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FRIENDS, RELATIVES, AND RELEVANT OTHERS: CONDUCTING ETHNOGRAPHIC NETWORK STUDIES

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INTRODUCTION TO NETWORK RESEARCH

There is a Spanish proverb that states, "Di me con quien andan, y dire quien eres," which generally translates as "Tell me who you walk with, and I will tell you who you are." We all reflect our values and beliefs, as well as our hopes and accomplishments, through the people with whom we choose to associate and those whom we avoid. Our social world is made up primarily of our family and friends, work partners, acquaintances, and the organizations and communities in which we participate. Anthropologists have studied the composition of these relationships, or social networks, in villages, towns, and urban centers all over the world. Social scientists most frequently

Definition: A social network is a specific type of relation linking a defined set of people, organizations, or communities

have used studies of social networks for two purposes: to identify the members of and patterns of interaction among groups of various kinds, including friendship, work, and kinship groups; and to select respondents or participants for a research study by identifying people who know or know about each other. The latter procedure is called "network sampling" and is described in Books 1 and 2.

Today, however, the social network approach has been put to use for more sophisticated purposes. Once ethnographers noticed how group structures differ within and between cultures, and began to question how these differences might influence what people think and do, network research gained importance in understanding and predicting individual knowledge, behavior, and beliefs. Differences in the ways in which organizations are structured, as well as in the positions people occupy within them, affect the flow of information, constraining not only the amount but the specific content of information that people receive. Studies of social networks allow social scientists to explore cultural differences in the ways that humans organize themselves into groups, communicate about critical life circumstances, and work out the problems they encounter in everyday life. This information can be used to very good effect in studies as widely different as explorations of drug use patterns, analyses of why parents choose particular schools for their children, or investigations into the reasons people do or do not welcome agricultural innovations.

In this chapter, we use an extended case example to describe the use of ethnographic network analysis. In our case example, network analysis was instrumental in identifying various kinds of drug user networks; it also illuminated how different patterns of behavior among the drug users within specific networks are affected by the different bases or purposes upon which the networks are based. Although the extended example used in this chapter is drawn from medical anthropology, the techniques used in

this study could be applied to the study of any kind of social network. Typical applications of social network research might include studies of the implementation of educational innovations, shifts in voting behavior or diffusion of health care information in a community, and reorganization or restructuring of bureaucratic institutions. We believe that such studies are particularly useful for intervention programs whose purpose is to induce change in how a particular group of people behaves.

Two different approaches to understanding cultural networks are important in ethnographic research. The first, systematic exploration of kinship groups, was summarized by Pasternak (1976). The second, ethnographic exploration of social networks, was spelled out by Elizabeth Bott (1971) in studies she conducted in England. These two works represent anchor points for ethnographically framed social network analysis. The first describes methods for collecting data on, and comparing the ways that different cultures identify, genealogical relationships. The second provides both in-depth exploration of the intimate or personal support networks that most people use to survive in their culture, and a model for exploring these relationships across cultures. Following these studies, anthropologists have crafted increasingly fine-tuned examinations of both informal and formal human groups and associations (Galaskiewicz & Wasserman, 1993; Johnson, 1994; Wasserman & Faust, 1993). These works have allowed us to expand our knowledge of the dynamics and effects of both kinship and nonkinship networks in all aspects of human cultures.

There are a number of ways to approach social network research in ethnographic studies. These range from the purely qualitative descriptions of groups and associations to highly technical quantitative models derived from graph theory and matrix algebra. These approaches are compatible with each other, and each provides valuable insights into human cultures. In combination, they provide power-

ful explanations for the ways in which humans think, act, and organize their daily lives within their personal cultural context. The same approaches described in this chapter for describing and analyzing social networks consisting of individuals can be applied to networks consisting of organizations such as service agencies, towns, cities, and larger social entities. The three primary contemporary approaches to networks are the following:

1. The ethnographic exploration of social networks
2. The investigation of ego-centered (single-person-focused) networks
3. The collection of data on full relational networks, where each person describes his or her relationship with each other person in the network

Ethnographic Network Mapping

We first describe ethnographic network mapping, a type of network research that can be used to describe family groups, friendship networks, work groups, voluntary associations, problem-solving groups, and any other types of social groups that are found in different cultures. Ethnographic network mapping is accomplished through extensive qualitative interviewing at the community level, combined with observations of people's behavior. An example of this approach currently in use in medical anthropology is the study of drug-using networks (Friedman, 1995; Latkin, 1995; Trotter, Bowen, & Potter, 1995). These drug networks are groups whose primary purpose is purchasing, distributing, and using illegal drugs. The ethnographic description of these networks includes the following:

Definition: Ethnographic network mapping uses ethnographic field research methods to describe the most common groups found in a culture

- The identity of people in them
- How people define or self-define themselves as group members
- The rules people use for including and excluding members

- Familial and sexual relationships within the groups
- Information about how group members avoid the police and prosecution

These are, of course, only a few of the interactions that occur within such groups, and between these groups and others, such as the police and other drug traffickers. Ethnographic network studies provide descriptions of the individual and group cultural context of drug use (such as crack houses, local manufacturing and distribution systems, or police approaches to drug busts) and create typologies or classifications of different types of drug use networks. These studies are very useful for understanding group-based differences in drug use and creating targeted intervention and education activities for the highest risk groups (Trotter, Bowen, & Potter, 1995). Classic gang studies also use the concept of ethnographic networks, considering differences in group organization and functions, and changes in groups in space and over generations.

Ego-Centered or Personal Network Research

The second approach to network research focuses on ego-centered (personal) networks. Studies based on this approach describe index or focal individuals (often called egos) and all of the people (sometimes called "alters") whom these index individuals identify as being associated with them. The data collected on personal networks usually include information about the size of the network, as well as the gender and ethnic composition, age, and socioeconomic attributes of all of the people that egos name as being close to themselves. This allows the researcher to describe "typical" network profiles. These profiles can be related to an infinite variety of other characteristics (level of social support in a specific cultural area, success in personal relationships, risks for infection, quality of life,

Definition: Ego-centered networks are the personal networks of individuals, also called "egos" or "focal individuals"

Definition: "Alters" are those people whom index individuals (egos) identify as members of their personal networks

educational attainment, types of help-seeking behavior that members use regarding their health, ideas about success in the future, etc.) that are associated with people's lives. One result of ego-centered network research is that it gives ethnographers the ability to describe the context of people's lives beyond their individual social and psychological characteristics. These contextual elements can be treated as variables and then used to describe the ego's network characteristics, much as demographic variables such as sex, age, political affiliation, and ethnicity describe individual egos.

Full Relational Social Networks

Definition: A full relational social network is a socially bounded group in which the relationships of all members to each other can be defined

Definition: A naturally occurring social network is one that exists and interacts in a specific setting independent of researcher intervention

The third approach to network research is the study of full relational social networks, which requires different analysis procedures (Knoke & Kuklinski, 1982). This approach requires the researcher to identify a naturally occurring social network and to explore key relationships among and between all of the members of the network. This is accomplished by either observations or interviewing, or a combination of the two. The questions or the observations are designed to allow the ethnographer to explore reciprocal actions that potentially take place between each member of the network and each other member. All of the questions asked, and the observations conducted, focus on questions about relationships that are phrased in terms of what respondents are doing with one another, such as, "Who attends social events with each other?" "Who trusts whom?" and "Who shares food, space, or ideas with whom?" and discovering through additional inquiry more about the question. For example, ethnographers might ask, "Which social events occur?" "What purposes do these events have?" and "What do people do together there?" These questions usually can be qualitative—that is, they are phrased as

open-ended or semi structured questions if the social network is small enough for the researcher to conduct in-depth interviews with all of the members. Larger networks (10 people or more) call for quantitative interviews and could include such specific questions as "Did you ever share a needle with X?" (answer yes or no) or "How many times in the past 30 days did you share a needle with X?" (answer in absolute numbers).

These relationship questions allow researchers to

- Explore both the actual and potential connections between people in the network
- Describe the primary sources of power, influence, and communication in a network
- Find subgroups within the network
- Identify common or unusual social roles and positions in the networks
- Find bridges between networks and portions of networks
- Identify and compare the overall structure of one social network with others

The results of these studies can be used in a number of practical solutions to human problems by identifying people or organizations who can influence the behavior of the remainder of the network in some desired fashion, or by making use of the social network itself to set group goals and change group norms in relation to behaviors that are to be modified.

The social network approach allows ethnographers to move beyond the level of the individual and the analysis of individual behavior into the social context where most people spend the vast majority of their lives, living and interacting with the small groups that make up the world around them.

Definition: Subgroups are subunits within a larger network that are distinctive because the people or units in them are more strongly interconnected with each other compared with other parts of the network

Definition: Bridges are people or organizations that connect two networks

KEY CONCEPTS FOR ETHNOGRAPHIC APPROACHES TO SOCIAL NETWORKS

Key point   *Ethnographic studies of sociocultural networks are needed in almost all areas of life.* Some of the most common subjects for these studies include the following:

- *Defining the boundaries and core participants* of social groups
- *Creating network typologies* that explain the variation in people's life experiences
- *Studying embedded behaviors* (the things that go on in specific groups)
- *Exploring cross-group differences* in the cultural behavior of networks

Cross Reference: For a definition of culture, see Book 1

Definition: Boundaries constitute the edges of networks and are defined by rules for entry and exit from groups as well as by other cultural patterns of participation that differentiate one group from another

Cross Reference: See Book 2, Chapters 5 and 6, for more information on observation and open-ended interviewing

Definition: Bounded groups are networks with clearly defined membership

Boundaries and Bridges

Understanding the existence of and being able to identify boundaries, the "edges of networks," and bridges are central to any understanding of both small and large groups. Ethnographic techniques, including direct, long-term observation of behavior and relationships, provide important clues to the formation maintenance, change, and dissolution of network boundaries and the identity and functions of people or groups of people who serve as bridges between networks.

The mechanisms that allow a group to get together, identify itself as a group, maintain an identity (even with changes in membership over time), and eventually loosen its boundaries and disappear can all be explored descriptively through observation and open-ended interviewing. Ethnographic documentation shows that these conditions change according to key environmental and cultural conditions, such as population density, gender differences, and cultural values and beliefs. Once bounded groups have been identified, it is possible to determine how interpersonal connections are created between different people and groups of people, and to understand the strength of the links between network members.

The ethnographic study of bridges and boundaries helps social scientists understand both the cognitive models of roles held by network members and the indigenous understandings of the conditions that produce and maintain boundaries at the edges of networks. For example, detailed qualitative description of the behavior and function of boundaries and bridges between networks can be used to create a model of how vulnerable different types of networks are to infectious disease risk. This type of description also can show how a teenage fad is transmitted throughout a high school, or be used to trace a technological innovation through a culture.

Network Typologies

Ethnographers can use typologies of networks or descriptions of different kinds of networks as useful tools for understanding some of the cultural variations that exist within any group. Different types of networks may be focused on a particular problem, a resource, an idea, or a social condition. For example, lifestyle groupings such as the following can typically be found among teenagers in most high schools in the United States; they clearly reflect different behaviors and interests:

- Skaters
- Jocks and cheerleaders
- Drug users
- Preppies
- Dweebs and nerds

Ethnographers generate typologies by looking for the terms that people use to define such natural groupings, identifying common behaviors that cut across groups, and describing relationships within and between groups. The groupings

listed above represent only one kind of typology of peer groups in high school settings. Typologies advance our understanding of the important social relationships that exist in networks. They can be used to generate hypotheses about social groups that can be tested in other studies. They allow us to classify differences among social networks based on conditions such as the amount of time people spend with relatives, the types of economic exchanges in which people engage, the risks people are willing to take, or any other set of social conditions that is important for understanding a culture.

An example of how a typological study can be carried out comes from the Flagstaff Multicultural AIDS Prevention Program (FMAPP). In this study, we asked a series of questions guided by structural characteristics of networks. Terms that we used to describe networks are defined in the margin.

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Case Study
FMAPP project

The purpose of the FMAPP project was to find new ways to reduce the transmission of HIV among active drug users. Some of the questions that the researchers asked elicited information on the following:

- How long people had been using drugs
- What drugs they used
- Why they were using drugs
- What kinds of risks they were taking (especially those risks that might lead to HIV infection)
- What their own drug-using networks' characteristics were

The purpose of these questions was to provide an overview of local drug use and drug-using groups. One of the first uses of our ethnographic network mapping was to develop a drug networks classification or typology to see if risks varied across different kinds of networks. Our ethnographic interviews indicated that there were three major structural conditions that differed among the various drug networks. These were the following:

- The openness versus the closed condition of networks
- The types of social bonds present in the groups
- The different kinds of social interactions that existed between network participants

We measured the openness of the networks by the number of new members recruited over time, combined with the length of time it takes for someone to join a network from the outside. An open network is one that has a high percentage of newly or recently recruited members; a closed network is one that does not allow the recruitment of new members to any significant degree over time.

The types and the number of social bonds we identified across different groups include kinship relations, long-term friendships, shorter term acquaintanceships, and weak or close-to-anonymous relationships. A single drug-using group may include all or only some of these relationships.

The third variable we used to construct our classification was the type and amount of social interactions (or activities) that exist within networks, such as group drug use, joint recreational activities, or work-related associations. Joint drug use, in particular, is a key social activity for these groups. For this variable, we defined at one end of the continuum the absence of any joint social activities for the group as a whole. Moving away from this end of the continuum, the next level of interaction we observed was face-to-face activities limited to dyads or triads in the group. The far end of the activity continuum included a high level of social interaction, including parties, participation in Softball leagues, and other recreational activities involving the entire group.

Our ethnographic network data combined these three structural domains to produce a typology with four distinct, internally consistent, and externally divergent kinds of drug networks. These were the following:

- Long-term injector networks
- Family-based drug networks

Definition: The openness/ closedness of networks refers to the number of new members recruited during a designated period of time

Definition: Social bond refers to the type of relationship between ego and other members of the network. Social bonds may be multiple and weak versus limited and strong

Definition: Social interactions refer to activities in which network members participate together

- Friendship-based networks
- Convenience networks

We found that *long-term injector networks* often included individuals from a variety of social, economic, and ethnic backgrounds. The primary purpose of such a group was to pool resources for the acquisition of drugs. Joint drug use activities did not extend very much beyond "scoring" (acquiring drugs). The group had social bonds based on kinship and very long-term friendship that helped to maintain the group, but the members almost never got together socially. One of our ethnographic respondents described the group's primary activity, "scoring":

> Somebody in the group will get ahold of the others when they want to score or when they are going to score. Whoever wants some will put their money together and someone will go to ... (major city).... usually and get the stuff and call the others. The others will come and get their part and go home and use.

These drug users tended to be very secretive. Most of them were married or in monogamous relationships. They were employed at various economic levels. They might use drugs on a maintenance level during the week and get "loaded" on weekends or special occasions. The major area of risk for HIV transmission was contact with people outside of their own group (weak ties) whose HIV status was unknown.

Definition: Weak ties are links between people characterized by lack of intimacy and infrequent contact

These networks are quite different from *family-based networks,* which are predominantly kinship groups (parents; children; siblings; in-laws; or fictive kinship, godparenthood, or *compadrazgo* relationships in the Hispanic communities). One particular drug network we studied consisted of a three-generation family of more than 10 injection drug users. Members of this network were born into, had married into, or had a steady sexual partner in the group. The participants had gone to school together, and many were raised together. The groups tended to be homogeneous in terms of socioeconomic status and ethnic identification. Drug use with this group could be considered a family tradition; a special case of peer pressure. The individual faced very strong pressure to conform to group norms. The nonuser was considered to be condemning the group's behavior. An example of this was reported by a group member who was attempting to abstain from drug use:

> They called me names, they said I was too good for them....
> I fought with them....I beat two of them up, but I still had to
> go to the hospital.

HIV risk for this group primarily involved the sharing of injection equipment among family and friends. For the most part, these kinds of networks involved individuals in long-standing monogamous partnerships, and there was little exchange of sex for drugs, although in some of the partnerships, co-use of sex and drugs could be found. Any one of several drugs could have been the drug of choice for the group; the most common were cocaine, crack, rock, crystal meth, marijuana, and alcohol.

Long-term friendship networks (friendship-based networks) were semi-open systems whose members scored together and were socially bonded through drug use. The majority of these networks were relatively homogeneous in terms of socioeconomic status and ethnicity. They consisted of friends who were alike and who liked each other. The predominant social bonds in the group were long-term friendships, although some kinship relationships were usually present. Individuals in these networks involved one another in both drug use and in other types of social activities. The members often were connected through work. These groups were somewhat open to recruitment of new members, although recruitment took time. "Good friends" could be invited to "party" (use drugs) with the group, but it was very common for a group to take from 1 year to 18 months to get to know someone before he or she was recruited. Multiple drugs were used in this type of group, including heroin, cocaine, crack, speed, and alcohol. The groups also tended to include both injectors and nonin-

jectors in the same network. A respondent described a night of mixed drug use as follows: "People will be drinking or doing coke, and those who want to shoot up go in the other room." Risk for this group centered on the sharing of works (drug paraphernalia, needles) "among friends." Sexual activity could also be present within the group, with multiple sexual partners a possibility and with changing sexual relationships within the group over time. Sex was sometimes exchanged for drugs, although this tended to involve ongoing social relationships rather than commercial transactions.

Convenience (acquaintance) networks are the most open of the four drug network types. They often included users of many kinds of drugs who "bridged," or skipped from group to group. The most common drug used was crack cocaine, and crack dealers tended to operate more openly than most of the other suppliers. Introduction into the group could be accelerated if an individual had become a known buyer. Acquaintances with little knowledge of the person would make the introduction to the group's dealer, saying "He's okay, he's buying." This indicated that the existing group member had seen and had been with the new person when the new person was scoring, or buying drugs. Having a known supply of money was an important credential for entry into these networks and expedited acceptance. Individuals in these groups regularly exchanged sex for drugs, and there were far more "impersonal" exchanges in them than in the other groups. A long-time drug user derogatorily referred to members of this type of group as "trash can addicts" because they would use any kind of drug. These networks tended to consist of users who were new in the area and looking for contacts, people who had progressed to a level of drug use that made them unattractive to members of the more closed groups, users in transition between groups, and young drug users who had not been recruited to a stable network. As a respondent indicated, "I was here chipping, running back and forth to [a nearby metropolitan area] for a year before I finally ran into one person, and from them I met about 10 others."

The convenience, or acquaintance groups appeared to be at highest risk for HIV infection because they engaged in a full range of activities involving the exchange of sex for drugs (commercial and noncommercial) and needle sharing with strangers. They also included a large proportion of individuals who were highly mobile and who were likely to move back and forth to nearby urban areas during the year, increasing local risks because of their contact with higher HIV prevalence sites.

Knowing the types of networks and their associated HIV risk was valuable for our AIDS prevention project. It allowed us to relate drug users' social contexts to other types of behavior. We used statistical procedures to test the usefulness of the classification system and found that network membership was an important predictor of the likelihood of getting tested for HIV (an important element in preventing the disease). The networks also differed in the frequency of overall drug use among members, the context of drug use (family vs. friends vs. strangers), the frequency of injection (from not using injectable drugs to frequent injection and sharing needles), the frequency and type of sexual encounters within the networks, and the frequency of self-protection by using condoms. These kinds of data were very useful for targeting HIV intervention and education activities.

Interaction and "Embedded Behaviors"

Much research in the social sciences has concentrated on individual behavior, motivations, and other personal conditions that influence behavior. However, many human behaviors are not conducted alone. Most are the result of interactions, not simple reactions, and network research is preeminently the study of these interactions. Social net-

work research is extremely important for examining specific kinds of behavior in the context of interaction, particularly in cases where researchers want to study if, how, and the conditions under which people do change their behavior. Such research takes place within the context where change in behavior is supposed to take place (i.e., in personal and social networks). The more that can be learned about how behaviors are embedded in a network context, the more likely we will be to make significant strides in understanding human behavior.

One example of the importance of studying embedded behaviors comes from research done on adolescents. Although individual teenagers can differ in their motivation, their intention to behave or misbehave, and their own values or norms, it is clear that, at least for most historically Euro-American cultures, the actual behavior of teenagers is much more likely to match that of their peers than that of any other group. Peer pressure occurs within a natural network, and studying how the structure and elements of a network condition individual behavior can tell us a great deal about how cultural systems, including those of teenagers, really work. For example, young people often start using drugs such as alcohol and marijuana because their friends offer such drugs to them and put pressure on the teens to use them. Doing so demonstrates that they "belong" to the group. By contrast, other teen peer groups can protect their members against such risks because members support each other in avoiding harmful behavior. These conditions can be studied through an ethnographic description of the behaviors associated with specific networks and the processes through which such behaviors are transferred and

Key point   supported or encouraged. ***The advantage of ethnographic description is that it can discover behavioral details and patterns of communication and influence specific to the group, which can then be quantified when the ethnographer wishes to measure them in other networks.***

Cross-Group Differences

Ethnographic network research also is useful for comparing and contrasting differences in social groups as well as differences in group dynamics across cultural, social, age, and gender configurations. It also can be used to consider how the characteristics of networks influence behaviors (both positively and negatively) and meet social needs. For example, different kinds of kinship groups can be examined for the ways in which they affect people's behavior. The study of voluntary associations in various cultures provides another example of the economic, social, and spiritual impact that those associations have on individuals' survival and success across cultures.

Definition: Voluntary associations are those that people join voluntarily to meet a variety of their personal, economic, and social needs

Steps in the Conduct of Network Ethnography

- Identify "neighborhoods" or geographic areas where research will take place.
- Obtain lists of "groups" by name or local jargon/terminology from local experts in the research domain.
- Identify individuals who are members of these groups.
- Develop rapport—a close and trusting relationship with these individuals—by spending time with them in the field.
- Use interviewing and participant observation techniques to gather information about them, their group, their activities, and the relationships of group members.
- Interview as many other members of the group as possible to find out whether their views of the group, their activities, and their relationships are similar to each other. This helps to define inclusion/exclusion rules (the boundaries of the group), bridges, bonds, activities, and relationships with other groups.
- Continue this work with other named or otherwise identified groups.

- Systematically compare and contrast groups on an ongoing basis (using continuous comparison) to identify dimensions or characteristics of difference in structures, boundaries, and behaviors among groups.
- Use either qualitative or quantitative (survey) methods to associate network (group) characteristics with other behaviors of group members (e.g., drug or sex risk, educational achievement, social mobility).

EGO-CENTERED APPROACHES TO UNDERSTANDING NETWORKS

Personal or ego-centered networks form one of the main cultural conditions that determine positive or negative outcomes for peoples' lives. They are a primary cultural anchor point, as indicated by the Spanish proverb quoted at the beginning of the chapter. People resemble and are influenced in their behavior and belief by those with whom they associate. Information about ego-centered personal networks allows anthropologists to quickly establish some of the important traits of "average" or typical networks in a given culture. These traits, such as the size of networks, the closeness and duration of relationships between ego and personal network members, and the impact of peer norms on ego can be collected from each person or from a selected sample of people in a community or a culture.

Personal network data normally are collected as part of a larger survey, using either questionnaires that people fill out themselves or an interview where everyone is asked the same set of questions. Figure 1.1a provides examples of questions asked to interviewees (egos) about their networks (alters); Figure 1.1b is an example of a form that can be used to fill in basic information about alters.[1]

Figure 1.2 lists questions asked of egos about the drug and risk behavior of each alter.

You have listed _____ people that you identify as being important to you, or being significantly involved in your life in some way. For each one of these individuals, I would like you to answer the following questions *to the best of your ability.*

Q44. Is_____   male or female?
    Male   1
    Female   2

Q45. Is_____ (Interviewer: read list and circle *only* one):
    Black (not Hispanic)   1
    White (not Hispanic)   2
    Hispanic/Latino (ASK Q45a BELOW)   3
    Other (Specify):_____   4
    DK/Unsure   77
    Refused   88

    NOTE TO INTERVIEWER: FOR OTHER THAN HISPANIC, GO TO Q62 BELOW

Q45a. (If Hispanic, ASK) Is_____ (Interviewer: read list and circle *only* one):
    Puerto Rican   1
    Cuban   2
    Mexican Am./Chicano   3
    Mexican   4
    Dominican Republican   5
    Central or South American   6
      Specify country_____
    Other_____   7
    DK/Unsure   77
    Refused   88

Q46.   How old is_____?
       AGE_____DK/UNSURE—77   REFUSED—88

Q47.   What is_____'s relationship to you?

       01 Mother/Father   07 Niece/Nephew   13 Lover, girls/boyfriend   19 Dealer
       02 Sister/Brother 08 Grandchild   14 Ex-lover/Ex-spouse   20 Houseman
       03 Child   09 Spouse   15 Friend   21 Doctor
       04 Grandparent   10 Mo./Fa. In-law 16 Roommate   22 Counselor
       05 Aunt/Uncle   11 Si./Br. In-law 17 Neighbor   23 Priest/Pastor/etc.
       06 Cousin   12 Compadres/   18 Running Buddy/   24 Other_____
                             Commadres   Associate

Q48.   How long have you known_____?

  Q48a.   Months_____Q64b.   Years_____

Q49.   On a scale of 1 (not at all) to 5 (extremely), how strong is your relationship with_____?
       (Score)_____DK/UNSURE 7   REFUSED 8

Q50.   On a scale of 1 (not at all) to 5 (extremely), how important is_____ to you?
       (Score)_____DK/UNSURE 7   REFUSED 8

Q51.   On a scale of 1 (not at all) to 5 (completely), how much can you trust_____?
       (Score)_____DK/UNSURE 7   REFUSED 8

Q52.   If you were HIV positive, or had AIDS, would you be willing to tell_____?
       No   0   Yes   1   DK/UNSURE 7   REFUSED 8

Q53.   How many days in the past 30 days have you been in contact (in person, phone, etc.) with this person?
               Number of days_____

Figure 1.1a. Elicitation of background data on alters.

This instrument is an adaptation of a network questionnaire used by the Institute for Community Research and the Hispanic Health Council in Hartford, Connecticut to record information on individuals' alters or members of their social networks.

DATE: _____

PARTICIPANT ID#:_____   MASTER #:_____

#	Full and Nick Name(s)	Relationship	Sex m/f	Eth. aa/l/w/o	Age
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Figure 1.1 b. Basic data entry form for identification of alters.[1]

Data such as these can be recorded in a data collection matrix such as the one in Figure 1.3, and then used in conjunction with questions such as those listed above in Figure 1.1 a.

To use the social networks matrix give each alter a number from 1 to 25. That number is used in the data matrix to refer to the alter. Question numbers head each column of the matrix, and the questionnaire is physically placed beside the matrix during the interview. As the questions are asked,

HIV RISK BEHAVIORS: NETWORK MEMBERS

		No	Yes	DK/Unsure	Refused
Q54.	Does _____ know that you use drugs?	No 0	Yes 1	DK/Unsure 7	Refused 8
Q55.	Does _____ provide you with drugs of any kind?	No 0	Yes 1	DK/Unsure 7	Refused 8
Q56.	Do you provide _____ with drugs of any kind?	No 0	Yes 1	DK/Unsure 7	Refused 8
Q57.	Does _____ inject drugs?	No 0	Yes 1	DK/Unsure 7	Refused 8
Q58.	Does _____ inject drugs in a shooting gallery?	No 0	Yes 1	DK/Unsure 7	Refused 8
Q59.	Does _____ inject drugs, using needles that he/she knows had been used by someone else?	No 0	Yes 1	DK/Unsure 7	Refused 8
Q60.	Does _____ share needles in a shooting gallery?	No 0	Yes 1	DK/Unsure 7	Refused 8
Q61.	Does _____ inject drugs using needles that had previously been used by you?	No 0	Yes 1	DK/Unsure 7	Refused 8
Q62.	Do you inject drugs using needles that had previously been used by _____?	No 0	Yes 1	DK/Unsure 7	Refused 8
Q63.	Does _____ share cookers or cotton with other people?	No 0	Yes 1	DK/Unsure 7	Refused 8
Q64.	Do you and _____ share cookers or cotton?	No 0	Yes 1	DK/Unsure 7	Refused 8

Figure 1.**2.** Drug risk behavior of alters.

This instrument is an adaptation of a network questionnaire used by the Institute for Community Research and the Hispanic Health Council in Hartford, Connecticut to record information on HIV-related risk of the individuals' alters or members of their social networks.

the matrix is filled in with codes corresponding to the informant's answers.

To assess the connectedness of the network, from ego's perspective, respondents may be asked how each member of the personal network interacts with every other member —based on their own knowledge (see Figure 1.4). Later in this chapter, we will discuss how a full relational network analysis proceeds from this point.

MASTER #:

DATE: _____

INTERVIEWER: Refer to Social Network Interview Guide for questions to fill out matrix. Copy list of network members by full and nick names and general characteristics to Network Matrix Pull Out List.

Total network members: _____

[2] This instrument is an adaptation of a data collection matrix used by the Institute for Community Research and the Hispanic Health Council in Hartford, Connecticut, to record basic demographic and drug risk related data from "ego" about the **members** of his or her social network ("alters").

Figure 1.3. Social Network Matrix

MASTER #:

Instructions: For each person in the network, place an X over the appropriate letter in relation to that contact's interactions with every other contact. Insert contacts' initials in the numbered boxes at the top and left using the Pull-Out Matrix to translate numbers into names. For each contact, ASK: 1) Do (2) and (1) know each other [if yes, CROSS out K]...; 2) In the past 4 months, have (2) and (1) done drugs together [CROSS out D]; 3) In the past 4 months, have (2) and (1) had sex together [CROSS out S]; and 4) In the past 4 months, have (2) and (1) gotten into a serious physical fight with each other [CROSS out V]; ETC.

[4] This instrument is an adaptation of a data collection matrix used by the Institute for Community Research and the Hispanic Health Council in Hartford, Connecticut, to record basic demographic and drug risk related data from "ego" about the risk related interactions among the members of his or her social network ("alters").

Figure 1.4. Data recording matrix for collection of data on interaction of all members of the network.

TABLE 1.1 Gender, Age, and Ethnic Distribution of Respondents, and Respondent's
        30-Day and Recent Use Networks

	Respondent (Ego)[a]	People in Respondent's 30-Day Network[b]	Alters Present in Most Recent Use[c]
Gender			
Male	34 (67)[d]	81 (63)	62 (68)
Female	18(33)	46 (37)	28(31)
Age			
10-19[e]	12(23)	36 (28)	28(31)
20-29	14(26)	38 (29)	25(27)
30-39	23(44)	43(33)	30(33)
40-49	3 (5)	9 (7)	7 (7)
50-59	0 (0)	1 (1)	0 (0)
Ethnicity			
African American	10(19)	22(17)	16(17)
Hispanic	19(36)	64 (50)	42 (46)
Anglo	18(34)	35(27)	27(30)
Native American	5 (9)	6 (4)	5 (5)

a. N = 52.

b. N = 127.

c. N = 90.

d. The number in brackets is the percentage figure.

e. In order to participate, individuals had to be 18 years of age or older, could not have been in treatment in the past 12 months, and had to have a positive urine screen for cocaine or heroine, or needle marks (tracks) and a positive urine screen for some other injectable illicit drug. Therefore, this category includes only 18- and 19-year-olds.

Information such as that collected in Figures 1.1-1.4, which is used to describe typical personal networks, is normally reported in the form of tables such as the one above, which comes from the Flagstaff Multicultural AIDS Prevention Project (FMAPP). Table 1.1 compares the people who provided the information (respondents or ego) with the people whom they named as being part of their personal network (alters). In this case, we asked about the demographic characteristics of people who were part of their network for the past 30 days, and people who were present the last time they used drugs with other people.

When we analyzed all of the personal network questions in our questionnaire, we found that the number of people with whom each respondent (ego) reported spending time ranged from 0 (they were isolated) to more than 25 people, with the majority responding that they spent time with from 1 to 10 other people. Thus, the typical personal network included up to 10 family members (all but 16 of the respondents fell into this range). These relatively small networks commonly include both users and nonusers, some kin relations, and close friends. Only 25% responded that all of the people with whom they spent time use drugs. Of those alters who used drugs, 25% injected drugs, 69% smoked crack, and the rest used some other drug.

By combining and examining all of the ego-centered network data, we determined that the majority of drug networks are small (2 to 10 individuals), are based on close friendships or kinship ties, and are relatively stable in their composition. The data also indicated that the majority of risky encounters, such as needle-sharing activities or sexual relationships, occur with the first three people named by ego as members of his or her network. A smaller proportion of the needle-sharing and sexual encounters occur with people outside of ego's close personal network, but the data also indicate that it is exactly these encounters, called weak ties, that are the most risky kinds of contacts for the majority of drug users. Weak ties are defined by less intimacy and infrequent association. Based on these data, part of our HIV prevention and education effort has been directed at making recommendations that would help these individuals break, reduce, or decrease the risks associated with their weak-tie relationships.

In the same project, we also explored how useful other ego-centered measures of network structure were in identifying conditions that linked individual social networks to the individual's risk of spending time in jail or becoming infected with HIV through drug use. This process allowed us to use relatively simple and nonthreatening questions that could be asked about individuals' social relationships,

Definition: Ties are links between people that are measured by perceived intimacy and frequency of association. Indicators of tie strength are "How close are you to X?" and "How often do you see X?"

yet it also told us important information about their probable health status and risk-taking behavior.

EXAMPLE 1.1

THE NATURE OF RISKS IN PERSONAL NETWORKS

In our study of drug use and its relationship to HIV/AIDS risk, we were able to collect data from a total of 496 active drug users. We hypothesized that the nature of personal relationships (close to distant, dense to dispersed, and few to multiple connections among members) had an impact on the average level of risk that a person incurs over time. Measuring different elements of personal network structure should show a significant relationship to the HIV, drug, and incarceration risks of individuals. This is possible because differences in personal networks may result in differences in the amount of information that passes to a particular individual, the length of time it takes information to reach a person in the network, differences in people who are gatekeepers for the information flow, measures of differential influence in the group, and measures of the probability that someone can or cannot receive information sent through the network (cf. Doreian, 1974; Ford & Fulkerson, 1956; Gomory & Hu, 1964; Katz, 1953; Taylor, 1969).

We assumed that risk taking is a generalized, rather than specific, activity for individuals. If they take risks in one area of their life, they are much more likely to take risks in other areas. Therefore, the individuals who are most likely to accept early recruitment into our program are more likely to be higher risk takers than are the individuals recruited from the same network later in the process. Because they do not know us or our project well, it is as much a risk for them to participate (and possibly be caught up in a drug sting) as it is for them to interact with other strangers. We felt that coming into the project as one of the first members of a network to be recruited (i.e., acting as bridging individuals) might be a proxy measure for individual influence or centrality in the network. We based our analysis on the assumption that the individuals most willing to try out a new program were also those most likely to take the lead in other social undertakings, or risky behavior.

We were able to show that the program recruitment order data (the rank order in which each individual was recruited into the project for their network) not only correlated with network structure measures (how they were connected, what subgroup they belonged to, etc.), but also were related to increased risk taking (Trotter, Bowen, Baldwin, & Price, 1996; Trotter, Bowen, & Potter, 1995; Trotter, Potter, Bowen, & Jiron, 1994). Early arrivals in each network were more likely to have tried a drug treatment program than were the later recruits in the same network, whereas later arrivals were more likely to have no injection-drug-user sex partners. Those recruited earlier in networks were very likely to have sex partners who were also injection drug users—that is, they participated in double-risk relationships.

We also hypothesized that participation in two or more networks involved more potential risk and risk taking than did membership in a single network. Three hundred twenty-one individuals in our study participated in only one drug network (66.5%), and 162 individuals (33.5%) were members of two or more drug networks. Analysis confirmed this hypothesis. We were thus able to conclude that simply asking individuals to self-identify as having either single or multiple network membership was sufficient to provide a direct indication of both their type and level of risk taking in their personal drug-using networks.

These results showed us that this type of personal or ego-centered network data collection could be very useful for finding out important facts about the most common personal networks of individuals in our projects. The same type of information could be easily collected on personal networks associated with participation in educational or economic development programs, social integration into community life, exposure to violence, gang affiliation, or any other cultural domain.

Steps in the Collection and Analysis of Ego-Centered Network Data

- Develop an instrument on your topic that includes collection of information on the research topic (e g , drug use) in five ways:
  1. From the individual,
  2. About each individual (alter) mentioned by the individual,
  3. About the interaction of the individual with each alter,
  4. Whether alters know each other,
  5. What known risk behaviors occur between each alter and all others.
- Identify a representative sample of individuals (or include these questions in your regular survey)
- Interview the sample of individuals

In the following box, we describe the steps used to analyze ego-centered network data in a study of drug use. In this study, the network characteristics of ego with regard to risky drug- and sex-related behavior can be analyzed in association with other behaviors or conditions, such as whether ego and his or her alters are infected with the HIV virus. Demographic and other known risk-related differences in the characteristic of ego-centered networks can be identified and the origins and impact of those differences explored. In the example below, these network differences include size of network, gender ratio, and drug risk indexes. Ethnographers can use the procedures similar to those listed in the box for network studies addressing any other topic in the social sciences.

An Example of the Steps in Analyzing Egocentric Netwvork Data

1. Describe the networks of individuals in terms of the following:
   - Network size
   - Gender ratio
   - Sexual preference
   - Ethnicity ratio (the relative proportions of people from various ethnic groups)
   - Age (in terms of the mean and modal age of members, the range of ages in the network, and their standard deviation)
   - Ratio of kin to nonkin sexual partners among members
   - Intensity of the relationships between ego and all other members of the network[2]

2. Establish levels of risk for ego as an individual by creating two indexes: a drug risk index and a sex risk index.
   - Sum up all of ego's risky drug behaviors.
   - Sum up all of ego's risky sex behaviors.
   - Add together the sum of ego's risky drug behaviors and the sum of ego's risky sex behaviors.
   - This sum total is an overall index of risk behavior for an individual.

3. Establish risk indexes for drugs and sex (as above in #2) for every network contact based on what ego reports for the contact or alter.

4. Obtain ego's total risk exposure score using the following steps:
   - Add ego's combined drug and sex risk index to the combined drug and sex risk indexes for al! network members (obtained in #3 above)
   - Divide this total score by the number of people in ego's network to create an average risk index

5. Obtain the total risk exposure score of ego's network.
   - Count and add together risky behaviors of all alters with one another

Definition: Connected-ness is the extent of reciprocal relationships among individuals in a network

Definition: Power/influence is the degree to which a person in a network gives and receives information or other resources

Definition: Role relationships are those associated with a particular place or position in a social network

Definition: Cliques/components are subunits within a larger network designated by the greater strength of their interconnected-ness compared with other parts of the network

Definition: Density is the actual number of relationships found in a network compared to the total number of possible relationships

The variables obtained in this way measure variations in ego-centered networks that differ from variation created by demographic characteristics. They can be correlated with demographic variables and used as "predictors" or correlates of other behavior or conditions (such as health or mental health status).

FULL NETWORK RELATIONSHIPS: RECIPROCAL NETWORK INFORMATION

Data collected about the reciprocal relationships within social networks can be very useful in helping ethnographers understand complex conditions in everyday life. Ethno-graphic research on entire relational networks includes in-formation about connectedness; the power and influence that individual actors exhibit in a network; the role relation-ships that are demonstrated in a network; the impact of that particular social network position (such as a bridge, or a particular configuration of network connections) on peo-ple; the subdivision of the network into cliques and com-ponents; and the overall density of a given network, com-pared with other networks. The following sections identify some of the most common ways that these aspects of net-works are analyzed and understood.

Communication Flow

Communication (speaking, visiting, sending messages) in networks can be assessed by measuring the presence or absence of changes in the level of information flow within the network (Hubbell, 1965; Taylor, 1969). Network data can be collected to identify the presence or absence of particular topics or of communication between individuals and between sets of individuals. The patterns of informa-tion flow within networks, sometimes called *connectivity* (Doreian, 1974), can be characterized by several measures,

including the amount of information that passes through a network, identification of the people who are gatekeepers to the information flow, measures of differential influence in the group, and measures of the probability that someone can or cannot receive information that is introduced into the network (Ford & Fulkerson, 1956; Gomory & Hu, 1964; Katz, 1953; Taylor, 1969). A social network research project that focused on communication would describe most or all of these conditions for each of the relationships or behav-iors that were studied.

Distance and Segmentation

Network researchers have created two primary methods for identifying key structural elements of groups. One is based on the idea of social cohesion, where cliques or circles of social actors are identified by the bonds that link them together (Bron & Kerbosch, 1973; Mokken, 1979). The other is based on the idea of structural equivalence, where people who are similarly connected (have the same types of links to others) are thought to be more similar to each other than to people in the same network who have different types of links to others (Burt, 1976; Kilworth & Bernard, 1974). These different measures all provide information on the ways that networks work.

Some of the configurations of relationships and the changes in relationships between individuals in a network also can be identified. Changes may be caused by some kind of intervention or event, or they may be attributable to natural changes in people's lives. These changes can be assessed by the number of reduced connections among all network members or among some portions of the network (Burt, 1976; Doreian, 1974), or by looking at changes in the composition or location of subgroups or cliques and the reasons for them. For example, in some of our drug-using networks, people who go into drug treatment programs

decide not to interact with their drug-using friends in order to stay away from drugs. This avoidance causes significant changes in the social networks of both the drug users and the nonusers.

Positions and Roles of Network Members

The roles people play and the positions they hold in a network also affect how communication flows in a network, because people who are more central to a network tend to have control over information. Looking at the centralization of a network provides a way to measure the degree to which information is controlled by specific individuals within a network (Stephenson & Zelen, 1991). For some networks, a reduction of centralization should correlate with the creation of more communication linkages between noncentral individuals. Careful ethnographic observation should be able to detect changes in influence, as is the case when individuals take on new roles within the group (Bonacich, 1987). Ethnographic studies should also be able to detect changes in influence, both for drug taking and sexual issues, as individuals take on new roles within the group to reinforce protective behaviors and reduce risks. These issues are explored below with examples from an instrument used in one of our Flagstaff projects to illustrate how data can be collected on these characteristics.

EXAMPLE 1.2

FULL RELATIONSHIP DATA FOR DRUG USER NETWORKS

One of our substance abuse projects provided full network relationship data on a total of 10 active drug-using networks. The size of these groups varied from 5 to 42 people. During the full network data collection process, we brought each group together and asked the members to rate their interactions with each member of their network based on a structured set of questions about their social relationships, their drug use patterns, and communication about intimate subjects such as sex (see Figure 1.5).

TRUST

   T1 How honest is_____with you?

   T2 How often does_____tell important things to you?

   T3 How comfortable would_____be to share works with you?

   T4 How often does_____tell his/her problems to you?

   T5 If you had AIDS, how willing would you be to tell_____?

SOCIAL relationship measures

   S1 How much do you hang around with_____?

   S2 How close a friend is_____?

DRUG relationship measures

   D1 How often do you use drugs with_____?

   D2 How often do you go to_____for drugs?

Combined INTIMACY/TRUST measures

   I1 How comfortable would you feel discussing AIDS with_____?

   I2 How comfortable would you feel discussing an affair with_____?

   I3 How comfortable would you feel discussing unwanted sex with_____?

Figure 1.5. Full relational network data collection instrument.

Analysis of this relational network data allowed us to describe each of these groups according to the conventional types of analysis that can be run on network relational data (cf. Burt, 1976; Glover 1989, 1990; Kilworth & Bernard, 1974; Knoke & Kuklinski, 1983; Panning, 1982; Scott 1991). A description of one of these networks illustrates the types of information we were able to gather by this method (Trotter, Bowen, & Potter, 1995; Trotter et al., 1996; Trotter, Rothenberg, & Coyle, 1995). This network is a multigeneration, family-based, drug-using network. It contains members from two kinship groups. The group includes both males and females who are drug users. The drugs of choice for the group are cocaine and crystal meth (methamphetamine), and the group includes both injection drug users and noninjection drug users. The socioeconomic status of the group is low, as denoted by the fact that they live in local public housing projects and receive welfare, or government-provided financial assistance. Three individuals from Mexico who do not have legal residency documents for the United States are members of the group. The core group has been using drugs together since high school, with some of the members now in their 40s. The network is relatively closed; membership is restricted to kin and sexual partners of kin.

Definition:
Actors are
individuals in
a social network

The relationships in this network can be thought of as

- The different types of connections between actors—the common network term used for identifying different individuals in the network
- The centrality or influence of individual actors, or of subgroups within the larger group
- Roles or "positions" that actors hold within the network (cf. Knoke & Kuklinski, 1982)

Relational network information is commonly presented in the form of diagrams, charts, tables, data matrices, cluster diagrams, and verbal descriptions.[3] One of the most common ways of displaying the data is to construct a sociogram that indicates actors by circles, and connections or interactions among them by lines. The diagram on the following page (Figure 1.6) is a model of the social relationships in the drug-using network.

The connecting lines between individuals (identified by a number) indicate the existence of a strong connection between those two people. All individuals in this group have some weak interactions with each other, but the influence or communication between some is minimal; Figure 1.6 concentrates on the strong ties. Females are represented by a number in a circle, and males by a number in a square. An arrowhead indicates a one-way connection between two people, whereas a solid line indicates a two-way connection. The width of the line indicates the strength of the connection. For example, the larger, shaded circle around Anita,[4] #13, indicates that she is the central person in terms of influence measures. She is also the most central communication node in the network. The core of the network is composed of Anita (#13), Lydia (#6), Adelita (#4), Marcos (#5), Jaime (#9), and Josepha (#3). All of these individuals have close kinship ties, and communication among them is strong (i.e., frequent and intimate). Miguel (#11) and Dolores (#12) are married, and Miguel is the first cousin of
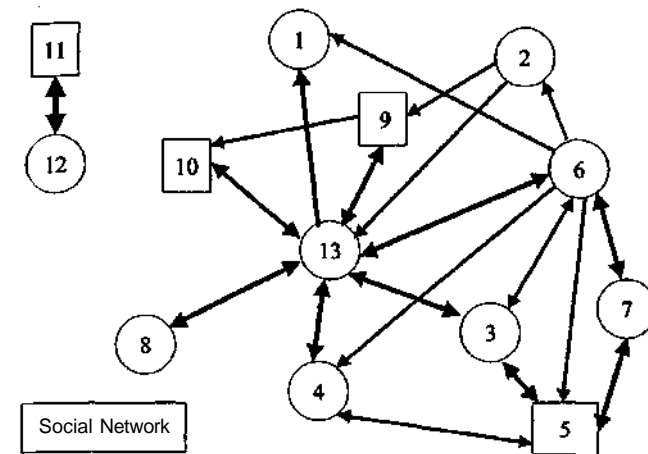

Figure 1.6. Social relations diagram.

Maria (#1) and Lydia (#6). Aida (#7) is Lydia's (#6) niece and Josepha's (#3) first cousin.

The *drug network* characteristics, which we derived from analysis of the drug questions on our network matrix, are an interesting contrast to the *social* relationships described previously. In the drug-related networks, several people changed position from peripheral to more strongly connected, or vice versa, as can be seen in Figure 1.7 below.

Drug issues create a change in the information flow and influence patterns of the network. Aida (#7) is a nonuser, which is clearly represented in her lack of connections on the drug questions. Anita (#13) shares the influence in drug networks with her son, Marcos (#5), and with Jaime (#9), who is a central member because he is a bilingual communication bridge between the Spanish (only) and the English (only) portions of the network. Marcos (#5) scores drugs for this network, keeps track of drug-related conditions, and

Figure 1.7. Drug
relations diagram.

Drug Network
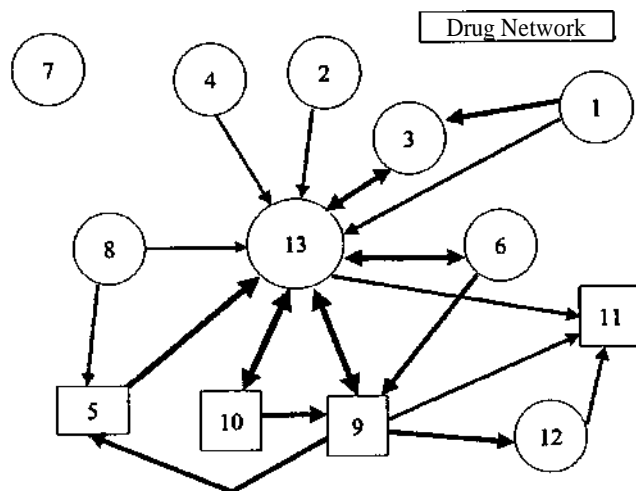
influences the network through his mother's close connec-
tions with everyone else. Some of the individuals who were
strongly connected by social relationships are connected by
weak ties, or no longer directly connected in terms of their
drug relations. For example, #4 and #5, who are married to
each other, are strongly tied in the diagram on social rela-
tionships, but #4 does not communicate much about drugs
with her husband, only with her mother-in-law (#13). The
kinship ties between *#9* and #2 (living as married) are not
visible in the drug relationship diagram, nor is the aunt-
niece connection between #6 and #7. This indicates that
some people who can be reached for *drug-related* HIV risk
reduction information through the drug relationships net-
work must be accessed via different people and lines of
communication if they are to receive *social* risk reduction
information, such as information about the need to reduce
the number of sexual risks they encounter or how to nego-
tiate condom use.

We have also analyzed several other classic measures of
network connections and network structure[5] for this group
of drug users. An analysis of the network structures termed
factions and cliques associated with the drug use network
(cf. Borgatti, Everett, & Shirey, 1990; Bron & Kerbosch,
1973; Seidman & Foster, 1978) indicates that when social
relations alone are considered, most members are closely
connected to central members; only a small number of
people are marginal to the core of the group (Figure 1.6).
However, the configuration within the group changes sig-
nificantly when the drug relation questions are analyzed. In
this second analysis, the core drug group is divided into two
subsystems: a predominantly English-speaking clique, and
a predominantly Spanish-speaking clique. This division
was discovered in our initial ethnographic research and
confirmed in this second, quantitative analysis.

This information on cliques and factions can be used to
identify boundaries where information needed for the suc-
cessful implementation of an intervention may be blocked
unless at least one individual from each subgroup is in-
volved in the intervention. Information provided to cen-
tralized networks like this one, which has only a few mar-
ginal individuals, passes through fewer contacts and
through a smaller number of individuals than it does in
diffuse, less tightly constructed networks. Moreover, if a
network is badly fissured or fragmented, information must
be provided to multiple individuals.

As a final note on the relationships displayed by these
two representations, the shape of the drug relations net-
work diagram (Figure 1.7) is very similar to a classic prob-
lem-solving configuration displayed by networks. It is
called a star pattern; in it one person acts as a center who is
in direct communication with the rest of the network
through dyadic relationships and who has relatively few
interconnections among other members of the network.
This configuration allows rapid input from the central

Definition:
Factions and
cliques are
small groups formed
by their close and
special connections
to one another
within a larger
network

person to all members on any issue, thus facilitating problem solving for the group as a whole. The social network diagram (Figure 1.7) is a classic communication configuration where there are multiplex ties within the group. Multiplex ties mean that each individual has several different kinds of relationships with the other people in the group at the same time. This structure ensures that loss of a network member will not cause communication to break down, because everyone in the core group is tied to a number of other people and connected to each other through many different relationships.

These findings parallel those from other networks we have investigated. The majority of drug-using networks are small and relatively tight. They depend on kinship and long-term friendship for entry, and they show a strong tendency for tight communication and reinforcement of the group's norms. These norms can support the elimination of risks through the elimination of ties that produce HIV risks, such as needle sharing with strangers or unprotected sex with casual partners. In addition, the existing boundaries can be reinforced, and some assessment of HIV risk can be added to the trust issues that already affect new recruitment in the group. New recruits could be sought only from among people who engage in low-risk categories of drug abuse or sexual behavior. All of this information allows us to go far beyond an understanding of individual network members into the social organization and culture of drug use and relevant associated social action.

NETWORK SAMPLING STRATEGIES

Ego-centered network sampling is based on random, representative, or any other form of quota sampling. Full relational network sampling begins with the identification of individuals who act as entry points to the network. Entry to a full relational network can begin with any specific individual in the network. Usually, however, there are multiple entry points. Once the ethnographer has identified people who can grant entry to the network, the next step in relational network sampling requires creating a sample using one of the following four different strategies:

- A complete sample of all individuals in the full network, or the entire population of the network
- A randomized sample of index individuals' alters
- Individuals screened and selected as index people because of their specific characteristics
- Individuals selected because they are the alters of a specific index person

Creating a Sample of All
Individuals in the Full Network

This type of sampling is time-consuming and costly if the network is large and widely distributed, as it often is in an urban community. It is most useful when conducting research in smaller, bounded communities, such as classrooms, very small villages, girls' basketball teams, or circles of artisans and craftworkers.

Creating a Sample by Selecting
a Randomized Sample of
Index Individuals' Alters

To use this type of sample, the ethnographer first selects a number of index individuals for interviewing. If 10 index people are selected, they may, for example, identify up to 25 contacts or alters. From these 25 contacts, any number of individuals are then randomly selected for the second step of the interviewing process. For example, the ethnographer might randomly choose 6 people from the 25 identified

alters for the second stage of the interview process. The ethnographer bases his or her decision regarding how many alters to interview on how many people are needed for the entire interview project.

During the second stage of interviews, each of the six alters is, in turn, asked to identify his or her own alters. The ethnographer then randomly selects six more alters of each of these six individuals for the third step of the interviewing process. Usually, only two to four "nodes," or interview steps —and consequent identification of people to interview— are feasible in a relational network study. More steps or nodes render the sample larger than needed.

Creating a Sample by Screening and Selecting Individuals Because of Their Special Characteristics

Often, social scientists seek to study individuals because they display the characteristics important for the study. For example, drug use studies might seek to find injection drug users; studies of campus politics would look for school leaders; health care studies would try to identify users of spiritual healers, or pregnant older women; ecological studies would seek environmental activists. These individuals are asked to list alters, and among alters, only those who fulfill specific criteria (such as those criteria used for identifying the specific individuals sought for the first step of interviews) are included in the sampling frame for the network sample. Thus, instead of selecting 6 alters randomly from a total of 25, 6 alters are selected on a randomized basis only from among those who possess or display the characteristics that are key to the study. Interviewing of index individuals continues on the same basis as above, organizing from two to four steps or nodes out to complete the desired sample size for the study.

Creating a Sample by Choosing an Index Person and Selecting From Among All of That Person's Alters

This type of sampling is called a "random walk design." It involves first selecting an index person and asking him or her to identify all of his or her alters. The next step involves randomly selecting one or more of these alters for interviewing. These alters, in turn, list their own alters. From these lists, the ethnographer randomly chooses one or more individuals to interview. In this way, the ethnographer can "walk" from linkage to linkage in a connected chain of individuals who are part of a much larger social network. The result is a randomized sample of the larger network structure.

SUMMARY AND CONCLUSIONS

A multiple method network approach has numerous advantages in an ethnographic research project. Ethnographic network mapping is fully compatible with other forms of ethnographic research. It can be accomplished best by a combination of observation and interviewing, and either of those approaches can be combined with other forms (or foci) of ethnographic data collection. It is possible to collect network data using a life history perspective, a cultural modeling approach, or reflexive and systematic cognitive methods. Because ego-centered networks represent components and entry points into larger network configurations, ego-centered data collection can form an interesting bridge to full reciprocal network data collection.

Once the basic norms, beliefs, and values of specific social groups have been discovered through the ethnographic approach, many anthropologists find that they need to turn to survey types of data collection. These efforts include household surveys, population-based (probabilistic) surveys, and special group questionnaires. It is

Cross Reference: See Books 2 and 3 for elicitation methods

easy, and usually highly productive, to include ego-centered network questions along with the other questions embedded in this type of questionnaire. Of course, one must keep in mind that the addition of network questions takes quite a lot of extra time, so the purposes for including these questions must be defined clearly in your study.

Finally, full relational network data collection on reciprocal relationships in the network provides a level of detail about human groups that cannot be collected in any other manner. The overall measures of network structure and network connections that can be computed from network relational data are clearly associated with cultural differences in individual behavior. This approach shows a great deal of promise for both research and intervention work. Wherever data on the overall structures of full networks can be collected, these data can provide important guidelines for targeting both general (to everybody through social diffusion) and specific (to individuals) messages, and for developing community intervention programs, behavioral change training, and group assessment strategies.

Advantages of Ethnographic Network Approaches

Advantages of Ethnographic Network Approaches

- Identifying and assessing hidden populations
- Recruiting, retaining, and following up on intervention populations
- Understanding personal social influences on the lives, decisions, and behaviors of individuals
- Enhancing the efficacy of behavioral interventions by working with groups that have maximum impact on the lives of the individuals who are members
- Understanding and intervening to change barriers and facilitators to information flow in order to reach individuals and groups more effectively

Many public health projects in the United States require making contacts with hard-to-reach or hidden populations, such as people who are asymptomatic carriers of infectious or genetically transmitted diseases, or people with socially or culturally stigmatized conditions, such as women who become pregnant without being married, homosexuals, or individuals who are infected with the HIV virus. This is a difficult process, and the hardest part of the outreach process is orchestrating initial entry into a new group that needs to be recruited for participation. Network-based outreach can make that recruitment easier because it follows existing social relationships, and once the initial contact is made, members of the network can recruit other members, rather than each new recruit requiring a cold contact from an outsider. This type of sponsorship process allows the network to control recruitment and to feel more comfortable about risking contact with strangers. The normal network gatekeepers can then act as go-betweens who reduce barriers to participation by endorsing the project to others in the network, rather than create barriers to participation.

Used in this way, network-based outreach can help establish the contacts and relationships necessary to conduct efficacious programs. It allows individuals to participate in intervention programs within the cultural context of a social group that will reinforce (or oppose) program objectives. A network approach is also extremely useful for keeping people in a program, or bringing them back in if they have dropped out. Most intervention programs that focus on individuals must rely on individualized motivational techniques. ***Network methods are especially effective for*** Keypoint ***interventions because naturally existing network connections encourage participation and provide peer pressures that can reduce barriers to prevention and education and enhance retention.***

Network-based research programs have some additional advantages. Keeping track of network members is some-

thing the members of a network do naturally. This fact can assist in the long-term follow-up phase of any project, from ethnography to longitudinal survey research. If the core or most influential members of the network are identified and tracked, they can act as primary links between outreach workers and other members of the group. Because those cote members—or gatekeepers—generally know the whereabouts of network members, they can make it easier for outreach workers—who usually have little time to track down and locate network members—to conduct individually based follow-up.

[1] Our approach to risk reduction in small-town drug networks has proven to be valuable in the identification, location, and recruitment of hidden or difficult-to-access populations. Our ethnographic network analysis has led to a series of suggestions about combining qualitative and quantitative approaches in ways that increase our knowledge about HIV and drug intervention in "out-of-treatment" drug users. At the simplest level, network data identify the presence or absence of communication between individuals, and between sets of individuals, on particular topics. At the next level, network information data can identify the central person or people who exert the most influence on the group, the nodes (or central people) in the network who act as gatekeepers for interaction, or the subsets of individuals who interact more among themselves than they do with others in the larger network. Information on each of these factors can suggest plans for direct and indirect action and provide outcome measures of the efficacy of programs. Our data also explain the frequent failure of the classic strategy used in drug rehabilitation, health risk reduction, and most other public health interventions: moving an individual away from high-risk personal social networks into lower-risk relationships. Small-town drug networks are frequently kinship based, or based on long-term friendship. There are relatively few choices for making

friends in a small town. There is a restricted pool from which to choose compared with an urban area with more groups and associations. In a small town, it is unfortunate if you do not like someone in your Narcotics Anonymous group, because it is the only one in town. People might have to leave town or even leave the state to accomplish the classic goal of changing friends and networks. Our data show that this is an unlikely or impossible event for most of the people we have interviewed. On the other hand, our network data indicate that it is possible to change the norms and risk-taking patterns of networks as a whole by reinforcing positive risk reduction behaviors. For this reason, natural network-based approaches to risk reduction are highly desirable adjuncts to individual intervention strategies.

These findings can be expanded to match up with other applied ethnographic programs and theories. Although they were designed within the context of medical anthropology, they can be transferred easily into any other area of culture in which groups have an impact on individual behavior. The three network approaches described in this chapter provide analytical tools that allow ethnographers to design and measure both the individual and the cumulative group effects of economic, agricultural, educational, ecological, political, and policy-oriented programs.

Our ethnographic findings demonstrate that we can use qualitative descriptions of network conditions as a direct adjunct to one type of applied program, and by extension to others. The ethnographic data act as an important theory-generating bridge to quantitative measures of the impact of social networks on cultural dynamics.

Researchers can measure both individual effects and cumulative network effects of any other type of applied programs or intervention using quantitative network data collection and analysis tools. The conditions that require increased communication can be measured by increased information flow within the network (Hubbell, 1965; Tay-

lor, 1969). They are also measurable in terms of reduced distances among all network members, or some portions of the network (Burt, 1976; Doreian, 1974). For example, we learned from our HIV project that the size of the network probably affects the ease or the difficulty of changing group norms in ways that would protect members from risks in the community. It is probably harder to have an impact on larger, diffuse networks than on smaller, highly connected ones. We can measure differences in the overall risk to individuals and to the group as a whole based on the ratio of kin to nonkin membership, or the ratio of strong to weak ties, or on the basis of group norms that favor or interfere with positive attitudes toward drug treatment programs. Knowing the network membership of our participants allows us to measure peer influence on attempts to enter, or avoid, drug rehabilitation programs. We may be able to identify risk reduction in the network before and after high-risk elements of the network have been isolated or segmented off, and interactions with those cliques reduced or eliminated (Glover, 1989,1990). We believe that factions within the network should show either risk reduction or risk increase, depending on their distance from the more risky elements or members of the network.

Centralization is a measure of the way that information is being controlled by individuals (Stephenson & Zelen, 1991), and for some networks, a reduction of centralization should correlate with risk reduction through the creation of more communication linkages between noncentral individuals. We also should be able to detect changes in influence, both in drug and socially related issues, when individuals take on new roles within the group to reinforce protective behaviors and reduce risks (Bonacich, 1987). We have also hypothesized that network relational and structural analysis can identify individuals who should become

key players in network-level intervention and outreach, as adjuncts to project staff for a particular network.

An individual's potential for social, marital, economic, educational, or any other kind of success may be directly related to network variables. We should be able to measure the impact on individuals of such network characteristics, including such factors as divisions or conflicts in the group. We also should be able to assess differences in how groups within the networks address risk taking and how these differences affect the likelihood that both individuals and the groups will encounter risks. We may be able to detect changes in influence patterns when individuals assume new roles within the group that involve taking responsibility for encouraging group members to engage in protective behaviors and to reduce risks. In sum, network analysis in its various forms appears to be a highly desirable and productive tool for a wide variety of ethnographic research projects.

NOTES

1. Figures 1.1a, 1.1b, 1.2, 1.3,and 1.4 are taken from instruments currently in use for joint studies by the Institute for Community Research and the Hispanic Health Council on networks related to drug use and HIV risk, funded by the National Institute on Drug Abuse.

2. Intensity, as we explain later, is usually measured in terms of how often the ego sees a particular individual.

3. Full relational network data can be readily analyzed and displayed in a variety of diagram formats using two computerized programs developed by Borgatti and colleagues—UCINET and KRACKPLOT. These program resources are described as suggested resources at the end of this chapter.

4. All of the names in this description are pseudonyms to protect the identity of the individuals in the network. The networks we investigated included African Americans, Native Americans, Hispanics, and Anglo Americans. In this case, the example is a predominantly Hispanic network, but it easily could have been from any of the other cultural groups.

5. All of the calculations were conducted using the program UCINET 4.0 (Borgatti, 1993).

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SUGGESTED RESOURCES

There are five resources that will expand your knowledge and skills in network analysis. The following three books provide an excellent introduction and an in-depth exploration of networks.

Knoke, D., & Kuklinski, J. H. (1982). *Network analysis.* Beverly Hills, CA: Sage.

This book provides an excellent rapid introduction to social network analysis. It defines social networks in clear and concise ways, and it provides definitions and explanations for the most basic types of social network data collection, concepts, and analysis strategies.

Johnson, J. C. (1994). Anthropological contributions to the study of social networks: A review. In S. Wasserman & J. Galaskiewicz (Eds.), *Advances in social network analysis* (pp. 113-151). Thousand Oaks, CA: Sage.

This chapter provides an excellent summary of all of the recent advances in network analysis in anthropology. It briefly discusses the history of ethnographic network analysis, provides an overview of the theories being explored, and discusses new directions for this type of research.

The other chapters in the book provide a very useful comparative over-
view of how social network analysis has developed in other social science
disciplines.

Wasserman, S., & Faust, K. (1993). *Social network analysis: Methods and
applications.* New York: Cambridge University Press.

This book provides you with a thorough introduction to network analy-
sis, and an in-depth description of the theory, methods, and analytical
strategies for all but the most obscure approaches to social network
research. It is an excellent resource for everyone from beginners to very
advanced scholars.

There are two computer programs available that are highly
useful to network researchers. One, ANTHROPAC, has a
small number of routines available for creating network
questionnaires and doing some data manipulation. The
other, UCINET IV, is designed specifically for conducting
many of the basic types of social network data analysis.

Borgatti, S. P. (1996). *ANTHROPAC 4.0.* Natick, MA: Analytic Technologies.

ANTHROPAC provides ethnographers with a set of analytical tools for
conducting rapid assessment studies and for collecting and analyzing
several different types of cognitive data (e.g., pilesorts, triads tests,
scaling, etc.). It allows ethnographers to develop questionnaires in the
field, enter and modify data sets, and analyze a number of different types
of data sets. There are several statistical routines available that are useful
in analyzing personal network data as well as some social network data
sets.

Borgatti, S. P., Everett, M. G., & Freeman, L. C. (1992). *UCINET IV Version
1.00.* Columbia, SC: Analytic Technologies.

This program allows researchers to enter social network data, transform
chose data into several different configurations that are useful for inten-
sive analysis, and conduct most of the basic types of social network
analysis that are routinely done in a social network research project. The
manual for the program is an excellent reference source both for theory
and for the algorithms that are used to analyze these data.