Structures of power and constraint

Papers in honor of Peter M. Blau

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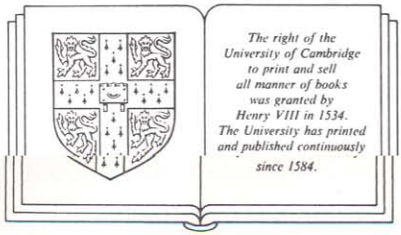

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Kinds of relations in American discussion networks*

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It seems fitting in this celebration of Peter Blau to address a formidable impediment to the broader use of the social structural theories to which Blau has made such foundational contributions. Applying social structural theory beyond a limited range of demographic and economic questions, we must have a clear sense of the distinctions that people make between kinds of relations. Explaining why is a preliminary task in this chapter. For methodological and financial reasons, however, network data have not been available in the national probability samples so often used to resolve social science debate. The 1985 General Social Survey (GSS) changed this by supplying the first national probability sample data on kinds of relations in American discussion networks. Complementing Marsden's (1987) use of the data to describe the form of relations in discussion networks, the GSS data are used here to describe kinds of relations. I describe kinds of relations distinguished on average and describe kinds of Americans who make different use of these distinctions. Obviously, many fine points

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will be passed over in this brief discussion, but the results provide a broad sense of critical distinctions needed in empirical research on the social structure of personal contact between Americans.

Why is the accuracy of distinctions between kinds of relations important?

Accurate distinctions between kinds of relations are important because structural analysis by definition involves comparisons across relations. The typical social structural research project begins with one or more tables of network data, in which each table contains data on a distinct kind of relations. Constructed around individuals or within a social system, the data exists as cells (A,B) measuring the strength of the relation from A to B, and the analysis involves comparisons across these relations. The point is apparent in any review of network models (for example, Burt, 1982, Ch. 2). Quick illustration suffices here. Prestige and centrality are often measured by summing across the rows of a column (comparing relations across rows) and using the sum as a measure of the demand for attention from the column individual or group (for comparison across columns). Mobility between statuses is often measured in terms of the magnitude of diagonal elements in a density table relative to certain off-diagonal elements (comparing relations across cells).

Despite the obvious need to insure that formal comparisons are made only between substantively comparable relations, accurate distinctions between kinds of relations have never been a central concern. With the notable exception of ethnographers, social structural analysis rarely captures the complexity of naturally occurring relations. The concern is less the complexity of contents mixed within the typical relationship than it is the complexity of the formal structure of relations of a single kind: the network structure of informal social relations, the network structure of authority relations, the network structure of economic exchange relations, and so on. The necessarily prior questions of why certain networks are distinguished in a system, how individuals in the system interpret their relations, and how they distinguish kinds of interaction are assumed to be resolved.

Unhappily, these unasked questions are quite unresolved; not only in general, but in the particular. When someone poses a sociometric question to you asking for the names of people to whom you go for such and such, you must disentangle the welter of interactions in your naturally occurring relations and classify some as such and such before you can answer the question. If you are asked to name your best friends, for example, you must decide which of your interactions

involve friendship. If you are asked to name the people with whom you engage in leisure activities, you must decide which of your interactions involve leisure. If you are asked to name the people whose personal comments most influence your decisions, you must decide which of your interactions involve influence. Obviously, people can differ in their interpretation of specific interactions as manifestations of general kinds of relations; some viewing as intimate, for example, what others view as no more than friendly. More obviously, people in different social situations or from different subcultures can differ in their interpretation of specific interactions as indicators of more general relation content.

The distinctions between relation contents needed to formulate sociometric questions before collecting network data are thus unsettlingly ad hoc. The sociometric questions eventually selected for a study can be no more than a compromise between two extremes. The upper limit is defined by the practical impossibility of gathering data on all relations in which respondents are involved. The other extreme is defined by the analyst's early hunches about the minimal number of the most significant kinds of relations in a study population.

The data definition problem creates problems for data analysis. Measurement error is an obvious problem. Ad hoc definitions of relation content increase the likelihood of random errors in identifying kinds of interaction in a relationship. If the meaning of friendship is unclear, for example, then respondents will be inconsistent when asked to identify those of their relationships which involve friendship. As in any data analysis, random errors in network data can be expected to attenuate standardized effects, amplify standard errors, and so suppress evidence of true effects. But the problem is especially troublesome here because network indices are less often used as a dependent variable than they are used to predict other variables. This means that random error in network data attenuates standardized and unstandardized effects. Network analyses based on ad hoc content definitions can be expected to produce equivocal research findings and spurious evidence of trifling effects.

Beyond random measurement error, there are validity problems. Ad hoc content definitions increase the likelihood of misinterpreted relations. The kind of relation solicited in an ad hoc sociometric question can be understood by a social scientist in a way distinct from its understanding in a study population. There is the related problem of erroneous inferences from comparative research. Even if identical sociometric questions are posed to individuals in two study populations, there is no guarantee that the questions have identical interpretations in the two populations. What the heroin addict understands

to be friendship probably differs from the suburban housewife's friendship. More generally, ad hoc content distinctions make it difficult to compare relations for their magnitude, and such comparisons are the essence of a social structural analysis.

But who is to say where one kind of relation stops and another begins? When does a colleague become a friend? One analyst might decide that each of the above interactions is a distinct kind of relation – social, economic, and collegial – whereupon the aggregate relationship is multiplex. Another analyst might distinguish only two contents, kinship and nonkinship, whereupon the described relationship is uniplex – it consists of multiple examples of nonkinship interactions. Without evidence of the content distinctions recognized in a study population, these alternative distinctions between contents are ad hoc, raising an important analytical question: When is a uniplex relationship mistakenly treated as a multiplex relationship merely because a structural analyst defined various aspects of a single kind of relation as different contents? As important as a clear understanding of relation content is for describing social structure, very little is known about it. Research inferences are correspondingly equivocal.

With these points in mind, it is not surprising to find the most successful structural analyses where network data are defined most clearly across relations. Studying social differentiation by occupation, for example, Blau and Duncan (1967) can very clearly define the kinship tie from one occupation to another by counting the fathers in the first occupation whose sons work in the second. Everyone – from social scientist to data coder to survey respondent – can agree on when a father–son relationship exists and when it does not. Similarly, Burt (1983b, 1988) can very clearly define certain aspects of the social structure of American markets by counting the dollars of goods exchanged between sectors of the American economy as reported in Department of Commerce input–output tables. Similarly, Blau and Schwartz (1984) can very clearly define the marriage relation from one occupation to another by counting the husbands in the first occupation whose wives work in the second.

Beyond concrete measures of relations in the metric of bodies, dollars, or kinship, however, the clarity of interpersonal relations dissolves quickly, eroding the reliability of survey network data. For example, Laumann (1966) studies an interoccupation network of friendship relations corresponding to the above-cited Blau analyses of interoccupation kinship. For Laumann's analysis, the friendship relation from occupation A to B is defined by the number of close friends in occupation B cited by respondents in occupation A. With these network data, he describes the manner in which occupational

differences underlie patterns of differential socialization between people. But comparing number of friendships across cells of the inter-occupation network is much less reliable than comparing marriages or father–son ties. With varied social backgrounds and exposure to different kinds of interaction, different people can use the word "friendship" to refer to different qualities of interaction. Relevant to Laumann's study, for example, there is evidence to suggest that people of low socioeconomic status use the word "friend" to identify their frequent contacts, whereas people of high socioeconomic status use the word as a generic label for anyone they know (Burt, 1983a). Friendship is only one of many kinds of relations beyond kinship that interest the sociologist. Influence, information exchange, intimacy, economic exchange, helping, and so on are similarly difficult to define clearly for comparison across individuals.

Structural theory cannot yield reliable results when applied to network data that cannot be compared reliably across relationships. Without a clear understanding of how people in a study population make verbal distinctions about their relations with one another, in short, the power of structural theory cannot be brought to bear on substantive questions beyond those few areas, such as kinship, personal mobility, or dollars exchanged, in which relations can be measured concretely to be comparable across relationships.

This difficulty has not been felt by structural analysts as strongly as it should because of a misplaced confidence in face validity. When gathering network data, we typically presume that a single question wording applied to different respondents elicits a single kind of relation. If two respondents are asked to name their closest friends, we presume that the criteria one uses to define friends are comparable to the criteria that the other uses to define friends. If they are asked to name people with whom they most often discuss important matters, we presume that the important discussion relations named by one respondent are comparable to the important discussion relations named by the other respondent. Ignored is the likelihood that different respondents use the same word to refer to different kinds of relations. Wording consistency across relations is no guarantee of network data comparable across relations.

Fortunately, well-known network models of relation form have the potential to inform studies of relationship content, treating kinds of relations as linguistic elements in the language used by a study population to describe its social structure (Burt and Schøtt, 1985). This chapter is the first report with national probability sample data on kinds of relations that Americans distinguish in their relationships with important discussion partners. The purpose here is to highlight

content distinctions so that future network data can be more reliable, making possible more powerful tests of social structural theory.

The 1985 GSS network data

In a sense, the 1985 General Social Survey is a return to the tradition of social survey research established by Paul Lazarsfeld with various Columbia University colleagues through his voting studies (Lazarsfeld et al., 1944; Berelson et al., 1954), marketing studies (for example, Katz and Lazarsfeld, 1955), and the more detailed, subsequent studies by his colleagues and students (for example, Lipset et al., 1956; Coleman, 1958, 1961; Coleman et al., 1966; Rossi, 1966; Barton et al., 1973; see Barton, 1982, for historical review). In this tradition, respondent attitudes and behaviors are studied in the context of interpersonal environments, the social setting for respondent attitudes and behaviors.

Taking advantage of developments in network analysis, the 1985 GSS brought this tradition to the national sampling frame. The rich diversity of data obtained in the GSS on American attitudes and behaviors is enhanced in the 1985 survey with network data on the interpersonal environments of respondents. Each respondent was asked the following name generator: "From time to time, most people discuss important matters with other people. Looking back over the last six months, who are the people with whom you discussed matters important to you?" Name interpreter questions were then asked about the first five persons named.[1] A crude image of the form of the respondent's network is defined by the (up to) five important discussion partners named, their closeness to the respondent, and their closeness to one another. From these data one can build around each respondent sociogram as is seen illustrated to the left of Figure 14.1. This respondent named three especially close discussion partners and two less close. Two of the discussion partners are especially close to one another, three pairs of people named know one another but are not especially close, and the remaining six pairs of discussion partners are total strangers to one another. A variety of useful network density and range measures could be computed from no more than these formal data. Even better, the formal data were fleshed out in the GSS with name interpreters about the history and substance of relations with each discussion partner. This makes it possible to expand the formal sociogram to the left of Figure 14.1 into the substantively richer illustrative diagram you see to the right of the figure. With these added data, a variety of useful network composition measures can be computed to describe the proportion and position of

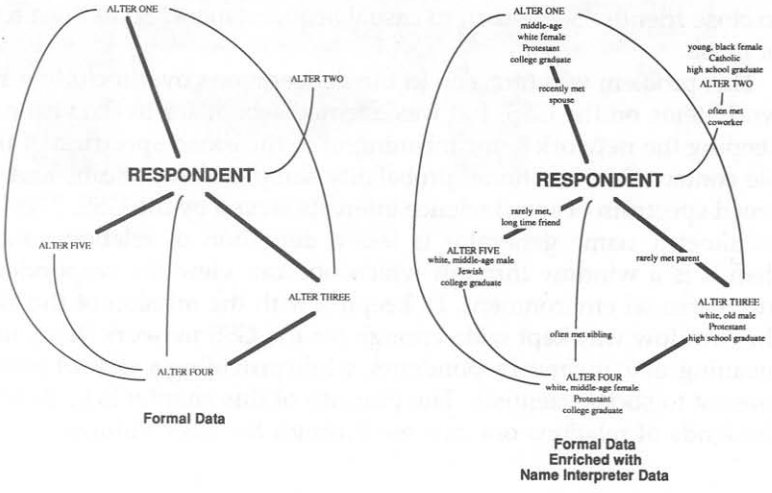


Figure 14.1. Illustrative sociogram from the GSS network items. Name generator: "From time to time, most people discuss important matters with other people. Looking back over the last six months, who are the people with whom you discussed matters important to you?" In the sociograms, a bold line indicates an especially close relationship, a narrow line indicates some relationship, and no line indicates total strangers.

specific kinds of contacts in the respondent's network (for example, kin, coworkers, males versus females, racial groups, age groups, and occupation groups).

In short, diverse network measures can be constructed from the GSS network data to represent the complexity of relationships defining each respondent's interpersonal environment. The social structure of this environment then can be studied systematically as a source of respondent opportunities and constraints and a correlate of respondent attitudes and behaviors, enhancing traditional survey research models by taking into account the social context for opinion and behavior.

However, there is an important caution to bear in mind when using the data. Diverse kinds of relations are mixed together in the data. The elicited relations are similarly "important discussion relations" in the sense that the sociometric name generator asked each respondent to name important discussion partners. This gives legitimacy to analyzing relations presumed to vary only in form – some especially close, others weak. But different matters are important to different people in different situations. The kinds of relationships in which important matters are discussed vary enormously within and between respondents. Some turn to coworkers. Some turn to kin. Some turn

to close friends. Some turn to casual acquaintances. Some turn to all of these.

This problem was foreseen in the deliberations over including network items on the GSS, but was deemed secondary to the virtues of keeping the network items meaningful to the broad spectrum of people contacted in a national probability sample of Americans and the broad spectrum of social science interests served by the GSS. The GSS sociometric name generator is less a definition of relation content than it is a window through which one can view the respondent's interpersonal environment. In keeping with the mission of the GSS, this window was kept wide enough for the GSS network items to be meaningful to diverse respondents, while providing a view of general interest to social scientists. The purpose of this chapter is to describe the kinds of relations one can see through the GSS window.

Kinds of relations in the typical network

The problem is to recover distinctions as they are understood by respondents in a study population, instead of presuming the validity of distinctions meaningful to the individual conducting the study. There are two strategies for solving this problem (Burt, Marsden, and Rossi, 1985), although the two complement one another's strengths and so are highly desirable as dual prongs in any systematic attack on the network content problem.

The first strategy is to use semantic differentials to elicit respondent judgments about the meanings of kinds of relationships created in a factorial design. There is some precedent in sociometric studies, but the impact on network analysis has been negligible. Lindzey and Byrne (1968:459) cite several references to early psychological studies. A more recent example is Wish's (1976) spatial analysis of kinds of relations evaluated on semantic differentials. In anthropology, Romney and D'Andrade (1964) analyze dimensions of kinship ties evaluated on semantic differentials. In sociology, Heise (1979) uses semantic differential ratings of identities and actions from student populations to describe expected actions within relationships, and Laumann (1966, Laumann and Senter, 1976) modifies Bogardus' (1959) social distance scales to measure the desirability of relations with people of specified attributes. But the real power of this strategy lies in applying factorial survey designs to disentangle the meaning of relationship components (as in Rossi and Nock, 1982; Rossi and Berk, 1985), and that work remains to be done.

The second strategy, the one used here, is to infer meaning from the manner in which contents are mixed together in observed rela-

tionships. It is assumed in this approach that people make distinctions between relation contents insofar as they can refer to different people and different relationships with the contents. Distinct relationships are necessary for cognitive distinctions between relation contents. For example, if you get advice only from your friends, it would be difficult to distinguish friendship relations from advice relations. In contrast, a distinction between advice and friendship would be very clear to someone who gets advice from professional consults and reserves friends for leisure activities. When a relation content is poorly understood, some sense of its meaning can be obtained by observing the manner in which it appears in relationships with contents that are understood. In the same way that the meaning of a word can be derived in part from the structure of words combined in sentences containing the unknown word, the meaning of a relation content can be derived in part from the structure of contents combined in the relationships that contain the unknown content. Network concepts, methodology, and empirical illustration for this analytical strategy are available elsewhere (Burt, 1983a; Burt and Schøtt, 1985).

Turning to the GSS network data, I have distinguished in Table 14.1 various kinds of relations elicited by the GSS name generator. Kinds of relations are distinguished by words indicating formal strength, kinship, nonkin roles, and attribute homophily. These are distinctions that might be made by someone using the GSS network data before any study of their meaning has been attempted. Formal strength is measured in terms of how long the respondent has known the discussion partner, how frequently he or she has personal contact with the discussion partner, how close he or she feels to the discussion partner, and the order in which the discussion partner's name was mentioned (indicating relationship strength, Burt, 1986). Five kinds of kin relations are distinguished. The nonkin roles distinguished coworkers, comembers of an organization, neighbors, friends, professional advisors, and a rarely used category of other roles. Homophily between respondent and discussion partner is defined by sex, race, education, age, and religion.

The results shown in Table 14.1 are sample estimates of the probability of specific kinds of relations being cited. The first column gives the probability across all relations, the second gives the probability across relations with relatives, and the third gives the probability across relations beyond the family. Because the GSS is a national probability sample, wording can be precise here. The .502 probability in row fifteen of column one, for example, is the average probability of a respondent naming a relative as an important discussion partner.

Table 14.1. *Probability of specific kinds of relations in the average discussion network*

Probability	Probability if kin	Probability if nonkin	Kind of relation
			Strength of Tie
.383	.331	.195	first alter mentioned
.157	.125	.132	third alter mentioned
.049	.042	.047	fifth alter mentioned
.149	.210	.065	especially close to respondent
.566	.440	.326	equally close to respondent
.194	.086	.243	less close to respondent
.118	.051	.087	total stranger to first-mentioned alter
.492	.448	.290	daily contact
.270	.188	.219	weekly contact
.107	.078	.086	monthly contact
.040	.018	.040	less than monthly contact
.102	.012	.144	recent acquaintance (less than 3 years)
.128	.034	.162	acquaintance (3 to 6 years)
.676	.683	.324	old acquaintance (more than 6 years)
			Kinship
.502	1.00	.000	some kind of kinship relation
.158	.237	.000	spouse (husband, wife, spouse surrogate)
.100	.155	.000	parent (mother or father)
.082	.124	.000	sibling (brother or sister)
.087	.111	.000	child (son or daughter)
.075	.110	.000	other family (e.g., grandparents, uncle, nephew, cousin, in-law)
			Other Roles
.148	.048	.187	coworker (work with or usually meet at work)
.155	.120	.118	comember of group (e.g., someone who attends your church, or whose children attend the same school as your children, or belongs to same club, classmate)

.083	.027	.100	neighbor (outside household living close by)
.621	.398	.556	friend (someone with whom you get together for informal social occasions such as lunch, dinner, or parties, or drinks, or movies, or visiting one another's home; this includes "boyfriend" or "girlfriend")
.139	.113	.101	professional advisor or consultant (a trained expert you turn to for advice, for example, a lawyer or clergyman)
.018	.005	.023	other role
			Attribute Homophily
.539	.342	.469	same sex
.434	.310	.337	male
.476	.425	.299	female
.856	.707	.587	same race (Asian, black, Hispanic, white)
.009	.005	.007	Asian
.074	.050	.055	black
.037	.032	.022	Hispanic
.782	.642	.547	white
.327	.247	.233	same education (less than high school, high school graduate, some college, associate, bachelor, graduate)
.334	.246	.248	more education (alter in higher category)
.246	.234	.151	less education (alter in lower category)
.403	.288	.343	same age (within five years)
.267	.212	.150	younger (more than five years)
.232	.228	.131	older (more than five years)
.679	.600	.367	same religion (Protestant, Catholic, Jewish, None)
.538	.445	.330	Protestant
.257	.206	.154	Catholic
.024	.018	.018	Jewish
.054	.041	.039	None

Note: Column one reports the mean probability of a respondent naming a discussion partner with the row attribute. The probabilities in columns two and three are conditional on whether a named discussion partner is kin or nonkin to the respondent. Probabilities are based on all 1,531 respondents answering the network items.

Some respondents never discuss important matters with relatives and others only discuss important matters with relatives, but, on average, 50.2 percent of the important dicussion partners named by a respondent are relatives.[2] Generalizing to the study population of all "English-speaking persons eighteen years of age or over, living in noninstitutional arrangements within the continental United States," there is about a fifty–fifty chance of the average American citing a relative when asked to name important discussion partners (.502 point estimate and .469 to .535 interval estimate at the .001 level of confidence).

Table 14.1 illustrates two points: First, the GSS discussion partners are typically drawn from family and friends close to respondents. Second, there are many exceptions to this aggregate tendency. The first column of the table shows what kinds of relations occur in the network; the second and third columns can be compared to see how kinship affects the likelihood of each kind appearing in the network.

These are clearly close relationships. Half of the discussion partners named by the average respondent are kin, 62 percent are friends, and most are either especially close (15 percent) or so close that the respondent could not distinguish being closer to one discussion partner relative to the others (57 percent). Not surprisingly, respondent and discussion partners tend to be homophilous on religion and race.

At the same time, there is heterogeneity. For each relative named, the average respondent names a discussion partner beyond his or her family. For every two friends named, the average respondent names a discussion partner he or she did not consider to be a friend. Fourteen percent of the average respondent's discussion partners are professional advisors, 15 percent are coworkers, and 16 percent are members of groups with which the respondent is affiliated. Two-thirds of the average respondent's discussion partners have a level of education different from the respondent's, 66 percent are more than five years older or younger, and about half are members of the opposite sex. Of course, kinship generates heterogeneity on some attributes at the same time that it generates homogeneity on others. The point illustrated is that the GSS discussion partners tend to be family and friends close to the respondents, but often are not.

Picking up this theme more systematically, the spatial map in Figure 14.2 illustrates the ways in which kinds of relations are combined in reaching important discussion partners. Thirty kinds of relations are distinguished in the figure. All are categories in Table 14.1. The spatial map is a nonmetric, multidimensional scaling of joint probabilities.[3] Two kinds of relations are close together in Figure 14.2 to the extent that they typically occur with the same discussion partners. Kinds of relations are far apart to the extent that they typically occur

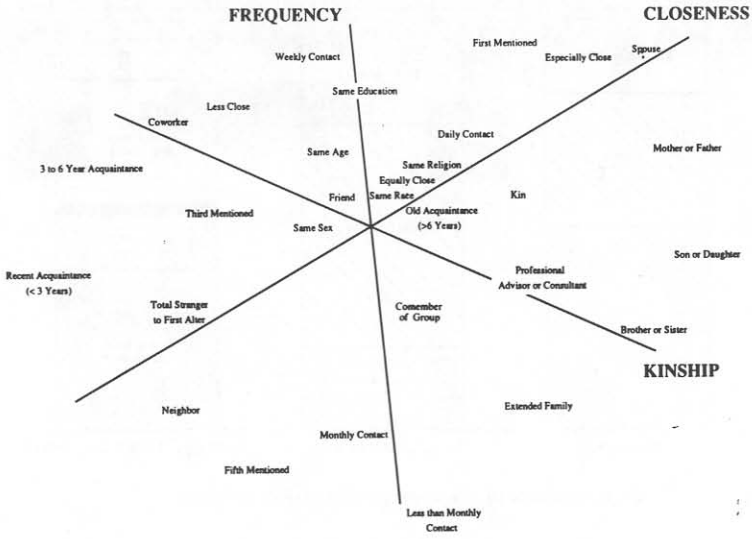


Figure 14.2. Tendencies for kinds of relations to be mixed together in contacts with important discussion partners (nonmetric scaling of joint probabilities across all 4,483 discussion partners)

with different discussion partners. For example, discussion relations with coworkers are typically among the weaker relationships cited. In the upper left of Figure 14.2 "Coworker" and "Less Close" are contents that typically reach the same discussion partners. Both contents are rarely found in discussion relations with relatives. Their lack of overlap appears in Figure 14.2 with kinship relations appearing in the lower right of the figure, at the opposite end of the space from coworker and less close discussion partners.

Three dimensions are marked in Figure 14.2, separating kinds of discussion relations distinguished by the average American. The three dimensions are merely heuristic contrasts in relation content for interpreting discussion relations. They are the result of a visual search through the spatial map for contrasting contents on opposite sides of the map.[4] Kinds of relations are distributed across the horizontal axis by their closeness and up the vertical axis by their frequency (see Marsden and Campbell, 1984, for a similar orthogonal distinction between closeness and frequency in earlier regional studies).

Frequency is the simplest dimension, varying from infrequent contacts at the bottom of the map of frequent contacts at the top. The infrequent contacts at the bottom of the map are discussion partners met once a month or less than monthly. Neighbors and extended

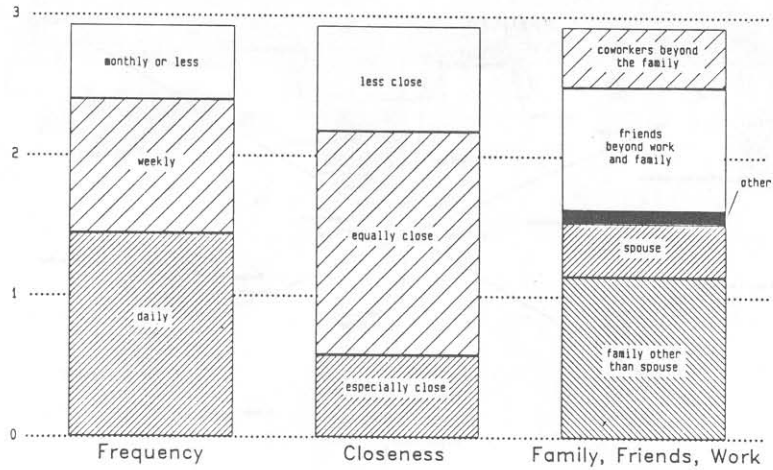


Figure 14.3. Kinds of relations in the average discussion network

family are the roles nearest in the map to infrequent contacts. The map is denser at the other extreme of frequent contacts. Frequent contacts are daily or weekly. These contacts tend to share socially significant attributes with the respondent (for example, age, education, and so on). Coworker, friend, and spouse are the roles nearest in the map to frequent contacts.

Closeness varies on two dimensions correlated with the horizontal axis of the map. Emotional closeness varies from spouse and especially close discussion partners in the northeast of the map, to equally close relations and friends in the center of the map, and on to neighbors in the southwest of the map. The other aspect of closeness, perhaps better described as obligation, varies from various kinds of kinship relations in the southeast of the map, to friends in the center of the map, and on to coworkers and less-close relationships in the northwest of the map. Note that spouses are not grouped with kinship relations. Spouses are often-met, especially close discussion partners, contrasted at the other extreme to neighbors. However, kin other than the spouse are close, infrequently met discussion partners contrasted at the other extreme to coworkers.

To summarize, the average American distinguishes important discussion partners by (1) contact frequency, (2) emotional closeness, and (3) obligation (decreasing from kinship, to friends, to coworkers). Focusing on these key kinds of relations, the bar chart in Figure 14.3 shows the relative frequency with which each occurs in the average

Table 14.2. *Aggregate coincidence matrix among kinds of relations spanning the space in Figure 14.2*

	1	2	3	4	5	6	7	8	Dyad N
Frequency									
1 Daily	.492	.000	.222	.202	.094	.320	.692	.260	(2207)
2 Monthly or Less	.000	.181	.160	.373	.054	.463	.682	.086	(812)
Closeness									
3 Especially Close	.556	.148	.196	.000	.055	.403	.700	.141	(880)
4 Less Close	.382	.260	.000	.260	.105	.264	.757	.298	(1164)
5 Neighbor	.491	.104	.114	.289	.094	.244	.874	.168	(422)
Family, Friends, and Work									
6 Kin	.404	.215	.203	.176	.059	.390	.543	.047	(1749)
7 Friend	.483	.175	.195	.279	.117	.300	.706	.203	(3163)
8 Coworker	.703	.086	.152	.425	.087	.100	.788	.182	(816)

Note: Diagonal elements report the probability of a kind of relation reaching a discussion partner and off-diagonal elements report the probability of the column kind of relation reaching one of the discussion partners reached by the row kind of relation. Kin discussion partners do not include the spouse. Results are based on all 4,483 cited discussion partners and so are not properly weighted for statistical interpretation.

discussion network. The coincidence matrix in Table 14.2 gives the conditional probabilities of each kind of relation occurring with one another in reaching the typical discussion partner (Burt and Schøtt, 1985).

The average respondent named three discussion partners. In terms of contact frequency, the average network contains one and a half daily contacts, one weekly contact, and a half contact met monthly or less.

In terms of emotional closeness, about half of the respondents made no distinctions between especially close and less-close discussion partners. The respondents who did make such a distinction split their discussion partners almost evenly on average between especially close and less-close relationships.

In terms of family, friends, and work, half the average network is family. Of these, 25 percent is spouse (who was almost always named as an important discussion partner if the respondent was married), 22 percent are the respondent's parents, 19 percent are the respondent's children, 18 percent are the respondent's brothers or sisters, and 16 percent are other kinds of kinship relations combined. Coworkers be-

yond the family comprise a small proportion of the average network (slightly more likely to be named than a spouse).[5] Table 14.2 shows that half of the friends named as important discussion partners come from the respondent's family or work. Of the 3,163 discussion partners named as friends, 30 percent are relatives (other than the spouse) and 20 percent are coworkers. Friends beyond work and the family are largely just friends and no more. Of 1,343 friends cited beyond family and work, 12 percent are professional advisors (for example, accountants, brokers, doctors, ministers), 17 percent are comembers (beyond advisors) of an organization with which the respondent is affiliated, 11 percent are neighbors (beyond advisors and comembers), 1 percent are something else (the "other" category in the GSS network items), and the remaining 59 percent are none of the above. In other words, 59 percent of the friends named beyond family and work are "just friends" in that they have no other role relation with the respondent (at least no other of the basic role relations in the GSS network items). The very few discussion partners named beyond family, friends, and work (the black bar in Figure 14.3) are most often professional advisors (55 percent advisors, 12 percent comembers beyond advisors, 20 percent neighbors who were neither advisors nor comembers, and 13 percent something else).

Kinds of respondents

At this point, it is clear that important discussion relations are sorted into kinds according to their contact frequency, emotional closeness, and obligation (decreasing from kin to friends to coworkers). But Americans differ from one another in many ways. Before using these results to guide research, it is reasonable to question the extent to which kinds of relations distinguished by the average American are similarly distinguished by all Americans.

Drawing on research linking network structure to background variables, I have defined sixty-four kinds of respondents by familiar attribute categories and categories specially constructed for this analysis. The kinds span respondent differences in sex, education, ethnicity, geographic mobility, household size, income, marital status, occupation, region, and urbanization.

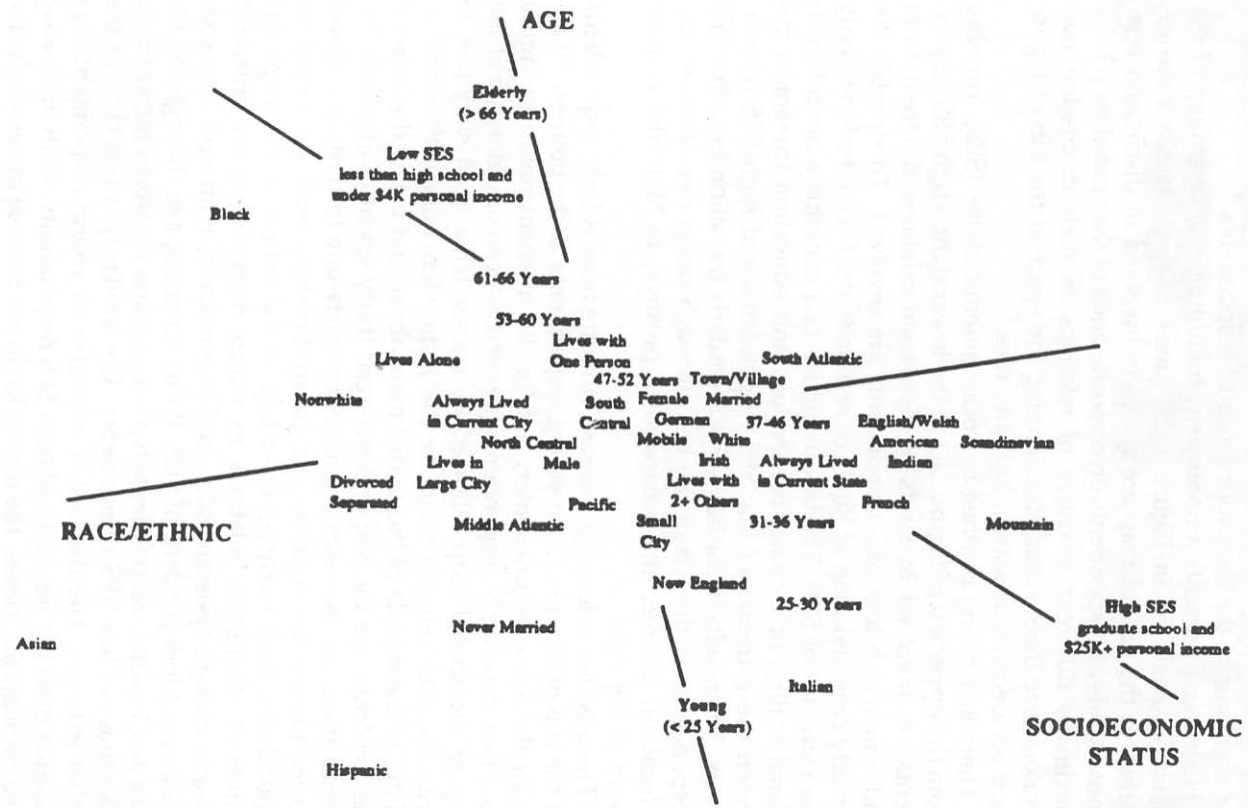
To describe the mixture of kinds of discussion relations around each kind of respondent, I have computed for each a coincidence matrix like Table 14.2, but extended to include all thirty kinds of relations listed in the spatial map in Figure 14.2. To the extent that two kinds of respondents make similar distinctions between kinds of discussion relations, their respective coincident matrices will be similar. To mea-

sure the discussion network differences between respondents, I have computed the Euclidean distance between the coincidence matrices for each pair of the sixty-four kinds of respondents.[6]

Figure 14.4 presents a nonmetric, multidimensional scaling of the distances analyzed in Figure 14.2. Kinds of respondents close together in the spatial map are similarly involved in discussion relations. Kinds of respondents on opposite ends of the spatial map have maximally different mixtures of relations in their discussion networks. I see three contrasts spanning the space at the top of Figure 14.4: socioeconomic status, age, and race.[7]

There is a strong contrast by socioeconomic status (SES), running from the upper left of Figure 14.4 to the lower right. High SES respondents are involved in kinds of discussion relations different from those in which low SES respondents are involved. To simplify the already crowded map of kinds of respondents, I have included only the extremes of SES. The box in Figure 14.4 contains a multidimensional scaling of income, occupation, and education categories between the extremes of low SES respondents and high SES respondents. The results in the box show an orderly transition from low SES respondents at the left of the box, through categories of increasing education, income, and occupational prestige, to high SES respondents at the right.

There is also a clear age contrast, running from elderly respondents at the top of Figure 14.4 to young respondents at the bottom. I'll explain the age categories later, but for the moment notice in Figure 14.4 that the elderly respondents (age sixty-seven or older) are at the top of the spatial map followed by respondents aged sixty-one to sixty-six, and beneath them are the respondents aged fifty-three to sixty. In the middle of the spatial map, above and below the married respondents, are the respondents aged thirty-seven to fifty-two. Beneath them are the respondents aged thirty-one to thirty-six, down to the twenty-five to thirty age group, finishing with the young respondents, aged twenty-four or less, at the bottom of the map. The kinds of discussion relations in which respondents are involved clearly change systematically, and dramatically, with age. This contrast is not independent of SES. With increasing age through the fifties and beyond, respondents have discussion networks increasingly like those of low SES respondents. The similarity is less clear at the other extreme. The discussion networks of young respondents are distinct from the networks of high SES respondents. With increasing age through the forties, the networks do not become increasingly like low SES respondents as much as they come to resemble the average, white, married respondent to the right of the map in Figure 14.4.


AGE
Elderly
(> 66 Years)
Low SES
less than high school and
under $4K personal income
Black
61-66 Years
53-60 Years
Lives with
One Person
Lives Alone
South Atlantic
47-52 Years
Town/Village
Female
Married
Nonwhite
Always Lived
in Current City
South
Central
German
37-46 Years
English/Welsh
Mobile
White
American
Scandinavian
North Central
Lives in
Large City
Male
Irish
Always Lived
in Current State
Indian
Divorced
Separated
Lives with
2+ Others
French
Pacific
RACE/ETHNIC
Middle Atlantic
Small
City
31-36 Years
Mountain
New England
25-30 Years
High SES
graduate school and
$25K+ personal income
Never Married
Asian
Italian
Young
(< 25 Years)
SOCIOECONOMIC
STATUS
Hispanic

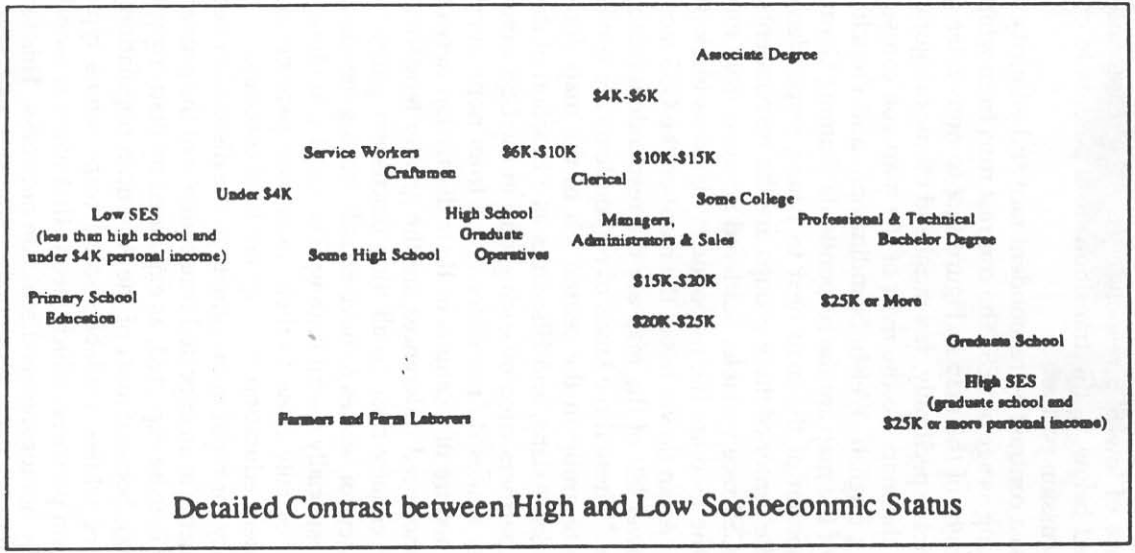


Figure 14.4. Kinds of Americans distinguished by their relations with important discussion partners (age, sex, education, ethnicity, geographic mobility, household size, income, marital status, occupation, region, urban-rural)

The network changes from youth to middle age that seem to reflect maturing but major changes during the forties move respondents to the left of the map in Figure 14.4, with networks becoming increasingly like those of low SES respondents. A big component in this shift, described below, is the transition from parents to children as important discussion partners.

There is also a contrast by respondent race and ethnicity, although it is not as strong as age or SES. The contrast runs from white respondents at the right of the map in Figure 14.4 to nonwhites at the left of the map. More specifically, ten racial and ethnic categories are distinguished in the map. To the right of the map you can see respondents claiming English, Welsh, Scandinavian, and French ancestry. In the center of the map are the respondents claiming German, Irish, and (at the bottom of the map next to young respondents) Italian ancestry. In the center of these groups are the respondents listed as white on the GSS race variable. Scattered far apart from one another at the left of the map are the respondents listed as black (upper left of the map) or Asian (lower left of the map) on the GSS race variable. Also in the lower left of the map are the respondents claiming Hispanic ancestry.[8] These three kinds of respondents are combined in a single nonwhite group in the central left of the map (located with respect to blacks, Asians, and Hispanics as a function of the number of discussion partners cited by each group in the GSS sample).

On average, whites do not differ much from nonwhites with respect to the mixture of relations in their discussion networks.[9] The two most pronounced differences are the greater tendency for nonwhites to feel equally close to all their discussion partners and the greater tendency for whites to have racially homogeneous networks. Neither is an especially useful finding. The greater tendency for nonwhites to feel equally close to their discussion partners disappears when respondent education and age are held constant.

The tendency for racial homogeneity in the discussion networks of white respondents is an expected consequence of the primarily white population. It is to be expected, as explained by Blau (1977, Blau and Schwartz, 1984), because most of the American population is white. There are more whites available, so all respondents typically cite white discussion partners, which means that white respondents end up with racially homogeneous discussion networks. This tendency is not affected by controls for respondent education, age, network size, and density. As expected from Blau's arguments, nonwhite respondents are more likely to include other nonwhites among their important discussion partners (which is the reason that the black, Asian,

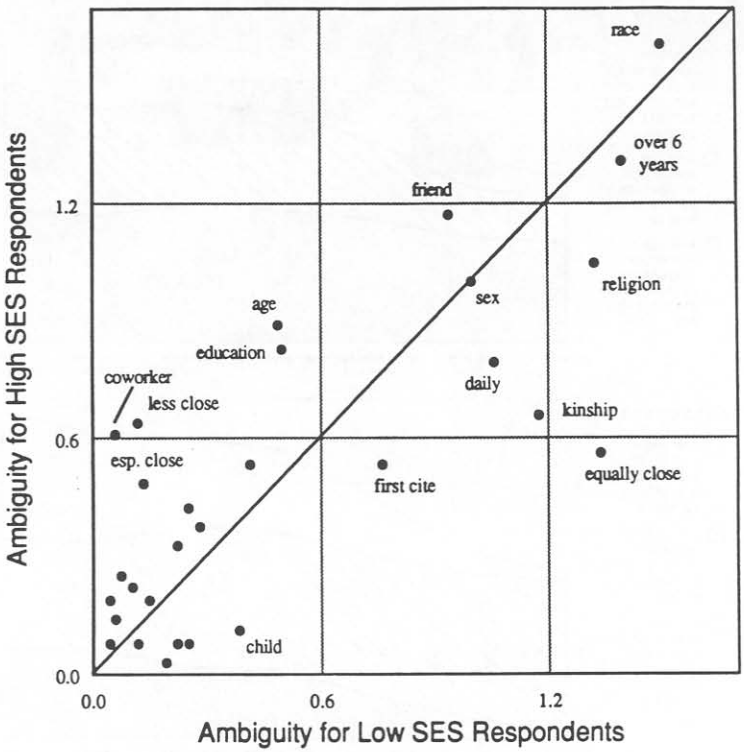


Figure 14.5. Relation ambiguity by socioeconomic status

and Hispanic respondents are so distant from one another and other kinds of respondents in Figure 14.4).

Variation with socioeconomic status

The final task for this analysis is to describe how socioeconomic and age differences between Americans are associated with distinctions between kinds of discussion relations.

To highlight the differences responsible for the polar separation of high and low SES respondents in Figure 14.4, I have studied the relative ambiguity of contents in their respective discussion networks and graphed the frequency with which they use each of the three dimensions of important discussion relations. The results are summarized in Figures 14.5 and 14.6. Figure 14.5 is an ambiguity graph contrasting high and low SES respondents. The frequency, closeness, and

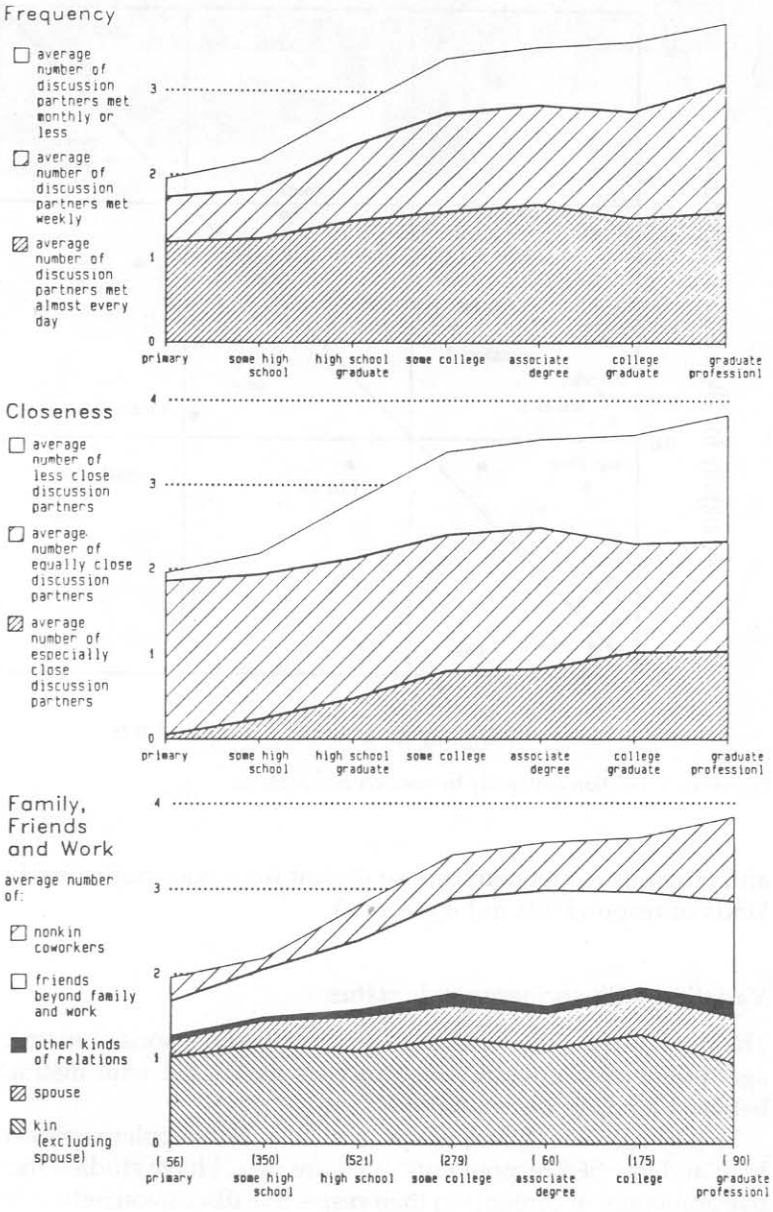


Figure 14.6. Kinds of relations by respondent education

obligation dimensions of important discussion relations are charted in Figure 14.6 across levels of education as an indicator of respondent socioeconomic status.

Drawn from the method of studying relation meaning through the coincidence of contents (Burt and Schøtt, 1985), ambiguity measures the extent to which a relation content occurs with many other contents so that it has little unique meaning, and so is ambiguous.[10] The thirty kinds of relations in Figure 14.2 are plotted in Figure 14.5 – on the horizontal axis by their ambiguity in the discussion networks of low SES respondents (less than a high school education and a personal income of $4,000 or less per year), and on the vertical axis by their ambiguity for high SES respondents (graduate school education and a personal income of $25,000 or more). Ambiguity is measured here relative to sex homophily as a numeraire. A .5 indicates a kind of relation that is half as ambiguous as an important discussion relation with someone of the same sex. I am not proposing to study relation ambiguity relative to intragender relations. Sex homophily is the numeraire because it is not much different in relative ambiguity for the kinds of respondents to be contrasted.

To explain the great distance between high and low SES in Figure 14.4, look in Figure 14.5 for kinds of relations far from the diagonal line in the figure. Kinds of relations close to the diagonal are similarly ambiguous for both high and low SES respondents. For example, race homophily is the most ambiguous of the thirty kinds of relations for high and low SES respondents. Respondents and discussion partners are so often both white that the fact of two people being white adds little meaning to their relationship. In contrast, kinship (well below the diagonal in Figure 14.5) is more ambiguous for low SES respondents because it is so often a part of their important discussion relations and much less pervasive in the networks of high SES respondents. At the other extreme, coworker (above the diagonal) is a more ambiguous relation for high SES respondents because they are more likely to draw on coworkers for all kinds of important discussion relations.

There is a clear size difference. This is apparent in Figure 14.5 from the greater ambiguity of relations with the first person cited by low SES respondents. With fewer discussion partners cited, there is less unique meaning in the relation with each person. More specifically, Figure 14.6 shows that the size effect is steepest through entry into college. The three graphs in Figure 14.6 show an increasing number of important discussion partners with increasing respondent education. The increase is from an average of two important discussion partners cited by respondents with a primary school education, to an

average of three and a half cited by respondents with some college, and on to just under four cited by respondents with graduate or professional school educations.

The size effect is uneven across kinds of relations. There is a slight increase from left to right in the dark stripe area at the top of Figure 14.6, but you can see that respondents at each level of education are more similar than different in the number of daily contacts they cite as important discussion partners. All tend to name slightly more than one. It is contact with less often-met discussion partners that increases with respondent education. The larger size of high SES networks is created by high SES respondents expanding their networks to include discussion partners that they meet weekly, monthly, or less often.

Since a larger proportion of low SES discussion partners are daily contacts, however, daily contact is for them a more ambiguous relationship than it is for high SES respondents, as indicated in Figure 14.5 by daily contact located below the diagonal. This greater ambiguity is increased by the kinds of discussion partners with whom low SES respondents have daily contact.

First, it is increased by the tendency for low SES respondents to combine frequent contact and emotional closeness. The GSS network items ask whether respondents feel equally close to their cited discussion partners, or closer to some than to others. High and low SES respondents respond differently. In Figure 14.5 "equally close" relations with discussion partners are much more widely cited, and accordingly ambiguous, for low SES respondents. The second graph in Figure 14.6 shows increasingly variable closeness with respondent education. Almost all respondents with less than a high school education, 95 percent, claim that they are equally close to their discussion partners. This drops to 38 percent of the respondents with graduate or professional school degrees. In other words, the large networks of higher SES respondents include more discussion partners with whom they feel less close and have less frequent contact. This tendency is even stronger than it would seem from the middle graph in Figure 14.6 because the dark stripe area of especially close relations is disproportionately spouses.[11]

Second, contact ambiguity is increased by the tendency for low SES respondents to mix frequent contact with kinship. There is no significant difference across levels of education in the tendency for respondents to cite relatives beyond their spouse as important discussion partners. All cite slightly more than one. However, more-educated respondents are more likely to expand their networks to include nonkin coworkers and friends beyond family and work. This

tendency is pronounced in Figure 14.6 for respondents who have had any education past high school. The tendency is apparent in Figure 14.5 from the greater ambiguity of relations with coworkers and friends in the networks of high SES respondents. The greater presence of age and education homophily in high SES networks, also evident in Figure 14.5, further indicates discussion relations formed by choice rather than kinship. Since a smaller proportion of high SES discussion partners are relatives, kinship is for them, as indicated in Figure 14.5, a less ambiguous relationship than it is for low SES respondents.

More specifically, respondents with less than a high school education are distinguished in Table 14.3 from those completing high school or some college, and those with a Bachelor's degree or more. The two fractions in each cell are the conditional probabilities of a discussion partner being cited as a daily contact or a close contact, given the presence of the row relation (and the number in parentheses is the row percent of all contacts cited by column respondents). Close contacts here are either equally close or especially close relationships. For example, a nonkin coworker cited by a respondent with less than a high school education has a .82 probability of being a daily contact and a .77 probability of being a close contact (and nonkin coworkers are 7 percent of all contacts cited by low education respondents).

The high probabilities in the first two columns of Table 14.3 relative to the lower probabilities in the last columns show that low-education respondents are more likely to cite close contacts met daily, but notice who is cited.

Nonkin coworkers, when cited by low-education respondents, are very likely to be cited as close, daily contacts. The .82 conditional probability is so high that daily contact is almost a prerequisite for coworkers being important discussion partners for a low-education respondent. However, nonkin coworkers are cited so rarely by low-education respondents that their tendency to be close, daily contacts contributes little ambiguity to the meaning of closeness or frequent contact.

Ambiguity is created by the mixture with kinship. Half of the relatives other than spouses cited by low-education respondents are daily contacts (.52), almost all are close contacts (.93), and these relatives are half of all important discussion partners cited by low education respondents (53 percent). These numbers increase to .61, .94, and 66 percent respectively if spouses are included as relatives. In other words, kinship, closeness, and daily contact are familiar and closely woven together in these networks.

Table 14.3. *Conditional probabilities of discussion partners being cited as daily and close contacts*

	RESPONDENT EDUCATION								
	LESS THAN HIGH SCHOOL			HIGH SCHOOL TO COLLEGE			BACHELOR DEGREE OR HIGHER		
	daily	close		daily	close		daily	close	
Relatives (excluding spouse)	.52	.93	(53%)	.40	.80	(37%)	.26	.75	(32%)
Spouse	.99	.97	(13%)	.98	.98	(13%)	.99	.96	(13%)
Coworkers (nonkin)	.82	.77	(7%)	.70	.56	(15%)	.60	.36	(21%)
Friends (beyond family and work)	.44	.80	(25%)	.34	.66	(31%)	.25	.58	(31%)
Other Kinds of Relations	.25	.94	(2%)	.21	.53	(3%)	.06	.32	(3%)
All Discussion Partners	.57	.89	(100%)	.50	.73	(99%)	.41	.63	(100%)

Note: Results are based on all 4,483 cited discussion partners. Each probability is the number of discussion relations with the column content (daily or close contact) and row content (kin, spouse, coworker, friend, other) divided by the number of relations with the row content. For example, respondents with less than a high school education cited 62 nonkin coworkers, of whom 51 were daily contacts, for a conditional probability of .82 in the third row, first column of the table. The number in parentheses is the row percent of all contacts cited by column respondents. For example, respondents with less than a high school education cited 879 important discussion partners, of whom 463 were relatives other than the spouse which is the 53 percent in the first row, third column of the table.

Different relations form the discussion networks of college-educated respondents. As with low-education respondents, spouses tend to be close, daily contacts if they are cited. However, relatives are half as likely to be cited as daily contacts, slightly less likely to be cited as close contacts, and much less likely to be cited as important discussion partners. In comparison with low-education respondents, important daily contacts are more likely outside the home. Half of the daily contacts cited by college-educated respondents are nonkin coworkers (30 percent) or friends beyond their family and work (19 percent), and such people provide about half of their important discussion partners (52 percent). These percentages increase to 43 percent, 27 percent, and 59 percent respectively if spouses are excluded (as ubiquitous daily contacts). Closeness and frequency are distin-

guished beyond the home. Nonkin coworkers tend to be frequent contacts, whereas friends beyond family and work tend to be close contacts. In other words, daily contact for college-educated respondents is less likely to be encrusted with kinship meanings, and is much more likely to derive meaning from work and friendship.

In sum, distinctions between kinds of discussion relations increase with socioeconomic status. Closeness, frequency, and kinship are less distinguishable and more ambiguous in the networks of low SES respondents because all three tend to occur together. This makes it difficult to give any one a unique meaning, so the three kinds of relations blend into one another – frequent contact generating some of the closeness and obligation expected of kinship, and kinship expecting emotionally close, frequent contact. At the other extreme, high SES respondents draw from their families about the same number of important discussion partners that low SES respondents draw. But they go on to include among their important discussion partners frequently met, nonkin coworkers, and close friends beyond their families and jobs. The result is that closeness and frequent contact for high SES respondents are less encrusted with kinship meanings, and are much more likely to derive meaning from qualities of age, education, and occupation shared with discussion partners.

Variation with age

A first look at age differences suggests that age is little more than a reverse image of socioeconomic status. This is true of aggregate contrasts between elderly and young respondents, but there are significant age-specific differences overlooked between the extremes of age. Network distinctions between Americans are much less continuous over age than they are over socioeconomic differences.

For the aggregate contrast between young and elderly respondents, Figure 14.7 shows many similar results by age that Figure 14.5 revealed in the contrast between respondents at polar opposites of socioeconomic status. The thirty kinds of relations are plotted in Figure 14.7 on the horizontal axis by ambiguity in the networks of young respondents (age eighteen through twenty-four) and on the vertical axis by ambiguity for elderly respondents (age sixty-seven and up). I will explain the age categories below. Comparing Figures 14.5 and 14.7, the smaller network of an elderly respondent is evident in Figure 14.7 from the greater ambiguity of relations with the first-cited discussion partner. The lack of distinctions by elderly respondents between especially close and less close discussion partners is evident from the greater ambiguity of equally close relations for elderly re-

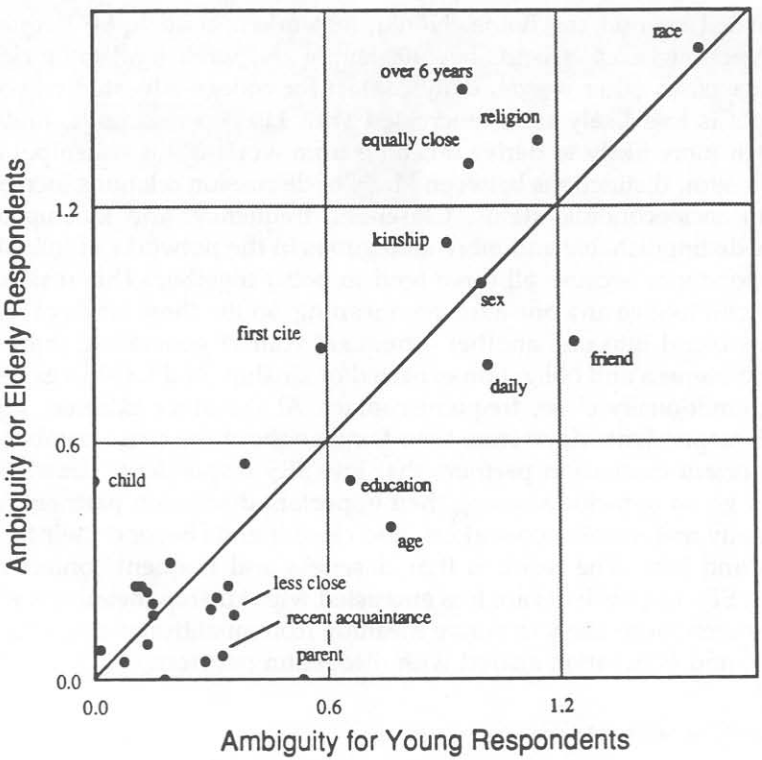


Figure 14.7. Relation ambiguity by age

spondents. The tendency for elderly respondents to build their networks around relatives is evident from the greater ambiguity of kinship relations for them – with the obvious age-connected exception that parents are more prevalent in the networks of young respondents and children more prevalent in the networks of the elderly.

The aggregate contrast is fleshed out across all ages in Figure 14.8. The size effect with age is almost the exact opposite of the effect observed with socioeconomic status. Young respondents cite an average of four important discussion partners, and elderly respondents cite an average of two.

Moving to contact frequency, age-specific differences begin to appear. In contrast to socioeconomic status, where respondents at all levels of education tend to cite the same number of daily contacts, there is a strong decrease with age. The number of important discussion partners met daily is greatest in the early twenties, stable through the thirties, and begins a sharp decline from the forties

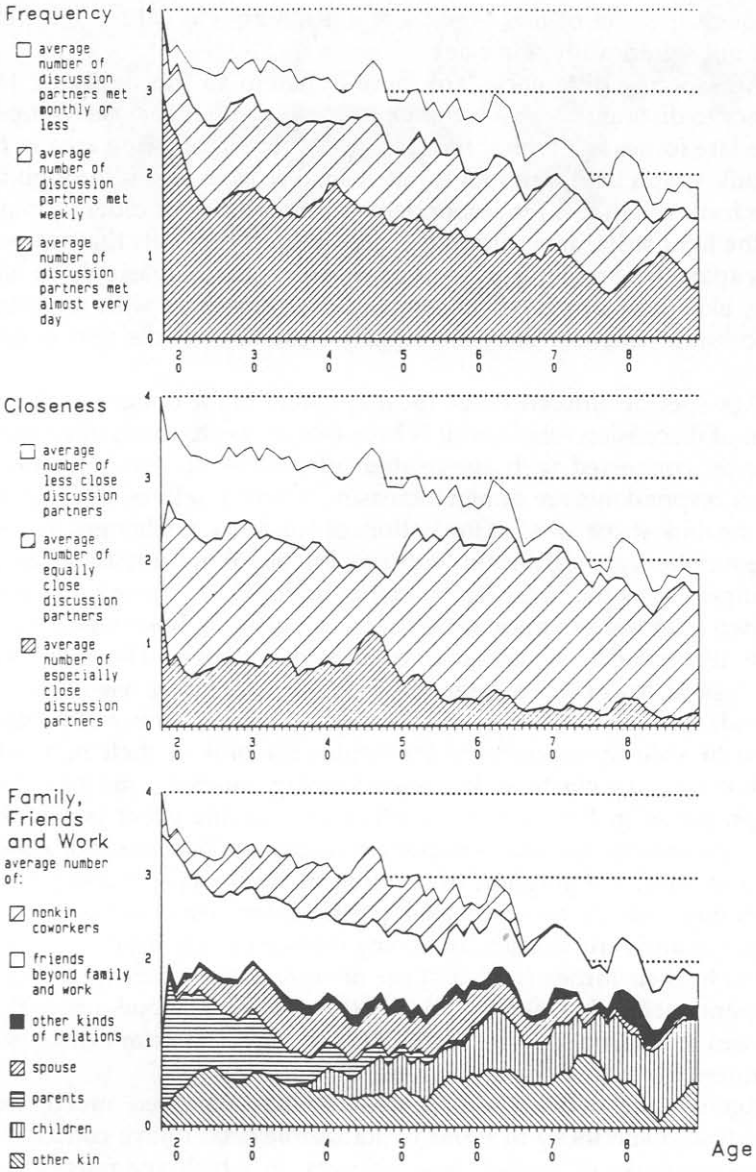


Figure 14.8. Kinds of relations by respondent age

through the end of life. Weekly and less frequent contacts decline, but not significantly, after age forty.

Age-specific differences are more apparent in the declining tendency to distinguish between especially close and less-close relations. The late forties is a critical time. Note that the light stripe area in the middle graph in Figure 14.8 is much smaller from youth through the late forties than it is for respondents in their fifties or older. A pinch in the light stripe area during the late forties clearly sets the two periods apart. Respondents over fifty are more, and increasingly so with age, likely to make no distinctions in their closeness with important discussion partners. They are equally close to their discussion partners.

Age-specific differences are most apparent in the obligation dimension of discussion relations. It is here that access to kinds of relations is most connected with age-related roles. Overall, the networks of older respondents are drawn increasingly from relatives, as indicated by the dark stripe areas at the bottom of Figure 14.8. Changes in absolute numbers are significant with age, but slight in comparison to the changes in proportions. Respondents under thirty name an average of two relatives as important discussion partners. Respondents over sixty-five name an average of one and a half relatives. However, with the loss of coworkers at retirement and the declining use of nonkin friends as discussion partners, the slightly fewer number of relatives cited by elderly respondents constitutes the bulk of their networks. This creates the cluster of kin-related ambiguous relations for elderly respondents in Figure 14.7. Another age-specific event is the shift from parents to children as important discussion partners. For Americans in 1985, the graph at the bottom of Figure 14.8 shows parents declining quickly as discussion partners for respondents in their twenties and early thirties, and being replaced by children for respondents in their forties (with a silver of contact with parents for some respondents in their fifties). Also in this period, respondents in their thirties and forties are the most likely to draw important discussion partners from their coworkers.

Age-specific network differences can be expressed much more clearly and succinctly in terms of status/role-sets. I have constructed three networks of contact between ages, in which age ranges from one to the oldest cited discussion partner, age ninety-three. Each network is a (93,93) matrix where cell (A,B) is the tendency for respondents of age A to cite respondents of age B[12]. The first network is kinship. The second is marriage. The third is all-important discussion relations beyond the family. By studying the structurally equivalence of years across these three networks, I can define statuses in the age

Table 14.4. *Age statuses and discussion relations*

BIRTH DATES	AGE IN 1985	AGE STATUS	CHARACTERISTIC IMPORTANT DISCUSSION RELATIONS
after 1966	under 19	**I Children**	not interviewed for the GSS
1961–1966	19–24	**II College**	large networks; frequent contact with parents, and age homophilous close and casual friends
1955–1960	25–30	**III Young Adults**	fewer daily contacts; continuing age homophilous friends; spouses and coworkers enter
1949–1954	31–36	**IV Twilight Youth**	parents decline; last period of concentrated age homophilous relations (other than spouse) until old age
1939–1948	37–46	**V Middle-Age**	daily contact begins continuing steep decline; children a concentrated focus of relations; children begin to replace parents and siblings; coworkers prominent; minimum age homophily in relations with relatives, spouse, and contacts beyond family
1933–1938	47–52	**VI Older Adults**	continue changes begun in middle-age; transition to less differentiation between especially close and less close relations
1922–1932	53–60	**VII Senior Adults**	parents disappear, coworkers decline
1919–1922	61–66	**VIII Retiring Adults**	coworkers disappear; concentrated age homophilous relations reappear with relatives and contacts beyond the family
before 1919	over 66	**IX Elderly**	small networks; declining friends beyond family; high proportion kin; equally close to all important discussion partners

stratification of Americans. Two years are structurally equivalent to the extent that respondents in those years are (1) equally likely to cite people of every other age as relatives, spouses, and discussion partners beyond the family, and (2) equally likely to be cited as relatives, spouses, and nonkin discussion partners by people of every other age. An age status is then a set of contiguous, structurally equivalent years. Age statuses offer a promising method for operationalizing boundaries around cohorts and life-cycle stages, but that is a topic beyond the scope of this analysis.[13]

The results of the network analysis are summarized in Table 14.4 and Figures 14.9 and 14.10. Nine age statuses are distinguished and

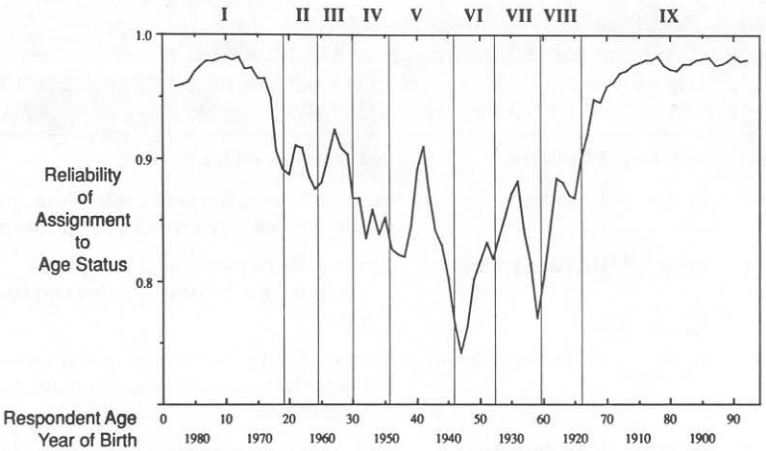


Figure 14.9. Reliability of assignments to age statuses as an indicator of differences between statuses (three-year moving averages are presented)

numbered by Roman numerals.[14] Figure 14.9 is a plot of the reliability with which each year has been assigned to an age status. The results indicate the adequacy of the judgments made about combining years as structurally equivalent. The reliabilities also provide a quick picture of the severity of network differences between age statuses.[15] Figure

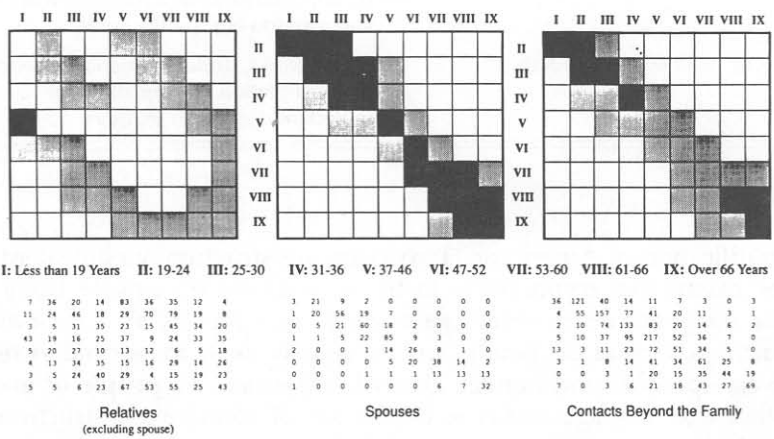


Figure 14.10. Adult discussion relations between statuses in the age stratification of Americans (NOTE – Respondents are in rows citing columns as important discussion partners. Citation frequencies are given in the matrices. Shaded areas in the grids indicate frequencies that are 1.25 to 4 times their magnitude expected from the marginals, and dark areas indicate frequencies over 4 times their expected magnitudes.)

14.10 summarizes contact between age statuses within each of the three networks. The exact frequency of contact is reported in the matrices.[16] For example, the 217 in row four, column five of the third matrix indicates that the respondents who were thirty-one to thirty-six years old in 1985 cited beyond their families 217 important discussion partners who were also thirty-one to thirty-six years old that year. The dark areas in the grids show where contact is greater than expected by random chance in a loglinear model of the contact frequencies; black areas indicate especially concentrated contact.

I note three points in these results. First, the average reliability of status assignments is high. The mean is .91 across the ninety-three years.

Second, reliability is weakest where social activity is most complex. The highest reliabilities occur among children and the elderly, mostly years of isolation in the GSS data. The most complex mixture of relations occurs in the networks of respondents in their forties and fifties. This is evident in Figure 14.8 from the number of different kinds of relations cited during these years, and it is evident from the relatively low reliabilities observed in the middle of Figure 14.9.

Third, there are two especially severe transitions between age statuses. The most severe occurs for Americans in their late forties, born at the beginning of World War II, and in 1985 in transition between statuses V and VI. The sharp drop in reliability during the late forties in Figure 14.9 means that it is difficult to draw a clear boundary in continuous time between the statuses. The networks of respondents age forty-six and forty-seven are different from one another at the same time that they are different from networks observed in the preceding and subsequent age statuses. In Figure 14.8 notice that three major transitions occur between age statuses V and VI. Children begin, and largely finish, replacing parents as important discussion partners. The shift occurs from making extensive distinctions between especially close and less-close discussion partners to feeling equally close to all discussion partners. The sharp decline in daily contact with important discussion partners begins, to continue thereafter. In Figure 14.10 status V is the only status in the kinship network with relations concentrated in a single other status – the children status. In earlier years kinship contacts are with parents and siblings. In later years kinship contacts drift to the younger age statuses of the respondents' children. Contact with relatives of the respondents's own age do not become significant again until the final two statuses, the period immediately before and following retirement. For respondents younger and older than age forty to fifty, spouses are concentrated in the age statuses surrounding the respondent. In earlier and

later years, important discussion partners beyond the family show the greatest age homophily with respondents. It is during their forties that children are a new and concentrated source of important discussion partners, spouses come from the most varied ages, and contacts beyond the family come from the most varied ages. In 1985, in short, respondents in their late forties were undergoing the most profound network changes observed on average anywhere in the age stratification of Americans.

The next most severe transition, judging from the other sharp drop in Figure 14.9, happens around age sixty, in the transition from status VII to status VIII, experienced in 1985 by Americans born in the mid-1920s. At the bottom of Figure 14.8 it can be seen that status VIII, ages sixty to sixty-six, is the period in which coworkers disappear. The first grid in Figure 14.10 shows that this is the period in which contact with relatives their own age is again significant for respondents. The third grid shows that this is also the period in which strong age homophily is again apparent in respondent contacts beyond the family.

Summary

I began by explaining how the typically ad hoc distinctions between kinds of relations in network analysis pose crippling limits to social structural research. Speaking to this problem, I used the 1985 General Social Survey network data to describe kinds of relations in American discussion networks to guide distinctions made in future network studies with a national sampling frame. I described kinds of relations distinguished on average and kinds of Americans who make different use of these distinctions.

The GSS discussion partners tend to be family and friends close to respondents, but there are frequent deviations from this aggregate tendency. Distinctions between partners on average show three criteria: (1) contact frequency, (2) emotional closeness, and (3) obligation (decreasing from kinship, to friends, to coworkers). The clarity of these distinctions varies most informatively with respondent socioeconomic status and age.

Important discussion partners tend to be people met frequently. Half of the cited contacts are met daily, another third weekly. The remaining one in five partners is met once a month or less. With increasing education, respondents are more likely to expand beyond their daily contacts to include people that they meet less frequently; however, respondents at all levels of education average one important discussion partner that they typically meet daily. With age, just

the opposite happens. In particular, daily contact with important discussion partners shows a consistent decline from young, to middle age, to elderly respondents.

Respondents rely on emotionally close relations for important discussion partners (or being such a partner generates closeness). The discussion partners are either especially close to the respondent (15 percent), or so close that the respondent cannot distinguish being closer to one partner relative to others (57 percent). Respondents that did make a distinction between especially close and less close split their partners almost evenly, on average, between the two extremes. The tendency to make such distinctions increases with respondent education and decreases with age (especially for respondents in their fifties or older).

With respect to the third dimension – obligation decreasing from kin to friends to coworkers – half of the discussion partners are family, typically nuclear family. A larger proportion of the discussion partners are friends, but half of the friends come from the respondent's family (30 percent) or work (20 percent). Friends beyond family and work are largely just friends and no more. The number of discussion partners drawn from the family is stable across levels of education. However, discussion networks expand with respondent education to include friends and coworkers beyond the family, which decreases the proportion of high SES networks drawn from relatives. The number of discussion partners drawn from the family declines only slightly with respondent age, despite the shrinking observed for respondents in their fifties and sixties with the loss of coworkers, and the continuous shrinking across respondent ages with the loss of discussion partner friends beyond family and work. The result is that relatives become an increasing proportion of discussion networks for older respondents.

Much of this can be summarized by saying that distinctions between kinds of discussion relations increase with socioeconomic status and decrease with age. Closeness, frequency, and kinship are less distinguishable and more ambiguous in the networks of elderly and low SES respondents because all three tend to occur together. This makes it difficult to give any one a unique meaning, so the three kinds of relations blend into one another – frequent contact generating some of the closeness and obligation expected of kinship, and kinship expecting emotionally close, frequent contact. At the other extreme, young and high SES respondents draw from their families about the same number of important discussion partners that old and low SES respondents draw. But they go on to include among their important discussion partners frequently met, nonkin coworkers, and close friends beyond their families and jobs. The result is that

closeness and frequent contact for young and high SES respondents are less encrusted with kinship meanings, and are much more likely to derive meaning from qualities of age, education, and occupation shared with discussion partners.

Age is more than a reverse image of socioeconomic status. There are significant qualitative differences between statuses in the age stratification of Americans. Network analysis of age stratification reveals nine age statuses, summarized in Table 14.4, with one particularly severe watershed. For respondents in their late forties in 1985, children were replacing parents and siblings as important discussion partners, the steep decline in daily contact characteristic of all older respondents was beginning, and this was the final period for respondents tending to distinguish especially close from less-close discussion partners. It is during the forties that children are the most prominent new source of discussion partners, spouses come from the most varied ages, and contacts beyond the family come from the most varied ages. In 1985, in short, the respondents born at the beginning of World War II were going through the most profound network changes observed on average anywhere in the age stratification of Americans.

Having asserted, at some length, the generality and importance of the reported distinctions between kinds of discussion relations, I close with three questions that have intruded into my thinking as I wrote this chapter.

Are the dimensions of frequency, closeness, and obligation peculiar to the GSS name generator? All distinctions reported here are between kinds of discussion relations elicited by the GSS name generator. A case could be made that these dimensions are general features of personal relations between Americans. They could just as well be features specific to discussion relations, with different criteria used to distinguish kinds of business relations or kinds of authority relations. Only future research with substantively diverse name generators in socially heterogeneous populations can determine the generality of frequency, closeness, and obligation as dimensions of personal relations.

Are the socioeconomic correlates of network differentiation an artifact? I have described a strong connection between socioeconomic status and distinctions between kinds of relations. But is the increasing differentiation associated with socioeconomic status real, or is it merely the result of better-educated respondents being more articulate about their relationships? Perhaps the important discussion relations of low SES respondents are just as varied as the relations of high SES respondents, but with education comes the ability to verbalize

network complexity. This is a difficult and important question for a wide range of social scientists, from survey analysts studying response effects, to sociolinguists studying the connection between social life and cognition.[17]

Third, are the network differences between age statuses evidence of differences between cohorts, or are they stages in more general life-cycle processes? This is a familiar question articulately laid out by Riley (1973), and cast as a central analytical question for sociology in her American Sociological Association presidential address (Riley, 1987). For example, do Americans typically pass through an identifiable stage of their lives in which parents are replaced by children as important discussion partners, or is that observation peculiar to 1985, reflecting parents in a youth-oriented society turning to their baby boom children? In the past, did contact with both children and parents last longer in the life-cycle when relatives were more likely to live close to one another and parents produced children at a younger age? In the future, as the baby boomers age, will they too turn to their children as important discussion partners, or will the lack of suitable children and the massive number of baby boomers lead them to turn to one another as important discussion partners, driving America to recognize the wisdom of their accumulated experience, just as they focused America's attention on the vitality of their youth in the 1960s?

Notes

1 Burt (1984) provides a detailed discussion of the network data and various issues taken into account by the GSS Board of Overseers in their deliberations over the network items. The draft questionnaire items proposed in Burt (1984) are very similar to the items eventually adopted for the GSS, but the exact wording is given in a later issue of the newsletter for the International Network for Social Network Analysis (*Connections*, 1985: 119–23).

2 Note that the .502 probability is not the proportion of all 4,483 discussion partners named who were relatives. It is the average proportion of each respondent's discussion partners who were relatives. This means that the kin and nonkin probabilities in columns two and three need not sum to the overall probability in column one. It also means that probabilities do not sum to 1.0 across exhaustive categories (for example, duration of relation; less than three years, three to six years, more than six years) because respondents citing no one are included in the probability sample for Table 14.1, but would be excluded in a dyad file of all relations cited.

3 The map in Figure 14.2 was created using the Guttman algorithm in SYSTAT to describe the joint probabilities of contents appearing in the same discussion relations. The joint probability of contents A and B appearing in the same relations was computed as the number of relations containing A and B divided by the number of relations containing A or B.

4 In two ways, the three dimensions are more than is necessary to describe the

data. First, you can see in Figure 14.2 the strong correlations between the closeness dimension, kinship dimension, and horizontal axis of the map. If Figure 14.2 were a data-reduction exercise, only two dimensions would be distinguished: a closeness dimension on the horizontal axis (strongly correlated with kinship), and a frequency dimension on the vertical axis. Second, even this is a slight exaggeration over what is needed to describe the mixture of contents in important discussion relations. The data are principally described by a center-periphery dimension. A cluster analysis of the joint probabilities shows that the only probabilities over .1 occur in the center of the space – between the attribute homophily contents (same age, education, race, religion, and sex), friend known more than six years, equally close, kin, and daily contact. Toward the periphery of the space, the probabilities reach their minimum with many pairs of contents close to one another merely because they have a .001 joint probability rather than a perfect zero probability of occurring together. This center-periphery axis is the only dimension detected in a structural equivalence analysis of content meaning following the methods proposed by Burt and Schøtt (1985). In other words, the dominant feature of these data is a tendency for discussion partners to be close and similar to the respondent. To get the variation in content meaning so clearly evident in studies like Fischer's (1977) regional study of northern California (see Burt, 1983a), multiple name generators are needed rather than the one "discussing important matters" generator used in the GSS. The variations reported here between closeness, frequency, and kinship are significant variations between kinds of discussion relations, a subset of kinds of relations more generally.

5 Family coworkers are a small proportion of kin and a small proportion of coworkers. Of all 816 coworkers named as important discussion partners, 153 are relatives. Of these 153 kin coworkers, 46 percent are spouses, 37 percent are nuclear family (parent, sibling, child), and 17 percent are other relatives.

6 Specifically, the Euclidean distance between two kinds of respondents A and B is defined as follows: $d_{AB} = \sqrt{[\Sigma_i \Sigma_j (c_{ijA} - c_{ijB})^2]}$, where c_{ijA} is, for the A kind of respondent, the conditional probability of content j appearing in a discussion relation containing content i, c_{iiA} is the probability of content i appearing in an A kind of respondent's discussion relations, and the summations are across all thirty contents i and j.

7 There is no contrast running from the upper right of the map to the lower left that is as strong as the three contrasts indicated in Figure 14.4. The closest is between married rural respondents toward the middle upper right to the map versus single urban respondents toward the mid-lower left. The principal distinguishing characteristic of the single urbanites is their greater tendency to draw discussion partners from same-sex friends: men relying on friendships with other men, women relying on friendships with other women. In contrast, the married respondents in small towns are more likely to include a spouse as an important discussion partner, rely on people their own age, and draw important discussion partners from their families. These differences can be established statistically as significantly different from zero, but Figure 14.4 shows that they span minor differences between respondents relative to age, race, and socioeconomic status.

8 Ancestry groups have been combined for Figure 14.4 based on the discussion partners they cited. The respondents listed as Hispanic claimed ancestry in Mexico, Puerto Rico, or Spain. They had in common a tendency to cite discussion partners they coded as Hispanic on the GSS network item asking for the race of discussion partners.

9 Specifically, all but two of the thirty kinds of discussion relations are clustered around the diagonal in the ambiguity graph contrasting white with nonwhite respondents (see the discussion of Figure 14.5).

10 More specifically, ambiguity is defined by the left-hand eigenvector correspond-

ing to the maximum eigenvalue of a coincidence matrix (Burt and Schøtt, 1985:298ff). It increases with the extent to which a relation content is used in many different discussion relations, and those relations tend to contain other ambiguous contents. Ambiguity scores were obtained by using the network analysis program STRUCTURE to compute prestige scores for the contents in each (30,30) coincidence matrix, then dividing each score by the prestige of sex homophily.

11 In fact, the association between frequency and closeness can be attributed to variation in respondent socioeconomic status. Excluding spouses (who are almost all close and daily contacts), the tabulation of discussion relations across closeness (three categories) and frequency (daily versus less often) shows a strong tendency for close relations to be frequent contacts (22.8 likelihood ratio chi-square, $P < .001$ with 2 df). Holding constant three categories of respondent education distinguished by the results in Figure 14.6 (less than high school, high school up to some college, and Bachelor degree or more), eliminates the association (10.8 chi-square, $P = .10$ with 6 df). Furthermore note that these statistical tests are inflated in some undetermined measure because they are computed from 3,875 nonspouse discussion relations instead of the 1,531 sample respondents.

12 Specifically, the relations are marginal strengths. The relation from age A to age B, z_{AB}, is the number of discussion partners of age B cited by respondents of age A, divided by the most discussion partners of any age cited by respondents of age A. Relations vary from zero to a maximum of one. These marginal strength relations can be compared across ages variably sampled in the 1985 GSS sample. Differences in maximum number of citations is held constant across respondent ages (rows), but relation pattern is not. Where no respondents were sampled for an age, I put a 1.0 in the diagonal, implying that their strongest relations would have been to people of the same age. This occurred in all ages below eighteen and many ages over seventy-five.

13 For example, in his widely cited article on cohorts as a vehicle for studying social change, Ryder (1965:845) defines a cohort as: "the aggregate of individuals (within some population definition) who experienced the same event with the same time interval. In almost all cohort research to date the defining event has been birth, but this is only a special case of the more general approach." The central problem in cohort detection has been the ambiguity of drawing empirical distinctions between adjacent birth years as a boundary between two cohorts. Network analysis provides an interesting strategy for drawing those boundaries. Operationalized as an age status, a cohort is an aggregate of individuals who experience kinship, marriage, and nonkin relations with people of the same ages. Not only do persons in an age status share proximate birth years, they share similar age parents, similar age spouses, and similar age coworkers and friends beyond the family. Moreover they are similarly not in contact with parents, spouses, coworkers, and friends of certain other ages.

14 The statuses have been distinguished in a routine network analysis with the general purpose program STRUCTURE. Structural equivalence is measured as the Euclidean distance between age-specific patterns of discussion relations, $d_{ab} = \sqrt{\{\Sigma_q \Sigma_k [(z_{aqk} - z_{bqk})^2 + (z_{qak} - z_{qbk})^2]\}}$, where z_{bqk} is the strength of relation from age b to age q within network k, and the summation is across all ninety-three ages q and the three networks k. The nine age statuses were defined with cluster analyses and testing structural equivalence within alternative density tables (for example, see Burt, 1982; Burt and Minor, 1983, for details and examples).

15 The reliability of assigning an age to a status is an item-scale correlation, routinely provided in the STRUCTURE density table printout. It is the correlation between distance to an age and average distance to all other ages assigned to a status. An age's reliability is 1.0 to the extent that the age is perfectly structurally equivalent with all other ages assigned to its status.

16 The four eighteen-year-old GSS respondents are combined with the nineteen to twenty-four-year-old respondents in status II for the second row of the matrices in Figure 14.10 because they do not represent relations from all children (persons of age one to eighteen) and are somewhat structurally equivalent with the status II respondents.

17 In fact, this question was called to my attention by Stanley Presser in an NSF sponsored workshop on survey network data held at Columbia University in 1985. The question is a direct extension of Presser's considerable work with Howard Schuman on response effects (for example, Schuman and Presser, 1981). As I write this chapter four years later, there is still no evidence with which I can resolve the question, although there are some interesting leads for systematic survey work in the work linking behavioral and cognitive images of social networks (for example, Romney and Weller, 1984; Johnson and Miller, 1986).

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