juvenile justice system sent prenotification letters, enclosed return envelopes with the survey, used official letterhead and envelopes, and consulted studies dealing with survey response rates. Even so, the study had a response rate of less than 40 percent. It was also questionable whether a low response rate in the social network data collection was due to question wording as mentioned above.
Also related to the response rate, and a way of ensuring the validity of social network data, it is worth considering if there is any way of employing the probabilistic approach in social network data collection and analysis. One of the characteristics of social network analysis is that the result of a study is hard to generalize because it does not have any method by which to generalize the result; this makes every study individually contextual and only represents different network features of different studies. Therefore, if the probabilistic approach can be employed, it contributes to theorization of network studies through generalization of similar results in similar groups of research subjects. As an example, if the idea of power analysis is employed in this type of network analysis, this contributes not only to the validity of data, but also solves problems related to the survey response rates.

Finally, the results of the two empirical social network studies (Pennsylvania juvenile justice system and Indian farmers in 14 villages) suggest further study is needed on cultural influences in consideration of using existing social network data collection methods and instruments and the creation of culturally relevant data collection methods and instruments. The two studies had different research sites and subjects; however, both studies used a sociometric method, following the guidelines that were presented in Table 7. The analyses, especially shown in the social network maps, illustrated different types of networks. While communication networks in the Pennsylvania juvenile justice system showed multiple links among people in a large network (see Figure 8), the networks among Indian farmers were clearly divided by different Sanchalaks with similar size, and a Sanchalak and other people in a group had direct relationships (see Figure 12). Even though the difference between the Pennsylvania juvenile justice project and the Indian project was related to the results of two
studies, the difference encourages researchers to consider culture as another criterion in choosing a data collection method and instruments. Since most studies reviewed for this dissertation were conducted in a western culture, it is highly questionable whether or not the existing social network data collection methods and instruments are applicable in a different cultural context.
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One Choupal (n.d.) *About e-Choupal*. Retrieved February 1, 2007, from


dissertation, Iowa State University, 1957)


Appendix A: Frequency of Each Data Collection Method Used in Empirical Opinion Leadership Studies

<table>
<thead>
<tr>
<th>Sociometric</th>
<th>Informants’ Rating</th>
<th>Snowball</th>
<th>Observation</th>
<th>Self-Designating</th>
</tr>
</thead>
</table>
Appendix B: Scales for Sociometric Data Construction

Hiss, MacDonald, and Davis (1978) opinion leadership scale.

The three paragraphs that follow are an attempt to describe the behavioral characteristics of physicians as they interact with their colleagues on an informal basis during the course of a typical day in practice. These characteristics have been derived from a survey of over three hundred Michigan physicians. Most physicians demonstrate these characteristics through their careers. However, as with any human interaction, some physicians demonstrate such behavior more often and more consistently than others. What we would like to learn from you is which physician(s) in your hospital best fit the descriptive paragraphs that follow.

Please read each paragraphs carefully and indicate the name(s) of the physician(s) that best fit each description. You may write the names of up to three physicians for each paragraph. The same physician may be named in more than one paragraph. Remember all information on this survey is strictly confidential.

Paragraph A
They convey information in such a fashion as to provide a learning experience. They express themselves clearly and to the point—provide practical information first and then an explanation or rational if time allows. They take the time to answer you completely and do not leave you with the feeling that they were too busy to answer your inquiry. They enjoy and are willing to share any knowledge they have.

Name___________________________________
Name___________________________________
Name___________________________________

Paragraph B
They are individuals who like to teach. They are current and up to date and demonstrate a command of medical knowledge. They demonstrate a high level of clinical expertise.

Name___________________________________
Name___________________________________
Name___________________________________

Paragraph C
They are “caring” physicians who demonstrate a high level of humanistic concern. They never talk down to you; they treat you as an equal even through it’s clear they are helping you.

Name___________________________________
Name___________________________________
Name___________________________________
Wright et al. (2004) opinion leadership scale.

Please read the following items and think about the physicians in your community. If possible, please list as many as two physicians in your community who best fit each description.

Note: You may include the same physician in more than one section and you may include your own name in any section that you feel is appropriate.

I. Physicians as Educators
These physicians convey information in ways that lead to learning. They express themselves clearly and to the point. They provide practical information first and then an explanation or rationale if time allows. They take the time to answer you completely and do not leave you feeling that they were too busy to answer your inquiry. They enjoy and are willing to share any knowledge that they have.

Name: ______________________________    Name: ____________________________

II. Physicians as Knowledgeable Practitioners
These are physicians who like to teach. They seem always up-to-date, demonstrate a command of recent medical knowledge and a high level of clinical expertise.

Name: ______________________________    Name: ____________________________

III. Physicians as Caring Professionals
These are physicians whom we might call real humanist. They treat people as equals; they listen, communicate well and never talk down to others even when helping them.

Name: ______________________________    Name: ____________________________

IV. General surgeons whose advice you value on colorectal cancer

Name: ______________________________    Name: ____________________________

V. Pathologists whose advice you value on colorectal cancer.

Name: ______________________________    Name: ____________________________

VI. Designated leaders in your community

Name: ______________________________    Name: ____________________________
Would you mind telling us a little about yourself?

Gender: Female □  Male □  Age: _________  Years in Practice: _________
Practice Location: Rural □  Urban □  Remote □
Nature of your practice (e.g. General Surgery or Pathology, subspecialty surgery or pathology):
________________________________________________________________________

Estimated percentage of your clinical volume that relates to colorectal cancer:_________

How important are the following resources when you need medical information quickly?

Scientific and Professional Journals  Vary □  Moderately □  Somewhat □  Not □
Online data bases such as Medline  Vary □  Moderately □  Somewhat □  Not □
Other internet resources or email  Vary □  Moderately □  Somewhat □  Not □
Hospital physicians  Vary □  Moderately □  Somewhat □  Not □
University faculty  Vary □  Moderately □  Somewhat □  Not □
Informal communication with a specialist  Vary □  Moderately □  Somewhat □  Not □
Formal CE  Vary □  Moderately □  Somewhat □  Not □
Informal communication with other colleagues  Vary □  Moderately □  Somewhat □  Not □
The opinion leader physicians in your community  Vary □  Moderately □  Somewhat □  Not □

Think about the physicians whom you approach for medical information or advice and let us know how you chose them (you can select more than one reason)
Knew them in medical school
Heard of them through taking with other colleagues
Heard of them through interaction with hospital departments
Met them at professional medical meetings
Met them at informal social gatherings
Work in the same building

Any other reasons?_______________________________________________________________

When you have completed the materials would you kindly put them in the enclosed self-addressed envelop and drop it in the mail?

Once again, thank you very much for your help.
Appendix C: Questions for Snowball Data Collection Method

(Michiellutte & Beal, 1990, p. 63)

1. Do we only want female leaders?
   (the answer was no)

2. Do we only want black leaders?
   (the answer was no)

3. How do we define leadership?
   (Aside from the general categories, they were told to think of people who get
   things done in the community and who are considered influential by others?)

4. Should they assume we already had certain names on our list?
   (Answer was no, we also want to know how many times people are mentioned in
   order make a special effort to reach the most frequently mentioned leaders)

5. What are you going to ask the persons named to do?
   (A general answer was given; to endorse or help promote the program, and provide
   information about the community)

6. Where did you get the name?
   (Answer was from one or more other community leaders)
Appendix D: Scales for Self-Designating Data Construction

Rogers and Cartano (1962) six item scale.

1. During the past six months have you told anyone about some new farming practice?

2. Compared with your circle of friends, are you (a) more or (b) less likely to be asked for advice about new farming practices?

3. Thinking back to your last discussion about some new farming practice,
   (a) were you asked for your opinion of the new practice, or
   (b) did you ask someone else?

4. When you and your friends discuss new ideas about farm practice, what part do you play?
   (a) Mainly listen, or
   (b) Try to convince them of your ideas?

5. Which of these happens more often,
   (a) you tell your neighbors about some new farm practice, or
   (b) they tell you about a new practice?

6. Do you have the feeling that you are generally regarded by your neighbors as a good source of advice about new farm practices?
King and Summers (1970) opinion leadership scale.

1. In general, do you like to talk about ___________ with your friends?
   Yes_____   No_____

2. Would you say you give very little information, an average amount of information, or
great deal of information about ___________ to your friends?
   You give very little information _________
   You give an average amount of information _________
   You give a great deal of information _________

3. During the past six months, have you told anyone about some ____________?
   Yes_____   No_____

4. Compare with your circle of friends, are you less likely, about as likely, or more
likely to be asked for advice about ____________?
   Less likely to be asked _________
   About as likely to be asked _________
   More likely to be asked _________

5. If you and your friends were to discuss ____________, what part would you be
most likely to play? Would you mainly listen to your friends’ ideas or would you try
to convince them of your ideas?
   You mainly listen to your friends’ ideas _________
   You try to convince them of your ideas _________

6. Which of these happens more often? Do you tell your friends about some ________, or
do they tell you about some ____________?
   You tell them about ____________ _________
   They tell you about some ____________ _________

7. Do you have the feeling that you are generally regarded by your friends and
neighbors as a good source of advice about ____________?
   Yes_____   No_______
Childers’ (1986) revision of King & Summers’ opinion leadership instrument.

Please rate yourself on the following scales relating to your interactions with friends and neighbors regarding cable television

Valid items)

1. In general, do you talk to your friends and neighbors about cable television:
   very often
   5 4 3 2 1
   never
2. When you talk to your friends and neighbors about cable television do you:
   give a great deal
   5 4 3 2 1
   of information
   give very
   little information
3. During the past six months, how many people have you told about cable television?
   told a number
   5 4 3 2 1
   of people
   told no one
4. Compared with your circle of friends, how likely are you to be asked about cable television?
   very likely
   5 4 3 2 1
   to be asked
   not at all
   likely to be asked
5. In a discussion of cable television, which of the following happens most often?
   you tell your
   5 4 3 2 1
   friends about cable
   your friends tell
   you about cable
6. Overall, in all of your discussions with friends and neighbors, are you:
   often used as a
   5 4 3 2 1
   source of advice
   not used as a
   source of advice

Invalid item)

1. In a discussion of cable television would you be most likely to:
   listen to your
   5 4 3 2 1
   friends’ idea
   convince your friends
   of your idea
Flynn, Goldsmith, and Eastman (1996b) six item scale out of 11 initial items.

Valid six items)

1. My opinion on rock [fashion; environmentally friendly products] seems not to count with other people.
   (Strongly disagree)                                                                                     (Strongly agree)
   1 2 3 4 5 6 7

2. When they choose a rock music recording [fashionable clothing; “green” products], other people do not turn to me for advice.
   (Strongly disagree)                                                                                     (Strongly agree)
   1 2 3 4 5 6 7

3. Other people [rarely] come to me for advice about choosing cd’s and tapes
   [fashionable clothing; products that are good for the environment].
   (Strongly disagree)                                                                                     (Strongly agree)
   1 2 3 4 5 6 7

4. People that I know pick rock music [clothing; “green” products] based on what I have told them.
   (Strongly disagree)                                                                                     (Strongly agree)
   1 2 3 4 5 6 7

5. I often persuade other people to buy the rock music [fashions; “green” products] that I like.
   (Strongly disagree)                                                                                     (Strongly agree)
   1 2 3 4 5 6 7

6. I often influence people’s opinions about popular rock [clothing; environmentally correct products].
   (Strongly disagree)                                                                                     (Strongly agree)
   1 2 3 4 5 6 7

Invalid items)

1. Other people rarely ask me about rock cd’s before they choose one for themselves.
   (Strongly disagree)                                                                                     (Strongly agree)
   1 2 3 4 5 6 7

   (Strongly disagree)                                                                                     (Strongly agree)
   1 2 3 4 5 6 7

3. Other people think that I am a poor source of information on rock music.
4. People rarely repeat things I have told them about popular rock music to other people.
   (Strongly disagree) 1 2 3 4 5 6 7 (Strongly agree)

5. What I say about rock music rarely changes other people’s minds.
   (Strongly disagree) 1 2 3 4 5 6 7 (Strongly agree)

1. Often influence people’s opinions about new (skin care, CDs, snack food) products.  
   (Strongly disagree)  (Strongly agree)  
   1  2  3  4  5  6  7

2. When they choose new (X) products, other people do not turn to me for advice.  
   (Strongly disagree)  (Strongly agree)  
   1  2  3  4  5  6  7

3. I often persuade other people to buy new (X) products that I like.  
   (Strongly disagree)  (Strongly agree)  
   1  2  3  4  5  6  7

4. People that I know pick (X) products based on what I have told them.  
   (Strongly disagree)  (Strongly agree)  
   1  2  3  4  5  6  7

5. Other people rarely come to me for advice about choosing new (X) products.  
   (Strongly disagree)  (Strongly agree)  
   1  2  3  4  5  6  7

6. My opinion on new (X) products seems not to count with other people.  
   (Strongly disagree)  (Strongly agree)  
   1  2  3  4  5  6  7
Hirschman (1980b) measurement of Innovativeness and Opinion Leadership.

Fashion Innovativeness = Question A + Question B – Question C
Fashion Opinion Leadership = Question D + Question E + Question F

Part I:

A. Are you willing to try new ideas about clothing fashions? How often?
   __4. Often       __3. Sometimes       __2. Seldom       __1. Never       __0. Don’t know

B. Do you try something new in the next season’s fashions? How often?
   __4. Often       __3. Sometimes       __2. Seldom       __1. Never       __0. Don’t know

C. Are you usually among the last to try new clothing fashion? How often?
   __4. Often       __3. Sometimes       __2. Seldom       __1. Never       __0. Don’t know

D. How often do you influence the types of clothing fashions your friends buy?
   __4. Often       __3. Sometimes       __2. Seldom       __1. Never       __0. Don’t know

E. How often do others turn to you for advice on fashion and clothing?
   __4. Often       __3. Sometimes       __2. Seldom       __1. Never       __0. Don’t know

F. How many of your friends and neighbors regard you as a good source of advice on clothing fashions?
   __4. Almost everyone I know       __3. More than half       __2. Less than half
   __1. Almost no one       __0. Don’t know

Part II: Demographics

Race / Sex / Income / Education /
Occupational Category (Housewife, Clerical, Professional) /
Social Class (Upper, Upper Middle, Middle, Working Lower)
Marshall and Gitosudarmo (1995) measurement scale used to assess opinion leadership.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. I like to talk with people about personal computers.
2. I give information about personal computers to other people.
3. During the past six months, I have told at least one person about personal computers.
4. I am more likely than most of the people I mix with to be asked for advice about personal computers.
5. If I were to discuss personal computers with others I mix with, I would more likely to convince them of my ideas rather than listen to theirs.
6. I tell the people I mix with about personal computers more often than they tell me.

**Single-item validation measure**

How important do you think that your personal opinion would be to the people you mix with, if they were about to purchase a personal computer?

| Extremely Important | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Totally Unimportant |

1. I like introducing new brands and products to my friends.
   (Strongly disagree)                      (Strongly agree)
   1  2  3  4  5  6  7

2. I like helping people by providing them with information about many kinds of products.
   (Strongly disagree)                      (Strongly agree)
   1  2  3  4  5  6  7

3. People ask me for information about products, places to shop, or sales.
   (Strongly disagree)                      (Strongly agree)
   1  2  3  4  5  6  7

4. If someone asked where to get the best buy on several products, I could tell him or her where to shop.
   (Strongly disagree)                      (Strongly agree)
   1  2  3  4  5  6  7

5. My friends think of me as a good source of information when it comes to new products or sales.
   (Strongly disagree)                      (Strongly agree)
   1  2  3  4  5  6  7

6. Think about a person who has information about a variety of products and likes to share this information with others. This person knows about new products, sales, stores, and so on, but does not necessarily feel she or he is an expert on one particular product. How well would you say that this description fits you?
   (Strongly disagree)                      (Strongly agree)
   1  2  3  4  5  6  7
Rogers’ (1961) six-item scale.

(1) During the past six months have you told anyone about some new farming practice?

(2) Compared with your circle of friends (a) are you more likely, or (b) are you less likely to be asked for advice about new farming practices?

(3) Thinking back to your last discussion about some new farm practice, were you (a) asked for your opinion of the new practice or (b) did you ask someone else?

(4) When you and your friends discuss new farm practices, what part do you play (a) mainly listen, or (b) try to convince them of your ideas?

(5) Which of these happens more often (a) you tell your neighbors about some new farm practice, or (b) they tell you about a new practice?

(6) Do you have the feeling that you are generally regarded by your neighbors and friends as a good source of advice about new farm practices?
Traoldahl and Van Dam (1965) Perceived opinion leadership scale.

1. About how often would you say people ask you for your opinion on topics which get a lot of attention in the news?
   3 – Several times a week
   2 – About once a week
   1 – Once or twice a month
   0 – Less than once a month

2. About how many people you know look to you for opinions on major topics in the news?
   4 – 4 or more persons
   2 – 1 to 3 persons
   0 – No one

3. If someone you know…said that he depended a great deal on your judgment regarding major news topics…would you believe him?
   4 – Surely
   3 – Probably
   2 – Don’t know
   1 – Probably not
   0 – Definitely not

4. Would you like to be thought of as a person who others depend upon in making up their minds about major issues in the news?
   4 – Unqualified “yes”
   3 – “I guess so”
   2 – Don’t know
   1 – Probably not
   0 – Unqualified “no”

5. Compared with your circle of friends…are you more likely…or less likely…to be asked for opinions on topics in the news?
   4 – More likely
   2 – About the same, don’t know
   0 – Less likely

6. When you and your friends discuss topics in the news, what part do you play?
   4 – Try to convince them
   2 – Both, don’t know
   0 – Mainly listen

7. How important is it to you to be considered a person whose opinions on topics in the news are well-founded?
3 – Very important
2 – Fairly important
1 – Not very important
0 – Not at all important
Appendix E: Prenotification Letter for Data Collection

June 14, 2006

Name, Title
Address
Address

Dear Honorable (Position) (Name):

I am writing you to request your consideration in completing a one-page questionnaire about the juvenile justice system in Pennsylvania. The questionnaire will be mailed to you next week.

For years, the John D. and Catherine T. MacArthur Foundation has supported efforts to move Pennsylvania closer to a shared goal of having an exemplary juvenile justice system. The foundation has supported children’s rights organizations, statewide commissions, researchers, and county and state departments in their identification of reform opportunities in the court system and the service-delivery system and, especially through county leadership, demonstrated models that work in practice.

Via a modest grant, the MacArthur Foundation has asked me to study the informal flow of new ideas among key stakeholders in Pennsylvania’s juvenile justice system. You have been identified as someone whom we would very much like included in this study. Please consider filling it out and returning it to me.

The questionnaire will take you fewer than five minutes to complete.

Cordially,

(Name)
(Position and Institution)
Appendix F: Cover letters for data collection

(For 1st wave)

June 21, 2006

Name, Title
Address
Address

Dear Honorable Judge Kuhn:

I am writing to ask you to complete the attached one-page questionnaire concerning the Pennsylvania juvenile justice system. I mailed you a preliminary letter last week announcing this effort.

This brief survey is supported by the John D. and Catherine T. MacArthur Foundation. For some years, MacArthur has supported efforts to move Pennsylvania closer to a shared goal of having an exemplary juvenile justice system. The foundation has funded the efforts of some of Pennsylvania’s children’s rights organizations, statewide commissions, researchers, and county and state departments in their identification of reform opportunities in the court system and in the service-delivery system. The state has shown to be a leader nationally in its Models for Change effort with strong county leadership paired with demonstrations of effective practices, programs, and policies.

The MacArthur Foundation has asked me to study the informal flow of new ideas among key stakeholders in Pennsylvania’s juvenile justice system. You have been identified as someone whom we would very much like included in this study. Please consider filling it out and returning it to me in the attached addressed, stamped envelope, along with signing and returning the attached consent agreement.

Cordially,

(Name)
(Position and Institution)
(For 2nd wave)

July 19, 2006

Name, Title
Address
Address

Dear (Name):

I am writing to ask you to complete the attached one-page questionnaire concerning the Pennsylvania juvenile justice system. I mailed you this same questionnaire three weeks ago.

This brief survey is supported by the John D. and Catherine T. MacArthur Foundation. For some years, MacArthur has supported efforts to move Pennsylvania closer to a shared goal of having an exemplary juvenile justice system. The foundation has funded the efforts of some of Pennsylvania’s children’s rights organizations, statewide commissions, researchers, and county and state departments in their identification of reform opportunities in the court system and in the service-delivery system. The state has shown to be a leader nationally in its Models for Change effort with strong county leadership paired with demonstrations of effective practices, programs, and policies.

The MacArthur Foundation has asked me to study the informal flow of new ideas among key stakeholders in Pennsylvania’s juvenile justice system. You have been identified as someone whom we would very much like included in this study. Please consider filling it out and returning it to me in the attached addressed, stamped envelope, along with signing and returning the attached consent agreement.

Cordially,

(Name)
(Position and Institution)
Appendix G: Opinion leadership instrument invented for the project of the Pennsylvania juvenile justice system

Information Sharing in the Pennsylvania Juvenile Justice System
A Survey Study Funded by (Funding Institution)
Directed by (Name), (Title), (Institution)

All responses to the following statements/questions will be kept strictly confidential.

Who do you look to for new ideas or better ways of doing things concerning juvenile justice in Pennsylvania?

1. 
First name ___________________________ Last name ___________________________
Organization: ______________________________________________________________
Position: _________________________________________________________________
I communicate with this person:
5 = daily or more  4 = weekly  3 = monthly  2 = quarterly  1 = yearly

2. 
First name ___________________________ Last name ___________________________
Organization: ______________________________________________________________
Position: _________________________________________________________________
I communicate with this person:
5 = daily or more  4 = weekly  3 = monthly  2 = quarterly  1 = yearly

3. 
First name ___________________________ Last name ___________________________
Organization: ______________________________________________________________
Position: _________________________________________________________________
I communicate with this person:
5 = daily or more  4 = weekly  3 = monthly  2 = quarterly  1 = yearly

How many years have you worked in the Pennsylvania juvenile justice system?
_________________________________________ Years

Please return this form and the consent form in the attached envelope.
Thank you very much for your participation.
Appendix H: Annotative Bibliography of Studies Identifying Opinion Leaders

Sociometric Methods (pp.176-193)

Informants’ Rating Method (pp.194-200)

Snowball Method (pp.201-204)

Observation Method (pp.205-207)

Self-designating Method (pp.208-218)

This annotative bibliography was organized by each opinion leadership data collection method and includes each article’s 1) research purpose, 2) place of investigation, 3) type of data collection method, 4) data collection procedure of identifying opinion leaders, and 5) who are the opinion leaders identified through using a method. Additionally, any significant finding/argument related to the opinion leadership studies was included for some studies. In order to maintain originality of information and ideas, this annotative bibliography quoted exact wording from the studies for most parts.

**Research Purpose:**
“This study examines the effect of information sources on the adoption of a milestone development in radiology, a medical procedure termed uterine fibroid embolization (UFE), among interventional radiologists in Michigan” (p.451)

**Hypothesis/ Research Questions:**
1. “Is there a relationship between the use of information sources—mass versus interpersonal—and early or late awareness of UFE among radiologists?” (p.453).
2. “Is there a relationship between the use of information sources—mass versus interpersonal—and early or late adoption of UFE among radiologists?” (p.453).
3. “Are certain types of relations in the social network of radiologists more conducive to the flow of information about UFE?” (p.453).
4. “Are there opinion leaders among radiologists who were influential in the diffusion of UFE?” (p.453).

**Place of investigation:**
32 interventional radiologists in Michigan.

**Type of data collection method:**
Sociometric Method

**Data collection procedure of identifying opinion leaders:**
Telephone interview with available people.

**Who are the OLs?**
“Information sources which physicians commonly use to find information are journals, textbooks, drug reference manuals, drug texts, conferences, consultants, colleagues, and pharmaceutical representatives. The sources are familiar, relevant, accessible, and easy to use” (p.451); In this case, mass-media sources seem to be relatively more important than interpersonal channels for early adopters than later adopters.

**Notes:**
“Conferences were found to be an initial source of information, creating awareness among early adopters, but other individuals were found to be influential sources in the adoption of UFE by later adopters. Radiologists rarely browsed Web-sites for information. Work relations in everyday clinical practice were the communication relations most conducive to the flow of information about UFE” (p.458).

**Research Purpose:**
“the author trained peer-identified teacher leaders in evidence-based classroom practices for students with ADHD, and examined the diffusion of information about these practices to other classroom teachers” (p.505). – Key Opinion Leaders (KOL)
“A primary goal of the project was to determine whether teachers in KOL schools used more recommended strategies compared to teachers in comparison schools as would be suggested by the diffusion of innovation literature” (p.508).

**Place of investigation:**
10 inner city Chicago Public Schools. Low-income Afro-American communities

**Type of data collection method:**
Sociometric Method

**Data collection procedure of identifying opinion leaders:**
“In the six experimental condition schools, KOL teachers were identified through nomination procedures with the targeted classroom teachers. Classroom teachers were asked to name the other teachers at their school to whom they go for advice on a variety of classroom issues” (p.508).

**Who are the OLs?:**
“Teachers who received the highest number of nominations were identified as the KOL teachers in their respective buildings. Two or three teachers were identified at each school to reach an exposure rate of 70% of teachers in each school… All 13 identified KOL leaders agreed” (p.508)
“KOL-supported teachers reported using significantly more of the 11 recommended strategies compared to the other two groups of teachers, and significant between-group differences were found on 7 of the strategies” (p.508).

**Research purpose**
The major research questions were addressed in this study:
1. Will opinion leadership, age, teaching experience, and centrality closeness serve as predictors of time of adoption?
2. Is there a relationship between time of adoption and spatial proximity and organizational unit proximity?” (p.18).

**Place of investigation**
“This study was conducted in a college of education in a southern university with an enrollment of approximately 25,000. A total of 66 of the 74 faculty in the college participated in the study” (p.18).

**Type of data collection method:**
Sociometric Method

**Data collection procedure of identifying opinion leaders**
“A questionnaire, based on Coleman, Katz, and Menzel’s (1966) questionnaire was distributed to participants…In this study, individuals were asked to identify to whom they go for advice…friendship…discussion” (p.20)

“The roster technique was used to collect the sociometric information. Each respondent was presented with a list of all faculty and asked to identify whether he or she talks with each of them for advice, friendship, and/or discussion. Time of adoption data were collected using a time and date stamp implemented by the online services. When faculty members used the service, the time and date that the service was used was automatically added to their request.” (p.20)

**Who are the opinion leaders?**
“Friendship networks tend to have a higher degree of homophily than discussion or advice networks. This homophily can act as a barrier to the diffusion process” (p.24).

**Research Purpose:**
“We evaluate the effectiveness of a community-based, multimodal educational program designed to improve CPM (Cancer pain management) without many of the limitations of previous studies. The aims of the study were to improve the knowledge, attitudes, and clinical behaviors of physicians and nurses, improve the knowledge and attitudes about CPM of cancer patients and their family members, and to reduce cancer-related pain experienced in cancer patients” (p.193)

**Place of investigation:**
Six Minnesota communities.

**Type of data collection method:**
Sociometric Method

**Data collection procedure of identifying opinion leaders**
“Opinion leaders were selected by their expressed willingness to participate in the study and by recommendations of their community peers as potentially effective opinion leaders using a method similar to that described by HISS et al.” (p.193)

**Who are the OLs?:**
Failed to identify opinion leaders.

**Notes:**
In this study, opinion leadership intervention did not show statistical significant differences between intervention groups and control groups. The reason may be the self-designation method of selecting opinion leaders.

This opinion leadership intervention may be not proper in this case of CPM (cancer pain management) because 1) CPM is a complex clinical activity, and 2) Pain is a subjective experience. These made evaluation hard (p.200)

Another problem may be on the education process for selected opinion leaders. The reasons are based on the views that 1) this is a medical matter, which is hard for people without professional medical training to fully understand, and 2) the training might be not effective and not enough for opinion leaders to understanding the CPM.

**Research Purpose:**
“To evaluate an educational strategy to increase neurologists’ adherence to specialty society-endorsed practice recommendations…We conducted a randomized, controlled trial to evaluate a multifaceted, evidence-based educational program to enhance the adoption of practice recommendations for the care of patients with dementia that were endorsed by the American Academy of Neurology (AAN) and local opinion leaders. We hypothesized that more neurologists who received the educational intervention would adhere more to the guideline recommendations than would neurologists who did not receive this intervention” (p.237).

**Place of investigation:**
Six major urban regions (Albany, Buffalo, the Upper East Side of Manhattan, Queens, Rochester, and Syracuse) in New York State.

**Type of data collection method:**
Sociometric Method

**Data collection procedure of identifying opinion leaders:**
To identify local opinion leaders, we mailed a survey to a random sample of half of all eligible persons in each region except Albany and Syracuse, where all eligible persons received the survey. This survey was completed before neurologists were randomly assigned to study groups. (pp.238-239)

**Who are the OLs?**
12 opinion leaders (1 in Albany; 2 in Buffalo, Manhattan, Rochester, and Syracuse; 3 in Queens)

**Notes:**
A specialty society-sponsored educational intervention involving local opinion leaders was effective in improving decision making for three of six practice recommendations, which shows a partial effect of the intervention.

“Passive efforts to disseminate guidelines, such as mailing copies of guidelines to physicians and educational programs, have generally been ineffective in changing physicians’ practice unless they are coupled with other methods, such as the use of reminders or financial incentives” (p. 243): This result is related to following studies:


Research Purpose:
This study is to investigate “whether a hospital intervention utilizing medical opinion leaders and performance feedback reduced the proportion of women who reported that surgeons did not discuss options prior to surgery for early stage breast cancer” (p.171).

Place of investigation:
28 hospitals in Minnesota in various conditions.

Type of data collection method:
Sociometric Method

Data collection procedure of identifying opinion leaders:
The authors identified opinion leaders through a questionnaire based on Soumerai, et al (1998) and Hiss (1978) and mailed to all surgeons who had a patient enrolled in the study during the pre-intervention period (p.173). “Respondents were asked to nominate local colleagues who best exemplified the following characteristics: Convey information so as to provide a learning experience, likes to teach, demonstrates a high level of humanistic concern, and is called on to discuss difficult cases” (p.173)

Who are the OLs?:
Nine ranking the highest on the attributes – six agreed to participate in the study.

Notes:
“The proportion of patients at intervention hospitals who said that their surgeon did not discuss options decreased significantly from 33% to 17%, but a similar decrease was observed among control hospitals. Using medical opinion leaders to intervene in hospital appeared as effective as performance feedback.” (p.171). In general, no significant effect on opinion leadership intervention was found.

**Research Purpose:**
“Objective of the present study is to develop a methodology to quickly and accurately identify educational influential within community hospitals, and to describe the personal characteristics which distinguish these individuals. The study has been the foundation for the use of EI’s as a deliberate means of delivering continuing medical education to their physician colleagues in small community hospitals” (p.283).

**Place of investigation:**
For instrument construction, 16 individuals were initially interviewed and 74 potential overlapping characteristics were identified.

**Type of data collection method:**
Sociometric Method

**Data collection procedure of identifying opinion leaders:**
Educational Influentials (EI) Identification of Instrument
In order to determine which descriptors might pertain to individual physicians who have influence on the education and patient care practice of their colleagues, several physicians and medical educators active in community hospital-based continuing medical education were interviewed. They hypothesized that some physicians might have influence on the professional behavior of their colleagues (p.284).

(See Appendix B for details of their opinion leadership instrument)

**Research Purpose:**
“The purpose of this study was to evaluate whether a marketing strategy would promote research-based intrapartum nursing practice and improve patient outcomes” (p.13)

**Place of investigation:**
Twenty Ontario hospitals.

**Type of data collection method:**
Sociometric Method

**Data collection procedure of identifying opinion leaders:**
“The EIs were identified via a one-page sociometric tool, an adaption of the physician tool used in previous EI trials. The tool contained three paragraphs describing caring nurses with expert clinical and teaching skills. Staff nurses completed the tool by listing colleagues who best fit the descriptions; the nurses named most often were the EIs” (p.16).

**Who are the OLs?:**
Selected people by using the opinion leadership instrument.

**Research Purpose:**
1. Who are the opinion leaders?
2. Educating hospital staffs and Implementing a new guideline for urinary catheter care in a hospital.

**Place of investigation:**
Queen Mary Hospital (QMH), a 1350-bed teaching hospital in Hong Kong.

**Type of data collection method:**
Sociometric Method

**Data collection procedure of identifying opinion leaders:**
Authors said Sociometric method, but this study actually used “informants’ rating” method

Questions:
“We are going to introduce a guideline for the control of catheter-associated urinary tract infection and we need the help of a nurse in your ward. Can you recommend someone who: (a) possesses good knowledge and/or interest on the subject, and (b) is able to educate the ward staff on the new guideline and effectively influence them to comply with the recommendations” (p.210).

Processes:
“Each nursing officer was asked to nominate three staff nurses according to the above criteria. They were also requested to indicate their first, second and third choice among the three nominees and a weight of ‘3’, ‘2’ and ‘1’ was then given, respectively. The total score thus obtained was designated the nomination score. All nominated staff nurses were in turn contacted by the ICN and were similarly asked the above question. They were then requested to nominate one of the three nursing officers in their ward, who in their opinion would be most competent for the task. In each ward, the staff nurse with the highest nomination score and the most frequently nominated nursing officer, were selected as OLs” (p.210).

**Who are the OLs?:**
The most frequently nominated staff nurses.

See exactly the same study:

**Research purpose:**
The research question is “will MPTM (mobile phone text messages) social networks produce more superficial ties within the network, or segmentation of the network (i.e., particular ties are strengthened while others become weak?” (p.695).

**Place of investigation:**
“Participants were 132 first-year law undergraduates in an introductory psychology class at a university in central Japan” (p.697)

**Type of data collection method:**
Sociometric Method

**Data collection procedure of identifying opinion leaders:**
“Participants were asked to ‘think of all the friends with whom you have contact, and select those who communicate with you via face-to-face or via voice telephone since entering university.’ One restriction was that participants could only list persons they had seen at least once during the past 2 weeks. Participants were allowed to list up to 10 individuals’ initials for each assessment” (p.698).
Research Purpose:
“This study evaluates, in a randomized controlled trial with community hospital physicians, two strategies for encouraging local implementation of a surgical practice guideline. The two strategies are audit with feedback and education using physicians nominated by their colleagues as opinion leaders” (p.2202)

Place of investigation:
This study took place during the 24 months of 1988 and 1989 in Ontario, Canada.

Type of data collection method:
Sociometric Method

Data collection procedure of identifying opinion leaders:
“All physicians engaged in obstetrical care in these four hospitals were mailed a questionnaire, previously validated in a survey of over 300 physicians, asking them to nominate the local colleague(s) who best match set descriptions of an educationally influential opinion leader” (p.2203)

Who are the OLs?:
“The four physicians identified by this process agreed to participated as their communities opinion leaders and attended and 1 ½ day work-shop on evidence for the practice guideline’s recommendations and on basic principles of behavior change” (p.2203).

Notes:
“After 24 months the trial of labor and vaginal birth rates in the audit and feedback group were no difference from those in the control group, but rates were 46% and 85% higher, respectively, among physicians educated by an opinion leader” (p.2202).

**Research Purpose:**
“Krannich and Humphrey (1983) concluded that because local change is increasingly the consequence of extralocal events and decision, local mobilization is large inconsequential. “In an alternative formulation of what Krannich and Humphrey (1983) have called the ‘growth machine hypothesis,’ this paper presents a model relating the extra local participation of influential to small town growth and applies this model in analysis of the distribution of growth in manufacturing and population among small towns in northwestern Wisconsin during the 1970s” (p.531).

**Hypothesis/Research Questions:**
“The central hypothesis of this paper is that, given similar ecological advantages in a context without local opposition to growth, the greater the extra local participation of local influential, the greater the locality’s participation in state and federal programs, and, partly as a consequence, the greater the locality’s rate of growth” (p.532).

**Place of investigation:**
88 small northwestern Wisconsin towns in 1970s.

**Type of Method:** Sociometric method

**Methods of identifying OL:**
“The measurement of the extra local participation of influential involved selecting influential and assessing their outside ties. Traditionally, community researchers have used informants in a locality to compile a list of its influential. In towns of the size included in this study, the position of municipal clerk is ubiquitous and, being central to local affairs, it generally results in an extensive knowledge of local activities and local actors. The measure of influential extra local participation is based on a telephone survey of municipal clerks carried out in early 1978” (p.533). “The municipal clerks or, where they had taken office only recently, their immediate predecessors were asked to name the five people who had been most influential in local affairs in the past five to ten years. Prior lists had been complied during personal interviews with county extension agents. Where the agents had given other names, the clerks were asked if these other names should be substituted in their list. To further increase the reliability of the clerks; responses, opportunities to adjust the list were also given later in the interview. Substitutions were infrequent and ever involved more than one person. Nearly two thirds of the named influential were owners or managers of locally owned businesses serving local market areas” (p.533-534).
““To gauge the extent of extra local participation of influential, the clerks were asked how often each influential traveled to a metropolitan center for reasons other than shopping—a few times a year or less, about once a month, a few times a month, or extensively (coded 0-3). An average was then calculated for each holiday” (p.534).
“The question of extra local travel had been pre-tested on the extension agents. It was one the clerks felt able to answer, and their answers generally corresponded with what had been learned about various towns and individuals from extension agents” (p.534).

**Notes:**
“Where local influential, generally people with a strong material interest in growth, traveled more extensively to metropolitan areas: (1) towns were more participative in state and federal programs; and (2) they had a greater share of growth in manufacturing and population than would be expected on the basis of their ecological characteristics alone” (p.538).

**Research Purpose:**
“The purpose of this study was to examine data emanating from an evaluation of an LO study to understand what OLs did, how they saw themselves, how they assumed their roles as OLs following training and their comfort with their roles as well as to discern those aspects of an OL initiative that appeared to contribute to success” (p.438)

**Place of investigation:**
Two communities; southern U.S.A and northeast U.S.A.

**Type of data collection method:**
Sociometric Method

**Data collection procedure of identifying opinion leaders:**
“OLs were selected in each community through surveys of the medical staff prior to the initiation of the program. The survey asked the primary care physicians in the two communities to name other primary care physicians with expertise in the general care of older physicians in three categories: (1) physicians who were educators about geriatric care, (2) experienced practitioners in the care of the elderly, and (3) caring professionals for the elderly”  (p.438-439)

**Who are the OLs?:**
The physicians who were most frequently nominated were 6 physicians in community A and 9 physicians in community B.

**Notes:**
Most identified opinion leaders “did not see themselves as opinion leaders and wondered how they were chosen. “Iam still mystified by it. I never thought of myself as an opinion leader.” Some struggled with ambiguity of being an OL and wanted more specific duties and role clarification… A year later, some still felt uncomfortable giving information to other physicians in a clinical discipline that they did not see as their area of expertise or subspecialty….Some expressed discomfort about the open-ended nature inherent in the initiative…Physicians who did not feel that they had expertise in dementia care had more difficulty assuming the OL role in this area” (pp.439-440).

“Many of the OLs reported personal improvement in their assessment and management skill of dementia” (p.440)

“The selection of OLs appears critical. There is probably not a ‘generic’ opinion leader. Ideally an OL requires some expertise, preferably through a certification-type designation or focused and extensive clinical work over many years, for his/her own comfort as an OL as well as recognition by peers” (p.440)

“Building OL competence is essential and while this can be enhanced in a short training program, it needs to be supplemented with ongoing contact and additional training for the OLs to develop educational strategies and comfort in their roles” (p.441)

**Research Purpose: (Research Questions)**

1. The socio-demographic, economic, system linkage and social psychological characteristics of opinion leaders and how they differ in these respects from non-leaders?
2. The most essential correlates which will help us predict opinion leadership.
3. The degree of specialization (or monomorphism) of opinion leadership in Indian villages. Is there a shift from polymorphic leadership to monomorphic leadership as one moves from more traditional villages to more modern villages?
4. The role played by village norms in the level of acceptance of new idea by opinion leaders.
5. The structural location of opinion leaders in the village power system and subsystems and the degree of homophily between opinion leaders and followers in personal characteristics, friendship ties and power positions. (p.9)

**Place of investigation:**

“In the first phase, 108 villages in three states; In the second phase, the focus was on the individual farmer, and eight villages were selected from the original 108 villages, which provided a sample of 680 farmers” (p.10).

**Type of Method:**

Sociometric Method

**Methods of identifying OL:**

“Respondents were asked to name one person whom they sought first for advice and information on each these problems. The questions were: if you needed advice on problems regarding the following matters, who is the one person in this village you seek advice from first? (If respondent mentions an extension agent, e.g., village level workers, then ask again)

1. technical problems associated with farming;
2. obtaining credit;
3. health; and
4. how to get the maximum return for your products” (p.11)

**Who are the OLs?:**

Attributes of opinion leaders in Indian villages are:

1. They are fully integrated into the village society as shown by their conformity to village norms;
2. They are recognized power-holders in the community and maintain their status by conventional means;
3. They are sought by followers as opinion leaders because of their authority and competence;
4. They are not innovators;
5. They maintain links with extra-village systems. (p.27)

**Research Purpose:**
“To evaluate a guideline-implementation intervention of clinician education by local opinion leaders and performance feedback to (1) increase use of lifesaving drugs (aspirin and thrombolytics in eligible elderly patients, beta-blockers in all eligible patients) for acute myocardial infarction (AMI), and (2) decrease use of a potentially harmful therapy (prophylactic lidocaine)” (p. 1358)

**Place of investigation:**
37 community hospitals in Minnesota.

**Type of data collection method:**
Sociometric Method

**Data collection procedure of identifying opinion leaders:**
“We used a one page questionnaire to identify local opinion leaders at each hospital from whom other physicians regularly obtained advice on AMI cases and whose personal attributes were most similar to key characteristics of opinion leaders” (p.1360).

**Who are the OLs?:**

“Opinion leaders are not necessarily innovators or authority figures, but are trusted by their colleagues to evaluate new information and assess the value of new medical practices in the context of local group norms (Greer, 1988); are approached frequently for clinical advice; have good listening skills (Lomas et al, 1991); and are perceived as clinically competent and caring (Hiss, 1978)” (p.1358)

**Research Purpose:**
“We tested the effectiveness of peer leader selection strategies and group creation within a school-based tobacco prevention program. Three conditions were compared: (1) random – leaders defined as those who received the most nominations by students, and groups created by randomly assigned students to leaders; (2) teacher – leaders and groups created by teachers; and (3) network – leaders defined as those who received the most nominations by students, and groups created by assigning students to the leaders they nominated” (p.1837)

**Place of investigation:**
16 middle schools in Los Angeles County, California.

**Type of data collection method:**
Sociometric Method

**Data collection procedure of identifying opinion leaders:**
“Peer leader data were collected by instructing students, ‘Think about the 5 people in this class who would make the best leaders for working on group projects. Write up to 5 names on the lines below, starting with the best leader on the first line.’ Students also were instructed to write numbers from a class roster next to the names to facilitate data entry. These data constituted a social network of peer leader nominations” (p.1839)

**Who are the OLs?**
People selected by the opinion leadership instruments

**Research purpose:**
This study reexamined the “two-step flow of communication hypothesis.”

**Place of investigation:**
Three agricultural communities in the Netherlands

**Type of data collection method:**
Sociometric Method

**Data collection procedure of identifying opinion leaders:**
In order to establish opinion leadership, three sociometric questions were asked:
1) Which two farmers do you ask for advice when you are not sure of the merits of new farming methods?
2) Which two farmers do you consider to be good farmers?
3) Which two farmers do you talk to most frequently?

**Who are the OLs?:**
1) The adoption of a new idea usually takes quite a long time, certainly in the case of methods which imply many changes in related spheres.
2) Mass media are major agents in arousing the interest in new methods early in the adoption process, but during a later stage personal contacts are especially influential in the decision to adopt a new method. Basically, this process is the same for opinion leaders and for their followers.
3) The first persons to adopt a new idea make intensive use of all sources which can provide reliable information about the idea including mass media as well as personal contacts with qualified informants.
4) Often these innovators and early adopters are also the opinion leaders of their groups, but the relationship between pioneering and opinion leadership is much closer in progressive than in traditional groups.
5) Problems, about which more information is badly needed, will often make people turn for advice to the best informed people in the community. These are usually people of a high social status.
6) On most new ideas, however, people will not feel an urgent need for information. In this case, people will get their information personally through casual conversations, mainly with people of about the same social status. (pp. 248-249)

**Research Purpose: EIP (Educationally Influential Physicians)**

“To explore the issue of EIPs among two disparate groups of specialists in Ontario. Identification of EIPs from the general surgery and pathology communities” (p.214). “We particularly wanted to identify pathology and surgery EIPs with special expertise in CRC because we were planning an intervention directed at surgeons and pathologists to improve colon cancer care in the province and felt that these physicians would be socially integrated within the groups we were targeting and would, consequently, have local influence” (p.215).

**Place of investigation:** Ontario

**Type of Method:**
Sociometric method

**Methods of identifying OL:**
A two-page survey developed by Hiss et al. (p.215)

“The wording that was used to describe the three EIP characteristics (knowledgeable practitioners, educators, and caring professionals who exhibit a high level of humanist concern) was minimally changed from the original Hiss survey instrument…Physicians were asked to indicate how they identified these members of their medical community from a list of sources (medical school, via colleagues, interaction through hospital department, professional medical meeting, informal social gathering, or by working in the same building)…Respondents also identified the designated positional leaders (i.e., head of department) in the community to determine if local EIPs filled these positions. Respondents physicians were asked to include demographic data, including age, sex, number of years in practice, and estimated volume of clinical practice that related to CRC” (p. 215).

**Notes:**
“Hiss criteria do not appear to appropriately describe all influential physicians within a local context…EIPs for CRC were not the only physicians within valued opinions within a social network – Domain experts also wielded local informal influence – It has been suggested that there are no “magic targets” in changing local practice patterns” (p.222).
Informants’ Rating Method


**Research purpose:**
“This paper describes the lessons learned when planning and implementing a needs assessment in a rural, southern, impoverished, and predominantly African American school system” (p.122).

**Place of investigation:**
Alabama County, Alabama.

**Type of data collection method:**
Informants’ rating Method

**Data collection procedure of identifying opinion leaders:**
“The first step in gaining entrée into the seven county schools was to meet with the acting superintendent during a state-sponsored administrators’ conference. Contacting a highly credible gatekeeper increased the likelihood of recruiting the entire school system and eliminated the risk of being perceived as “operating behind the superintendent’s back”…Following the initial meeting, the assistant superintendent was appointed to oversee all project activities” (p.123).

**Who are the OLs?:**
Invitees to the first meeting of the school health task force were selected by the superintendent, assistant superintendent, and university partners.
Research Purpose:
“The purpose of this investigation was to experimentally test an AIDS prevention intervention based on diffusion of innovation/social influence principles” (p.168).
“Peer norms influence the adoption of behavior changes to reduce risk for HIV infection. By experimentally intervening at a community level to modify risk behavior norms, it may be possible to promote generalized reductions in HIV risk practices within a population” (p.168).

Place of investigation:
Biloxi and Hattiesburg, Mississippi / Monroe in Louisiana in 1989.

Type of data collection method:
Informants’ rating Method

Data collection procedure of identifying opinion leaders:
“To identify key popular people, four club bartenders familiar with population members were trained to observe social interaction patterns within the city’s gay clubs. Each made unobtrusive behavioral observations in the clubs for one week, recording first names and a physical identifier for 30 persons observed to socialize and be greeted positively most often by men in the clubs” (p.169).

Who are the OLs?:
36 out of 82 names received multiple nominations and were considered as opinion leaders.

Notes:
The gay men who were in the intervention city significantly changed their risky behaviors, while those who were in the comparison cities had no or little change over the same period of time.

The following study is exactly the same study that this study:


Research Purpose:
“We investigated whether an intervention in which popular opinion leaders endorsed risk avoidance could reduce the rate of sexual-risk behavior among homosexual men visiting gay bars” (p.1501).

Place of investigation:
Eight cities, with population of less than 180,000, in Wisconsin, NY, West Virginia, and Washington.

Type of data collection method:
Informants’ rating Method

Data collection procedure of identifying opinion leaders:
“To identify popular opinion leaders, we trained bartenders in all the intervention-city bars to observe the crowds in the bar for 10 days and to record the names of people they judged to be the most popular with the other men (e.g., those who greeted others, were greeted most often, and were sought out for advice by gay male friends). – Frequency
Each bar had several bartenders, and each bartender made independent popularity nominations. Nomination lists were cross matched, and we took those whose names appeared on more than one list to be opinion leaders; we recruited these men for training. Each opinion leader was also asked to nominate one or two popular friends, in the same way, to attend training sessions. Smaller numbers of opinion leaders were recruited in cities with one bar and smaller crowds than in cities with larger crowds and more than one bar. The number of opinion leaders trained was about 8% of the total number of men present in each city’s bars during the baseline survey period” (p.1501).

Who are the OLs?:
Recruited gay people.

Notes:
“Social-network approaches may be particularly useful for HIV-prevention interventions at a community level since HIV-vulnerable populations commonly have behavioral norms different from the general population” (p.1504).

“We found that conversational messages systematically delivered by popular and well-liked opinion leaders to members of their social networks influenced the sexual-risk behavior of population members to a greater extent than did HIV education posters, brochures, and other printed information alone” (p.1504).

**Research Purpose: prosthodontist**
“The research reported here attempts to determine whether the concept of opinion leadership can be usefully extended in two ways: (1) to describe the influence that nationally recognized experts in a profession many have over time on the high-involvement decisions of professionals about an evolving technology, and (2) to explore the potential for influence by negative opinion leaders” (p.914).

**Place of investigation:**
National-wide, Boston area.

**Type of data collection method:**
Informants’ rating Method

**Data collection procedure of identifying opinion leaders:**
From the interview with dentists, leading prosthodontists in the area were identified.

**Who are the OLs?:**
Two groups of opinion leaders were investigated in this study: 1) Nonprecious metal advocates and 2) Gold advocates.

**Notes:**
“Advocates for nonprecious metal play a dual role in diffusion process: They both provide information and model the behavior…Advocates for the nonprecious metals teach skills to dentists and technicians alike” (p.920).

“Expert who dislike the innovation serve mostly as sources of information…Anti-innovation experts influence the evaluation of nonprecious metals by shaping and reinforcing opinion rather than through role modeling” (p.920).

“The positive opinion leader must propagate new skills; the negative opinion leader need only denigrate the innovation” (p.920).

“The sociometric approach was not practical for the national sample” (p.918).

**Research Purpose:**
“The purpose of this article is to improve the understanding of the process of introducing new products or services and to suggest a technique and conceptual framework designed to increase the likelihood of new product success. The technique described deals with ‘creation’ of opinion leaders” (p.20).

**Place of investigation:**
Geographically diverse high schools

**Type of data collection method:**
Informants’ rating Method

**Data collection procedure of identifying opinion leaders:**
“The initial step was to seek out social leaders among the relevant buying public—high school students. Class presidents, secretaries, sports captains, and cheerleaders were selected from geographically diverse high schools so as to insure separate spheres of influence. Their names were obtained through high school administration officials. Later research revealed that most of these students owned very few records, which suggests that they would not have been classified as opinion leaders under the usual predictive criteria” (p.21).

“The social leaders then were contacted by mail and invited to join a select panel to help evaluate rock-and-roll records. The panel was established for a period of several months. The introductory letter stressed several major points:
(1) The recipient had been carefully selected, and the organizers felt that he, as a leader, should be better able to identify potential rock-and-roll hits than his followers.
(2) In return for his help, he would receive a token of appreciation for his cooperation—free records.
(3) He was encouraged to discuss his choices with friends and to weigh their opinions before submitting a final vote.
(4) He would be told something about each specific record and the singing star. In addition, *Billboard Magazine* and record stores were suggested as sources of information to verify his attitudes and eventual choices.
(5) He was a member of a panel of leaders, and after the panel members had voted he would be informed of the outcome.
(6) He was under no obligation to join the panel and he could withdraw from it at any time.
(7) The experiment was essentially unstructured, but he would be informed of any expected or unexpected results.
(8) An informal two-way atmosphere was encouraged and any new ideas or suggestions would be welcomed and, if appropriate, adopted.
(9) He would be asked to answer a few simple questions each month, and the results of the previous month’s questionnaire would be made available to respondents the following month” (pp. 21-22).

**Research Purpose:**
“Using 1995 data, this study re-examines the social networks of leaders in five more and less viable rural communities in Missouri which were originally studied in 1989” (p.109).

**Place of investigation:** rural communities in Missouri

**Type of Method:**
A positional-Reputational method (Informants’ rating)

**Methods of identifying OL:**
“This method entailed compiling, with the assistance of local informants, a list of persons in each community who held positions in organizations, public offices or committees, businesses, religious groups, educational organizations, professions, and any other identifier of potential leadership. Informants from seven different institutional sectors in each of the five communities were then asked to select 15 leaders from the list of position-holders in their respective communities. Next, informants were instructed to select the five most influents leaders, then the next five most influential leaders, from their list of fifteen. Leaders who were identified in the top five were given a score of three; those identified in second five were given a score of two; and those identified in the bottom five ranks were given a score of one. Those scores awarded to the position-holders by the seven informants in each community were then summed, and the 15 persons with the highest scores were identified as community leaders” (pp.113-114).

**Who are the OLs?**:
“Of primary interest in both the 1989 and 1995 surveys was the measurement of the horizontal and vertical networks of leaders. Vertical ties were identified by the number of state offices leaders held in voluntary associations. Two types of horizontal ties within the community were identified. The first type of horizontal ties measured the extent to which leaders socialized informally with one another, ate breakfast on a regular basis, and shared a meal in one or the other’s home. The second type of horizontal ties measured the extent to which leaders worked with one another on specific community projects and whether or not they belonged to a community development association” (pp.114-115)

“Leaders in more viable places continue to work with a larger number of fellow leaders and to be more involved in community development organizations than their counterparts in less viable places. These findings show the importance of social capital for rural community viability” (p.109).
Research Purpose:
“This article describes the systematic use of lay opinion leaders in the North Karelia project, a comprehensive community-based preventative cardiovascular programme in Finland” (p.437).
“The aim was to assess the long-term feasibility and impact of this comprehensive community program” (p.444).

Place of investigation:
North Karelia county, Finland

Type of data collection method:
Informants’ rating Method

Data collection procedure of identifying opinion leaders:
“The project staff launched the activity together with the county’s heart association in every municipality of the area. (participation observation). The heart association staff, together with their local representatives, and the project staff interviewed key persons (“informants”) in each municipality” (p.438).

Who are the OLs?:
“Based on these interviews, two opinion leaders were selected for each village. They were usually active members of local organizations (e.g. a farmers’ union, housewives’ club, church, hunting club, heart association, village committee…” (p.438).
Two-thirds of the active lay workers were women (267 out of 399).

Notes:
“The basic attitude towards lay opinion leadership was largely favorable among the population and the workers themselves” (p.444)

“In many societies, females are more interested in health-related issues than males and may also be more effective in promoting the needed dietary changes in a community (Neittaanmaki et al, 1980)” (p.444).

Related Study:
Snowball Method


**Research Purpose:**
This study was to exam “whether or not network data and network analysis can help to evaluate the infectious agent hypothesis when studying a disease or disease outbreak of unknown etiology, and how an understanding of the structure of social networks might help to design appropriate containment strategies” (p.1204).

**Type of data collection method:**
Snowball Method

**Data collection procedure of identifying opinion leaders:**
“The data were provided by Darrow (1983), have been described in detail elsewhere, and consisted of information on 40 patients with AIDS. The initial 19 patients were diagnosed as suffering from AIDS and resided in LA or Orange County, CA. These patients were asked to name their sexual partners, and on the basis of the information supplied were found to be linked together by previous sexual contact. Similar interviews let to the discovery that 21 other patients with AIDS – who resided in San Francisco, NY, and other parts of the U.S. – could be linked by sexual contact the original 19” (p.1204).

**Who are the OLs?:**
Selected people were visualized through social network maps.

**Notes:**
“Increased personal mobility based on greater availability of inexpensive energy for transportation has led to structural changes in society during this century” (p.1205).

This paper advocates the usefulness of social network analysis.

**Research purpose:**
“This paper focuses on the identification of community leadership within the context of a community cancer prevention education program” (p.60).

**Place of investigation:**
Forsyth County, North Carolina

**Type of data collection method:**
Snowball Method

**Data collection procedure of identifying opinion leaders:**
“The sampling approach was a “modified snowball” technique in which a non-random sample of 10 recognized leaders in the black community initially were conducted. They were told they were being contacted as recognized leaders in the community and in the course of discussing the project, were asked to name others we should contact. Individuals they named were called and the process continued until no new names were generated by the last few respondents interviewed” (p.62).

**Who are the OLs?**
Selected people from the snowball data analysis.

**Research Purpose:**

“The objectives of the study were (1) to examine the feasibility of using social network information for case-finding activities; (2) to determine the nature and role of groups that may be actively involved in transmission; and (3) to examine the long-term impact of the pilot effort” (p.12).

**Place of investigation:**

Atlanta, GA

**Type of data collection method:**

Snowball Method

**Data collection procedure of identifying opinion leaders:**

“The team chose to begin with a 42 years old woman who had been diagnosed with syphilis in Jan. 1998, for whom one contact had been identified but not found, and whose case was closed administratively, in February 1998. The team reinterviewed this client in March 1998, and identified a small network of four syphilis-infected persons (including the previously identified contact) and their associated drug and sexual partners” (p.14).

**Who are the OLs?**

Selected people from the snowball data were visualized through social network maps.

**Research Purpose:**

“This study has a twofold purpose: (a) to assess policy actor centrality and prestige in the state reading policy networks and (b) to compare the network structure of the reading policy domain across eight states” (p.9).

**Hypothesis and results:**

H1: Government actors will occupy significantly more central positions than nongovernment actors in state reading policy networks. (Supported)

H2: Teachers organizations will be the most central actors among nongovernment actors in the state reading policy networks (Not supported)

H3: Government actors will occupy significantly more prestigious positions than nongovernment actors in the state reading policy networks. (Supported)

**Place of investigation:** 8 states – Alabama, California, Connecticut, Indiana, Maine, Michigan, North Carolina, Texas, and Utah.

**Type of data collection method:**

Snowball Method

**Data collection procedure of identifying opinion leaders:**

“This initial sample was supplemented by using the snowball sampling technique to ensure adequate coverage of the policy domain. At least one individual from each organization or group was included in the sample, with the most likely candidate being the head of the organization or director of government relations” (p.17)

**Who are the OLs?:**

430 individuals identified by snowball method

**Notes:**

1) The social network perspective is particularly well suited for examining the relational system in which social actors dwell and for exploring how the nature of relationship structures effects actor attitudes, behaviors, and well-being (p.13).

2) Social network analysis uses relational data that describe the relationships between actors.

3) One of the primary applications of social network analysis is the identification of the most important actors in a network. (using actor centrality – degree centrality)

4) A limitation of network analysis in general is its sensitivity to missing data, particularly the mission of key actors. Failure to include key actors in a network analysis may distort the overall configuration of the network and produce misleading results (p.18).

**Research purpose:**
“This study tests the effects of using frontline employees who are opinion leaders as designated service-quality leaders” (p.987).

**Place of investigation:**
A major commercial bank in Hong Kong

**Type of data collection method:**
Observation

**Data collection procedure of identifying opinion leaders:**
“To identify the opinion leaders, the branch managers of Branch C was asked to make independent and unobtrusive behavior observations of all the tellers in her branch and to nominate 6 tellers she believed were the strongest opinion leaders” (p.990).

**Who are the OLs?**
Identified people through unobtrusive observation.

**Research Purpose:**
“This paper focuses on the ways in which the social network influences (and is influenced by) innovation paths in a small business. It aims to analyze whether the position of early adopters of an innovation in the social network is a predictor of changes in the map of intra-organizational power” (p.2).

**Place of investigation:**
A small Italian firm that manufactures staircases

**Type of data collection method:**
Observation Method

**Data collection procedure of identifying opinion leaders:**
“We have used an ethnographic study to analyze the introduction of a new Information System in a small Italian firm producing staircases for home interiors. Our study is based on participant observations and ethnographic interviews. The term ‘participant observation’ refers to a process in which the research observes one or more actors, called ‘informants’, in their natural setting. The aim is to gather as much data as possible, linking the informants’ statements (from the interviews) to what has been observed directly to build up a grounded theory (Strauss and Corbin, 1990; Lofland and Lofland, 1995; Golden-Biddle and Locke, 1997)” (3-4).

“In the organization studied, participant observations started 1.5 months before the new Information System was introduced and ended 4.5 months afterwards. The top two levels of the hierarchy were observed, a total of 13 people. The overall observation hours amounted to around 2160; on average 160 hours for each actor observed, spread out over a week, in their daily working time. The interviews with the various informants were conducted at the end of the observations” (p.4).

“Field note analysis provided the starting point. By examining each interaction, we built up a first general interpretation of the phenomena and, on this basis, singled out an initial coding (open, axial, selective) of the interactions (Strauss and Corbin, 1990). The coding activities were performed by each observer separately and the coding criteria were then compared during weekly meetings to ensure a greater homogeneity for the data analysis. The coding, along with the knowledge of the actors involved in the interactions, allowed us to build actor-by-actor interaction matrices that permitted the use of social network analysis techniques” (p.4).

**Who are the OLS?**
“We notice that early adopters, who are peripheral actors in the social network, do not succeed in changing their position. Hence, we argue that the uncertainties fostered by the development of an innovation generate new judgments and behaviors in those actors who had initially supported the innovation…In fact, early adopters maintain their peripheral position until the end of the innovation process” (p.11).

**Research purpose:**
“This note reports the results of two empirical studies designed to (1) assess both the reliability and validity of the King and Summers (1970) opinion leadership scale and (2) develop and test a modification of that scale designed to improve its psychometric qualities” (p.185)

This study deals with scales of previous opinion leadership scales.

(See Table 3 in Appendix D)
Self-Designating Method


**Research Purpose:**
“The purpose of this research is to develop the concept of a marketplace influencer whose influence is based not on knowledge or expertise in particular product categories, but rather on more general knowledge and experience with markets. We develop a measure of this influencer, whom we call a ‘market maven,’ and relate this measure to marketplace behaviors and consumer characteristics” (p.83). (<- King & Summer study? + Informal communication)

**Propositions:**
1. “Market mavens will demonstrate earlier awareness of new products through (a) reported early awareness of new product across product categories and (b) awareness of specific new brands within several product categories’ (p.86).
2. “Market mavens will exhibit higher levels of information provision to other consumers across product categories” (p.86).
3. “Market mavens will demonstrate higher levels of general market information seeking through (a) readership of *Consumer Reports* and (b) use of diverse sources in acquiring market information” (p.86).
4. “Market mavens will demonstrate higher levels of general market interest through (a) enjoyment of shopping, (b) attention to advertising, and (c) use of coupons” (p.86).

**Place of investigation:**
A large northeastern metropolitan area

**Type of data collection method:**
Self-Designating Method

**Data collection procedure of identifying opinion leaders:** (King & Summers, 1970; Rogers & Cartona, 1962)
A probability sample of 303 male and female heads of house holds; “The measure we used allowed respondents to name a brand, product type, product class, or some other product grouping (e.g., health foods, woolen goods, personal computers, Italian spices) as an area of expertise. We classified as an opinion leader anyone who felt that s/he is knowledgeable about some product and that s/he influences other people about this product. Specifically, individuals were defined as opinion leaders if they answered ‘yes’ to two questions: Is there a particular kind of product that you feel you are very knowledgeable about? If so, do you think that you ever influence other people in their purchase of or opinions about this kind of product?” (pp.87-88).

**Who are the OLs?:**
“46% of the total sample reported being an opinion leader in some self-selected product category. The correlation between the market maven and opinion leader measures is .22. With such a large sample, this correlation is significant, despite being modest in size” (p.88).

“We demonstrate that market mavens are distinct from opinion leaders and early purchasers…Market mavens enjoy shopping and use browsing and shopping as an important way of finding out about new products” (p.94).

“Opinion leaders and early purchasers of products have been a particular focus of attention in marketing communications…Though these groups are important prospects when a marketer is interested in diffusion of new product information, they may not be as important in communicating other information such as changes in prices or availability of products, new stores, and so on” (p.94)

“Targeting opinion leaders may be very effective in diffusion information about products such as automobiles or personal computers, but ineffective for products such as refrigerators or dehumidifiers (Bloch, 1986)” (p.95).

**Research Purpose:**
“The authors describe the development and validation of multiple-item self-report scales to measure opinion leadership and opinion seeking for specific product or service domains” (p.137).

**Type of data collection method:**
Self-Designating Method

**Data collection procedure of identifying opinion leaders:**
“We used the blueprint described by Churchill (1979) and more recently by Spector (1992) to develop scales to measure opinion leadership and opinion seeking for a specific product field. The first step was the generation of a pool of items from which final scales could be selected. Rogers and Cartano’s (1962) definition of opinion leadership and our corresponding definition of opinion seeking were used as starting points. Based on a review of the literature, a list of 13 opinion leadership and 8 opinion seeking items were generated by two marketing professors and an advanced doctoral student. After the list was revised by each scale developer for content validity to ensure that it tapped some aspect of the construct being measured, the 21 questions were examined for face validity by six Ph.D. students. Their comments and revisions yielded a list of 11 opinion leadership questions and 8 opinion seeking questions” (p.139).

“We conducted five studies to purify the scale items in the manner described by Nunnally (1978), Churchill (1979), and Spector (1992). This is an incremental process that seeks to increase the internal consistency of the scale to maximize its reliability and to enhance and to demonstrate the validity of the scale. The goal is to retain the items that form a reliable and valid measure. Although reliability and validity are never proven, we can accumulate evidenced that the scales possess thees critical characteristics and this is the goal of the five studies” (p.139).

(See Table 4 in Appendix D)

Research Purpose:

“It was hypothesized that an innovative predisposition toward online buying would be associated positively with more hours of Internet use, greater Internet purchasing, higher likelihood of future Internet purchase, and use of the Internet to download music” (p.149).

_results show all positive!!_

Place of investigation:
117 undergraduate business students at a large southeastern U.S. university

Type of data collection method:
Self-Designating Method

Data collection procedure of identifying opinion leaders:
“Survey participants completed a multi-page questionnaire at the beginning of the semester in January, a second questionnaire about seven weeks later, and a final questionnaire at the end of the semester in April, 15 weeks after the first. The questionnaires contained a variety of self-report measures including demographics, the Domain Specific Innovativeness Scale (DSI), and seven Internet-related buyer behaviors” (pp.152-153).

“Demographic questions appeared in the January questionnaire asking the consumers to report their age in years, their gender, class standing (freshman, sophomore, junior, senior, graduate student, or other). They were also given six categories to report the socio-economic status of their families that ranged from ‘Unskilled worker, perhaps unemployed’, to ‘the local elite with inherited wealth and family tradition’” (p.153).

“The DSI appeared in the second questionnaire. The items were written to measure how innovative consumers are with regard to buying over the Internet. One item read: ‘In general, I am among the last in my circle of friends to purchase something over the Internet.’ Along with the DSI appeared three questions asking the respondents to report their likelihood of ‘Buying Products Online’. These were worded ‘How likely are you to buy (snack foods/CDs or tapes/skin care) online?’ A five-point response format was provided where 1= definitely will not buy online, 2= probably will not buy online, 3= might buy online, 4= probably will buy online, and 5= definitely will buy online’” (p.153).

“The third and final questionnaire contained measures of the final dependent variables representing additional Internet-related buyer behaviors. The respondents were asked to report the average number of hours they spend on the Internet in the past week, labeled NETUSE. These estimates ranged from 0 hours (only one person) to ten hours (three respondents) in the last week. One questions asked ‘Regardless of how much you buy online now, how likely are you to buy online in the coming year?’ and use the same response
format as the earlier three buying likelihood questions. This variable was labeled LIKELY. One question conceded downloading music from the internet. It asked, ‘Have you ever downloaded music from the Internet?’ Responses were coded so that 0= No and 1= Yes. This variable was labeled MUSIC. To measure the amount of online buying, three questions were used. The first asked ‘How often would you say that you purchase online?’ and used a five-point response format where 1= never, 2= rarely, 3= sometimes, 4= often, and 5= very often. The second question asked ‘…how often do you purchase online?” using a six-point response format where 1= never do, 2= less than once a month, 3= less than once every two weeks, but more than once a month, 4= only about once very two weeks, 5= about once a week, and 6= more than once a week. The third item asked respondents to record ‘How many times have you bought something online since January 1, 2001?’ Since these three questions used different measurement scales, the responses were intercorrelated and submitted to a principal components analysis” (pp.153-154).

**Research Purpose:**
“This study evaluated the dimensionality, internal consistency, discriminate validity, and predictive validity of a self-report scale for consumer opinion leadership within a specific product field” (p.28).

**Place of investigation:**
117 undergraduate business students at a large southeastern U.S. university.

**Type of data collection method:**
Self-Designating Method

**Data collection procedure of identifying opinion leaders:**
”The first questionnaire contained the opinion leadership scale written in three formats to reflect consumption behavior for each of the target product categories: new snack foods, CDs and other forms of recorded music, and skin care products. Discussions with students revealed these to be relevant product categories for these consumers. The instructions for each section read: ‘Who do you talk to about new snack foods (new music CDs or tapes; new skin care products)?’ The opinion leadership items were mixed with other similar items unrelated to the purpose of the present study. We used six versions of this questionnaire to systematically vary the order in which the three product categories appeared. A five-point agree/disagree response format was used. Fifteen weeks after the first questionnaire was administered, another questionnaire was given to the same student consumers. One section entitled: ‘What did you buy and whom did you talk to?’ After questions asking whether they had purchased any new snack food (CDs, tapes, or downloads; skin care products) and the names of those they could remember, a question asked, ‘If you purchased new snack foods (music, skin care products), did you tell anybody about them?’ ‘Yes’ or ‘No.’ The next question asked ‘If you told others about the new snack foods (music, skin care products), how many people did you tell?’ These last two questions operationalized the dependent variable, amount of interpersonal communication about the product category” (p.30).

**Who are the OLs?:**
1. “Opinion leadership for one product category is not overlap with opinion leadership for other unrelated product categories” (p.30).
2. “Within any product category, people who score high on opinion leadership are more likely to tell other consumers than those who score low” (p.30).
3. “Within any product category, people who score high on opinion leadership should tell more people than those who score low” (p.30).

**Notes:**
Polymorphism: the degree to which an individual acts as an opinion leader for a variety of topics.

**Research Purpose:**
“Consumer researchers describe two types of consumers they term ‘the consumer innovator’ and the ‘market maven.’ The present study examined the relationship between these two constructs as a part of a nomological network analysis” (p.54).
“ This study’s purpose is twofold: the primary contribution is to establish the distinctiveness of the two constructs (i.e., establish construct validity for each concept in a nomological network), and secondarily, to examine the relative contribution of each construct in explaining shopping behavior.” (p.55)

**Hypothesis:**

1. “There is a positive correlation between scores on the consumer innovativeness scale and scores on the market maven scale” (p.56). – o.k.
2. “Consume innovativeness and market mavenism are two separate constructs” (p.56). Mod.
3. “Both the consumer innovativeness scale and the market maven scale are positively correlated with a measure of opinion leadership” (p.57). – o.k.
4. Scores on the innovativeness scale should be negatively correlated with scores on a measure of price sensitivity” (p.57). – negative correlation – o.k.
5. Scores on the market maven scale should be uncorrelated with scores on a measure of price sensitivity” (p.57). – positive – o.k.
6. “Both the consumer innovativeness scale and the market maven scale are positively correlated with a measure of the amount of time spent shopping” (p.57). – o.k.

**Place of investigation:**
Student sample

**Type of data collection method:**
Self-Designating Method

**Data collection procedure of identifying opinion leaders:**
“The opinion leadership scale (OLS; Flynn et al. 1996) is used here to measure a consumer’s propensity to be asked for and give advice to other consumers about methods and means of shopping” (p.59).

“Opinion Leadership Scale (Seven-point Agree/Disagree Response Format)” (p.58).

1. I often persuade other people to but the products that I like.
2. Other people rarely come to me for advice about choosing what to buy.
3. People that I know puck their purchases based on what I have told them.
4. My opinion on what to buy seems not to count with other people.
5. I often influence people’s opinions about buying things.
6. When they choose products to buy, other people do not turn to me for advice.

**Research Purpose:**
“The main purpose of the present study was to re-examine sex and racial influences on fashion attitudes” (p.413).
“The present study reexamined these issues using samples of black and whites matched for age and levels of income and education” (p.411).

**Place of investigation:**
Predominantly white and predominantly black universities.

**Type of data collection method:**
Self-Designating Method

**Data collection procedure of identifying opinion leaders:**
“The questionnaire contained several demographic items, including a five-point scale asking for estimates of monthly spending for new fashions. The range was in fifty dollar increments from ‘under $50.00’ to ‘$200.00 and over.’ The other dependent variables were measured by either psychographic items or self-designating questions.
General opinion leadership, generalized innovativeness (new brad trier), and fashion consciousness were measured by ten Activities, Interests, and Opinions (AIO) items described by Tigert and Arnold (1971).
Fashion innovativeness and fashion opinion leadership were measured by six self-designating items described by Hirschman (1980b) with a four-point response format. Higher scores indicated greater levels of these variables” (p.415).

**Notes:**
Sex, income, education, and socioeconomic status seem to play a more important role in shaping fashion attitudes and behavior than race alone.

**Research Purpose:**

H1: Relative to whites, black innovative communicators will have lower socioeconomic status. (Supported)

H2: Because of their lower income levels relative to whites, black innovative communicators will place more emphasis on pricing of merchandise, credit policies and return/guarantee policies in retail stores. (Only supported for credit/billing policy category)

H3: Because of their lower socioeconomic status relative to whites, and past discrimination, black innovative communicators will have less access and, therefore, possession of credit card. (Supported)

H4: Because of greater prior problems in obtaining satisfactory service from sales people in retail stores relative to whites, black innovative communicators will place more emphasis on this store attribute. (Not Supported)

H5: Black innovative communicators will have a greater tendency to shop at discount stores than will whites. (Not Supported)

H6: Black innovative communicators will utilize different types of mass media than will whites. (Supported)

H7: Because of their desire to maintain ethnic boundaries and the stronger development of informal groups generally found in smaller communities, black innovative communicators will exhibit a lower degree of involvement in formal groups and social activities than will whites. (Supported)

**Place of investigation:** Atlanta, Georgia.

**Type of Method:** Self-designating method – A random digit dialing technique

**Methods of identifying OL:**

- A random digit dialing technique was used to gather the sample, which helped minimize possible bias against new arrivals and unlisted numbers caused by using the telephone directory.
- Five call-backs were made for all telephone numbers included in the sample to reduce non-response bias.
- All interviewing was conducted from 6:00pm to 9:30pm weeknights to help insure an adequate representation of working persons. (p.105).

(See Table 6 in Appendix D)

**Research Purpose:**
“The central focus of this article recognizing the critical role of interpersonal communication, is on the overlap of opinion leadership across topic areas” (p.43).

(1) “Is opinion leadership generalized? Do opinion leaders in one topic area tend to be opinion leaders in other topic area?” (p.43).
(2) “Do opinion leaders tend to overlap more or less across certain combinations of topic areas instead of other combinations of topic areas” (p.43).

**Place of investigation:**
Marion County (Indianapolis), Indiana

**Type of data collection method:**
Self-Designating Method

**Data collection procedure of identifying opinion leaders:**
“The measure of opinion leadership used in this project was a modification of the six question self-designating method used by Rogers¹ and discussed by Rogers and Cartano.² The use of the self-designating method was necessitated by the fact that the random sample of 1,000 housewives was made in a county of 200,000 households. The choice of Rogers’ method was based on its validity, reliability, and intuitive appeal.”³ (pp.45-46)

(See Table 6 in Appendix D)
(Modification of Rogers’ scale included: (1) omitting the word “new” in each of the six questions to remove the bias in favor of innovators; (2) adding an additional question; and (3) changing the order of questions.

The research explored the dynamics of new product adoption across a range of product categories including packaged foods, household cleansers and detergents, women’s fashions, cosmetics and personal grooming aids, drugs and pharmaceutical products, clothing materials, and large and small appliances.

**Who are the OLs?:**
Selected people by using the instrument.

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**Research Purpose:**
“This paper reports the results of an investigation into the characteristics of opinion leaders in 8 different cultures” (p.5): 4 western; 4 eastern.

**Place of investigation:**
Undergraduate business or marketing students at ten universities in eight countries.

**Type of data collection method:**
Self-Designating Method

**Data collection procedure of identifying opinion leaders:**
“The [opinion leadership] scale used in the present research is slightly more sensitive than that of Childers (it uses a 7-point rather than 5-point scale) and contains one further refinement. Item 7 in the original scale is a ‘give-away’ direct self-assessment of opinion leadership. It is not subtle in any way, and respondents could clearly see the purpose of the instrument. In the present study this item was separated from the other six and placed at the very end of the questionnaire after a section collecting basic demographic data, so that answers to the other questions would not be biased. This single item provides a direct measure of opinion leadership, this is used to validate the six rather more indirect items of the main scale. This six-item scale as used in the present study is shown in Table 1. The single-item measure is shown at the foot of the table” (p.7).

“From the answers to the six items, a single average score of opinion leadership (O/L) was computed for each respondent, where ‘1’ indicated an extremely high level of opinion leadership and ‘7’ an extremely low level. Subjects scoring less than 4 on this scale were deemed to be opinion leaders, whilst those scoring 4 or more were designated non-opinion leadership. Those responses falling on the mid-point of the scale are treated as indicating non-opinion leadership is merely a subjective interpretation of the data. This is an ‘absolute’ interpretation of self-reported opinion leadership commensurate with the etic research approach adopted here” (p.8).

(See Table 6 in Appendix D)

**Notes:**
“Difference between opinion leaders and non-opinion leaders were investigated over the eight countries. Two of the factors, ‘expertise’ and ‘sociability,’” differed for all cultures tested; “maturity,” showed a significant difference in three Eastern cultures; “wealth” varied only in Indonesia” (p.5).
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(For Figure 4 & 5)

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