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This article is concerned with the problem of the relative contributions of structural cohesion and equivalence to the explanation of social homogeneity. Structural Cohesion models are explanatory models in that they are based on causal assumptions concerning the effects of structural cohesion upon individuals' attitudes and behaviors. The results of the present analysis indicate that direct and short indirect communication channels are critical components of cohesion models that largely account for their success in predicting social homogeneity. However, not all social homogeneity is caused by structural cohesion. Structural equivalence models offer a general approach for mapping the distribution of social homogeneity in a population. Rejection of the null hypothesis of no difference in homogeneity between structurally equivalent and nonequivalent persons supports the construct validity of structural equivalence with respect to its use as an indicator of social homogeneity. The present results provide little support for the additional claim that structural equivalence provides some explanation of social homogeneity.

Structural Cohesion and Equivalence Explanations of Social Homogeneity

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From structural cohesion models in which social homogeneity is predicted among persons involved in complete, or nearly complete, interpersonal networks, we have moved to structural equivalence models in which social homogeneity is predicted among persons who may be totally disconnected in terms of face-to-face interactions. Structural cohesion and equivalence models must differ in their abilities to predict and explain social homogeneity. A more thorough understanding of these differences is crucial to their appropriate use and interpretation. This article is concerned with the problem of the relative

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contributions of structural cohesion and equivalence to the explanation of social homogeneity. I shall argue and illustrate that structural cohesion and equivalence models are entirely consistent approaches to such explanation.

STRUCTURAL COHESION MODELS

Structural cohesion models are founded upon the causal propositions that pressures toward uniformity occur when there is a positively valued interaction between two persons; that these pressures may occur by being "transmitted" through intermediaries even when two persons are not in direct contact; and that such indirect pressures toward uniformity are associated with the number of short indirect communication channels connecting the persons. Cliques, formally defined by Luce and Perry (1949) as consisting of persons all of whom are in face-to-face contact, were a successful first approximation of the structural environment in which effective pressures toward uniformity occur. However, with their stipulation that all persons must be in direct contact, cliques were recognized as being too restrictive and a variety of alternatives were proposed: See Alba (1973), Luce (1950), Mokken (1979) on n-cliques; Seidman and Foster (1978), Seidman (1980) on k-plexes; Hubbel (1965); Johnson (1967). To date, the most theoretically developed alternative to cliques are social circles (Alba, 1972; Alba and Moore, 1978; Alba and Kadushin, 1976; Kadushin, 1968). In general, these alternative models locate persons in a common subgroup if they are involved in an area of an interpersonal network where the incidence of face-to-face contact is high; hence, a subgroup may consist of some persons who do not have direct contact with all other members.

Structural cohesion models are explanatory models in the following sense. They assume that social homogeneity is fostered by face-to-face interaction and short communication channels

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through intermediaries. The models lead to the division of a network into subgroups, such that persons within subgroups have a higher incidence of face-to-face interaction and a larger number of short communication channels between them than persons within different subgroups. Accordingly, persons within subgroups are predicted to be more homogeneous in terms of attitudes and behaviors than persons in different subgroups. Rejection of the null hypothesis of no difference in homogeneity among persons within and between subgroups is consistent with the causal assumptions upon which structural cohesion models are based.

The use of structural cohesion models is appropriate in circumstances where social homogeneity is expected to arise, in part, from elements of structural cohesion. The models are expected to be powerful predictors of social homogeneity to the extent that (1) social homogeneity among the persons being studied arises *exclusively* from elements of structural cohesion, and (2) the specific structural model succeeds in clustering together persons who are connected by network structures that foster homogeneity and segregating persons who are not connected by such structures. When social homogeneity is caused by factors other than structural cohesion or when the structural model defines "effective structural cohesion" either too restrictively or too liberally, the predictive success of these models is diminished—the effect will be to place homogeneous persons in different subgroups and/or heterogeneous persons in the same subgroup.

STRUCTURAL EQUIVALENCE MODELS

Models based on the concept of structural equivalence have recently emerged and quickly become prominent (Boorman and White, 1976; White et al., 1976). Persons are defined as structurally equivalent if they are related in the same ways to other persons or types of persons (Lorrain and White, 1971; Sailer, 1978; White, 1980). Two persons may be structurally equivalent whether or not they are in direct contact and regardless of the number of communication channels through intermediaries that connect them. Structural equivalence is based on the configuration of those relations, few or many, that persons do have. Thus, structural equivalence permits subgroups to be formed in which the incidence of face-to-face contact may be close to zero—a result that is not possible in models that emphasize structural cohesion.

Structural equivalence models provide a more general approach than structural cohesion models for predicting social homogeneity (Burt, 1978). Structural equivalence models assume that homogeneous persons will interact (directly and indirectly) with other persons or types of persons in similar ways and, accordingly, use indicators of persons' attitudes and behaviors that are relational in character. An observed occurrence of structural equivalence is a direct manifestation, or consequence, of *all* forces that lead to social homogeneity among persons (of which mechanisms based on structural cohesion are a subset). For example, if formal organization members occupy similar roles (offices), are similar in their ascribed and achieved individual characteristics (e.g., age, education, and sex), and work under similar social conditions (e.g., in organizations whose size, division of labor, and technology are similar), then they are likely to possess similar patterns of cognitions and behaviors toward other persons or types of persons in their organizations. Hence, structural equivalence models cluster persons into subgroups who may be homogeneous as a result of causes other than structural cohesion. The claim that social homogeneity may occur in the absence of structural cohesion is highly plausible in the context of such models.

Structural equivalence models are not explanatory models in the same sense as structural cohesion models. Rejecting the null hypothesis of no difference in homogeneity between structurally equivalent and nonequivalent persons is consistent with the assumption that homogeneous persons tend to have similar configurations of cognitions and behaviors toward other persons or types of persons. That is, rejection of the null hypothesis supports the construct validity of structural equivalence with respect to its use as an indicator of social homogeneity (see White et al., 1976: 770-771).

Structural equivalence models provide an approach for mapping the structure of social homogeneity in a population. The approach also can be used to scale pairs of persons in terms of the extent to which they are socially homogeneous. It would be appropriate, for example, to explain variation in social homogeneity with elements of structural cohesion where the measure of social homogeneity is based on the presence/absence or degree of persons' structural equivalence. In circumstances where structural cohesion does not contribute to social homogeneity, the association between structural cohesion and equivalence will be low. Where structural cohesion is the main source of the social homogeneity in a population, structural cohesion will be strongly associated with structural equivalence.

An important question is whether structural equivalence also provides some explanation of social homogeneity. Controlling for the contributions of all other factors to homogeneity, are persons who are structurally equivalent more likely to be homogeneous than persons who are not structurally equivalent? Burt suggests that this may be the case—namely, that pressures toward uniformity are fostered when persons' interpersonal environments are structurally equivalent:

> Structurally equivalent actors should have similar attitudes and behaviors because they tend to interact with the same types of other actors in the same manner. Structurally equivalent actors are similarly socialized by others. They should have similar attitudes and behaviors as a result [Burt, 1978: 199].

How plausible is this argument? While the occurrence of structural equivalence indicates that the interpersonal environments of two persons are similar, all structurally equivalent pairs are not involved in the same type of interpersonal environment. Various environments will not have equally powerful effects on behaviors and attitudes. Hence, structural equivalence may be an unreliable indicator of those particular environments that have some causal force. Moreover, while two structurally equivalent persons are similarly socialized by particular individuals or types of individuals, the actions of the *set* of socializing agents in their networks are unlikely to be consistent. It is questionable whether, in general, persons can be expected to respond similarly to an equivalent set of *heterogeneous stimuli* (i.e., to the actions of different persons or types of persons who have different attitudes and behaviors).

Similar responses to an equivalent set of heterogeneous stimuli is more likely in the presence of social controls that severely limit the possible range of persons' responses. Structural cohesion is a powerful source of pressures toward uniformity. Thus, if structural equivalence has some independent effect on behaviors and attitudes, one might expect to observe the effect in the presence of structural cohesion, but not in its absence.

EMPIRICAL ILLUSTRATION

This article will attempt to empirically illustrate the main points of the above argument. The setting is a single network of face-to-face interactions consisting of school district officials and other persons in the school district organization or community who had some influence on school district policies. An assessment is made of the relative contributions of structural cohesion and equivalence to the explanation of one form of social homogeneity in the network—consensus on policy issues.

First, the article will seek to demonstrate with a particular structural cohesion model that the ability of the model to predict social homogeneity can be explained by the disproportionate occurrence within subgroups of dyads whose members are either in face-to-face contact and/or connected by short communication channels through intermediaries. Social circles in the network are located and the network's dyads are classified into two sets: those that share membership in at least one social circle, and those that do not share membership in any social circle. On the basis of this classification a relationship is obtained between joint social circle membership and dyadic consensus on policy issues. The presence of face-to-face interaction in a dyad and the absolute number of contacts shared by the members of a dyad are controlled. One expects on the basis of the causal assumptions underlying structural cohesion models that once these controls have been introduced there will be little association remaining between social circle membership and dyadic consensus because the salient interpersonal structures contributing to consensus have been controlled. A strong explanation of the zero-order relationship will suggest that direct and short indirect communication channels are *critical components* (Rosenberg, 1968: 40-49) of structural cohesion.

Second, it will be demonstrated that structural cohesion may help to explain the social homogeneity associated with structural equivalence when structural equivalence pertains to persons involved in a single social network. In the context of a single network, structural cohesion should be one among the several factors that acccount for the homeogeneity among network members. Accordingly, structurally equivalent persons in the network are located and the network's dyads are classified once more into two sets—in this instance, it is those whose members share membership in a structurally equivalent position and those that do not. The relationship between joint membership in a structurally equivalent position and dyadic consensus is obtained; and the presence of face-to-face interaction in a dyad and the absolute number of contacts shared by members of a dyad are controlled. To the extent that structural cohesion contributes to dyadic consensus, the zero-order association should be correspondingly reduced.

Third, the article will seek to disconfirm the theory that structural equivalence fosters pressures toward uniformity. If structural equivalence influences social homogeneity, we should find after introducing controls for structural cohesion that persons who are structurally equivalent are more likely to be homogeneous than persons who are not structurally equivalent. However, there are several reasons why structural cohesion might not explain the zero-order association other than an independent effect of structural equivalence. Even if structural equivalence is not a causal factor, an association will persist if structural cohesion is not the major cause of consensus in the network. Thus, a positive finding (i.e., the inability to explain the zero-order association) does not necessarily indicate that structural equivalence is a source of consensus. In general, it is difficult to confirm such an independent contribution in the absence of a true experiment as confirmation requires controlling for *all* other factors that contribute to social homogeneity.

A negative finding is more conclusive. If structural cohesion can account for the agreements predicted by structural equivalence, one may claim that it is unlikely that structural equivalence is a cause of social homogeneity.

In sum, I hope (1) to illustrate that direct and short indirect communication channels are critical components of structural cohesion models that help to explain their ability to predict social homogeneity; (2) to illustrate also that structural cohesion may account for some, if not all, of the social homogeneity associated with structural equivalence; and (3) to disconfirm the argument that structural equivalence is a source of social homogeneity comparable to that of structural cohesion.

METHODS

The data are comprised of measures of the interpersonal relations and policy issue agreements occurring among a set of persons who were influential in determining the policy decisions of one school district located in the suburban ring of a major midwestern city. These data were obtained by means of a survey questionnaire.

THE SURVEY

A snowball procedure was used to define the population of persons in the school district who had some influence on school district policies around the time of the survey. The superintendent, school board members, and school principals were asked to name persons they believed to be influential in the school district. The persons they named were contacted and also asked to name influential persons. The procedure was repeated until it was felt that further contacts would be relatively unproductive in terms of generating new names of influentials. Everyone who was named as an influential by at least two different persons was included in the population to be surveyed (N = 50).

A questionnaire was administered to the influentials identified by the snowball sampling. The questionnaire contained a list of the names of those persons identified as being influential. Respondents were asked in a series of check list items to describe their relationships with each other person on the list. The rate of usable response was 76%, yielding 38 respondents. These 38 respondents, in turn, yield the 703 dyads upon which the analysis is based.

MEASUREMENT

Dyadic consensus. The measure of dyadic consensus is a self-reported summary measure of the relative positions of two persons across the variety of controversial policy issues that arose in the school district. It is a measure of two persons' general tendency to agree on controversial issues even though they may have found themselves in disagreement on occasional specific issues.

The measure is derived from the following two questions:

> (1) When there are differences about school district matters, which of the persons on the entire list are usually on the same side of issues as yourself?
> (2) Which persons are usually on a different side of these issues from yourself?

Consensual dyads are defined as ones in which i or j reported that the two members are generally in agreement on school district issues and in which neither reported that the two generally are in disagreement. All other dyads are defined as nonconsensual, with the exception of 17 dyads in which one member reported that the two generally are in agreement while the other reported that the two generally are in disagreement; these ambiguous cases are treated as missing. Note that only a small proportion (.024) of the total number of dyads are classified as ambiguous; persons tend to be consistent in their reports about who tends to agree and disagree with them.

Social structure. Respondents were asked to check off the names of various persons on the list according to the following instructions:

(1) Check off persons with whom you frequently discuss matters having to do with the district.
(2) When you need information or advice having to do with the district, to which persons on the list do you turn?
(3) Check off persons who were with you at three or more private social occasions during the past year.
(4) Check off persons who are your close friends.
(5) Check off persons who are your close associates at work.

For each type of social contact a 50 × 50 matrix M_k (k = 1,5) is constructed in which all the (i, j) cells are set to 0.0 unless respondent i reports that the particular type of social relation k is present, in which case the (i, j) cell is set to 1.0. Thus, M_1 is a matrix of directed relations based on frequent discussion of matters having to do with the school district, and M_2 is a matrix of directed relations based on seeking information or advice about school district matters, and so on.

These matrices, representing various dimensions of the social structure of the school district, enter into the construction of social circles and structurally equivalent positions. The matrices also enter into the definition of direct and shared contacts.

Direct and shared contact. Two persons are defined as being in direct contact if there is any evidence that they have been in face-to-face interaction on the basis of one of the five types of relations. Two persons are defined as being not in direct contact if there is no evidence that any of the various types of relations exist between the two persons. A shared contact of a dyad (i, j) is any person who is in direct contact with both i and j.[1]

Social circles. Social circles are defined in three stages using COMPLT, a program developed by Alba (1972). First, all the cliques (maximal complete subgraphs) are located by the program. Second, it is ascertained which pairs of cliques differ from one another by a single member. If the deletion of one person from one of two cliques makes its membership a subset of the other clique, then the two cliques are merged. Third, the percentage of overlapping membership of the subgroups (defined in the second step) is ascertained as follows: The number of persons who are members of both cliques is divided by the total number of members in the smaller of the two cliques. Subgroups are merged in which overlap occurs to a prespecified extent; the choice of the criterion of overlap is arbitrary.

The program requires a symmetric matrix as input. It will take as input either a matrix of 1's and 0's or a proximity matrix with values ranging between 0.0 and 1.0, which is then transformed to a matrix of 1's and 0's. With the latter type of input, in addition to specifying a criterion of overlap one must also specify a threshold value at or above which a relation is defined to be in existence.

The present analysis took as input a proximity matrix, the entries of which are based on the M_k matrices ($k = 1, 5$): proximity is determined by the *number* of directed social relations that connect two persons. Hence, dyads in which each of the five types of relations are reciprocated receive a score of 1.0 (i.e., 10 directed relations are present in the dyad). Dyads in which fewer relations are present receive smaller scores; for example, dyads in which no relations are present receive a score of 0.0. These proximity scores were found to be related to the likelihood of agreement in a dyad (see Table 1), suggesting that they may be useful in defining social circles that are associated with consensus.

The results obtained using different combinations of overlap and threshold criteria are reported in Table 2. The merits of the subgroups are assessed in terms of (1) the Yule's Q for the association between dyadic consensus (1=yes,0=no) and joint

TABLE 1
Association Between the Proximity of Two Persons in the Network and Dyadic Consensus*

Dyadic Consensus	Proximity Score .0	.1	.2	.3	.4	.5	.6	.7	.8-1.0
Yes	23%	51%	73%	88%	79%	83%	93%	100%	100%
No	77	49	27	12	21	17	7	0	0
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
(base)	(337)	(78)	(60)	(60)	(33)	(12)	(15)	(11)	(9)

*Based on dyads in which both members are survey respondents (n = 703): 17 cases in which the occurrence or nonoccurrence of dyadic consensus is ambiguous are treated as missing data, as are 73 cases in which there is not data on one of more of the indicators of direct contact (their union results in 88 missing cases for this table).

subgroup membership (1 = yes, 0 = no) and (2) the Yule's Q for the association between direct contact in dyads (1 = yes, 0 = no) and joint subgroup membership.

Which among these overlap and threshold combinations should be selected? The answer depends on the aims of the analysis. The present analysis does not aim to evaluate whether social circles or structurally equivalent positions are a better predictor of dyadic consensus. Rather, it is to examine the extent to which the relationship between joint membership in a subgroup and consensus (under different definitions of subgroup membership) can be explained by a common set of variables. Accordingly, we need subgroups that reflect the different models being entertained.

The concept of social circles is built upon the belief that dyads *not* in direct contact might be permitted within subgroups *without* great loss to the strength of the association between joint subgroup membership and social homogeneity. A concomitant underlying belief is that the likelihood of homogeneity in those dyads *not* in direct contact is a function of the density of direct contacts within the social circle which contains them. Therefore, in selecting an example of social circles for analysis, subgroups are rejected whose networks are nearly complete; such subgroups are closer to cliques than social circles. However, we do not want subgroups in which the association between direct contact and joint subgroup membership is too weak. We want a moderately strong relationship between contact and subgroup membership along with a strong relationship between dyadic consensus and subgroup membership.[2]

The combination of overlap and threshold criteria that comes closest to meeting these stipulations is the one with an overlap of .90 and a threshold of .3. The selected combination produces two subgroups of 14 and 27 members. While the density of relations in the network at or above the threshold of .3 is .12, within the subgroups the density of these relations is .53 and .38, respectively. The density of relations between the subgroup members and persons not in the subgroup is respectively .13 and .03. With these subgroups, joint subgroup membership has an association with dyadic consensus of .767 and an association with direct contact of .784.

Structurally equivalent positions. Several excellent discussions of the method of finding structurally equivalent positions in a network exist (Arabie et al., 1978; Light and Mullins, 1979). In the present analysis the conventional practice was followed of entering a stacked matrix, consisting of the M_k matrices discussed previously. Using correlational methods (the equivalent of CONCOR) the network was succesively split into positions (Figure 1).

A similar question arises with these results as did with the results for social circles: Which of the positions should be selected for analysis? Various combinations are possible; for example, B-C or B-F-G or D-E-F-G and so forth. The concept of structural equivalence does not require a strong association between joint membership and direct contact. Therefore, we need be concerned only with choosing that appropriate combination of positions in the hierarchy of positions that provides the strongest association between joint membership and dyadic consensus (Table 3). This is

TABLE 2
Social Circles

a. Yule's Q for the association between joint membership (1 = yes, 0 = no) and dyadic consensus (1 = yes, 0 = no).

	Overlap Criterion		
Threshold Criterion	.90	.80	.70
.1	.662†††	.662†††	.662†††
.2	.843†	.843†	.843†
.3	.767	.736**	.736**
.4	.716	.732††	.732††
.5	.832*	.832*	.820

b. Yule's Q for the association between joint membership (1 = yes, 0 = no) and direct contact (1 = yes, 0 = no).

	Overlap Criterion		
Threshold Criterion	.90	.80	.70
.1	.936†††	.936†††	.936†††
.2	.718†	.718†	.718†
.3	.784	.776**	.776**
.4	.762	.776††	.776††
.5	.933*	.933*	.932

†, ††, †††, *, ** indicate that the subgroups obtained are identical.

the combination F-G-H-I-J-K (Q = .583). It turns out that this combination also has the strongest association between joint membership and direct contact (Q = .747; Table 3).

SOCIAL CIRCLE AND STRUCTURAL EQUIVALENCE ASSIGNMENTS

Each procedure classifies dyads into two sets—the dyads' members are either in the same or different subgroups. The

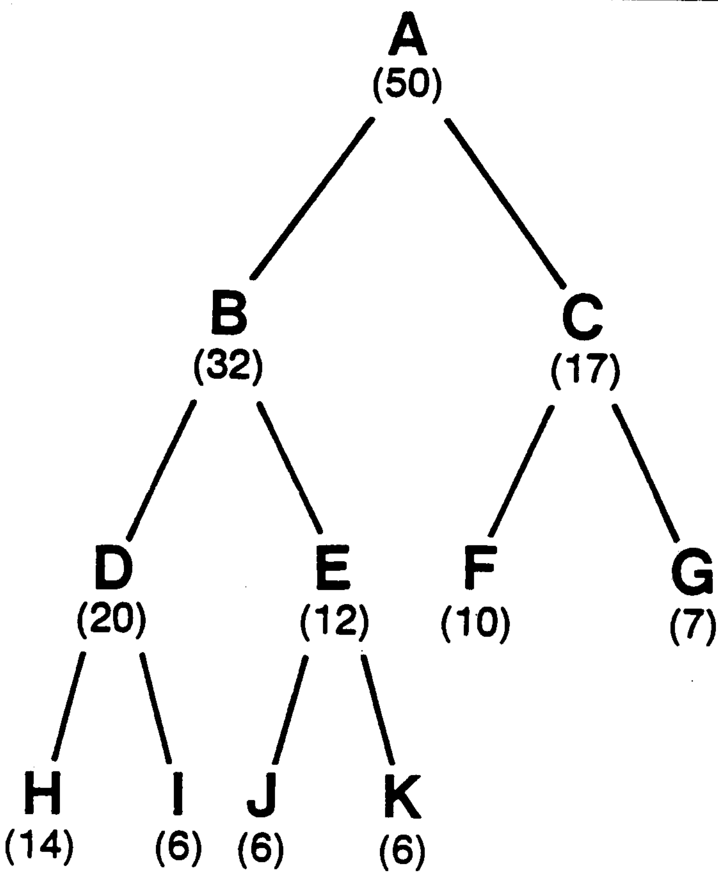

Figure 1: The CONCOR Tree

procedures agree in their classification of 56% of the dyads. Of the dyads that are classified differently, 89% are located in the same social circle but in different structurally equivalent positions. That is, structural equivalence created distinctions among many of the dyads that were placed in the same group by the social circle assignment.

You can get a better idea of what is going on by looking at Figure 2. The social circles are represented by circles and the positions by rectangles. Many persons are not assigned to a social

TABLE 3
Structurally Equivalent Positions

Combinations of Subgroups	Association between joint membership and dyadic consensus Yule's Q	Association between joint membership and direct contact Yule's Q
B-C	.315	.531
B-F-G	.319	.537
C-D-E	.310	.480
C-D-J-K	.294	.482
C-E-H-I	.510	.651
C-H-I-J-K	.525	.688
D-E-F-G	.332	.509
D-F-G-J-K	.319	.516
E-F-G-H-I	.555	.697
F-G-H-I-J-K	.583	.747

circle because of the lack of network cohesion between them and the persons who belong to a social circle. In contrast, all but one person in the population is assigned to a jointly occupied position; the one person left out is an isolate. Cohesion is not as salient a criterion in the structural equivalence approach.

In the case of social circles, persons may be assigned membership in more than one group. Overlapping membership is not permitted in the structural equivalence approach.

One can see that structural equivalence tends to make distinctions among persons who share membership in at least one social circle. Meanwhile, social circle assignments do not generate distinctions among persons in a position who are members of a social circle. The only time this happens is with person #50 who is in the same position as persons #37, #40, #49 but who does not share a common social circle membership with them. The main distinction that social circles make is among the persons in a position who are in at least one social circle and those who are not.

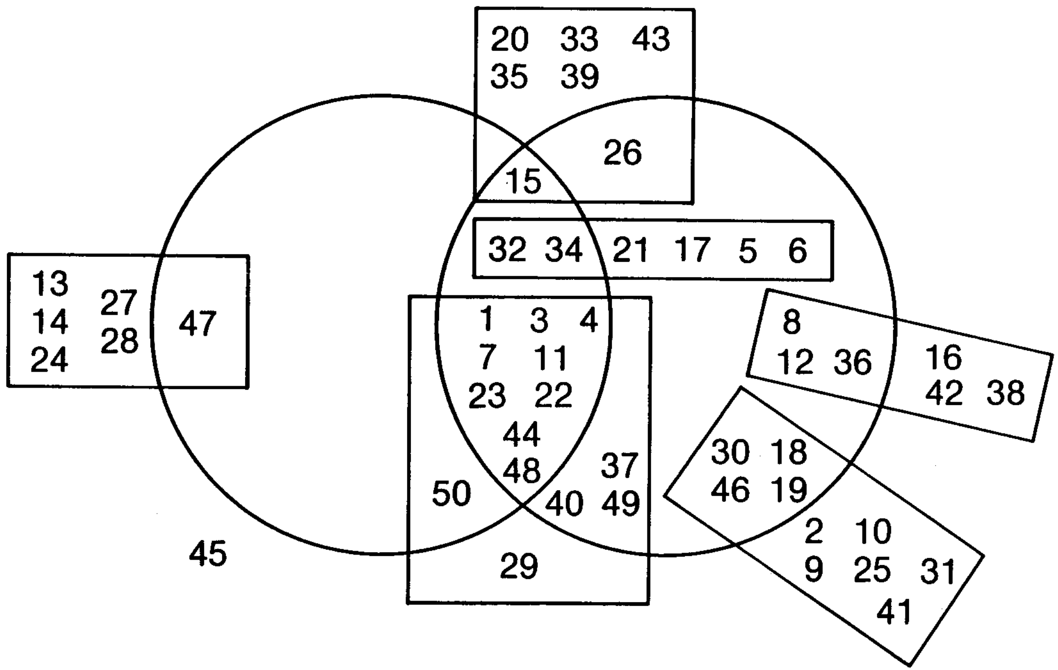

Figure 2: Assignments to Social Circles and Structural Equivalent Positions

TABLE 4
Joint Membership and Dyadic Concensus*

	Social Circles Joint Membership		Structurally Equivalent Positions Joint Membership	
	yes	no	yes	no
Percentage of Consensual Dyads (base)	65% (363)	20% (323)	70% (125)	38% (561)
Yule's Q	.767		.583	
Percentage Difference	45%		32%	

*See note in Table 1.

RESULTS

ZERO-ORDER ASSOCIATION

Membership in the social circles and structurally equivalent positions in this network are each strongly associated with the occurrence of dyadic consensus (Table 4).[3] The percentage differences are substantial: 45% and 32%, respectively, for social circles and structurally equivalent positions.

With each type of subgroup membership, the likelihood of direct contact is greater among the dyads with joint membership than among the dyads without joint membership (see part a of Table 5). Dyads with joint membership also have a larger number of shared contacts on the average than do the dyads without joint membership (see part b of Table 5). The occurrence of direct and shared contacts are not independent: The likelihood of direct contact is a positive function of the number of shared contacts (see part c of Table 5).

Meanwhile, direct and shared contact are associated with the likelihood of dyadic consensus. In the entire network, dyads whose members are in direct contact are three times more likely to be consensual than are dyads not in direct contact (.75 versus .23, Q = .813). In Figure 3, the likelihood of consensus among dyads in direct contact and among dyads lacking direct contact is plotted

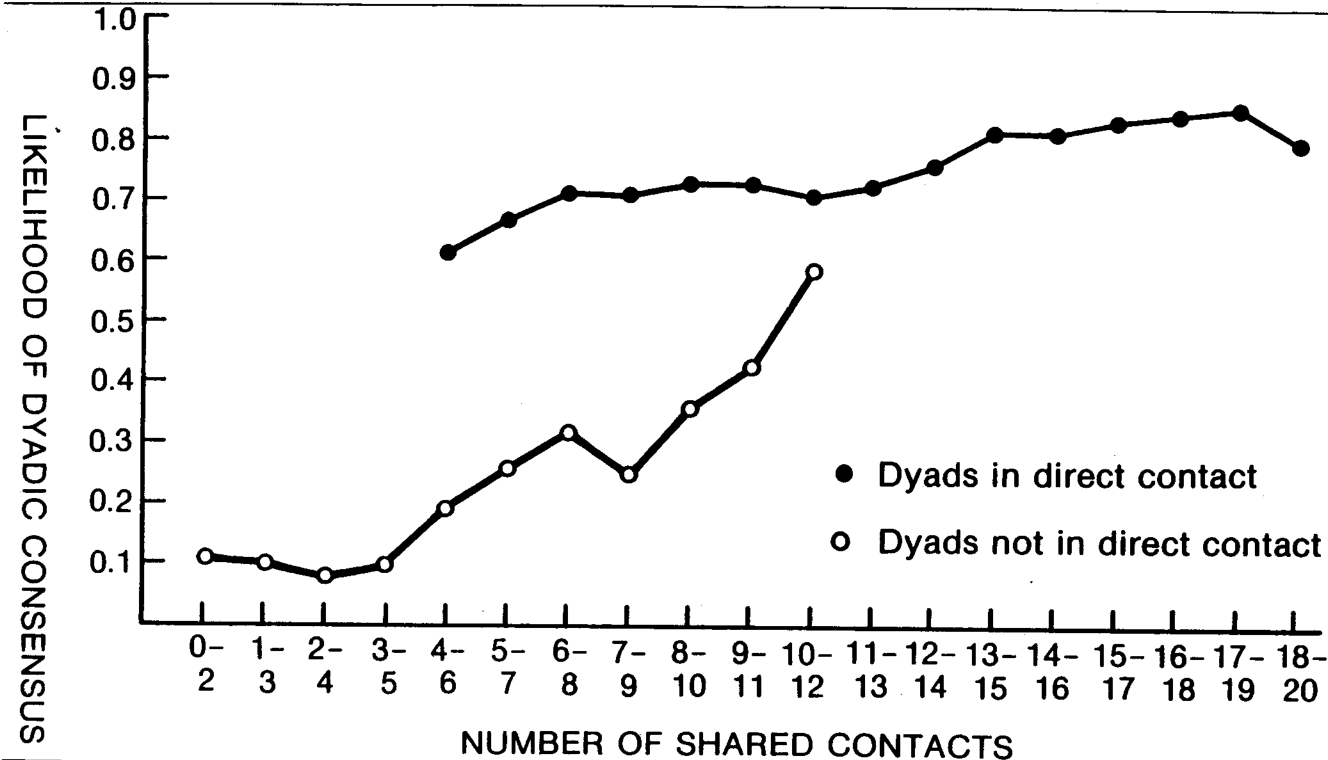

Figure 3: Likelihood of Dyadic Consensus As a Function of Shared Contacts

TABLE 5
Zero-Order Associations Between Joint Membership, Direct Contact, and Shared Contact in Dyads*

a. Joint Membership and Direct Contact

	Social Circles Joint Membership		Structurally Equivalent Positions Joint Membership	
	yes	no	yes	no
Percentage of Dyads in Direct Contact (base)	65% (376)	18% (254)	80% (127)	37% (503)
Yule's Q	.784		.747	
Percentage Difference	47%		43%	

b. Joint Membership and Shared Contact

	Social Circles Joint Membership		Structurally Equivalent Positions Joint Membership	
	yes	no	yes	no
Average Number of Shared Contacts per Dyad	12.0	4.0	13.0	7.2
SD	5.0	2.9	6.0	5.0
n	376	327	134	569

c. Shared and Direct Contact

	Number of Shared Contacts				
	0-4	5-9	10-14	15-19	20-
Percentage of Dyads in Direct Contact (base)	8% (147)	35% (236)	66% (131)	91% (81)	100% (35)

*See note in Table 1.

as a function of the number of shared contacts of the dyad. Consensus is highly likely (.60 - .85) where contact exists and rises slightly with increase in the number of shared contacts. Shared contact is strongly associated with consensus among dyads whose members are not in contact: Starting around .10, the likelihood of consensus increases to around .60 in the presence of 10-12 shared contacts. In the range of values available in these data, direct

TABLE 6
Association Between Joint Membership and Dyadic Consensus Controlling for Direct Contact*

a. Dyads in Direct Contact

	Social Circles Joint Membership		Structurally Equivalent Positions Joint Membership	
	yes	no	yes	no
Percentage of Agreeing Dyads (base)	79% (232)	50% (46)	85% (94)	69% (184)
Yule's Q	.578		.439	
Percentage Difference	29%		16%	

b. Dyads Not in Direct Contact

	Social Circles Joint Membership		Structurally Equivalent Positions Joint Membership	
	yes	no	yes	no
Percentage of Agreeing Dyads (base)	39% (131)	14% (206)	28% (25)	23% (312)
Yule's Q	.591		.129	
Percentage Difference	25%		5%	

*See note in Table 1.

contact is associated with a probability of consensus that is generally higher than the probability of consensus in the presence of shared contacts, even when multiple shared contacts exist. It would appear that the presence of direct contact is more salient than the presence of shared contacts; but among the dyads *not* in direct contact, shared contact is an exceedingly important predictor of consensus.

CONTROLLING FOR DIRECT AND SHARED CONTACT

Direct contact is exceedingly important in accounting for the zero-order associations between joint membership and dyadic consensus (Table 6). In the case of social circles, we had a zero-order percentage difference of 45%; this is reduced to a difference

TABLE 7
Percentage of Consensual Dyads Among Those Dyads Whose Members Share Membership in a Subgroup and Among Those Dyads Whose Members Do Not, Controlling for Direct and Shared Contact

	Social Circles						Structurally Equivalent Positions					
	Direct Contact						Direct Contact					
	Yes			No			Yes			No		
	Joint Subgroup Membership			Joint Subgroup Membership			Joint Subgroup Membership			Joint Subgroup Membership		
Number of Shared Contacts	yes	no	%	yes	no	%	yes	no	%	yes	no	%
0 - 2		20.0			11.0						10.1	
1 - 3		16.7			8.9						8.8	
2 - 4		0.0		11.1	7.9	3.2					7.4	
3 - 5	66.7	41.7	25.0	18.8	8.8	10.0*					9.8	
4 - 6	75.0	50.0	25.0*	34.8	14.9	19.9*				33.3	17.3	16.0*
5 - 7	72.7	62.5	10.2*	34.3	21.5	12.8*	88.9	62.2	26.7	33.3	25.0	8.3*
6 - 8	77.8	59.1	18.7*	36.0	26.2	9.8*	92.3	64.4	27.9*	33.3	31.2	2.1*
7 - 9	74.4	62.5	11.9*	26.3	21.0	5.3*	87.5	68.1	19.4	20.0	25.4	-5.4
8 - 10	76.6	50.0	26.6*	39.6	21.4	18.2*	100.0	68.1	31.9		35.9	
9 - 11	73.5			46.7	22.2	24.5	80.0	72.3	7.7		42.3	
10 - 12	70.2			63.6			77.8	69.0	8.8*		58.3	
11 - 13	73.3			56.5			71.4	73.5	-2.1*		52.2	
12 - 14	77.5			50.0			77.8	75.0	2.8*		50.0	
13 - 15	83.3			40.0			79.2	85.0	-5.8*		50.0	
14 - 16	84.2			30.0			87.0	76.5	10.5*		33.0	
15 - 17	85.4			33.3			88.0	77.8	10.2*		40.0	
16 - 18	86.7						91.7	73.9	17.8*			
17 - 19	86.0						85.7	86.4	-0.7*			
18 - 20	83.3						78.9	81.2	-2.3*			
19 - 21							76.9	78.6	-1.7*			
20 - 22							81.2	75.0	6.2*			
21 - 23							92.3	83.3	9.0*			
23 -												
Mean Percentage Difference												
Using Percentages with base > 5			19.6%			13.0%			10.0%			5.2%
Using Percentages with base ≥ 10			18.5%			12.7%			6.2%			8.8%

of 29% among the dyads in direct contact, and to 25% among the dyads not in direct contact. In the case of structurally equivalent positions much the same effects are observed. We started with a zero-order percentage difference of 32% that is reduced to 16% among the dyads in direct contact and to 5% among the dyads not in direct contact.

Continuing to control for direct contact, the control for shared contact is introduced (Table 7). Due to the small number of cases falling under the different conditions, a somewhat different format is employed in Table 7 than has been employed up to this point. The table shows the proportion of consensual dyads under the various conditions of the variables. The percentage differences across the various conditions of shared contact are averaged to give the percentage difference between consensual dyads who are joint members in a social circle or position and those who are not. Further reductions are obtained as a result of introducing the control.

Introducing the controls for direct and shared contact has substantially reduced the original zero-order associations. The results indicate that direct and shared contact are common critical components of social circles and structurally equivalent positions that help to explain their abilities to predict dyadic consensus.

These data also suggest that structural equivalence has a relatively small independent impact on the likelihood of dyadic consensus. If structural cohesion is the major source of consensus in this network, among those dyads with low structural cohesion we should find that structurally equivalent and nonequivalent dyads differ only slightly in their likelihoods of consensus. This is what has been observed: Among the dyads not in contact, the percentage difference is 5% even before the control for shared contacts was introduced.

A feature of these data requires further attention. Note in Table 7 that among the dyads whose members are in direct contact and have 10 or fewer shared contacts, there are relatively large differences in the likelihood of consensus between structurally equivalent and nonequivalent dyads. These differences are substantially greater than those found among the dyads not in direct contact, with the same number of shared contacts. At face value, these data indicate that the association between structural equivalence and dyadic consensus is contingent on the presence of direct contact. Such an effect is consistent with the previously mentioned proposition that persons may be expected to respond similarly to an equivalent set of heterogeneous stimuli *only* in the presence of social controls that severly limit the possible range of their responses.

DISCUSSION

Structural cohesion models are explanatory models in that they are based on causal assumptions concerning the effects of structural cohesion upon individuals' attitudes and behaviors. A finding that structurally cohesive subgroups are not associated with social homogeneity must lead to a rejection of the causal assumptions upon which such models are founded. The results of the present analysis suggest that direct and short indirect communication channels are critical components of cohesion models that largely account for their success in predicting homogeneity. Direct and short indirect communication channels foster the homogeneity of persons located in the same or in different subgroups. Accordingly, we should expect homogeneity to occur not only within cohesive subgroups but also between subgroups when members of different subgroups are in direct contact and/or connected by substantial numbers of short indirect communication channels.

For some purposes it may be useful to treat two or more subgroups joined by a structurally cohesive interface as a single subgroup; however, in collapsing such subgroups into one we may lose information about differences between them with respect to their connections with other subgroups in a network. The pattern of structural cohesion within and between subgroups in a network provides evidence on the possible contributions of network cohesion to the overall level of homogeneity in the network's membership (see Friedkin, 1983).

However, not all social homogeneity is caused by structural cohesion. Structural equivalence offers a general approach for mapping the distribution of social homogeneity in a population. As structural equivalence is a plausible consequence of all the forces that foster the social homogeneity of individuals, the approach is capable of indicating homogeneity resulting from causes other than structural cohesion. Findings that structurally equivalent persons are more homogeneous than nonequivalent persons supports the assumption underlying this approach—that homogeneous persons tend to have similar cognitions and behaviors towards other persons.

With regard to the theory that structural equivalence fosters social homogeneity, I have argued that equivalent sets of heterogeneous stimuli are unlikely to result in similar responses from persons and that structural equivalence is an unreliable indicator of those particular positions in network structures that influence persons' attitudes and behaviors. The present results are consistent with this argument in showing that with controls for cohesion, structurally equivalent persons differ slightly from nonequivalent persons in their likelihood of homogeneity.

I have suggested that negative findings on the independent effects of structural equivalence are more compelling than positive effects because confidence in a set of positive findings requires control for all factors that might possibly contribute to such an effect. For this reason, the negative results among the dyads not in direct contact should be more heavily weighted than the positive findings (consistent with a conditional effect) among the dyads in direct contact. That persons will respond similarly to an equivalent set of heterogeneous stimuli is an extremely powerful assertion. We should not accept it without strong supporting evidence. The results of this analysis do not strongly support such an assertion.

While intensive work on the effects of various types of positions in network structures has just begun, some theories and supporting evidence on the effects of particular types of position can be found in the literature; an example is the work on centrality and the distinction between central and peripheral persons (Breiger, 1976; Freeman, 1979). It is likely that the homogeneity of *some* structurally equivalent persons arises in part from the particular type of structure in which they are embedded (e.g., structures in which they occupy central positions). Such explanation of social homogeneity must be kept separate from the assertion that structural equivalence *in general* has some causal force.

Structural cohesion and equivalence are entirely consistent concepts. It is reasonable to contemplate analyses in which measures of structural cohesion and particular types of structural configurations are used to account for social homogeneity where social homogeneity is indicated by the occurrence or degree of structural equivalence. Analyses that simultaneously measure cohesion, equivalence, and position (e.g., centrality) provide a powerful way to explore the contributions of particular positions net of structural cohesion and the contributions of structural cohesion net of position.

NOTES

1. A shared contact may be a nonrespondent so long as both responding members of a dyad report that a direct contact is present between themselves and the nonrespondent.

2. This method of determining subgroup membership does predetermine to a certain extent the amount of reduction that may occur in the association between joint subgroup membership and consensus when direct and shared contact are controlled (e.g., Hays, 1973: 713). Knowing two of the zero-order associations among three variables determines the smallest value that the third association can possibly have. However, in the cases I am examining the constraint on the third association is minimal and therefore does not consitute a problem.

3. Due to the central role of these associations in the present analysis, I have presented the full table from which the Yule's Qs in Tables 2 and 3 were computed.

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