Building Connections: Understanding Relationships and Networks to Improve Adolescent Sexual and Reproductive Health Programs

Katherine C. Bond
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# References and Resources
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I hope that future applications of these approaches will result in improved programs and, ultimately, better health and development status among young people around the world.

Many thanks.
ABOUT THIS TOOL

This tool is designed for field application by program practitioners who have heard about the application of network approaches but are unfamiliar with the concepts and tools, and researchers and academics who are interested in familiarizing themselves with the concepts and practice of social network research.

*Building Connections* describes the structures and dynamics of relationships and networks, and of program approaches that influence youth behaviors.

- Chapter 1 provides information about topics—including objectives, resources, and ethical issues—that should be considered when preparing for social network analysis.
- Chapter 2 discusses the importance of social influences on young peoples’ behaviors, drawing on theories of interpersonal relationships and social networks.
- Chapter 3 discusses programmatic approaches that emphasize strengthening relationships through peer programs, social mobilization efforts, organizations, coalitions, and networks. It suggests specific analytic techniques described in the tool that can be used for each program approach.

This tool also suggests techniques used to conduct different types of social network analysis according to a program’s needs.

- Chapter 4 provides a step-by-step explanation of how to conduct each of these techniques. There are three basic techniques for conducting social network analysis: identifying local language, categories, and nature of relationships; characterizing networks; and mapping networks.
Finally, *Building Connections* illustrates how an understanding of social relationships and networks can help with program design, implementation, monitoring, and evaluation.

- Chapter 5 illustrates how social network analysis can be applied to programs. Case studies are presented from Chiang Mai, Thailand, where attention to youth issues has grown in light of epidemics of HIV/AIDS and drug use. This approach was developed through a collaborative effort between program staff concerned with young people’s social networks and environments, and researchers interested in learning more about social network influences on behaviors.

- Chapter 6 describes applications in other countries and proposes possible program settings where this approach may be used.

In addition, the appendices provide extensive resources for conducting social network analysis.

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1The work began with a small study of the HIV/AIDS risks of social networks of migrant youth (Bond 1995). The results were used to design an urban initiative to address youth reproductive health issues and to strengthen networks of nongovernmental organizations (NGOs) responding to HIV/AIDS and youth needs (Bond et al. 1997; Athamasar et al. 2000; Fongkaew et al. 2000). Community organizations and NGOs, local school teachers, and government workers have since incorporated network mapping, planning, implementation, and evaluation into their initiatives for youth and people with HIV/AIDS. While the illustrations used in this tool are specific to Thailand, the methods have been applied in other contexts.
Building Connections:
Understanding Relationships and Networks to Improve Adolescent Sexual and Reproductive Health Programs
Chapter 1: Overview

Understanding Adolescence

Social Network Analysis

Preparing for Social Network Analysis: Important Considerations
Defining Objectives
Resources
Ethical Considerations
Building Connections:
Understanding Relationships and Networks to Improve Adolescent Sexual and Reproductive Health Programs
Safe and supportive social environments are critical to the health and development of young people. Positive relationships with parents and other adults, friends, romantic and sexual partners, and broader institutions can protect young people from risks associated with negative reproductive health behaviors and outcomes. They can provide encouragement and support to help young people realize their potential and contribute meaningfully to their communities. These connections serve as a foundation upon which young people enter adulthood.

A growing body of evidence suggests that young people’s behaviors and beliefs are shaped positively and negatively by their relationships with others and the societies in which they live (Barber 1997; Bearman and Bruckner 1999; Blum 1998; Bond et al. 1999; Friedman et al. 1994; Kirby 1999b). Effective approaches to adolescent reproductive health build supportive relationships and social environments (Kirby 1999a; Brown and Theobald 1999).

To date, many adolescent reproductive health programs have emphasized providing information about reproductive anatomy and physiology, delivering contraceptive supplies and services, or increasing access to clinics. While these activities are important and necessary, research and program experience indicates that interventions focused solely on individuals’ knowledge or access to services often do not change sexual and reproductive health behaviors (Kirby 1999a; Houvras and Kendall 1997).

In many developing countries, communities of parents, health providers, policymakers, and other concerned adults, as well as young people themselves, are working to improve young people’s connections with one another, with the adults who care about them, and with the institutions that serve them.

**UNDERSTANDING ADOLESCENCE**

Adolescence is a period of formative and dynamic transitions, when young people take on new roles, responsibilities, and identities. During this period, health behaviors that will last long into adulthood can be strongly influenced. Gender norms, notions about appropriate sexual behaviors, and awareness of such issues are shaped during adolescence.

Adolescence also marks cultural transitions through traditions such as circumcision, marriage, and childbirth. As young people experience new situations, leave school or home, gain exposure to peer groups and friends, and take on their first jobs, they exhibit creativity, energy, vulnerability, and resilience.
Emerging evidence indicates that the ability to effectively navigate the unpredictable passage from childhood to adolescence is highly dependent on the presence of connections—positive relationships with peers, adults, and institutions that provide a safety net to support healthy development. Attention given to creating and strengthening connections directly contributes to the ability of youth to assess risks and make reasonable choices.

**SOCIAL NETWORK ANALYSIS**

To understand and positively influence young people’s relationships, researchers and program staff are conducting social network analysis, an analytic approach that is being used more frequently in social research and program evaluation. A social network consists of the informal links among members of a social system. Social network analysis is an approach to help understand patterns of social relationships and communications to learn who has contact with whom (Valente 1995). By analyzing these patterns, we can learn how relationships constrain or encourage social behavior and social change (Bond et al. 1999). More specifically, we can analyze how a person’s interactions with others can affect his or her perceptions, beliefs, and actions (Valente 1995).

This information can be applied to programs in three ways. First, it can help programs assess risk to improve program design, targeting, and selection. In order to make the most of limited resources, programs need to target their services and activities to those most in need, and where they are likely to have the greatest impact. Many programs, while designed to increase knowledge and promote healthy behaviors, target and reach young people who are most protected, primarily through school-based programs. By engaging in an assessment of youth networks and behaviors, programs can improve their targeting strategies and engage youth to become involved in program strategies and implementation.

Second, this information can help improve peer programs by helping build positive relationships and communication. The majority of effective youth programs that have been well evaluated are based on interpersonal behavior models, in which behavior is viewed as a dynamic interaction between the individual and his or her environment. These programs help do the following:

- understand risks and benefits of behaviors, including how engaging or not engaging in behaviors might jeopardize or support a relationship;
- recognize who influences a young person’s decision making;

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2 Social network analysis has been applied to public health in four key areas: the influence of social support has been demonstrated in relation to mortality and morbidity; network theory and modeling have supplemented HIV/AIDS, sexually transmitted infections (STIs), and family planning research; network analysis has improved message dissemination and program implementation in community-based health projects; and interorganizational collaboration, cooperation, and exchange studies have been carried out with an aim to improve health service provision (Valente 1997).

3 These theories include Social Learning Theory (Bandura 1986), Social Influence Theory (McGuire 1972), Social Inoculation Theory (Homans 1965), and Cognitive Behavioral Theory (Fishbein and Ajzen 1975).
• focus on perceived norms, roles, and incentives of behaviors (risk analysis);
• develop the ability to carry out behaviors in relation to others (role plays);
• change individual and group values and norms;
• build social skills;
• provide social support for healthy behaviors.

Finally, social network analysis can help programs build support for youth and youth programs. Health promotion for young people involves creating supportive environments and social systems that protect them from risk and promote healthy behaviors. Successful efforts aimed at promoting young people’s reproductive health acknowledge that youth behaviors are shaped by the societies in which they live, and aim to change aspects of those societies that contribute to youth vulnerability and risk. Changing social institutions, rules, and values requires an approach different from that for changing individual behaviors. Efforts aimed at social change include the following:

• mobilizing communities to create alternative social norms and values that protect young people from risk;
• creating linkages and strengthening positive relationships with adults and social institutions;
• creating favorable policies and regulations that support youth;
• increasing access to programs and services; and
• expanding opportunities.

**PREPARING FOR SOCIAL NETWORK ANALYSIS: IMPORTANT CONSIDERATIONS**

**DEFINING OBJECTIVES**

How you use this tool will depend on the objectives and stage of your program or research effort. At the program design stage, the information gathered can help you select or target individuals and types of relationships for your intervention, train providers to communicate in language and terms used by youth, incorporate relevant terms and concepts into your information and communication materials, and engage in participatory problem solving.

If you plan to monitor your program, the techniques will help to verify that you are reaching the targeted youth or need to modify your strategy. You can assess how young people feel about communicating with parents, friends, partners, and service providers and identify weak links in a communication or peer network. Using these techniques over time can help track trends or changes in your program.

You may need to evaluate the effect of your program on young people’s relationships and social networks. In this case, a more formal evaluation process must be developed, including a baseline survey and experimental design. In addition to measuring changes in
individual behaviors and attitudes, it is possible to measure changes in the composition of social networks and patterns of communication. This level of evaluation is more complex than will be described in this tool; however, additional references are suggested.

**RESOURCES**

The techniques described in this tool can be applied at several levels. The amount of time, effort, and funds required depend on the size of your program and resources you have available.\(^4\) Program managers must determine whether the time, effort, and cost of using the techniques in this tool are justified in light of the expected benefits. Availability of money, staff, and time is essential for a full-blown data-collection effort. If you do not have staff capable of conducting the activities—or cannot release trained staff from other duties to concentrate on the activity—and if you cannot afford to hire outside assistance, you may elect to carry out only a very basic review of your program’s progress.

If you have few resources, you may want to use participatory learning techniques and map social networks by hand with smaller samples. At a minimum you will need:

- an understanding of the concepts and a clear plan for application;
- someone to supervise the process, which includes working with youth groups to define the questions and issues for analysis, develop or adapt instruments, plan and carry out data collection, process and organize data, and conduct analysis;
- resources to collect data, including paper for instruments, telephones (if appropriate) and other communication methods, transportation fees, and other forms of support for data collectors.

If additional resources are available, you may consider collecting data from larger samples and using computers for analysis. A moderate level of effort will require:

- a computer, with Excel spreadsheet software, DOS operating system, and Krackplot (Krackhardt et al. 1993);\(^5\)
- youth or others who can be trained to collect data, and who can assist with data processing, management, and analysis.

Managing a data-collection effort requires planning and creativity. Think carefully about the types of information you need to collect. Find ways to collect data that relate to the outcomes you are hoping to achieve, the meaning of your program for participants, and the factors that influence why your program is succeeding. Programs often collect too much data, either about too many issues or about issues that do not relate to their

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\(^5\)Krackplot is distributed by Analytic Technologies, 306 South Walker Street, Columbia, SC 29205 USA.
program approach. Spending a lot of resources on data collection does not guarantee that you will end up with results that help you understand your program and participants better. The table below offers a form for preparing a budget.

**Table 1.1. Preparing a Budget**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount of Funds Needed</th>
<th>Source of Financial Support</th>
<th>Source of In-Kind Support</th>
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<tbody>
<tr>
<td>Salaries: for the personnel needed for technical assistance, data collection, data entry, and analysis (staff, interviewers, supervisors, drivers, etc.)</td>
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<td>Per diem: daily costs for lodging and food</td>
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<td>Travel: bus or taxi fares, gasoline, vehicle rental and maintenance</td>
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<td>Printing: survey questionnaires, interview guides, final reports, etc.</td>
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<tr>
<td>Equipment and equipment maintenance: e.g., bicycles, computers</td>
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<tr>
<td>Communication: telephone, fax, computer, radio, postage</td>
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<tr>
<td>Supplies: paper, computer diskettes, pencils, portfolios, etc.</td>
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<tr>
<td>Dissemination activities: seminar or conference costs, refreshments, materials, portfolios, presentation supplies, etc.</td>
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<td><strong>TOTAL</strong></td>
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ETHICAL CONSIDERATIONS

When conducting research or evaluation activities with young people, one of the most important considerations is performing these activities ethically. Ethics refers to professional standards of conduct as well as moral principles and values exercised in conducting research and evaluation studies. Ethical reviews are designed to consider and minimize the potential risks and negative consequences to participants as a result of their participation in a study or evaluation. Responding to ethical concerns will positively influence your relationship with the community and enhance your ability to collect high-quality data.

Ethical concerns can be addressed in several ways:

- **Community input:** The effort should respond to concerns of community stakeholders such as parents’ groups, youth clubs, NGOs, religious groups, and youth. Many may have strong views on what types of questions are relevant and acceptable. For example, some youth may voice their concerns about participating in a survey that explicitly addresses sexuality. Others may have suggestions about developing questionnaires that young people will feel comfortable responding to, thereby increasing validity of responses. Document community input for reference in case the evaluation becomes controversial.

- **Parental permission:** Local standards and laws will determine the age at which a young person can consent to answer a survey or questionnaire. For example, in some places a young person is considered an adult at the age of 16; in other places, “emancipated minors” only include those who are married or serving in the military. Be sure to find out when you need to secure parental permission. If no legal standards exist, ask for advice and input from the community. Consider whether it is practical to obtain permission from parents, and explore the options for getting an “adult advocate” for a young person to permit them to participate in the evaluation. Parental consent can be verbal, but written is best.

- **Informed consent:** Before completing a questionnaire, youth must understand what they are being asked to do, and how the information they provide will be used. This is called “informed consent.” It is a key to getting good data, because youth may not answer questions honestly if they are concerned about who will see their answers or how the data will be used. Most questionnaires have an “informed consent” waiver that is read to youth before they begin the survey. The language of informed consent must be explicit and comprehensible to young people. Those collecting data should be trained to understand the concepts of informed consent, and able to answer...
concerns from youth about their participation. Finally, you should consider legal requirements to disclose certain types of information such as sexual abuse and illegal drug use. If you are required by law to disclose this information, you must tell youth this before they answer any related questions.

- **Voluntary participation:** You must ensure that young people are answering your questionnaire voluntarily. Compensation is acceptable, if it is modest (e.g., reimbursement for transportation costs, snacks). Avoid pressure by authority figures to participate in a survey conducted in an institutional setting. If possible, identify adults who can advocate for youth, such as a school nurse, and answer the questions of youth who are concerned about participating. Senior-level supervision can help ensure that the principles of voluntary participation are followed in the field.

- **Confidentiality and privacy:** Most research and evaluations of youth programs collect information anonymously. If names are collected, keep them separate from completed questionnaires and connect the two by a code. Privacy is also important. The survey should be administered in a private place, where others cannot hear or see a young person’s answers. Avoid testing techniques that inadvertently reveal something about youth (e.g., longer questionnaires for sexually active youth). Because the techniques described in this tool ask about relationships, it may be necessary to collect names, nicknames, or other ways of identifying the respondents in a network. There are two important measures to take to ensure privacy:

  1. Names must be kept confidential and in a place separate from analysis. This practice is consistent with most other forms of research.

  2. When, or if, network information is fed back to respondents, they may discover new information about their friends and partners. For example, they may discover that their feelings are not reciprocated. You should make sure that all respondents agree to share this information. If so, it is very important that the feedback process is facilitated with sensitivity and discretion. It is particularly important that no sensitive or confidential information about the respondents is easily linked with their names.

- **Risk to respondents:** Even with confidential surveys, concerns remain that certain kinds of questions are harmful to youth. The primary risk is possible violation of privacy. Another potential risk is that of introducing information or sexual behaviors to younger adolescents. Many researchers and evaluators develop a “skip pattern” in their questionnaire so that youth who have never heard of sex, for example, are not asked about sexual behavior. Some researchers offer a discussion or question-answer period after youth have completed their questionnaire.
Chapter 2: Understanding Social Influences on Youth Behaviors

The Interpersonal Environment: Dyads and Small Groups
- Family
- Peers
- Partners

The Social Environment: Institutions, Communities, Networks, and Organizations

Dynamics of Interpersonal Relationships
- Context
- Characteristics
- Feeling Connected
- Support
- Expected Norms or Perceived Values and Attitudes
  - Power and Communication
  - Behaviors and Activities

Dynamics of Groups and Networks
- Communication Patterns
- Leadership
- Subcultures
Chapter 2

Understanding Social Influences on Youth Behaviors

Research findings suggest that the social environment in which young people are embedded shapes their sexual and reproductive health behaviors. This chapter describes:

- the structure of relationships; and
- dynamics of relationships and networks that influence youth behaviors.

The content is compiled from a wide body of theories of social influence.

Environment refers to factors or relationships that surround the individual, including family, friends, peers, partners, organizations, and communities, or the physical environment, place, and time (Sweat and Denison 1995; Minkler and Wallerstein 1997). Several theories suggest that social relationships influence behavior differently, depending on how they are structured.

The interpersonal environment is composed of one-to-one relationships and small groups. It consists of relationships with family, peers, and partners. The broader social environment is composed of institutions, communities, networks, and organizations. Social network analysis is designed to understand these relationships and their influence on behaviors. Peer programs are designed to influence interpersonal communication and small-group norms and behaviors. Organizational networks and coalitions are created to address broader social issues.

The Interpersonal Environment: Dyads and Small Groups

One-to-one relationships between two people are known as dyads. For youth, dyadic relationships may describe specific, personal friendships, romantic or sexual relationships, relationships with brothers or sisters or other same-age family members, and relationships with individual adults (Brown and Theobald 1999). Small groups include relationships between more than two people, where all or most of the members of the group know one another. Small groups can be formal, such as members of a sports team or youth club, and have rules for who can belong and who cannot. Formal youth groups often have adult supervisors, who may protect youth from risky behaviors. Small groups can also be informal, such as groups of friends or gang members. Membership in the group can change frequently as people move in and out of the group. These groups often influence risky behaviors.
FAMILY

Relationships with parents and other adults are important in helping young people experience a healthy transition to adulthood, especially during early adolescence. Young people who live with both parents, who feel they are able to talk with their parents, or who feel cared for by another adult may be less likely to engage in early sexual activity. Communication with siblings, aunts and uncles, grandparents, or others about reproductive health matters may also contribute to the adoption of safer sexual practices.

Families also influence young people’s decision making. Families that devalue children’s education, encourage early marriage and childbearing, or discourage young people from getting information and services may prevent youth from acquiring the skills they need to make good decisions and avoid risky behaviors. However, families can also protect youth from taking risks. Living with both parents, having positive family dynamics, feeling supported by parents and other adult family members, and experiencing proper supervision by adult family members all seem to protect young people from taking risks. Parental values also influence young people; parents and elders who communicate with young people about their values can protect them from a variety of risks.

Research results about how communication between parents and youth affects adolescent decision making are mixed. When communicating values, parents seem to have a protective influence on youth. However, the evidence does not conclude strongly that parents communicating information to their children about sex and reproductive health protect them from health problems (Kirby 1999b).

PEERS

Peer influences can both positively and negatively influence health outcomes. Negative influences include encouraging the use of alcohol and drugs, or pressuring friends to engage in early sexual activity. More positively, peers can influence friends to protect themselves by controlling the consumption of alcohol or drugs, delaying onset of sexual activity, promoting the use of condoms and contraceptives, sticking to one partner, and seeking health services. Peers can be a source of support and encouragement, particularly when family members are not. Research has found that if youth perceive their friends as having sex, using alcohol or drugs, or smoking, they are more likely to engage in those behaviors as well (Kirby 1999b; Bond, Magnani et al. 2000). Because of the importance of friends in the lives of young adults, many youth reproductive health programs make peer education or peer promotion an important component.

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7The summary of research findings below is drawn from Kirby 1999b; Speizer and Mullen 1997; Resnick et al. 1997; and Bond et al. 2000.
PARTNERS

Romantic and sexual partners also influence the lives of young people positively and negatively. As young people begin to interact with members of the opposite sex (or in some cases, the same sex) in a romantic or sexual way, they learn about courtship patterns, sexual scripts, and expectations of gender roles (Parker et al. 1991; Gagnon 1990). Power imbalances in a partnership—such as age and income differentials between partners, exchange of money or other goods for sex, and sexual pressure from a partner—can contribute to sexual risks. A history of sexual abuse and coercion also contributes to sexual risk-taking behaviors. Conversely, a sense of commitment in a relationship seems to protect young people from undesired health outcomes. There is some evidence that males in same-sex relationships are also more likely to take sexual risks than their heterosexual peers.

THE SOCIAL ENVIRONMENT: INSTITUTIONS, COMMUNITIES, NETWORKS, AND ORGANIZATIONS

Social systems are the relationships, organizations, and institutions that govern a person’s behavior by their resources, roles, and rules. At the larger scale, economic, cultural, political, legal, and religious systems, or institutions, tend to dictate the rules about how relationships are organized, what kinds of interactions occur between people, and how those interactions are interpreted. By participating in these institutions, people learn expected behaviors. Creating supportive social systems for youth may be a long-term process, and it may be slow to show results. However, in many cases it is a necessary precondition for the success of shorter-term, smaller-scale efforts.

Communities may be defined as distinct geographic areas, like neighborhoods or villages. They may also be regarded as groups or units of a collective identity or common purpose, such as a religious community, or community of youth concerned about the environment. Communities have also been defined as informal networks of relationships.

Networks are informal patterns of relationships, such as friendship or neighborliness, that cut across formal institutions (Wellman 1988). Small groups and cliques, clusterings of relationships and people usually based on common characteristics, interests or identities (Brown and Theobald 1999), exist within a network.

Organizations serve specific functions, such as schools, courts, local government bodies, churches, temples, or mosques. Organizations are formal groups with defined structures, functions, and ways of interacting. Organizations may require internal change in order to be more responsive to youth needs, or they may form coalitions and networks—groupings with other organizations—to influence change in the broader environment.
Many organizations create links, or **partnerships**, with other organizations to share resources and complement areas of expertise. **Networks** may be established informally among a number of different organizations to respond to particular needs and concerns. **Coalitions** or **consortia** are set up more systematically with clear objectives, roles, and responsibilities. Understanding the composition of the organizations and their links with each other can help programs strategize to build systems, bring smaller programs to scale, and ensure broader coverage.

**DYNAMICS OF INTERPERSONAL RELATIONSHIPS**

Within these structures of relationships, we can identify dynamics that influence how young people make decisions.

**CONTEXT**

**Context** refers to the locale, place, time, setting, and frequency with which young people interact and reveals how and where relationships are initiated. This information may offer insights into possible settings in which to intervene. For example, some young people may meet their friends in a school setting that is supervised by adults, while others may encounter their friends in casual gathering places that allow for risk-taking behaviors to take place. Understanding how long people have known each other also provides insight into how close they are and what type of influence they may have on each other.

**CHARACTERISTICS**

Characteristics of individuals may include sociodemographic attributes, personal attributes, or individual behaviors. This information reveals the extent to which young people select friends who are similar to or different from themselves and each other, or the ideal traits of a romantic partner. The table below outlines possible characteristics to include in these assessments.

<table>
<thead>
<tr>
<th>Table 2.1. Characteristics of Individuals</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sociodemographic Attributes</strong></td>
<td><strong>Personal Characteristics</strong></td>
</tr>
<tr>
<td>Age</td>
<td>Positive</td>
</tr>
<tr>
<td>Gender</td>
<td>Mature</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>Reliable</td>
</tr>
<tr>
<td>Place of origin</td>
<td>Fun-loving</td>
</tr>
<tr>
<td>Marital status</td>
<td>Cute</td>
</tr>
<tr>
<td>Native language</td>
<td>Wealthy</td>
</tr>
<tr>
<td>Religion</td>
<td>Trustworthy</td>
</tr>
<tr>
<td>Occupation or work</td>
<td>Good-looking</td>
</tr>
</tbody>
</table>
FEELING CONNECTED

The type of relationship or connection that young people have with others appears to have an important influence on what they do. Positive interpersonal relationships, characterized by support, warmth, love, a sense of nurture, and consistency, provide young people with a sense of safety and security (Barber 2000). Conversely, negative relationships may be a source of stress or conflict. In many countries, “connectedness,” or the positive relationship with a caring adult, has been shown to protect young people from an array of health problems and promote positive development (Blum 1998; Barber 1997; Bond et al. 2000). By asking young people how they perceive their relationships with significant adults, friends, and partners, we can begin to understand the dynamics of their social environment.

SUPPORT

A more concrete dimension of relationships is the kind of support and information that is shared. Social support may provide direct assistance in times of need, or may protect against negative effects of stressful or harmful events. Research has shown that having this type of social support can build buffers from stress, improve the ability to cope with problems, and build protective environments for youth (Blum 1998). By mediating negative interactions, such as mistrust, criticism, and domination, positive connections can also improve young people’s health. Social support can be defined in the following ways:

- emotional—providing empathy, love, trust, and caring;
- instrumental—providing tangible aid (money, food, shelter, clothing) and services that directly assist a person in need;
- informational—providing advice, suggestions, and information to assist in solving problems; and
- appraisal—providing constructive feedback, affirmation, and social comparison (Heaney and Israel 1997).

Many relationships provide multiple types of support simultaneously.

EXPECTED NORMS OR PERCEIVED VALUES AND ATTITUDES

Norms are the expected and appropriate rules of behavior, and the costs and benefits associated with following or violating those rules (Giddens 1984). An individual learns behaviors by observing others in the environment and by enacting the behavior with appropriate skills and knowledge. The behavior is reinforced with positive feedback, either directly from others or in the form of self-regulation. Individuals expect certain outcomes from their behavior, which they learn from previous experience, observing others, hearing about situations from others, and experiencing or observing emotional or physical responses to behaviors. Outcome expectancies, or incentives, are values that a person places on a particular outcome. For example, avoiding HIV infection would be a positive expectancy...
of reducing unsafe sexual encounters. These values reflect the broader values in the environment, or the individual’s own assessment of consequences (Bandura 1994).

Sometimes young people follow the expected norms and behaviors of a group or of others close to them to gain acceptance or avoid reprisals. Some group norms may lead to negative reproductive health outcomes—for example, norms that promote early sexual activity or stigmatize using condoms. Young people may perceive that their parents expect them to behave in ways entirely different from the way their friends expect them to behave. Norms, or rules, regulate behavior. If parents instill their rules early in a young person’s development through supervision and monitoring, young people may be more likely to learn to regulate their own behavior as they grow older (Barber 2000). If not, they may be more prone to following the expectations set by their friends.

**Gender norms** are the expected roles and acceptable behaviors a society determines are appropriate for girls and boys, and women and men. As youth mature into adults, they learn about adult roles. Expectations of gender roles may strongly influence how friends interact with each other and how romantic and sexual partners negotiate and communicate with each other.

**POWER AND COMMUNICATION**

Some theories of behavior change argue that in order to enact behaviors, a person must feel confident that he or she can overcome barriers to the behavior. This is referred to as **self-efficacy**. In many cases, youth may not be able to act in certain ways because of power imbalances. Young people are often at a disadvantage in relation to adults or members of the opposite sex, and are thus unable to negotiate. Parents and guardians need to exercise authority over young people and regulate their behaviors, but they can also contribute to a healthy sense of identity by helping youth develop a sense of autonomy, or the ability to act in one’s own interests (Barber 2000).

Youth who are sexually involved with older partners may lack the power to negotiate sex and/or condom use and protect themselves from unwanted pregnancy, STIs, and HIV/AIDS. A girl who is newly married may lack the power to refuse her husband’s and in-laws’ demands that she get pregnant right away. Young people may engage in unwanted sexual activity in exchange for gifts or favors. Power dynamics often play out at the level of interpersonal relationships with family, peers, or partners. These dynamics are often supported, reinforced, and transmitted through social institutions and community norms, particularly relating to gender roles, or appropriate behaviors expected from males and females.

**BEHAVIORS AND ACTIVITIES**

Activities with parents may protect young people from becoming vulnerable to risky situations. Some behaviors, such as smoking or drinking alcohol, may occur among close friends as a joint activity. Sexual risk behaviors in and of themselves occur
between two people, thus the partnership is the important unit of analysis, not the individual.

Table 2.2 summarizes the key concepts discussed above and suggests types of questions that programs may consider asking family members, friends, and romantic or sexual partners.

Table 2.2. Dynamics of Interpersonal Relationships

<table>
<thead>
<tr>
<th>Dynamic</th>
<th>Family/Kinship</th>
<th>Friend/Peer</th>
<th>Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context</td>
<td>Do you live with A?</td>
<td>How long have you known A? How did you meet A?</td>
<td>Did you get together with A in the last week? How long did you know A before you became romantically involved?</td>
</tr>
<tr>
<td>Connection</td>
<td>How much do you feel that your family cares about you? How much do you feel that family member A understands you?</td>
<td>How much do you feel that friend A cares about you?</td>
<td>How much do you feel that partner A cares about you? Do you feel you could talk to partner A about most things? Has partner A ever made you feel inferior?</td>
</tr>
<tr>
<td>Support and exchange</td>
<td>What kinds of support do your parents provide for you?</td>
<td>Do you feel that you could turn to friend A in times of trouble?</td>
<td>Did partner A ever give you gifts or money in exchange for sex?</td>
</tr>
<tr>
<td>Perceived norms and values</td>
<td>How would your mother feel if you had sex with someone before marriage?</td>
<td>What does friend A think about premarital sex?</td>
<td>What would partner A think if you asked him to use a condom?</td>
</tr>
</tbody>
</table>
The processes, relationships, and structure of an organization, consortium, or network are critical to how effectively they work together to reach common objectives (Kegler et al. 1998). **Processes** include leadership, decision making, communication, conflict resolution, costs and benefits, development of organizational climate, staff selection, development and motivation, and capacity building. These dimensions of working together are, in part, determined by the nature of relationships among members.

Relationships can contribute to or hinder a coalition or network from engaging in successful action. For example, **reciprocity** refers to the extent to which ideas, resources, or sentiments are shared between two or more entities (Kegler et al. 1998). **Cooperation** refers to relationships characterized by “mutual understanding, shared goals and values and an ability to work together on a common task” (Alter and Hage 1993). **Coordination** refers to the extent to which elements of a system work together and maximize accessibility and compatibility of services (Alter and Hage 1993). **Conflict management** requires that organizations are able to negotiate competing interests, power imbalances, and differences in values or opinions and to compromise to achieve common goals. **Willingness to share resources** enables both cooperation and coordination to occur in order to improve skills of members, fill in resource gaps, and maximize access to services.

The table below suggests types of questions that programs may consider asking communities, organizations, and networks.

<table>
<thead>
<tr>
<th>Dynamic</th>
<th>Community</th>
<th>Organization</th>
<th>Network</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Characteristics</strong></td>
<td>What social groups exist? What target groups do you work with? What types of activities are you involved in? What geographic area(s) do you cover?</td>
<td>What is the identity of this organizations (e.g., religious, ethnic, issue-oriented)? What target groups do you work with? What types of activities are you involved in? What geographic area(s) do you cover?</td>
<td>How is this network/coalition defined? (e.g., formal, informal, etc.)? How was this network formed (e.g., issue-based or event-based, etc.)? What are the common goals of the network?</td>
</tr>
<tr>
<td><strong>Context</strong></td>
<td>How often do you meet with members? Where do you meet? How are meetings organized (e.g., informal, social gatherings or formal, agenda-driven gatherings)?</td>
<td>When and where does this organization meet? How are meetings organized (e.g., formal meetings, informal gatherings)?</td>
<td>How long has this network been working together? Where do network members meet?</td>
</tr>
</tbody>
</table>
## Dynamic Community Organization Network

<table>
<thead>
<tr>
<th>Dynamic</th>
<th>Community</th>
<th>Organization</th>
<th>Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>How much do you feel supported by the community? Who in the community supports you? How do members resolve conflict? How do members coordinate activities/meetings?</td>
<td>What is the level of trust among members? What is the level of cooperation among members? How does the media portray the organization? How does the surrounding community provide feedback for this organization?</td>
<td>How does this network/coalition coordinate activities? What is the level of trust among other organizations in this network? What is the level of cooperation/conflict among the different organizations?</td>
</tr>
<tr>
<td>Support and exchange</td>
<td>What information and resources are shared within the group?</td>
<td>How do members work together to mobilize external support? What are the challenges? What types of information do you share?</td>
<td>What resources do you share with which members? What resources do you compete for?</td>
</tr>
<tr>
<td>Information and communication</td>
<td>How do you receive feedback and resolve conflict with members of the community? How are concerns raised among different groups?</td>
<td>How are decisions made within the organization? How do decision makers communicate effectively with members?</td>
<td>In what ways do network members have influence over your target audience? Which organizations are more powerful than others? For what reasons?</td>
</tr>
<tr>
<td>Policies, norms, and regulations</td>
<td>How do community members interact with each other? What rules guide individual community members' behavior?</td>
<td>What are the rules the organization uses for conducting business? What is the mission statement? What are the goals? What guides network behavior?</td>
<td>What are the agreed-upon protocols for working together?</td>
</tr>
<tr>
<td>Activities/action</td>
<td>What activities do families or groups engage in together?</td>
<td>How does the organization plan activities? What implementation issues exist?</td>
<td>How do network members participate in each others' activities? What activities are planned and implemented together?</td>
</tr>
</tbody>
</table>
**DYNAMICS OF GROUPS AND NETWORKS**

**COMMUNICATION PATTERNS**

One important aspect of communication entails “the process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers and Kinkaid 1981; Rogers 1995), which is known as the **diffusion of innovations**. This theory has been applied to many types of development activities, including health. For example, assessing whether young people begin to use contraceptives or condoms, or whether they choose to act in ways that differ from the norms set by their community, would reflect the adoption of an “innovation.” Diffusion of innovation theory considers characteristics of cultures and of new ideas or technologies, as well as the social structure through which they are communicated (Friedman et al. 1994). Networks illustrate the links between individuals, and usually describe patterns of communication.

In many cultures, sex is regarded as a taboo subject about which to talk. Promoting communication by using natural networks can help to overcome the taboo and initiate discussions about sexual behaviors and protective health behaviors.

**LEADERSHIP**

Leaders can be members of a small group of peers, or leaders of communities. They can be formal leaders or informal opinion leaders, and their influence can be either positive or negative. Leaders sometimes have unusual positions in networks. For example, they can serve as a bridge between cliques or networks, or be central to a group. In considering how innovations and norms are transmitted through a group or social network, it is also important to consider whether there are leaders who influence the transmission or adoption of innovations or norms. It is important to understand how leaders can influence behavior, both positively and negatively. In order to understand who the leaders are, one needs to study local relationships and patterns of influence (Friedman et al. 1994).

**SUBCULTURES**

Many groups and cliques have **subcultures**—sets of values, beliefs, ideals, practices, and identities—that may be particular to a group, for example, of youth (Brown and Theobald 1999). These values are often transmitted through mass media, popular music, fashions, and slang. Many programs attempt to change the parts of youth subcultures that contribute to risky behaviors—for example, promoting efforts to reduce smoking, alcohol consumption, and drug use by creating an image that these behaviors are unattractive (Friedman et al. 1994).
Chapter 3: Using Social Network Analysis in Youth Programs: Applications and Techniques

Assessing Risk: Improving Program Design, Targeting, and Selection

Improving Peer Programs: Strengthening Relationships and Communication
Design of Peer Programs and Selection of Peer Leaders
Monitoring
Evaluation

Building Support for Youth and Youth Programs: Mobilizing and Strengthening Organizations, Networks, and Coalitions
This chapter describes three ways that social network analysis can be used to improve youth programs:

- Assessing risk: improving program design, targeting, and selection.
- Improving peer programs: strengthening relationships and communication.
- Building support for youth and youth programs: mobilizing and strengthening organizations, networks, and coalitions.

**ASSESSING RISK: IMPROVING PROGRAM DESIGN, TARGETING, AND SELECTION**

To make the most of limited resources, programs need to target their services and activities to those most in need, and in places where they are likely to have the greatest impact. It is important to identify how specific risk behaviors occur among groups of youth. For example, members of a youth sports club may not be sexually active, while youth who spend their free time with friends at entertainment establishments may engage in high-risk sexual behaviors. One group may simply need specific information about sexual and reproductive health issues, while another may require a safe place to meet, adult support, mentors, counseling, access to condoms and contraception, or alternative recreational activities.

One of the major reproductive health risks facing adolescents is the risk of becoming infected with HIV. Social network analysis can help health workers understand who is at risk for HIV/AIDS, and HIV/AIDS research has increasingly drawn on network analysis to trace the spread of the epidemic. In *Looking Deeper Into the HIV Epidemic: A Questionnaire for Tracing Sexual Networks*, UNAIDS asserts that an understanding of sexual networks is necessary for understanding the dynamics of the epidemic (UNAIDS 1998). Sexual networks refer to patterns of sexual partnering. Different patterns of partnerships have implications for how an epidemic of STIs or HIV might spread between groups of individuals (Gupta et al. 1989; Anderson 1996). For example, “age-mixing” between female sex workers and older customers in Thailand facilitated HIV transmission from older male to younger female, and from younger female to younger male, perpetuating the cycle of HIV transmission in the population (Morris et al. 1995). Mixing between partnerships of the same and opposite sex or with injecting drug users may be an impetus for an epidemic to spread more widely. “Bridge partners” or “bridge
Building Connections:
Understanding Relationships and Networks to Improve Adolescent Sexual and Reproductive Health Programs

“Building Connections” link otherwise unconnected groups and may play an important role in how an epidemic spreads from higher- to lower-risk populations.

Analyzing relationships and social networks can help identify youth at highest risk and how their friendships and other important relationships influence their behaviors. More specifically, it can help to answer the following questions:

- How do young people select their friends?
- What types of risk behaviors occur in friendship networks?
- How do young people select their romantic and sexual partners?
- Are young people involved in behaviors and activities that increase risk-taking (e.g., use of alcohol or drugs)?
- Which subgroups are at highest risk?
- What patterns of sexual partnerships, or sexual networks, exist that may contribute to the spread of STIs and HIV/AIDS?

The table below provides guidance on exploring these issues.

Table 3.1. Techniques and Instruments for Assessing Risk

<table>
<thead>
<tr>
<th>Step</th>
<th>Techniques</th>
<th>Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess network membership</td>
<td>Qualitative methods (Venn Diagram*); network mapping plus survey</td>
<td>Appendix 1, 4</td>
</tr>
<tr>
<td>Characterize relationships</td>
<td>Survey</td>
<td>Appendix 1</td>
</tr>
<tr>
<td>Examine communication, leadership, norms, subcultures, sexual network patterns.</td>
<td>Mapping plus survey</td>
<td>Appendix 1, 4</td>
</tr>
</tbody>
</table>

*See page 58 for an explanation of the Venn Diagram.
Chapter 3

Using Social Network Analysis in Youth Programs: Applications and Techniques

Improving Peer Programs: Strengthening Relationships and Communication

Due to the importance of peer influence on young people, especially in the later adolescent years, many program approaches involve peers. Peer programs are based on the assumption that connections among young people influence what they learn and how they behave. Many programs draw on natural opinion leaders within a network to try to move messages through communities or networks. Programs may also attempt to change peer norms that put youth at risk for sexual and reproductive health problems. Existing network leaders can be brought into a health initiative or youth program to facilitate changes in the subcultures of the group (Friedman et al. 1994).

Building on young people’s existing social networks, peer programs generally include one or more of the following: counseling; group activities; exchange of coping and communication skills in small groups; learning to model or “role play” behaviors; building communication, negotiation, and refusal skills; providing commodities; and making referrals for services. Peer educators and counselors are not usually health professionals, but they receive special training for conducting their activities. Peer programs may be located at schools, youth centers, youth organizations, and community youth programs, or as outreach from health facilities (Senderowitz 1997).

Peer programs have been described anecdotally as effective in creating a demand for family planning and HIV/STI services, distributing contraceptives and referring youth to other services, and changing social and cultural norms leading to risk behaviors. However, evidence about how to make peer programs effective is still weak, and only a limited number of peer programs have undergone systematic evaluations. In a UNAIDS needs assessment conducted among peer-education program managers around the world, managers stated that, among other things, they wanted more information on how to select peer educators and how to measure program effectiveness. They specifically mentioned a desire to learn more about the use of social network analysis for these purposes (Kerrigan 1999).

This document places special emphasis on peer programs because they are one of the most popular types of programs for youth. However, the techniques can be used to understand and improve communication and relationships among young people’s sexual and romantic partners. They can also be used to understand and improve communication and relationships between young people and adults such as family members, teachers, or adult mentors. Therefore, the techniques could also be used to improve other types of programs for youth.

As our understanding of peer and adult influences on youth grows, it is important to increase our knowledge of which features of these programs are important and to create localized programs that build on those influences. A commitment of resources and effort to conduct thorough evaluations is needed to draw conclusions about what really works.
Seeking to identify the elements that contribute to effective peer programs, the U.S. Campaign to Prevent Teen Pregnancy undertook a review of peer programs and documented its findings (Philliber 1999). In general, the review found that peer programs need to consider more strategically how peers influence each other, and identify the conditions under which peer programs are most effective (Philliber 1999). Peer programs can do this using the social network analytic techniques. These techniques can be used to improve the design of peer programs, the selection of peer leaders, and monitoring and evaluation of peer programs. These issues are discussed below, drawing on findings of the U.S. review, a review of developing-country peer programs (Senderowitz 1997), and other sources.

The table at the end of the section shows the techniques and instruments included in this tool that can be used to improve peer programs. Subsequent chapters in this document provide examples showing how actual programs have used the techniques.

**DESIGN OF PEER PROGRAMS AND SELECTION OF PEER LEADERS**

The results of the review (Philliber 1999) outline some of the following recommendations for enhancing the design of peer programs and the selection of peer leaders:

- Identify and use multiple modes of influence. Programs should be aware of multiple types of influences on youth, and should target and involve youth appropriately.
- Recognize heterogeneity of adolescents in designing peer strategies.
- Consider using naturally occurring peer groups and networks in productive ways.
- Choose peer leaders carefully and encourage them to present curricula and messages about social situations and peer group pressures.
- Identify important characteristics that peers relate to.

Youth may select friends like themselves and be influenced by others they admire. Selection of peer educators and peer leaders should be done judiciously, such that they have credibility with their peers, but also provide positive role models (Philliber 1999).

Some programs try to provide support to and counseling for individuals, or link them to slightly older mentors or “buddies” (Heaney and Israel 1997). The composition of support groups seems important for their success. Support groups need to reinforce safer behaviors, so group members should also include those at lower risk of the behaviors in order to reinforce risk reduction (Philliber 1999).

Table 3.2 shows the techniques and instruments included in this tool that can help with design and selection.
MONITORING

In order to monitor the progress of implementation, many peer programs institute a monitoring and information system (MIS) to track indicators of progress, such as the number of people trained, number of workshops held, number of condoms given out, and so on. However, it is also important to monitor peer programs by answering the following questions:

- What are the characteristics of peer leaders’ contacts (peers with whom they interact in their role as peer educators)? Do peer leaders talk to people like themselves?
- How often do peer leaders talk to their peers?
- Where do the contacts occur, what information is presented, and how long do the contacts last?

To answer these questions, programs should collect data from the young people whom peer leaders contact. Peer leaders can collect this data themselves as part of their routine activities (see Appendix 2 for sample instrument), or a separate research group can collect it.10 Table 3.2 shows the techniques and instruments included in this tool that can answer these questions to help monitor peer programs.

EVALUATION

Evaluating peer programs can be a challenging task that, to be done well, requires a fairly high degree of commitment and resources. In order to determine whether a program changed social norms and behaviors, programs use surveys to demonstrate norms and behaviors at a specific point in time. To address changes over time, a baseline survey and subsequent follow-up survey are used. To try to link changes in indicators to peer-program efforts, data must be collected from both areas where the program has been implemented and similar areas where program efforts have not been implemented.11 These data can then be compared over time. This helps to rule out the possibility that these changes could be occurring because of other factors, such as historical events, by chance, or due to mass media or other causes.12 The primary problem with these standards is that many organizations do not have the necessary resources for such an evaluation (Peterson et al. 1994). Thus, when planning the evaluation of a program, it is often necessary to work within existing frameworks while striving for the highest accuracy possible.

10 Having peer leaders collect the information can be done at marginal cost (paper, pens, time). Preliminary analysis from Ghana indicates that data collected by peer leaders is as reliable as data collected by a separate research group: data collected by peer leaders were comparable to data collected by an outside firm during a baseline survey (Wolf et al. 2000).
11 The group in the area where the program was implemented is known as the “experimental” group, and the group being used for comparison, where the program was not implemented, is known as the “control” group.
12 For an in-depth discussion and instructions on evaluation, see Adamchak et al. A Guide to Monitoring and Evaluating Adolescent Reproductive Health Programs, FOCUS on Young Adults, 2000.
Outcomes should be defined according to the program’s objectives. Intermediate outcomes can be expressed in the following categories, each of which can be explored using social network analytic techniques:

- Relationship qualities
- Communication
- Gender norms
- Behaviors
- Network contacts and structure

The following table shows the techniques and instruments included in this tool that can help evaluate peer programs.

### Table 3.2. Techniques and Instruments to Use With Peer Programs

<table>
<thead>
<tr>
<th>Design and Selection of Peer Leaders</th>
<th>Techniques</th>
<th>Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify influences and sources of information</td>
<td>Survey</td>
<td>Appendix 1, 2</td>
</tr>
<tr>
<td>Determine heterogeneity of groups and network members</td>
<td>Survey</td>
<td>Appendix 1, 2</td>
</tr>
<tr>
<td>Identify characteristics of network members</td>
<td>Survey</td>
<td>Appendix 1, 2</td>
</tr>
<tr>
<td>Determine natural peer groups</td>
<td>Survey, mapping</td>
<td>Appendix 2</td>
</tr>
<tr>
<td>Select peer leaders</td>
<td>Mapping</td>
<td>Chapter 4, Appendix 4</td>
</tr>
<tr>
<td><strong>Monitoring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Track characteristics of contacts</td>
<td>Survey</td>
<td>Appendix 2</td>
</tr>
<tr>
<td>Identify characteristics of peer leaders that contacts like or dislike</td>
<td>Survey</td>
<td>Appendix 2</td>
</tr>
<tr>
<td>Assess context and quality of interactions</td>
<td>Survey</td>
<td>Appendix 2</td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measure changes in outcomes: Relationship qualities Communication Gender norms Behaviors Network contacts and structures</td>
<td>Survey</td>
<td>Appendix 1, 2</td>
</tr>
<tr>
<td>Measure changes in network membership and structure</td>
<td>Survey, mapping</td>
<td>Chapter 4, Appendix 4</td>
</tr>
</tbody>
</table>
Building Support for Youth and Youth Programs: Mobilizing and Strengthening Organizations, Networks, and Coalitions

Many health promotion programs work to create structures and policies that support youth development and healthy lifestyles (Minkler and Wallerstein 1997). For youth, this means creating supportive and caring communities and ensuring that adults understand the realities of the lives of young people. For example, community organizing builds communities and institutions in ways that enable members to identify and solve problems and respond to needs. It fosters ownership and participation, and engages community members—adults and youth—in social action.

Supportive policies can protect young people from sexual and reproductive health risks. For example, legalizing contraceptive sales to youth and enforcing a minimum legal age of marriage can be protective actions. Policies that support education and health services for adolescents also foster positive reproductive health outcomes. Conversely, illegality of abortion and weak enforcement of laws concerning rape and sexual abuse may result in negative reproductive health outcomes among youth. Networks of local organizations and international NGOs are playing a growing role in community development, service provision, and advocacy (Madon 1999).

Youth programs may ask themselves two important questions in planning social change strategies:

1. What organizations, institutions, or coalitions can be used to improve systems that support the healthy development of young people?

2. To what extent do organizational networks and coalitions meet the needs of youth and how can they be strengthened?

The global movement of local and international NGOs shows that citizens are playing an increasingly significant role in promoting health and social change. Young people often serve as a key resource for these efforts and bring energy and vitality to the issues. These organizations concentrate on developing programs and services, as well as influencing policies at the local, national, and international levels. With improved networking and stronger organizations, this movement has the potential to expand their impact (Madon 1999).

Social norms influence youth to make decisions that result in positive or negative reproductive health outcomes. Gender discrimination, community norms that do not value adolescent education, restrictions on girls’ mobility, and cultural expectations to marry and bear children early in adolescence may negatively impact adolescent reproductive health outcomes. Community mobilization aims to change the norms...
and values of a community that constrain young people from developing healthy lives, and to replace them with norms and values that protect young people.

Positive relationships with adults and institutions that support and provide opportunities to youth seem to protect them from a variety of risk behaviors. For example, youth who feel connected to a religious organization or who have a sense of spirituality are less likely to engage in risky behaviors. A positive feeling toward school is also a protective factor, as is school performance and a supportive school environment. In the previous section, we discussed the importance of connections with family members. Creating linkages between schools, home, and other youth-centered organizations or groups may help to create a feeling among youth that they are safe and cared for, and thus mitigates, risk behaviors.

In contrast, some elements in the community may have negative influences on youth behaviors. The presence of a sex industry and widespread access to entertainment venues such as bars and discotheques may create opportunities for young people to engage in risky behaviors. Instituting regulations that restrict young people’s access to such venues or fining or taxing proprietors may curb the negative influences. Increasing access to recreation, vocational training, further education, and health services, such as counseling and treatment, that militate against risk behaviors may provide a positive alternative.

Engaging in advocacy to promote supportive policies can also protect young people from sexual and reproductive health risks. Advocacy is a set of targeted actions directed at decision makers in support of a specific issue (The Policy Project 1999). For example, legalizing contraceptive sales to youth, enforcing a minimum legal age of marriage, and supporting education and health services for adolescents can result in positive health outcomes. Conversely, weak enforcement of laws concerning rape and sexual abuse may promote negative reproductive health outcomes among youth.

Organizational networks and coalitions have emerged as a key component of an active civil sector, and are important in mobilizing support for youth programs. By creating strategic linkages, organizational networks can serve youth by creating reasonable demand for and provision of services, redefining cultural values and social relations, and combining resources to ensure broader coverage of services. Organizational networks play a crucial role in advocacy, promoting ethics and rights for young people, and taking on difficult and sensitive issues often neglected by government programs. Networks and coalitions are increasingly considered as important structures through which pilot programs can be scaled up.
The following table provides information on strategies and issues that can contribute to social change.

**Table 3.3. Strategies and Issues Contributing to Social Change**

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Process of Change</th>
<th>Structures of Organizing</th>
<th>Issues for Collective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobilize communities, organizations, and networks (grassroots organizing</td>
<td>Identify and define common problem</td>
<td>Partnerships</td>
<td>Reciprocity</td>
</tr>
<tr>
<td>and professional coalitions)</td>
<td>Understand local relationships and identify existing networks and channels of</td>
<td>Networks</td>
<td>Cooperation</td>
</tr>
<tr>
<td>Create linkages</td>
<td>influence</td>
<td>Coalitions and consortia</td>
<td>Coordination</td>
</tr>
<tr>
<td>Institute regulations and policies through advocacy</td>
<td>Identify common solutions, including promoting messages and behaviors; train</td>
<td></td>
<td>Conflict management</td>
</tr>
<tr>
<td>Create access to opportunities, programs, and services</td>
<td>members to promote new messages and behaviors</td>
<td></td>
<td>Willingness to share resources</td>
</tr>
<tr>
<td></td>
<td>Modify and overcome barriers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Identify resources to support change</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mobilize networks to broaden support</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mobilizing communities and organizations follows a common process. Organizational and community change begins with defining a problem. This first step should involve young people and others with influence (community leaders, organizational management) in becoming aware of the issues of concern. Once the problem is defined, solutions can be suggested and implemented through a policy or directive, or through the creation and promotion of positive messages. Resources to implement the change are then identified, allocated, or collected. As the new policy or practice is implemented, members of a community or organization react and potentially change roles and behaviors. These changes are then institutionalized through common practice and diffused more broadly to other communities or organizations.
Assessing how to strengthen an organization, coalition, or network involves asking several questions:

- How do organizational networks share information and resources?
- How can organizational networks improve the capacity of their members?
- How can organizational networks increase the coverage of services and improve targeting to those most in need?
- How can organizational networks strengthen their collective bargaining power for advocacy purposes?

Evaluating an organization, network, or coalition is more challenging and has been done less frequently. Evaluating a coalition and network is most commonly conducted at three levels:

- **Formative**: Obtaining information in the developmental stage in order to improve a program’s design and influence decision making on policy, resources, and programs (Goodman and Wandersman 1994).

- **Process**: Understanding patterns of actions taken to bring about change (Fawcett et al. 1997), including the process of community mobilization itself.

- **Outcome**: Assessing changes in a community’s programs, policies, and practices related to specific health behaviors (Fawcett et al. 1997).

Evaluating the overall impact of community-based interventions involving networks and coalitions is more challenging because it requires a controlled setting with comparison groups.

Social network analysis can help make social systems and institutional policies more responsive to youth, and it can help programs build community support for youth and youth programs. Social network analysis can help by:

- identifying channels of communication and influential leaders in a community;
- identifying bridge organizations for information exchange and advocacy;
- assessing organizational capacity to respond to youth needs;
- engaging young people to advocate on their own behalf;
- strengthening links to build collective bargaining power for advocacy and social change.
### Table 3.4. Objectives, Techniques, and Uses for Assessing Organizational Networks and Coalitions

<table>
<thead>
<tr>
<th>Objective</th>
<th>Technique</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify characteristics of members</td>
<td>Survey (Appendix 2)</td>
<td>Identify strengths and weaknesses among members; improve capacity of individual members and of network/coalition</td>
</tr>
<tr>
<td>Share information and resources</td>
<td>Survey, mapping</td>
<td>Identify types of information and resources exchanged; identify information flows and directions (reciprocity)</td>
</tr>
<tr>
<td>Improve coordination and collaboration</td>
<td>Survey, mapping</td>
<td>Assess quality of relationships among members; examine which organizations are central to the network</td>
</tr>
<tr>
<td>Assess coverage and improve targeting</td>
<td>Survey, mapping</td>
<td>Examine geographic coverage and target populations of member organizations</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strengthen collective action and negotiation for advocacy</td>
<td>Survey, mapping</td>
<td>Identify weak links between organizations with similar interests; foster subgroups; identify bridge organizations for exchange and advocacy</td>
</tr>
</tbody>
</table>
The table below provides a summary of how the issues described in this chapter—assessing risk, improving programs, and building community support—can be achieved. Techniques 1, 2, and 3 are described in the following chapter.

### Table 3.5. Social Network Analysis: Uses and Techniques

| Technique 1: Use qualitative techniques to identify terms, categories, and relationships | Help understand the local concepts and meanings of relationships | Determine characteristics of supportive relationships and issues of concern | Identify important community groups and qualities of cooperation and conflict |
| Technique 2: Use surveys to characterize networks | Identify characteristics of friends and romantic/sexual partners | Identify supportive relationships | Understand relationships between and among institutions |
| Technique 3: Map networks | Identify patterns of sexual partner selection and exchange | Identify peer subgroups | Help with scaling up and coalition building |
| | Identify group norms | Identify who should be selected as peer leader | Identify bridge organizations for exchange and advocacy |
| | Identify risk-taking subgroups | Track changes in composition of peer groups | Strategize for information- and resource-sharing |
| | | | Build systems to expand coverage |
Technique 1: Use Qualitative Techniques to Identify Local Terms, Categories, and Nature of Relationships

Step 1: Select the Sample
Step 2: Choose Methods for Data Collection and Analyze Data

Technique 2: Use Surveys to Characterize Personal Networks

Step 1: Select the Sample
Step 2: Develop an Instrument
Step 3: Examine Contacts Among Members of a Personal Network
Step 4: Analyze the Data

Technique 3: Map Networks

Step 1: Define the Type of Network to Be Analyzed
Step 2: Select the Sample
Step 3: Record Nominations, or Names, Provided by Network Members
Step 4: Track Responses
Step 5: Map Networks by Hand or Computer
Step 6: Analyze and Interpret the Network
Step 7: Combine Data From Surveys and Network Maps
Building Connections:
Understanding Relationships and Networks to Improve Adolescent Sexual and Reproductive Health Programs
This chapter introduces the techniques used in analyzing social relationships and networks. These include:

- qualitative and participatory techniques to identify local terms, categories, and nature of relationships;
- survey techniques to characterize personal networks; and
- techniques to map networks.

These techniques are best used together, in order to verify, or triangulate, results. Resource constraints may require that you select only one or two of these techniques.

**TECHNIQUE 1. USE QUALITATIVE TECHNIQUES TO IDENTIFY LOCAL TERMS, CATEGORIES, AND NATURE OF RELATIONSHIPS**

Young people often use specific terminology or slang to describe relationships, types of social groups, and types of sexual partners. These terms are often rich in detail, presenting a picture of youths’ social reality, the relationships that are important to them, and the meanings that shape their individual and group identities. Eliciting these terms, categories, and definitions from young people will help programs to better understand how they are related to the adolescent experience. They will also help programs to better understand the “scripts,” or cultural patterns of how young people learn and act out roles and behaviors in courtship, marriage, childbearing, and parenting.

Young people employ specific and finely graded terms and shades of meanings both to understand what is happening to themselves and their bodies, and to locate themselves within their culture and age group. These terms and meanings help young people to measure themselves against adults and their immediate milieu (Aggleton and Dowsett 1999).

One of the most important steps in analyzing social relationships and networks, and in communicating reproductive health messages in a way that is well received, is

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13How culture influences sexuality is discussed by Parker et al. 1991. The concept of sexual "scripts" is introduced by Laumann et al. 1994.
identifying and understanding the local terms, categories, and nature of relationships. These terms can refer to the type and nature of the relationship, the context (time and place) in which the relationship occurs, and the qualities or characteristics of the relationship.

Some of these relationships have to do with kinship. Examples of kinship terms include grandparents, parents, siblings, aunts and uncles, cousins, teachers, mentors, godparents, or guardians. Societies have different ways of expressing kinship. For example, some societies do not use different terms to distinguish between siblings and cousins. Other societies use different terms for aunts and uncles depending on whether the person is related to one’s father or mother. Classifications may also reflect an orientation toward age, gender, or other expected roles. In many societies, kinship terms (uncle, older brother, younger sister) may be used with close friends or others as a sign of closeness or respect.

Terms used to describe friends or peers may vary according to how close they are, what activities or interests are shared, or what behaviors are influenced. For example, a young person may refer to someone as a best friend, schoolmate, neighbor, peer, or teammate, with each term implying a slightly different level of closeness or type of association.

In many societies, as young people mature, they begin to have romantic or sexual partners. These are people of the opposite or sometimes the same sex, with whom feelings of affection, love, or romance are shared, and/or with whom they have a physical or sexual relationship. Terms used to describe these relationships also vary, and they reveal important distinctions in how close people are to each other, how they are expected to interact, what they do together, and what roles they play in the social system. For example, boyfriend/girlfriend, fiancé/fiancée, husband/wife, and partner all refer to a romantic or sexual relationship, but imply varying degrees of commitment and closeness.

Using participatory learning methods or qualitative research techniques can help program staff and researchers (including youth) to clearly understand the terms and definitions as understood by youth themselves. The simplified set of techniques presented below will serve as a foundation upon which to build your study of social networks. This step allows you to find general terms that capture the language and cultural context in which you work.

For a more in-depth discussion of qualitative and participatory techniques to use in adolescent programs, see Shah et al. Listening to Young Voices: Facilitating Participatory Appraisals on Reproductive Health with Adolescents, FOCUS on Young Adults, 1999.
**STEP 1: SELECT THE SAMPLE**

The first step in qualitative research is to select the group or population from whom you will collect information on terms, categories, and content. Within a youth program, particular groups of youth, parents, community members, religious leaders, or health providers may be of interest, for example. Commonly used sampling approaches include:

- **Probability sampling:** All adolescents in the population you plan to work with are listed, and a simple, random sample is taken to determine who will participate in the data-collection activity. With a random sample, individuals or other elements have an equal chance of being selected. If you select a simple, random sample of all youth in the population with whom you work, you will be able to make conclusions about youth networks of that population.

- **Purposive sampling:** Individuals representing specific groups, holding key roles in the community, or possessing expert knowledge about particular areas of interest are selected to participate in the data-collection activity. If you select a purposive sample of key informants, or youth of a particular type or interest, you will only be able to make conclusions about youth networks specific to those types of youth.

- **Roster sampling:** Individuals are selected from a list of specified members of a defined group, such as students in a classroom, members of a youth club, or residents in a dormitory. If you use a roster sample, or a list of members of a specific group, you will be able to draw conclusions about the group members and their contacts. You may consider using a cluster sampling technique to select classrooms or other units with clear boundaries. A cluster is an aggregated group of elements from which you collect data. In doing so you will be able to make generalizations or conclusions on a broader group of youth than only those in that particular classroom.

- **Snowball sampling:** Youth with specific characteristics—such as youth with a particular income, or gang members—are selected and asked to name others who would be willing participants. Those people are in turn asked to name others until the sample of the names is repeated and few additional nominees are identified. If you generate a snowball sample, you will produce a list of people in a network. The members of the sample are determined by how the relationships themselves are defined. For example, if a network is defined by members of a school, it will consist only of those in the school and not of those who do not attend the school. If you use a roster or snowball sample to generate personal network data, you may also be able analyze those data as communities or systems networks, a process described in the following section.
Whatever sampling method is chosen, differences among young people in the community must be considered to ensure adequate representation. Some differences can be easily predetermined by characteristics, such as gender, age, and school attendance. Other categories and criteria for differentiation will be identified by youth through informal discussions. For example, programs can build on the terms that young people use to differentiate among types of youth, such as terms that reflect differences in appearance, dress, number of sex partners, age, material well-being, lifestyle, or other characteristics. Once the differences and categories are clear, the sampling process should ensure that at least some young people from each of the identified groups are able to participate so that the exercise documents the variation of life experiences.

Special efforts may be needed to ensure the participation of specific groups. For example, a team of interviewers may arrange to meet with students at a local school, but also hold discussions with youth outside movie theaters or taverns, where out-of-school youth may gather.

**STEP 2: CHOOSE METHODS FOR DATA COLLECTION AND ANALYZE DATA**

Several qualitative research techniques can be used to generate categories of relationships, including informal discussions, in-depth interviews, and focus group discussions. These techniques will illustrate how people use terms naturally and may reveal their nuance in meaning. Program staff can ask informants to clarify and define terms by probing, or asking more specific questions to clarify the terms, such as, “What does that term mean? How and when would you use it? How is it different from ______?” Interview and discussion group transcripts require a high level of effort to manage and analyze, however. Free-listing may be a more efficient method.

**Free-listing** is a technique used to elicit terms or items of interest—in this case, categories of relationships. It is easily conducted with small groups or individuals, and is often the first step in a process of analyzing local terms and categories, their relative importance, and their relationships to each other. Responses are recorded by creating a form or using a flip chart. Program staff may wish to “probe” for explanations or interpretations of the terms and record them next to the term.

In general, a free-listing activity should involve at least 30 individuals from a target population to ensure that the relevant terms for that group are identified. However, free-listing can also be used with focus groups consisting of 8 to 12 members.

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18 Weller and Romney 1990. Larger or smaller numbers of informants may be necessary depending on the degree of agreement or variation in responses.
Example of Free-Listing Form

What terms are used to describe relationships between boys and girls, or males and females?

Table 4.1. Sample Free-Listing Form

<table>
<thead>
<tr>
<th>Term</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Free-listing can be used to identify the kinds of interactions that take place between individuals and groups: information shared; support provided; and expected norms, beliefs, or behaviors. This information can be obtained by asking questions that refer to the specific type of relationship, or that refer to types of relationships for specific issues. For example, one way of asking and organizing questions is to determine whom people talk to for a specific purpose (Table 4.2).

Table 4.2. Whom Do You Talk To?

<table>
<thead>
<tr>
<th>Need advice on personal issues?</th>
<th>Need money or other material support?</th>
<th>Need help with school?</th>
<th>Have health problems?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best friend</td>
<td>Father or mother</td>
<td>Teacher</td>
<td>Doctor</td>
</tr>
<tr>
<td>Counselor</td>
<td>Older relative</td>
<td>Older student</td>
<td>Friends</td>
</tr>
</tbody>
</table>

In the table above, terms are listed, rather than actual people. The same type of exercise can be done by listing specific people, but it is generally more informative to specify the type of relationship the person has with those listed.

To elicit items related to:

- **context or setting**, you might ask, “Where did you meet Person A? Where do you usually get together? How long have you known him/her? How often do you see each other?”

- **feelings or connections**, you might ask, “How do you feel about Person B?” “In what ways do you think Person B cares about you?” “In what ways do you care about Person B?”
• information shared, you might ask, “What do you talk about with Person C?”

• types of support or exchange, you might ask, “What do you give to and get from Person C?”

• expected norms, you might ask, “What is the role of Person D?” or “How should a girlfriend behave with her boyfriend?”

• behaviors, you might ask, “What activities do you do with your best friend?” or “What kind of physical contact do you have with Partner A?”

This information will provide a richer perspective on how young people distinguish between different types of relationships for different purposes. This information can help programs identify whom to involve in programs for specific purposes, and can help young people think more critically about people who influence their decisions.

In addition to general cultural expectations, personal qualities, and characteristics that are important to young people in selecting friends, partners and others who may influence their lives may also be identified. We can elicit these items by asking, “What qualities or characteristics do you look for in the following type of relationship?”

These items will also reveal the qualities that are valued by youth in a particular culture or society. Programs may be interested in this information to help them identify leaders or other influential individuals with these characteristics. They may also help young people identify and distinguish between positive and negative influences or characteristics among the people with whom they choose to associate.

Once a list of terms has been recorded, programs need to determine which are most meaningful within the context in which they are working. Programs often are first interested in determining the specific meanings of the terms. For example, in Thailand, this free-listing technique was used with 30 young men and women to describe relationships between males and females. It resulted in a list of more than 60 terms, some of which are presented in Table 4.4.

<table>
<thead>
<tr>
<th>Friends to Spend Free Time With</th>
<th>Close Friends</th>
<th>Boyfriend/Girlfriend</th>
<th>Spouse</th>
<th>Mentor or Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fun-loving</td>
<td>Trustworthy</td>
<td>Good-looking</td>
<td>Honest</td>
<td>Worthy of respect</td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Table 4.3. What Qualities Do You Look For?
Chapter 4
How to Conduct Social Network Analysis: The Techniques

Table 4.4. Terms to Describe Relationships Between Males and Females

<table>
<thead>
<tr>
<th>Term (Thai)</th>
<th>English</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faen</td>
<td>Fiancée, fiancé</td>
<td>Committed relationship between man and woman</td>
</tr>
<tr>
<td>Samii/pharayaa</td>
<td>Husband/wife</td>
<td>Formal usage, implies legal and ceremonial marriage</td>
</tr>
<tr>
<td>Phua mia</td>
<td>Husband/wife</td>
<td>Informal, not necessarily legal and ceremonial, live and eat together</td>
</tr>
</tbody>
</table>

- The position is determined by the order in which items are listed. Those items mentioned most frequently and listed first can then be selected for further classification or interpretation. Once the respondent has listed items, interviewers should ask the respondent to explain the responses and to differentiate items from each other.
**Frequency** is a univariate (single variable) measure used to summarize a number of observations. For example, the term *faen* was listed among 21 males and 25 females to describe relationships between boys and girls (out of a total of 30 male and 30 female respondents). **Percentages** are calculated by dividing the frequency in one category by the total number of observations, then multiplying by 100. As shown in the table below, the percentage of all respondents who reported the term *faen* was 77 percent (46 divided by 60 x 100).

**Table 4.5. Free Lists and Frequencies of Terms Describing Relationships Between Men and Women**

<table>
<thead>
<tr>
<th>Term</th>
<th>Frequency (males) N=30</th>
<th>Frequency (females) N=30</th>
<th>Total N=60</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faen boyfriend/girlfriend</td>
<td>21</td>
<td>25</td>
<td>46</td>
<td>77</td>
</tr>
<tr>
<td>Khuu rak/ Khon rak sweetheart loved one</td>
<td>26</td>
<td>12</td>
<td>38</td>
<td>63</td>
</tr>
<tr>
<td>Phuan friend</td>
<td>10</td>
<td>15</td>
<td>25</td>
<td>42</td>
</tr>
<tr>
<td>Khuu non sex partner</td>
<td>7</td>
<td>13</td>
<td>20</td>
<td>33</td>
</tr>
<tr>
<td>Samii/ pharayaa husband/wife</td>
<td>6</td>
<td>10</td>
<td>16</td>
<td>27</td>
</tr>
<tr>
<td>Phi nong older/younger</td>
<td>2</td>
<td>7</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Khon rujak acquaintance</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

The position on the list also gives an indication of the relative importance of the term. Generally, people list the most important or frequent items first, and the less important or less common responses later on the list. In this case, all the terms above were most frequently listed and listed early on.

**Probing**, or asking specific questions, determines the meanings, interpretations, and explanations of different terms, categories, and preferences. For example, the Thai term *faen* was explained with a variety of meanings using probing techniques. The term *faen* is borrowed from the English word “fancy,” or admirer, or the French term, fiancée. Respondents were asked to explain and interpret the term; this revealed variation in how the term is understood. For example:

*Someone we love and acknowledge we will marry in the future. (21-year-old male)*

*Someone we really love, the beginning of life as a couple. There is understanding, we share common attitudes, love. Someone we always think of. (22-year-old female)*

*Male and female who know each other, sometimes there is happiness, sometimes suffering. When they love each other, I assume they must definitely sleep together. They may live in separate places and visit each other, or they may live together. (30-year-old female)*
Someone we begin to know, learn about her personality and lifestyle before deciding to spend our lives together. (22-year-old male)

Future wife. We have to have sex together too. (19-year-old male)

There is more of a sexual relationship than with a friend. (22-year-old female)

Someone I love, and he loves me. We are able to help each other through difficulties and are sincere with each other. (23-year-old female)

Someone I only like, not love, but who can help relieve loneliness and will care about me. (20-year-old female)

The term is widely used, yet there is no single interpretation regarding the levels of care, compatibility, commitment, and sexual activity. This broad set of interpretations reflects how complex these meanings are, even among young people themselves.

The information generated from free-listing and probing can be used to build the network study. First, by engaging in this activity prior to asking other questions, program staff will be much more aware of how youth perceive relationships and what issues are important to them. Second, they can incorporate the terms into a survey instrument as categories or coded responses. Third, they can test and refine the questions to be asked to generate community or systems networks.

**Sample Questions for Probing**

- What is the sequence of events that is likely to take place in a girl’s and boy’s life?
- What happens when a boy and a girl start a relationship?
- What is the process of courtship and marriage?
- Who takes the initiative to start a relationship? How would they take the initiative? Where would they meet? How do they spend their time together? What are the girl’s concerns? What are the boy’s concerns? Are they ever alone? If so, under what circumstances? Would their parents know about it?
- After how much time knowing each other do adolescent boys and girls in intimate relationships have physical contact? What kinds of physical contact do they have? (probe: hold hands, kiss, fondle breasts, take off clothes, etc.).
- What is the progression of physical activity to intercourse?
- Under what circumstances would a boy and girl have sex before marriage?
- Have you ever heard of a girl being forced to have sex? Explain the circumstances: By whom? What happened to her?
- Who influences how quickly a couple decides to have a baby after they get married (parents of husband, parents of wife, community members)? If a woman does not get pregnant quickly, what will her family/community say?
The Venn Diagram is a visual method that allows researchers to analyze relationships among various institutions (either formal or informal groups) or key individuals within a community. The diagram can include the types of groups or individuals and the links they have with each other. For example, in the figure below, this technique was used to identify sexual networks and sexual “bridges.” Sexual bridges occur between people in sexual relationships across informant-defined partner categories such as mia noi (minor wife), faen (boyfriend/girlfriend), kratheuy (transvestite or effeminate male, suggesting men with male sex partners), and kai (“chicks” or “loose” women with whom it is easy to have a sexual relationship). Information on sexual bridging was collected from in-depth interviews with young men based on the categories of partners with whom they reported engaging in sexual relations. This methodology illustrates the complexity and dynamic nature of social and sexual relations and sexual partner selection.

Sexual networks, as reported by young men, are made up of people in the categories described in the diagram. The model presented in the figure illustrates the links between young men and the various partner types they described. Several central locations were identified, primarily brothel districts, where men contacted commercial sex workers. In addition, they reported relationships with waitresses, students, friends, village girls, wives, playgirls, and “lost chicks” (young women who have lost their way). From this diagram it is evident that small groups of male friends go to brothels together, but also engage privately in other relationships with a variety of partner types. Absent from this model are the potentially numerous partner types linking the women to other men, such as clients, regular customers, and boyfriends.

Figure 4.1. Social and Sexual Network of Young Northern Thai Men
Individual in-depth interviews may be used to cover sensitive issues that young people do not wish to discuss as part of a group. It is important to discuss these issues in a private setting where respondents do not feel that others may be listening or judging what they say. It may require several meetings with a respondent before these issues are introduced. Disclosing personal information, using humor and open body language, and demonstrating genuine interest in the young respondent all help to build rapport and open and honest communication, and will more likely result in honest responses.

- Have you ever had a boyfriend/girlfriend (or spouse)?
- If so, how old were you when you had your first girlfriend/boyfriend?
- Tell me about him/her. How did you meet? What did you like about that person?
- What happened? How did you know that you liked each other?
- Since then, have there been others? Please tell me about it.

Sexual History

- Tell me about the first time you had sexual intercourse with someone. How old were you? With whom? How did you meet? What was that person like?
- How did you decide to have sex? Under what circumstances did it happen? Did you think about getting pregnant? Did you talk with that person about getting pregnant?
- Did you think about getting an STI? Did you talk about it? Why or why not?
- Did you do anything to prevent getting pregnant or infected? If so, what did you do? If not, why not?
- Are you still with that person? If not, why did you break up?

For Married Adolescents

- Who decided you should marry? If you had a younger sister (brother), is this the way you would want their marriage to be decided?
- Do you think you married at the right age, or do you wish you had waited longer? Why?
- How has being married changed your life? What responsibilities do you have in the home? What responsibilities does your spouse have?
- Do you still have time to spend with your friends?
- Have you felt pressure to have children soon after marriage? If so, in what ways? By whom?
The information derived from all the techniques listed above can be applied directly to the program by training youth and adult service providers and others to be sensitive to the language, concepts, and expectations of youth in the area. Terms and meanings can also be incorporated into communication and media messages so that they relate more to youth in the locality. Characteristics and qualities important to youth can be identified in the process of selecting youth or adult staff for your program. Discussions with young people can help them to think more critically about how they interact with others and how those interactions influence their decisions.

**TECHNIQUE 2. USE SURVEYS TO CHARACTERIZE PERSONAL NETWORKS**

A personal network refers to an individual, other people with whom he or she has direct contact, the relationship between the individual and those with whom he or she has direct contact, and their relationships with each other. Characterizing personal networks allows researchers to explore and quantify different dimensions of relationships. These dimensions include:

- the characteristics of an individual and the specific members of his or her personal network;
- the context, setting, place, and time in which these specific relationships take place;
- the nature of relationships; and
- the extent to which people in an individual’s personal network are connected to each other.

In this type of analysis, respondents nominate specific people, or give names, nicknames, or initials of those who are in some way related to the respondent. This level of analysis is most commonly used because it is easy to include questions about personal networks in existing surveys. In fact, many youth surveys already ask questions about specific relationships to young people, including friends, siblings, parents, and romantic/sexual partners.

**STEP 1: SELECT THE SAMPLE**

The strategies for sampling described in the previous section also apply to this type of data-collection effort.

**STEP 2: DEVELOP AN INSTRUMENT**

A survey instrument, or questionnaire, should be developed using the relevant terms, categories, and issues identified through qualitative and participatory techniques to ensure that the respondents understand the questions. A personal network instrument or module added to a standard survey usually includes questions about the individual respondent characteristics and a “name generator” that asks about specific individuals...
with whom the respondent has a specified relationship. Some of the examples listed in Chapter 2 include family, friends, romantic or sexual partnerships, sources of information or support, or people with whom youth like to spend free time. Respondents are asked to list the nicknames or initials of the people who correspond to that type of relationship, either specifying a given number of individuals or leaving the question open. Questionnaires also include questions about the characteristics of the people named and characteristics of the relationship itself.

Appendix 1 provides sample instruments for use in collecting information about family members, friends, and partners. These instruments are composed of questions that have been collected from a variety of surveys and tested in different countries. The questions correspond to dimensions of dyadic relationships presented in the framework from Chapter 2. These include context; feelings or connections; types of social support; norms, perceived attitudes, and values; power and communication; and behaviors and activities.

The instruments should be viewed as illustrative and should be adapted to each setting according to the specific concerns of the program or research questions. Questions can be closed, with predetermined responses to allow for easier data management, or open-ended, to allow respondents to reply in their own words. If the questions are closed, responses generated from free-listing or other qualitative techniques should be provided.\textsuperscript{16}

Asking too many questions about relationships may become tedious or confusing. Using visual techniques may help make the interview more lively or interesting. For example, responses may be placed on pictures or cards, with respondents selecting the picture or term that most adequately corresponds to the person or relationship.

There are two ways to set up instruments regarding personal networks. First, the question may be presented in the left column, with response categories for each person named to the right of the questions. This format may be convenient for interviewing and data entry. However, in some cases it may be awkward to frequently turn pages back and forth. An alternative is to outline all the questions about each person sequentially. It is usually more efficient to ask all the relevant questions about each individual before moving on to the next nomination. It is very important that an instrument is adequately \textit{pretested} prior to being used widely.

Some programs involve peer educators as interviewers and use this approach to collect information about the people with whom they come into contact. Peer educators can be an excellent resource in helping to develop and test questionnaires, and in collecting and entering data. As with all research, they must be trained to use the instrument and ensure that all responses are kept confidential.

\textsuperscript{16}For tips on developing survey instruments and collecting data, see Adamchak et al. \textit{A Guide to Monitoring and Evaluating Adolescent Reproductive Health Programs}, FOCUS on Young Adults, 2000.
**STEP 3: EXAMINE CONTACTS AMONG MEMBERS OF A PERSONAL NETWORK**

Programs may be interested in whether or not the members of the respondent’s network know each other, and if so, how close they are. This information may indicate how intense the relationships are, and whether information or norms reinforce each other. You can obtain this information by developing a matrix, and asking the respondent how well he or she thinks Person A knows Person B and Person C, how well Person B knows Person A and Person C, and how well Person C knows Person A and Person B. At this level, you are only measuring the respondent’s perceptions because you are not asking Person A, B, or C directly how well they know each other. A table like the one below can be used to track this information.

<table>
<thead>
<tr>
<th>How well do these three people know each other?</th>
<th>Person A</th>
<th>Person B</th>
<th>Person C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person A</td>
<td>..........</td>
<td>1 2 3</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Person B</td>
<td>1 2 3</td>
<td>..........</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Person C</td>
<td>1 2 3</td>
<td>1 2 3</td>
<td>..........</td>
</tr>
</tbody>
</table>

Key: 1=Don’t know each other; 2=Acquaintances; 3=Close friends.

**Table 4.6. Tracking Information**

**STEP 4: ANALYZE THE DATA**

Personal network data can be analyzed at three levels: attributes of the individuals in the personal network; characteristics of the pairs (dyads); and characteristics of the personal network, including size, composition of members, and extent to which members are connected to each other.

**Individual Characteristics**

Analyzing characteristics of the individual respondent and network members can be done by calculating frequencies—for example, the percentage of respondents who are male or female, have a particular level of education, or report a particular risk behavior. This type of analysis is common to all survey data collection and analysis. Further analysis explores the dynamics of the relationships.

**Characteristics of One-on-One Relationships**

Personal network analysis is distinct from other surveys because it analyzes the relationship as the unit. Programs can look at specific characteristics of the relationship
and behaviors or communication that occur between two specific individuals. For example, they can calculate the percentage of youth who talk about reproductive health issues with their grandmothers, or who used a condom with a specific partner. They can also calculate:

- **Reciprocity**: The extent to which information, resources, and support are both given and received.
- **Intensity**: The extent to which relationships offer emotional closeness.
- **Duration**: The time two people have known or been connected to each other.

These measures can be developed by analyzing the individual’s perception of what is given and received and the perception of how close he or she is to the person nominated. Researchers can then begin to identify patterns of responses among the youth with whom they work. These patterns help researchers understand the social and cultural context.

If the program is interested in better understanding gender norms, or expected roles and behaviors that young men and women learn in a particular setting, it should analyze:

- the ideal characteristics of a girlfriend/boyfriend or spouse;
- the ideal behaviors or roles that person should play in relation to parents, friends, and partners;
- the kinds of support exchanged between males and females;
- the kinds of issues a young man and woman discuss with each other;
- the settings in which young men and women interact;
- the amount of time a young man and woman know each other before proclaiming themselves as romantic partners.

If staff are interested in learning about power dynamics between partners, or between adults and youth, they should look at:

- differences in age, gender, and income between the respondent and his or her partner;
- feelings about how much they are able to talk openly, or how much they contribute to decision making;
- ability to talk about important issues, such as money or contraception, with the partner.

After calculating frequencies separately for males and females, programs can compare differences in their responses.
Characteristics of the Personal Network

In analyzing the size and composition of the personal network, programs can better understand an individual’s access to information and support resources, and exposure to specific norms and behaviors.

How Many People Are in a Person’s Network?

Size measures the actual number of people nominated. The size of an individual’s personal network may indicate the extent to which that person has access to information, resources, and support.

What Are the Characteristics of Network Members?

Range is a measure of the diversity of members named, or how similar to or different from the respondent they are (homogeneity/heterogeneity). Range measures the actual number of people named (size), the percentage with particular characteristics, and contact with particular attributes (Burt 1980). Range is important to analyze because it can help programs to begin to address the following questions.

Friendship Selection

- To what extent do young people associate with people who are similar to themselves?
- What characteristics do members of a network share?
- Do young people engage in behaviors similar to those of their personal networks?

Monitoring Peer Programs

- What is the composition of youth networks that peer leaders reach?
- Are they people like themselves? If not, how are they different?
- Are they at higher or lower risk than peer leaders?

Composition of Organizational Networks

- What are the characteristics of network members (organizations/groups, etc.)?
- What services do they provide?
- How much variation exists in the services provided?
- What geographic areas are covered?
- What is the capacity of specific members to do different tasks?
How Does the Network Structure Influence Norms and Behaviors?

**Integrativeness** of personal networks is a measure of the number and combination of people named who know each other. Individuals in networks in which there are few members, most of whom know each other, may be more exposed to normatively prescribed beliefs and behaviors. In contrast, those in networks composed of more diverse members may have access to diverse types of information (Burt 1980; Bott 1957). These hypotheses may be tested by looking at how young people are exposed to risk behaviors among friends, such as brothel patronage, condom use, alcohol consumption, premarital sexual relations, and partner selection.

What Other Kinds of Relationships Overlap Within the Network?

**Multiplexity** indicates the degree to which multiple types of relationships or functions of relationships are associated with actors in networks. Multiplexity shows how relationships overlap. For example, are members of a friendship/trust network, social group, or exchange network also part of a sexual network? If so, what attributes of individuals are associated with the network types to which they were nominated? Comparing relationship qualities, as well as attributes of those named in friendship or other social networks, with those in sexual networks can provide insight into how individuals select their sexual partners from personal social networks.

**TECHNIQUE 3. MAP NETWORKS**

The **community or system network** refers to everyone in a certain population and the links between and among members. The community or system network incorporates members of a whole population or group, and is also defined as the aggregate or sum of personal networks within that population or group. The units in the community or system could be individuals or organizations.

Analyzing community or systems networks reveals the patterns or structure of a given population or target group. The advantage of this technique is that it creates a visual map, or **sociogram**, that allows you to look at the system of linked relationships, and at the parts of which it is composed, including positions of the individuals or organizations in a network and their links to one other (Valente 1995). The map can help to:

- identify channels of communication;
- identify individuals with influence in order to select “leaders” who can influence youth in a positive way;
- identify groups or cliques in order to better understand group norms and subcultures.
Building Connections:
Understanding Relationships and Networks to Improve Adolescent Sexual and Reproductive Health Programs

Programs can use this map to:

- facilitate discussions among network members about their relationships and relative influence on each other;
- identify ways to modify group norms and subcultures;
- strategize about how to strengthen weak links in a system.

This level of analysis is most easily done within settings with clear boundaries and membership (for example, among members of a school classroom, dormitory, military unit, or village). These networks are referred to here as **bounded networks**. Lists of members can be obtained from registration data or other records. It is less easily done in settings with unclear boundaries, or **unbounded networks** (for example, people who patronize a nightclub, those who live in a large urban area, or migrants who move frequently from one place to another). In such settings, community or systems network studies and mapping may not always be feasible.

**STEP 1: DEFINE THE TYPE OF NETWORK TO BE ANALYZED**

It is important to ask the questions that reveal the type of issue or network content that will be useful to the program. Networks based on different content may also be quite different in structure.

A general network question might be generated by asking, “Whom do you like to spend your free time with?”

A more specific or intimate network may be generated by asking, “Whom do you talk to about personal issues?”

A network specific to the program might be generated by asking, “In this classroom, whom have you talked to about reproductive health issues in the last three months?”

It is particularly important that staff think carefully about how the network questions are asked, and pretest the question to be sure that respondents understand the meaning of the question. The more specific the question, the more limited the network boundaries may be. For example, if researchers ask young people, “Whom do you spend your free time with?” they may respond that they spend it with friends, relatives, and others. If researchers specify the question to a narrower group, for example, “Whom in this classroom do you spend your free time with?” the network responses will be limited to only the members of the classroom, thereby leaving out other potential network links beyond the classroom. In this regard, the networks are defined by the questions asked. There will be a trade-off between understanding broader dimensions of influence and identifying links among specific individuals in a particular locale.

**STEP 2: SELECT THE SAMPLE**

Network data can be collected in several ways, depending on the population and level of organization. First, researchers can simply **observe** who talks to or interacts with
whom. This method may be most appropriate for exploratory research, or with well-bounded or small networks. For example, they can observe which young people who come to a youth center talk to each other, or play games with each other. This method is more difficult when trying to analyze larger networks, or networks where members may meet with each other in private or engage in private behaviors, such as a sexual network. As the geographic area of observation or the number of members of a network increases, programs may be more likely to miss relevant ties among network members (Klovdahl 1989).

Second, programs can use a roster, or list of all network members, to determine who communicates with whom. This method is most feasible in settings with distinct network boundaries, such as an organization, school, village, or military unit, as described above. A list of everyone in the set is generated. Each person on the list is asked a question about the network, such as, “Whom in this class did you talk with about reproductive health issues in the last three months?” Alternative questions to validate or expand upon answers to the first question include, “Whom did you talk to about boyfriend/girlfriend concerns?” or “Whom did you talk to about sex?”

This can be done in two ways:

1. Ask members to spontaneously name the people they think of. This approach would provide an idea of the more significant or memorable contacts, which may help to prioritize important contacts.

2. Provide all those on the list with the list of names, and ask them to check all the names of people they have talked with during that time. This approach would increase the chances that more of the communications links are reported, and that the responses are thorough.

Third, programs can collect a snowball sample of network members by asking initial members (or “seed” members) to nominate a specific number of people they know according to a specific network question asked. For example, if programs are interested in learning about networks of youth who go to entertainment establishments at night, they may begin by sampling a few popular entertainment establishments. There, they may identify a few individuals as “seeds.” These individuals may be selected based on specific criteria; for example, people who seem to know a lot of people there, or people who play a specific role in the establishment. Alternatively, they may be selected at random; for example, every fifth person who walks through the door.

Program staff may then ask them, “Can you name all the people with whom you have come to this establishment in the last week (or month)?” They may list five names, for example. Program staff would then try to find those five people and ask them the same question. They would continue to follow these nominations. Some of the names listed may be the same as those listed by the “seed” respondent and some may be new names. The challenge with this approach is deciding where and when to stop with nominations. This decision is largely up to the program or research team.
A team may determine that they have the capacity or resources to follow nominations out two nodes, for example. This means that they follow the nominations of the “seed” member and then follow the nominations of those nominations. In a larger network, they may decide to continue the process following more nominations. In this case, it becomes more difficult to manage data. Similarly, a team may decide to cut off the nominations at a specified number, for example 25, if they have limited time and resources to follow nominations. In a smaller network, the people named will be repeated by a number of members. When no new names are generated, the natural “boundary” of the network has been found. There are no hard and fast rules about establishing when and where to stop the snowball process. However, the more nominations one can follow, the more complete the network.

Once the program has generated a list of names by snowball sampling, they may then decide to use the roster technique. They would then ask all the people listed the original question, “In the last week (or month), did you come to this establishment with X?” (or “Do you know X?”). This allows programs to fill in any possible missing links.

**STEP 3: RECORD NOMINATIONS, OR NAMES, PROVIDED BY NETWORK MEMBERS**

In a bounded network, it is relatively easy to collect the names of members to create a roster. Programs will need to include an “identifier” code to refer to the member in order to keep the names confidential. This may look like a simple form with codes and names:

**Table 4.7. Student Members of Classroom A**

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
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<td>4</td>
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<td>16</td>
<td></td>
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<td>17</td>
<td></td>
</tr>
</tbody>
</table>
The names of people mentioned from the roster in a simple form can then be added.

Table 4.8. Roster Sample

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Nickname</th>
<th>Class Members Nominated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
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<td>16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In an unbounded network, researchers begin with listing the names of the seed members, then listing the nominations of each, and then listing their nominations, and so on. Once they have a full list, they can create a roster.
Table 4.9. Names in an Unbounded Network

<table>
<thead>
<tr>
<th>Seed Members</th>
<th>Nomination A</th>
<th>Nomination B</th>
<th>Nomination C</th>
<th>Nomination D</th>
<th>Nomination E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Alex</td>
<td>Bart</td>
<td>Alfonso</td>
<td>Carmen</td>
<td>Janet</td>
<td>Chen</td>
</tr>
</tbody>
</table>

For example, in the table above, the “seed” members consist of Alex, Jose, Nick, Maria, and Ling. We record Alex’s nominations as Bart, Alfonso, Carmen, Janet, and Chen. Bart’s nominations include Alex, Alfonso, Freda, Ginger, and Laura. Among the nominations, the same names are mentioned by several people, while new names are also generated. Researchers do not need to limit responses to five people. To protect confidentiality, record nicknames or identifiers in place of the actual names.

**STEP 4: TRACK RESPONSES**

A clear approach to keeping track of the responses, or contacts named, is needed to determine where to set boundaries on an unbounded network, and to decide what to do when people named cannot be found. There are no clear rules for these issues.
Creating a data-collection form can help to track responses. This allows the person collecting network data to determine who has responded, who was nominated, and how to find them. Practical tips for tracking responses by snowball sampling include:

- Asking first for permission to contact the person nominated; you can even ask the seed person to introduce you to those nominated. This may be more sensitive with specific types of networks, such as sexual or drug-using networks.

- Obtaining information about how to locate the contacts, for example, phone numbers, places they go to, or other information.

- Asking where and when they usually get together.

There are general research rules for following respondents over time that can also apply to tracking responses. Generally, three attempts are made to reach a nomination before stopping. It is important to recognize, however, that the “lost” nomination, or person you cannot track, is a missing link, and that the network map produced will not reflect his or her contacts, even if they are important to the overall network. The accuracy of the network is increasingly compromised as nominations are lost.

**STEP 5: MAP NETWORKS BY HAND OR COMPUTER**

It is possible to map networks either by hand or by computer. A small sample from a bounded network is easy to map by hand. In the Lifenet Project described in Chapter 5, networks were mapped both by computer and by hand. In order to train secondary school teachers in mapping techniques, trainers introduced the approach as follows:

Students have their own natural groups, which may be large or small. Within these groups, or networks, students interact and may behave in similar ways. There are usually natural leaders. Whenever there is a change in group membership, behaviors of the members may also change. Based on the network experience of the Lifenet Project, we learned that behavior of these groups can change in both positive and negative ways.

Trainers then presented the steps for analyzing networks to teachers.

1. Teachers randomly selected 10 students to provide them with an example of how to map social networks.

2. Teachers and trainers thought about what type of question to ask to identify social networks. Teachers handed out a small piece of paper with the following information:
3. Trainers took the responses and demonstrated to teachers how to draw a sociogram. They used a whiteboard or plain paper and pen and followed the process below:

A. Start with the first respondent (use nickname or real name).
B. Write the names of the respondents’ friends surrounding the respondent’s name.
C. Draw a line and arrow between the respondent and the friends named.
D. Write the name of the second respondent on the page and follow steps B and C above. If a student names someone already listed, draw a line and arrow between that student and the person named. It is not necessary to write the person’s name twice.
E. Follow the process until each respondent has been covered.
F. Find the person who was listed most often by friends by counting the number of lines and arrows to that person. Write the names of students in order of the number of nominations each received. Those who received many nominations are regarded as individuals who can be trusted by other students and can be regarded as a natural leader in the group.
G. Find clusters or small groups of friends within the network. Individuals in these groups may share similar values, attitudes, or behaviors. Each group may have a different leader or set of leaders. Some groups may not have a specific leader, but regard each other as equals (Duangdeetawerate et al. 2000).

Teachers found that mapping by hand, they were able to identify important elements of their students’ networks, including potential peer leaders and subgroups. Later, they were trained to map networks using computer software, as described below.
Map Networks Using a Computer

Once collected, network data must be organized into a framework, or data matrix (Scott 1991). A matrix is simply a table of figures with rows and columns drawn on paper or placed in computer records. With network data we are interested in the relationships between members of a network, or affiliations. We would place the cases, or individuals, along the first column and affiliations, or contacts, across the top, or horizontal, row.

Table 4.10. Sample Data Matrix

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person A</td>
<td>......</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person B</td>
<td></td>
<td>......</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person C</td>
<td></td>
<td></td>
<td>......</td>
<td></td>
</tr>
<tr>
<td>Person D</td>
<td></td>
<td></td>
<td></td>
<td>......</td>
</tr>
</tbody>
</table>

For each network, the names of all the members from the roster (or matching identifiers) will be listed in the first column. The same names will be listed across the top row, with one blank space in the very first cell block. Using the data-collection form, match the name of the respondent along the column with the corresponding name along the first column (respondent’s name/identifier). Then, for the first question, find the nominated person’s name across the top row. If a specific person is nominated, enter a “1” in the cell with the matching names. If the name is not mentioned, enter a “0.” This should be done for all respondents and all names, moving down the first vertical column.
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In this example, A nominates B and D. B nominates A and D. C nominates A and D. D nominates A, B, and C.

With small data sets, data can be managed easily by hand. As the data set increases, however, managing such data becomes more difficult. Using a computer to process the data will save time and allow for the management of larger data sets. Appendix 4 explains how to enter a data matrix into a computer spreadsheet.

### Table 4.11. Data Matrix With Data Set

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person A</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Person B</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Person C</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Person D</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Convert the Matrix Into a Map, or Sociogram**

Social network data graphs, or sociograms, represent properties of a social network, with individuals represented by “points” or “nodes,” and their social relationships to one another by “lines” (Scott 1991). When looking at a sociogram, a variety of features related to the network stand out: the individual nodes, the links between them, the distances between nodes, pathways from one node to another, clustering or groupings of individuals, and positions of individuals in the overall pattern of links.

Sociograms are constructed by creating a spatial map from the matrix data. In the example of A, B, C, and D above, the sociogram would look like Figure 4.2.

**Figure 4.2. Sociogram 1**

If additional individuals were mapped, the sociogram might resemble Figure 4.3.

**Figure 4.3. Sociogram 2**
**STEP 6: ANALYZE AND INTERPRET THE NETWORK**

The basic measures that help us to interpret the sociograms are described as follows:

A **node** is a point on the graph, representing an individual, organization, or other unit defined by the data collector. In Figure 4.3, all points A through J are nodes. In your program, nodes may be youth, teachers, facility workers, schools, NGOs, or communities.

The **line** indicates a link or relationship between individual nodes. If there is no line between nodes, no direct relationship was reported. In Figure 4.3, points A and B are connected by a line. Points A and E are not connected by a line directly, but are connected by lines linking point A to C and C to E (also A-D-E and A-B-D-E).

The **direction** of the relationship (who was nominated by whom) is indicated by an arrow at the end of the line, pointing to the linked nodes. In Figure 4.2, point C nominated point A but point A did not nominate point C. In this case the nomination was not reciprocal. No directions are indicated in Sociogram 2.

A **path** is the sequence of lines in a graph, in which each point and each line is distinct. In Sociogram 2, one path from A to F goes through points C and E; another path goes through points D and E.

**Length** is measured by the number of lines that make up a path. The length between A to F is three for both paths listed above. For information to travel from A to F, it would have to go through three individuals.

**Distance** measures how far apart two nodes are in a network by counting the number of paths in the shortest path between two nodes. Distance is calculated for the following nodes:

- A to E = 2
- A to F = 3
- A to H = 4
- A to J = 5

Distance can also be used to measure how many links are required to transmit information or resources within a network (Knoke and Kuklinski 1982). If the distance is greater, the communication between two nodes may be less efficient and accurate.

**Density** measures the number of links, or relations between nodes, out of the total number of possible links. The density of the subgroups “A, B, C, D” and “G, H, I, J” equals 1 because all points are connected in that subgroup. The density of subgroups “A, B, C, D, E” and “F, G, H, I, J” is 0.8 because only eight out of a possible 10 links are actually mentioned.
Density can map out paths of HIV infection, resource exchange, sources of support, and flow of information. Dense networks may have stronger social support and social norms than less dense networks. These norms may have either a positive or negative influence on young people.

**Subgroups** are clusters of people in a network who are closely associated with each other. As mentioned above, points A, B, C, and D comprise a subgroup, as do points A, B, C, D, and E.

**Cliques** are defined as “a set of actors in a network who are connected to each other by strong relations” (Burt 1980), or a subgroup of a network in which every possible pair of points is directly connected by a line (Scott 1991). Factions are another measure of subgroups that indicate the extent to which a specified number of groups form clique-like structures (Borgatti et al. 1992).

Subgroups reveal which youth cluster together. If researchers include characteristics of those in a subgroup, such as behaviors or attitudes, they may be able to determine what behaviors or attitudes members of the same subgroup share and characterize its **subculture**. Many social mobilization programs, including peer programs, aim to redefine the norms and subcultures of a group to protect members from, rather than expose them to, health risks.

**Centrality** measures how central an individual node is relative to other nodes, and how centrally a network is organized. Examining centrality at an individual level will expose the existence of specific leaders (e.g., opinion leaders) or influential people, those with many partners and their positions in terms of HIV transmission, and positions of greater or lesser risk and bargaining power. At the network level, more centralized networks tend to be more efficient, either with respect to the transmission of HIV or with the flow of information introduced through interventions.

**Figure 4.4. Sociogram 3**

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18 The sociogram and illustrations of centrality are derived from Scott 1991.
There are three centrality measures (Freeman 1979; Scott 1991):

**Degree** measures the number of points to which a particular point is connected. In-degree measures the number of nominations received, while out-degree measures the number of nominations given. In Figure 4.4, the centrality of points A, B, and C is 5, the centrality of points G and M is 2, and the centrality of points J, K, L, and all other points is 1. Young people with high “degree” centrality tend to be in the middle of things.

Two further measures—closeness and betweenness centrality—can help to identify **brokers** or **“gate-keepers,”** as well as links between groups, such as commercial and noncommercial sex partners.

**Closeness** measures distances among various points in a whole network. A point is central globally if it lies at short distances from many other points. In Figure 4.4, we can see that A, B, and C are central in local terms (they are each connected directly to 5 other points). However, point B is more globally central than points A and C. Similarly points G and M have a lower local centrality than A and B, but are more locally central in the network as a whole.

**Betweenness** measures the extent to which a particular point lies between various other points. Points G and M, for example, have a fairly low degree centrality measure, but have very central positions that link points A, F, E, D, and H and points C, N, O, P, and Q to the rest of the network.

**STEP 7: COMBINE DATA FROM SURVEYS AND NETWORK MAPS**

It is possible to analyze data collected on personal networks (as described in the previous section) as system-level networks under certain conditions of sampling. For example, if a program collected personal network data from a roster or snowball sample, they can analyze not only the dyads, but also the links among all the people in the roster. On the other hand, if they collected personal network data by randomly sampling individuals, they may be unlikely to show enough links among individuals to analyze a system.

Collecting information about relationships alone may not help explain the type of influences or common attributes shared by the individuals in the network. It is therefore preferable to combine findings about the individual members with network data. For example, in addition to asking who talks to whom, a research team may also want to know information about the values, perceived norms, or behaviors of the individuals in the network. Once they have mapped the sociogram, they can replace the identifier code with any other significant information they may have collected about the individuals. This information will provide them with a much richer interpretation of the characteristics of “central” or “influential” individuals, or the shared attributes of members of a subgroup.
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