

Drug Use, AIDS, and Ethnography: Advanced Ethnographic Research Methods Exploring the HIV Epidemic

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INTRODUCTION

The AIDS epidemic in drug-using populations has heightened the necessity for researchers to acquire accurate, in-depth, and intimate information about hidden and hard-to-reach populations. The spread of HIV infection has created an urgent need to focus on types of behaviors that are not readily accessible through survey, quasi-experimental, or experimental research designs, especially during the early exploration of these behaviors. Critical information about HIV risk-taking behaviors commonly includes issues that people do not feel comfortable discussing with strangers, such as intimate relationships and culturally unacceptable behaviors that may reflect subcultural values, actions, beliefs, and norms that are unfamiliar to individuals who only participate in the dominant culture.

Most of these hidden beliefs and behaviors can be investigated using ethnographic research approaches. Ethnographic research methods comprise the processes, procedures, and techniques that allow an anthropologist to select, collect, record, manage, and analyze qualitative data within the framework of anthropological theory. The classic configuration of ethnographic methods is participant observation. These data collection processes constitute a set of semiformal and formal techniques for direct observation of behavior, research participation in life experiences, and key informant interviewing. These approaches result in the collection of large volumes of descriptive data about peoples' lives. Historically, they make up the basic ethnographic toolkit. Now, in addition to classic ethnography, newly developed methodological advances are available that improve the ability to understand and predict human behavior.

BACKGROUND

Both basic and advanced ethnographic research methods allow researchers to explore key health and behavioral conditions related to HIV transmission across cultural, social, gender, and other critical boundaries. While the classic approach to ethnographic design has been in existence for more than 75 years, the newer methods evolved out of an intense discussion on research design in anthropology, beginning with the publication of two works that systematically described ethnographic field methods: Kroeber's (1953) seminal text, "Anthropology Today," and a book of recommended fieldwork questions published by the Royal Anthropological Institute (1951), called "Notes and Queries on Anthropology." Subsequently, there has been a steady dialog about ethnographic design, field entry, informant relationships, and the personal effects of field studies on the researcher.

The current works that characterize modern approaches to classic ethnographic studies as well as advanced ethnographic data collection techniques include Bernard's (1988) "Research Methods in Cultural Anthropology," the two-volume series by Werner and Schoepfle (1987) titled "Systematic Fieldwork," Strauss' (1985) "Qualitative Analysis for Social Scientists," Weller and Romney's (1988) "Systematic Data Collection," and a growing series of methodological monographs from Sage Publications. These works provide the methodological backdrop for the use of classic and current ethnographic techniques within the context of the AIDS epidemic.

ADVANCED METHODS AND RAPID ASSESSMENT TECHNIQUES

There has been a significant expansion of targeted ethnographic research techniques in the recent past. These approaches are predominantly focused on three areas of cultural analysis. There are new methods that improve the ability to analyze culturally defined cognitive systems, that assist in the exploration of social relationships and social structure, and that improve the ability to identify the conditions that affect human decisions, based on culturally defined decisionmaking processes.

These new methods must be supported by a solid ethnographic foundation and do not replace the need for baseline ethnographic data collection. However, they significantly enhance the ability to confirm

ethnographic and other social science findings from multiple directions. Referred to as "triangulation," this process is essential to high-quality qualitative research. These techniques permit ethnographers to produce greater analytical breadth and depth of detail. They also contribute to the potential for rapid assessment processes. They are focused techniques that allow ethnographers to explore narrowly defined areas of a culture more rapidly than is possible with classic ethnographic techniques. The following sections of this chapter provide examples of cognitive techniques and network analysis techniques drawn from the overall cadre of advanced ethnographic methods that have been used in AIDS research.

THE ANALYSIS OF CULTURALLY DEFINED COGNITIVE SYSTEMS

Efforts to prevent the spread of HIV require an indepth understanding and documentation of the cultural beliefs that determine the ranges and the variability in risk-taking behaviors. Cognitive anthropologists have been prolific in creating new methods to thoroughly explore the cultural dimensions of medical and other behavioral domains. These techniques can be divided into those that (1) assist in determining the content and limits of health care domains, (2) help in the analyses of structural elements of cultural domains, and (3) allow a more accurate portrayal of a domain from a consensual framework.

Determining the Content and Limits of Health Domains

The free-listing technique is the most common process that is used to begin the exploration of cognitive domains (consensual cultural beliefs) such as those associated with behavioral risks and HIV transmission. In one form or another, the technique has been used by every ethnographer who discovers an important cultural area and wants to explore the limits of that domain of knowledge, belief, or behavior.

The most basic free-listing approach is to systematically ask a set of "cultural experts" (articulate individuals with indepth knowledge about an aspect of their culture) to list and describe all of the elements that are part of a particular cultural domain. For example, the investigator has asked informants to list all of the risks that might increase someone's exposure to HIV. As other examples, the investigator has asked individuals to name all of the different ways that someone can catch AIDS, asked them to identify the different ways someone can find out they are HIV positive,

and asked about ways to beat drug urine screens using folk medical approaches.

Free lists provide natural language information that can be used in questionnaire construction or in educational materials that are culturally appropriate for a specific group. They also allow the differentiation between key subdivisions in the populations, since the domains can differ significantly by gender, ethnicity, age, and sexual orientation. Some of the more sophisticated uses of free-listing data allow the treatment of the listed domain elements as nominal or categorical data that can be statistically explored to identify the relationships among informants that connect the free-listing data to risk-taking behavior. The free-listing exercises, along with the techniques described below, become bridge techniques that tie together purely qualitative and general quantitative findings in the research.

As an example, the data in table 1 were collected by giving a piece of paper to 16 active drug users recruited for a National Institute on Drug Abuse (NIDA) HIV prevention program and asking them to "list all of the positive aspects of drug use." They were then given a second piece of paper and asked to "list all of the negative aspects of drug use." Part of the purpose of this exercise was to identify the barriers and potential positive reinforcement points for reducing HIV risks by reducing drug use. The investigator also wanted to determine if there were differences between injecting and noninjecting drug users, based on their free listings. The first free-listing exercise is presented in table 1.

The information from this and other free listings allows the investigator to more sensitively target prevention programs and more carefully educate prevention workers. For example, in working with out-of-treatment drug users, it is valuable to discuss drugs using the same terms they use and to not waste time on drugs that are uncommon to the region. This leads to greater credibility and trust in the intervention staff and to greater efficacy in preventing HIV transmission through drug use. This is an example of cultural competency in HIV prevention, rather than simple cultural sensitivity, since it can lead to more effective communication using the drug users' own model of reality.

Using free listing as a rapid scanning technique is useful in groups; it also can be used as a one-on-one interview exercise. The data enable a project to incorporate familiar terminology into written materials or behavioral

TABLE 1. *Free listing of positive aspects of drug use: Out-of-treatment drug users (N=16).*

Item	Frequency	Response Percentage
Escape reality		38
2. Relaxation		31
3. None		19
4. Feel good		13
5. Gives you energy		13
6. Get high		6
7. Makes you speed		6
8. Escape problems		6
9. Weight loss		6
10. No worries		6
11. More open		6
12. Better thinker		6
13. Calm		6
14. Head game with police		6
15. Mind expanding		6
16. Not in real world		6
17. Feed disease and keep it quiet		6
18. Recreation		6
19. Medicinal		6
20. Social		6
21. Educational		6
22. Spiritual		6
23. Popularity		6
24. Make friends		6
25. Friends		6
26. Impress opposite sex		6
27. Something to do	1	6
Total mentions; mentions per respondent	40	2.500

exercises constructed to meet intervention or health education goals. The free lists generated by one group or subgroup in the population (e.g., differentiated by ethnicity, gender, socioeconomic status) can also be compared with other targeted groups by using simple qualitative descriptions of the lists or cluster analysis and multiple dimensional scaling comparisons segmented by gender, ethnicity, or other demarcations. This provides researchers with the ability to describe both intracultural and intercultural variation across the nation or within the same geographical region.

The investigator uses the information collected on the demographic characteristics of the informants, in conjunction with the free-listing data, to analyze relationships between drug or HIV cultural domains and cultural orientation, intracultural variation, gender differences in knowledge, or economic and educational differences. Commonly, the answers to free-listing questions differ based on the sex, age, income, educational level, and other culturally significant factors of the respondents. In recent studies, the investigator has found statistically significant cultural differences in the knowledge of both drugs and the causes of HIV infection between cultural groups and between different types of drug users or nonusers (e.g., injection versus noninjection users). The comparisons use matched sets of 30 informants who vary on a single key social variable. The computer program creates distance matrices for each free-listing population and then systematically compares the answers using a set of statistical routines embedded in the program. The comparisons provide a measure of both the similarities and the differences for a single cultural domain, within and between the populations.

The investigator also uses free-listings to generate ethnographic questions and to suggest the wording for questions in quantitative survey instruments. The investigator commonly records responses in the free-listing exercises that are unexpected by the researchers. This technique identifies words and phrases that need to be explored and described in greater detail. These are often cultural labels that provide a window into behaviors that are unfamiliar to the researcher.

Free-listing data are open to several types of statistical analysis. These analyses include not only comparing nominal responses, but comparing rank orders of those responses based on frequency of mention. The advanced techniques for analyzing free-listings are described by Weller and Romney (1988).

Finally, there are techniques similar to free-listings, such as exploratory open-ended questions, Spradley's domain analysis techniques (Spradley 1979), or sentence completion processes that also can be analyzed using the approaches described for free-listings.

Techniques to Define and Analyze the Structural Relationships Among Elements in a Cultural Domain

Research methods in cognitive anthropology allow the exploration of relationships among all of the constituent elements of a cultural domain. They include pile sorts (Boster 1986; Weller and Romney 1988), triad tests (Lieberman and Dressler 1977; Weller and Romney 1988), and sentence frame techniques (Weller and Romney 1988). Each of these techniques begins where free-listings leave off. They start with the elements of a well-defined cultural domain and then allow the researcher to explore the relationships among the key elements of that domain. The basic approach common to each method involves asking informants to make judgments about the similarities and differences of the domain elements to one another.

A pile sort is a rapid assessment technique that uses visual aids to allow informants to create unconstrained classifications of elements within a cultural domain. The most common method is to place pictures, real objects, written labels, or combinations of the three, such as descriptors of risks for HIV infection, on cards. Each card represents one element in the domain being studied. The informant is asked to classify all of the elements by stacking the cards into piles and may form as many or as few piles as he or she wants. The final groupings of the cards represent the informant's individual topology of the domain.

This information then can be analyzed by one of several ethnographic computer programs to compare the variables in a distance matrix. Statistical analysis of the distance matrices can be used to transform the numbers into a visual representation of the relationships of informants to other informants, or of variables to other variables. The visual representations can include hierarchical clusters, graphic representations in N-dimensional space, or other common visual display techniques. The two most common statistical techniques associated with the use of these methods are cluster analysis (Aldenderfer and Blashfield 1984) and multidimensional scaling (MDS) (Kruskal and Wish 1978).

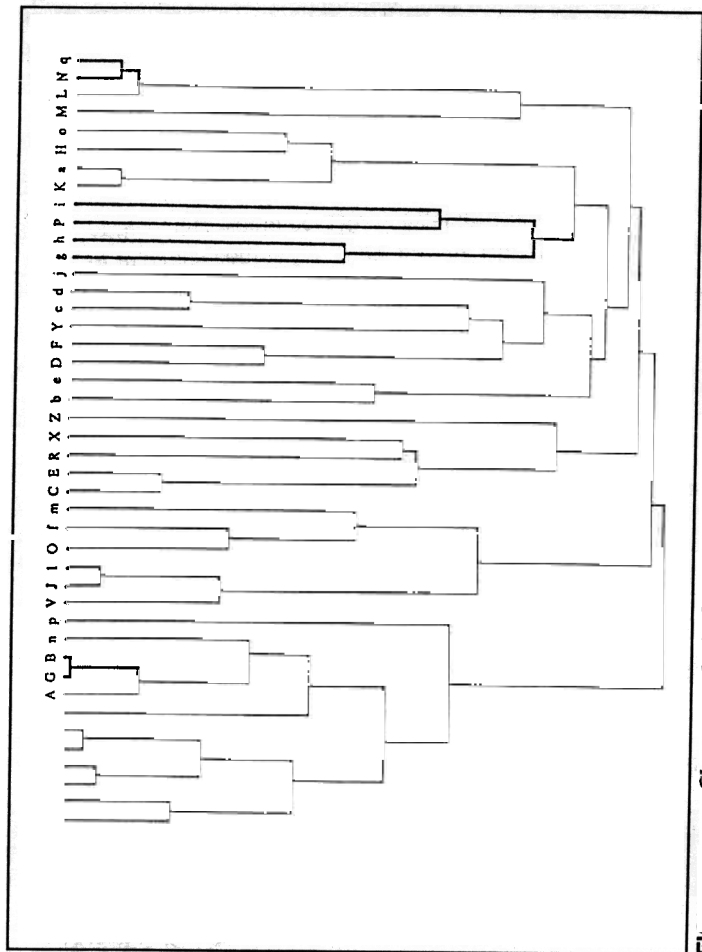
Cluster analysis can be used to create and explore cultural typologies by identifying hierarchical structural relationships in a complex data set. MDS is a related analytical technique for uncovering the underlying structure in complex databases (Kruskal and Wish 1978). MDS allows a researcher to analyze a complex database to find its organizational conditions, principles, or associations.

As an example, the investigator conducted an HIV risk pile sort with Navajo teenagers using a list of risks that had been generated from focus groups and ethnographic interviews with Navajo people. The purpose of the research was to identify ways that the teenagers related the HIV risks in their lives to other risks (including alcohol-, drug-, and sex-related risks). The investigator believed a more effective intervention and education program could be created if the program was informed by the structural relationships that the students used in thinking about the risks.

A list of 43 risks was used, which included risks related to school, family violence, alcohol, drug, and sex. Two of the risks were taken from Navajo traditional beliefs, including the belief in the supernatural effects of being exposed to lightning and the belief in walking home late at night when one might encounter ghosts. The resulting pile sorts were analyzed using both cluster analysis and MDS. The cluster analysis results are presented in figure 1a.

The cluster analysis results indicate that the teenagers link risks within bounded risk areas and that the linkages between areas are only weakly associated, if at all. An MDS analysis of the data was used to explore the underlying dimensions that the students used to organize their thinking about these risks. Figure 1b provides a representation on two of the dimensions present in the data, including the tendency of the students to organize the risks in terms of their perceptions of personal threat as opposed to a threat to the community as a whole.

The dashed and solid lines in the plot indicate two risk areas that remained distinct (weakly connected) to the other risks analyzed by this method: the sexually related risks (e.g., getting pregnant, STDs) and school-related risks (e.g., dropping out, flunking). This information indicates a need to integrate school and sexual risks in the prevention program to help the teenagers recognize the behaviors that place them at risk across multiple categories of behavior. A more complete description of this technique is available (Trotter and Potter 1993).



Cluster analysis dendrogram of Navajo teenagers' perception of risks.

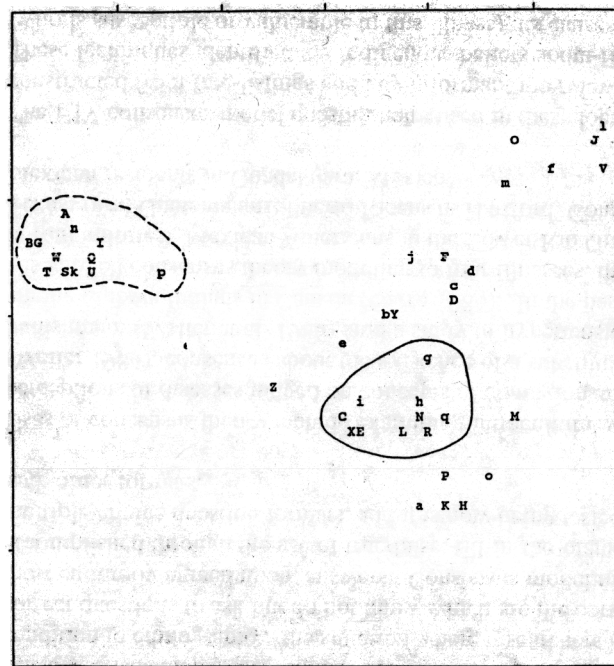


FIGURE 1b. MDS plot of risk pile sort data for Navajo teenagers.

KEY: A = unprotected sex; B = having sex frequently; C = using more than one drug at the same time; D = hurting yourself; E = sniffing something to get high; F = family violence; G = having lots of sex partners; H = drinking hard liquor (e.g., whiskey, vodka, gin, tequila); I = raping someone; J = poor grades or flunking out of school; K = drinking; L = cruising around in a car and drinking; M = driving fast; N = riding with someone who is driving dangerously; O = dropping out of school; P = passing out; Q = AIDS; R = getting high; S = having sex without birth control; T = getting pregnant; U = sexually transmitted diseases (STDs); V = ditching school; W = getting someone pregnant; X = marijuana; Y = beating someone up; Z = using intravenous (IV) drugs (needle drugs); a = drinking wine; b = walking around in a lightning storm; c = getting in fights; d = harassing people; e = suicide attempts; f = doing something that gets you suspended from school; g = smoking cigarettes; h = you can't remember what happened while you were high or drunk; i = someone getting you drunk when you don't want to; j = walking home alone at night; k = having unwanted sex or intercourse; l = not doing your homework; m = showing disrespect for parents or teachers; n = getting raped; o = drinking beer; p = having sex with someone you don't know; q = car accidents.

In addition to MDS and cluster analysis, there are multivariate and univariate analytical techniques that can be useful in analyzing traditional ethnographic data sets. Two works, Weller and Romney (1988) and Bernard (1988), provide details about these techniques and how they can be effective in ethnographic research.

Consensus Theory

Consensus theory is a method used to produce a consensual description of a cultural domain, while simultaneously assessing individual informants' expertise (consensual knowledge) in that domain. The creators of the technique describe its theoretical foundation as follows.

The central idea in our theory is the use of the pattern of agreement or consensus among informants to make inferences about their differential competence in knowledge of the shared information pool constituting culture. We assume that the correspondence between the answers of any two informants is a function of the extent to which each is correlated with the truth. Suppose, for example, that we had a "perfect set" of interview questions (cultural information test) concerning the game of tennis. Suppose further that we had two sets of informants: tennis players and non-tennis players. We would expect that the tennis players would agree more among themselves as to the answers to questions than would the non-tennis players. Players with complete knowledge about the game would answer questions correctly with identical answers or maximal consensus, while players with little knowledge of the game would not (Romney et al. 1986, p. 316).

The theory's assumptions are that cultural truth and informant accuracy can be derived from a model of culture that is probabilistic in nature. Behavioral research requires basic knowledge about the accuracy of information from self-reports of informants. Consensus theory provides one way to address these questions. The following statement on the nature of consensual cultural models flows from the above premises:

We suggest that informants' statements should be treated as probabilistic in character. When, for example, an informant states that the name of an object is "X," we should assume that there is some probability (that we can

estimate) that the statement is correct. This probability may be close to 1 in the case of a very knowledgeable informant and close to 0 in the case of an uninformed informant. The more informants there are who agree (when questioned independently) on an answer the more likely it is to be the correct cultural response (Romney et al. 1986, p. 314).

Consensus theory models of culture are developed through a formalized set of questions that explore cultural similarities and differences in shared experience and knowledge on the part of informants. The consensus theory technique melds ethnographic survey questions with a formal mathematical algorithm influenced by approaches used by psychometricians in test constructions, by signal detection theory, and by latent structural analysis procedures (Romney et al. 1986). The result is a model for deriving cultural truths from informants' statements about their beliefs and knowledge. Culturally correct answers are those that the most informed people believe to be true. They comprise a normative or consensual framework of a cultural worldview.

The consensus theory technique is designed to work with a common condition in ethnography: the situation where researchers know the correct questions to ask but do not know which are the correct, or the most culturally agreed upon, answers. Consensus modeling can be accomplished through the use of true/false, fill-in-the-blank, and multiple-choice question formats, and it is now being tested for use with rank order formats.

Uses of consensus theory include examining intracultural variation in perceptions of diseases judged on concepts of contagion and severity (Weller 1984), consensus about the existence of a subculture of corporal punishment (Weller et al. 1986), and a study of hypertension beliefs among Ojibwa Indians in Canada (Garro 1986). In the past year, a group has applied consensus theory modeling to four illnesses, including HIV, in four cultures: Mexican Americans in the Lower Rio Grande Valley of Texas; rural Guatemalans; Puerto Ricans in Hartford, Connecticut; and Mexican residents in Guadalajara, Mexico¹.

The HIV consensus model questionnaire used in these locations was constructed from free-listings and key informant interviews at each site. These techniques identified the indigenous beliefs about HIV infection (who is susceptible or vulnerable to this illness), its causes, treatments,

bodily effects, treatment modalities (who can treat it and where should it be treated), and consequences of the disease to both individuals and their society.

This preliminary ethnographic work led to the construction of an HIV consensus questionnaire that was translated and back translated. This is a process of translating a questionnaire into the locally appropriate Spanish from English, testing it in Spanish to make certain it is comprehensible, then translating it back to English from the Spanish version by someone who has not seen the original to determine if any meanings have been significantly changed in the translation and testing process. A randomly chosen set of cultural informants (40 individuals per site) was contacted in their homes and asked to respond to the questionnaire. The common questionnaire used at each site was constructed to accommodate the known variation in beliefs between the sites.

The final AIDS consensus questionnaire contained 135 true/false questions on susceptibility to the disease as well as on its causes, treatments, symptoms, and bodily effects. The susceptibility questions resulted in cross-cultural consensus about the people thought to be most susceptible to HIV infection and AIDS: homosexuals, persons engaging in extramarital affairs, injection drug users, prostitutes, persons who have unprotected sex, and unborn children. The consensual causes included having unprotected sex, receiving transfusions, using infected needles, having sex with prostitutes, and any blood contact. The lowest level of consensus across the cultures was in the area of symptom recognition. Only three symptoms (loss of weight, weakness, and susceptibility to other illnesses) were identified as consensual symptoms of AIDS. On the other hand, there were a number of symptoms (e.g., frequent urination, bloated stomach, wheezing, constipation, and swollen ankles) that were clearly seen as symptoms of other illnesses but not symptoms of AIDS. The answers to the treatment questions demonstrated that there is consensus that there is no cure for AIDS, that physicians are the best people to treat AIDS, and that death is inevitable.

Table 2 identifies some of the beliefs where there is consensus within specific cultures as well as matching or conflicting views between the four cultural groups. In the illustrations, a "Y" or an "N" indicate that there was consensus ($p < 0.001$) that the question was either true (Y) or false (N) within each culture (arranged in the order of Guatemalan, Puerto Rican, Mexican, and Mexican American). Where all of the answers

TABLE 2. *Consensus of beliefs.*

Selected consensual beliefs about AIDS from four cultures: Examples of validity check questions

G	PR	M	MA	
N	N	N	N	Does lying cause AIDS?
N	N	N	N	Does eating spoiled food cause AIDS?
N	N	N	N	Does air pollution cause AIDS?

Examples of cross-cultural consensus on public education information on AIDS

G	PR	M	MA	
N	N	N	N	Can you get AIDS from being near someone who has it?
Y	Y	Y	Y	Should you avoid using an injection needle used by another person?
Y	Y	Y	Y	Should you avoid contact with blood?
N	N	N	N	Can you get AIDS from drinking unboiled water?

Examples of conflicting consensus about AIDS in different cultures

G	PR	M	MA	
Y	N	N	N	Is AIDS inherited?
N	Y	N	N	Do people with AIDS often have TB?
N	Y	N	Y	Is a rash a sign of AIDS?
N	Y	N	*	Are night sweats a symptom of AIDS?

NOTE: The symbol "*" indicates a lack of consensus on the item within a particular group.

KEY: G = Guatemalan; PR = Puerto Rican; M = Mexican; MA = Mexican American.

match (e.g., Y Y Y Y), consensual agreement was found among all four cultures.

The results from this type of survey have a number of practical uses. First, there was a series of questions built into the questionnaire that were validity checks. These were symptoms and treatments that were patently false or were specific to other illnesses, but could be thought to pertain to HIV infection if there was a lack of knowledge about the disease. For these items, each cultural group correctly identified the absence of a relationship between the action and contracting AIDS. The consensus model supports the belief that educational diffusion programs about HIV transmission have increased people's knowledge about HIV infection on an international scale. The primary transmission routes (e.g., unprotected sex, prostitution, sharing infected injection equipment) were identified as causes of the illnesses, even where these behaviors are extremely rare. The nature of the disease, need for medical care, and lack of a traditional or folk medical component to the disease (although many said that prayer was at least an option in treatment) were common beliefs within each culture and between them.

There was also a strong indication that one of the major factors for early identification of the onset of illness (knowledge about symptoms and physical progress of HIV infection) was missing or reduced in those areas that had few HIV or AIDS victims. The investigator included the major known symptoms of the onset of HIV infection and AIDS in the consensus interviews. Only three of the symptoms were recognized by all four groups as symptoms of the illness. These were loss of weight, susceptibility to other diseases, and weakness. Thrush, night sweats, skin conditions, and other common symptoms of at least most of the HIV strains were not a part of the cross-cultural consensual model of the illness. On the other hand, these symptoms were part of the cultural model of HIV and AIDS for the Puerto Rican sample. That sample resides in the highest HIV prevalence area of the four groups. They have more direct contact with HIV- and AIDS-infected individuals. Some of the consensus about both symptoms and consequences appears to follow a seroprevalence gradient and a public education gradient (amount, frequency, and intensity of information disseminated through public media). This suggests that the technique provides one method for measuring the impact of social diffusion theory approaches to HIV/AIDS public education programs within a group or across cultural boundaries. It also provides a mechanism for the impact evaluation (i.e., small-group and community-level effects) of local prevention programs.

Consensus theory approaches are valuable in taking a step beyond simple knowledge tests about HIV/AIDS risks, since they measure the strength of belief in a population in addition to true/false answers to knowledge questions. In this specific case, the information from the consensus theory models identifies areas of lack of knowledge about HIV/AIDS, identifies the strength of both correct and incorrect information held within the community, and identifies the areas of belief that must be specifically targeted for change, as opposed to the ones that should be specifically targeted for reinforcement by both individual and community intervention processes.

NETWORK ANALYSIS

Anthropologists and other social scientists have been interested in the effects of social structure and organization on human survival and social interaction for a long time. Conklin's (1964) ethnogeneological method is an example of an early formal research method in anthropology to create kinship-based models of social relationships in a culture where the formal structure of the kinship system is unknown. More recently, anthropological research has involved increasingly sophisticated examinations of both informal and formal human networks. Modern network analysis provides a technique for expanding the knowledge of the effects and dynamics of human social organization in both kinship and nonkinship networks.

The investigator is currently using network analysis theory and practices in a Multicultural AIDS Prevention Project (MAPP). The MAPP prevention efforts focus on the combined use of network and individually based interventions in four cultural groups: African Americans, Anglo Americans, Hispanics, and Native Americans. More than 550 active, out-of-treatment, injection drug and crack cocaine users have been enrolled in the project. These individuals can be identified as members of more than 40 drug networks, plus some isolated individuals with no known network membership. The networks range in size from 2 to 70 people, and the serostatus of the networks ranges from zero to 50 percent HIV. The investigator has identified both the intra- and the internetwork connections of these individuals and has created a composite data set that allows the testing of prevention and intervention models combining social network considerations with psychosocial approaches to HIV risk reduction (Klovhdahl 1985).

The MAPP network approach has been constructed from three types of analytical processes used in a complementary fashion. These include an ethnographic exploration of drug networks, an ego-centered (single-person-oriented) quantitative data collection process, and a full relational network analytical approach that includes both qualitative and quantitative elements for analysis and interpretation of interactive network data.

Ethnographic Network Data

Ethnographic interviewing at the community level has identified numerous small drug networks that form the primary focal points for drug use in the study community. These networks represent the primary locus for purchasing, distributing, and the joint use of drugs. Most of the networks are interlinked by one or two people. Multiple network membership exists, but for some networks is rare. The composite ethnographic characteristics of the networks have been used to create a drug network typology or classification system.

The networks have characteristics that either increase or decrease the risk for HIV infection over time, including three major variables: the open versus closed nature of the network in terms of recruitment of new members, the type of social relationships (kin or peer), and the type of activities (drug use, work, or play). The interplay of the three variables has been used to produce a typology of four drug network types (Trotter et al. 1995).

Type A networks are closed groups based on long-term associations, with virtually no other social interaction beyond obtaining drugs. Members of this network type tend to use drugs in isolation and not engage in drug-related social activities. Type B networks are semiclosed, with membership based on kinship ties. Family activities and drug use are generally shared within the group. Type C networks are semiopen and are based on long-term friendships and sexual partnerships. It can take a year or more to be invited to join one. Recreational drug use is central to the group, as are social and work-related connections and activities. Type D networks are open and have loosely defined boundaries. Membership is based on acquaintance or willingness to purchase drugs (especially for others).

This network typology has been cross-validated using quantitative data about drug use and HIV risk patterns of the members. Each network was first classified using the qualitative criteria described above. One-way analysis of variance (ANOVA) was used to compare selected drug and

HIV risk variables across the four network types and isolated individuals. Significant differences in IV drug use among the categories were seen in the last 30 days ($F(4,171) = 9.16, p = 0.0000$), with the type A network reporting the most use in the last 30 days compared to the remaining four groups (isolated individuals were treated as an analytical category, in addition to the four network types). Sexual risk and HIV testing were also examined. Frequency of unprotected sex was expected to differ among them. This hypothesis was supported for males ($F(4,90) = 3.93, p = 0.006$), but not females ($F(4,49) = 0.16, p = 0.95$), with the kinship network and the isolated individuals engaging in the most frequent unprotected sex, followed, in order of decreasing frequency, by type A, type C, and type D (the youngest group) ($M = 0.51, SD = 0.46$). The isolated individuals may have less choice or less motivation in relation to using protection, and the family-based network members have many socially negative connotations associated with using condoms with regular partners. These results agree with the ethnographic data, including the lack of differences among females. The rate of unprotected sex was uniformly high across all five groups for females. Intercourse with IV drug users was also expected to vary across the groups, with type B networks engaging in the least amount of safe sex (intercourse with non-IV drug users). This hypothesis was supported ($F(4,139) = 3.06, p < 0.02$), with the members of type A networks engaging in significantly less safe sex (condom use) than the type D network members. The remaining three groups were between these two in frequency of safe sex. The frequency of HIV testing was not significantly different ($F(4,172) = 1.96, p = 0.10$) across the five groups, but there was a greater likelihood for members of network type B to be tested more often. The finding that type B network members have been tested most frequently may be related to social norms about the need to protect other family members, which was a consistent theme in the ethnographic interviews conducted with these individuals. The low rate of testing for isolated individuals may reflect the social ecology of nonaffiliation, including a limited access to resources, or other psychosocial and economic conditions.

These data have been useful to the MAPP initiative for targeting intervention and education activities for the highest risk groups, based on multiple risk criteria. They also contain important information about the subepidemics that are likely to be part of HIV transmission linked to drug use in rural areas, with transmission more likely within and between some types of networks than others.

Ego-Centered Network Data

Ego-centered network analysis describes an index individual (ego) and all of the individuals that he or she recognizes as being connected to him or her in terms of specified social relationships. The attributional data associated with ego-nominated networks (e.g., size, gender and ethnic composition, retrospective conditions) can be identified and described as a typical network profile and can be statistically analyzed in association with other psychosocial variables.

The ego-centered network questionnaire was developed cooperatively as part of NIDA's Cooperative Agreement Project and has been tested at five sites (Trotter et al. 1995; Williams et al., in press). The purpose of the instrument was to describe the ego-centered networks of out-of-treatment drug users and their risk behavior in relation to possible HIV infection. Respondents had to be at least 18 years old, could not have been in treatment for at least the past 12 months, and had to have a positive urine test for either cocaine or heroin use (or have fresh needle tracks and test positive for other injection drugs) at the time of the interview. The nonclient alters (other people named by the index individual) often included individuals younger than 19, since no age restrictions were placed on naming people in this category.

The number of people each index individual (N = 52) reported "spending time" with (i.e., the alters) ranged from between zero to more than 25, with 76.3 percent responding that they spent time with zero to 10 people; this included between 1 and 10 family members for all but 16 of the respondents. Only 25 percent responded that all of the people they spent time with used drugs and 13 percent reported that none of the people they spent time with used drugs. Of those alters who used drugs, 25 percent injected drugs, 69 percent smoked crack, and the rest used some other drug (mostly marijuana and alcohol). Respondents reported the size of drug-using networks as follows: 25 percent denied injecting drugs or smoking crack with anyone else, 17 percent identified one person, 11 percent identified two people, 13 percent identified three people, 11 percent identified four people, 9 percent identified five people, and 11 percent identified six people (maximum allowed). Examination of the ethnic composition of these 52 networks showed that 48.8 percent were confined to a single ethnic group, 46.5 percent included representatives from two ethnic groups, and two networks (3.8 percent) included three ethnic groups. The risk factors assessed by the ego-centered questionnaire included needle sharing and sexual relations with network members.

Sexual activity was reported with 20 of the possible 127 alters (15 percent). All of the sexual relationships included sex during drug use. The following risks were listed by at least one individual as occurring in the past 30 days: not cleaning shared needles with bleach, using the same cooker as someone else, using the same rinse water, and individuals having sex during drug use. A larger sample (stratified and sized according to a power analysis) would be needed to determine how these risks were distributed throughout the various local drug networks, but the confirmed presence of the risks indicates that the networks are at risk for HIV infection from drug use or sexual activities associated with drug use.

These preliminary data from the ego-centered network analysis and the ethnographic network identification process identify both ethnically homogeneous and heterogeneous networks. Homogeneous networks are hypothesized to represent the closed (e.g., marked by slow or minimal recruitment) types in the network typology. Heterogeneous networks that include members from more than one cultural background tend to be marked by more rapid recruitment and may be the higher risk networks. The homogeneity or heterogeneity of the networks is a potential analytical variable for measuring both risk and risk reduction at baseline and during the project. It should be possible to determine if there are different levels of risk-taking behaviors among the homogeneous groups and between the heterogeneous groups and each of the homogeneous groups. This will assist in targeting and defining the emphasis given to specific risk-reduction strategies in each of the targeted interventions.

In summary, the data indicate that the majority of networks are small (2 to 10 individuals), are based on close friendship or kinship ties, and are relatively stable in their composition. The networks are also at high risk for both needle sharing and sexual activity. The responses indicated that the majority of needle-sharing activities occur with the first three people named by the index individual as members of their network and that sexual activities occur predominantly with the first person named by the index individual, or one of the individuals named in the fifth or sixth position (casual partners). A smaller portion of the needle sharing and sexual encounters occur outside of the index individual's network, but these encounters, called "weak ties," are often the highest risk contacts for the majority of drug users and can significantly affect the serostatus of the network, if it is free of HIV. Based on this data, part of the HIV prevention and education effort has been directed at making recommendations that would help these individuals break, reduce, or decrease the risks

associated with weak-tie types of relationships. Breaking or reducing high-risk ties within the networks is a much more difficult proposition.

Full Network (Relational) Data

Ethnographic and ego-centered network approaches yield valuable baseline data for intervention strategies (Trotter et al. 1994), but they do not provide all of the information needed about the type, strength, or direction of the relationships within drug networks. They do not allow the comparison of differences in relationships based on specific interactions, such as drug use, social activities, or other intimate topics.

Members of 10 networks were asked to rate their relationship to each other based on a structured set of questions about their drug-use patterns and communications about intimate subjects such as sex. This full network questionnaire was a matrix of 27 questions that allowed each individual to define his or her relationship to each other member of their network. The questions include social relationship questions (e.g., how much do you hang out with ____?), drug relationship questions (e.g., how willing are you to share needles with ____?), and HIV- or intimacy-related questions (e.g., how willing would you be to tell ____ you have AIDS?). The responses were aggregated and analyzed to depict the social, drug, and intimate communication relationships in the network.

Figure 2 presents two types of full network data collected on one of the identified drug networks. The left half of the figure contains two classic kinship charts, since everyone in this particular drug network is a member of one of two associated kinship groups. The other diagram is a sociogram that presents a composite view of their answers to the drug items on the network questionnaire. The diagrams allow the illustration of the relationships in the group from two different perspectives: classic role analysis using kinship as the basis for interaction and views of the group on the basis of influence, and communication flow models derived from network analytical procedures.

This drug network is predominantly Hispanic and involves two generations of two associated family groups. The ages of members range from 18 to 38 years, and the group is only accessible to family, including relatives by marriage. The solid lines between individuals represent strong (or close) ties or influences. The arrows indicate the direction of

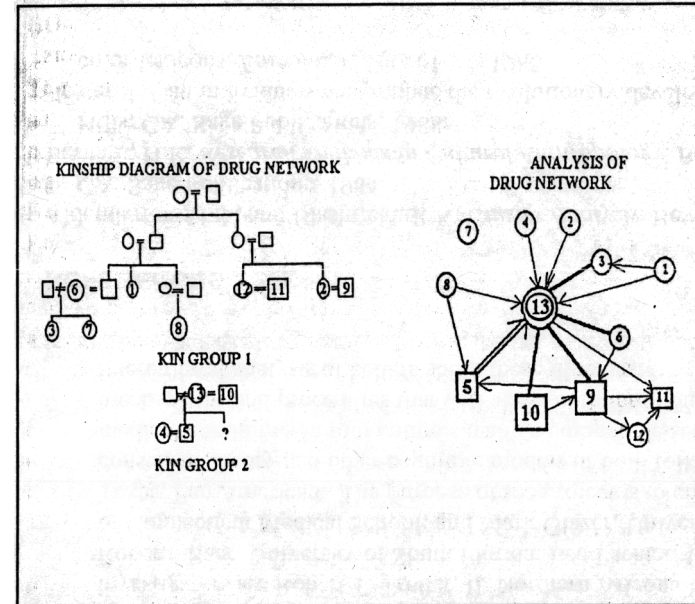


FIGURE 2. Anthropological network analysis information.

KEY: — = two-directional strong ties; ⊕ = centrality and flow betweenness; → = one-directional ties and direction; → = influence/direction.

that influence, and two arrows indicate a reciprocal relationship. For example, the central individual in the clique network diagram, number 13, is the primary communication node for both the social and the drug network relationships. Her son, number 5, exerts the primary influence in the group on drug-related issues and is the primary source of drugs for the group. She is the primary social influence in the group and one of the reasons why the group remains coherent.

In the early stages of this analysis, the first concern has been to demonstrate whether or not active drug groups are amenable to this type of research process. As can be seen from the examples above, the process works in this situation. Following that demonstration, the network data is being used in several creative ways. One is to determine the primary sources of influence and communication in the networks and target those individuals for interventions that will influence the behavior of the remainder of the network. Another is to use the network itself, and its

concomitant social influence processes, to set group goals and either reinforce or change group norms in relation to HIV risk-taking behaviors. This may help to overcome both the logistical and cost factors of doing HIV prevention work one person at a time.

The majority of drug-using networks tend to depend on kinship and long-term friendship for entry, tight communication, and reinforcement of the group's norms. This suggests that if the network is free of HIV infection, the group can become an excellent focal point for developing or reinforcing social norms that promote behaviors that will allow the network to remain free of HIV infection. These norms can be used to eliminate risky behaviors, such as needle sharing with strangers or unprotected sex with casual partners. The group boundaries can be reinforced and the members encouraged to make an assessment of HIV risk from potential new members. New recruits would then be sought only from lower risk individuals engaged in drug abuse or sexual behavior with the group.

There are numerous advantages to using a multiple-method network approach in HIV and drug risk-reduction programs: (1) network-based outreach can be an effective mechanism for establishing the contacts and relationships necessary to conduct effective HIV-related research with hard-to-reach populations; (2) recruiting can be accomplished within the context of the social groups that will also reinforce program objectives; (3) since tracking network members is a natural function of the gatekeepers of the network, use of the gatekeepers can greatly assist the followup phase of any project; (4) networks that exhibit strong group norms can be approached differently from those with predominantly weak ties and variable norms and can be encouraged to adopt or maintain norms that reduce HIV risks and reinforce protective behavior (e.g., needle cleaning, safe sex) as appropriate behaviors within the group; (5) network interventions can foster increased communications between members of these groups; and (6) using network techniques to identify interactions that constitute incomplete or poor communications can lead to more clearly targeted interventions. Network analysis provides opportunities for targeted intervention, education, and prevention of HIV risks beyond individually based risk-reduction efforts and promises to have direct applicability for out-of-treatment alcohol abusers as well.

SUMMARY AND CONCLUSIONS

This chapter identifies and explores a small number of recently developed advanced ethnographic research methods. There are other techniques that provide an excellent adjunct to standard prevention research efforts, as well. These include the cultural models approach (Price 1987; Quinn and Holland 1987), anthropological decision modeling (Gladwin 1980, 1989; Plattner 1984; Young 1980), the advances in focus group techniques (Morgan 1989), the processes for using ethnographic interviews to create culturally competent survey questionnaires (Converse and Presser 1986), and the uses of systematic direct observations of public behavior. Some of these issues are explored in the references cited above, as well as in other recent articles (e.g., Trotter 1991; Trotter et al. 1995). The number of tools available to ethnographers is growing rapidly, and they promise to greatly increase the capacity to make important contributions to reducing the spread of HIV in human populations.

NOTES

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