

SOCIAL POSITION AND SHARED KNOWLEDGE: ACTORS' PERCEPTIONS OF STATUS, ROLE, AND SOCIAL STRUCTURE

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In this study of a university administration office, we explore the implications of variation among informants in their understandings of the structure of the group. Each office actor completed two similarity judgement tasks (pile sort and triad test) and two advice ranking tasks (personal and work advice) evaluating the other actors. We compare the patterns of judged similarity, the patterns of advice seeking, and the patterns of agreement among the actors on the four tasks. We find there is a consensus about the similarities of actors and that the structural position of actors influences their approach to the consensus. However, we also find that individuals who agree with each other are not necessarily those who are judged similar by other informants.

1. Introduction

Much of the data collected in the course of doing social network analysis is cognitive in nature. Individual actors are asked to report about their communication behavior, economic exchange behavior, or another of a multitude of different behavioral interactions with others. Recently, there has been considerable debate concerning the correspondence between measures of social structure based on informants' reports and the behaviors these measures are intended to represent. A series of studies (Killworth and Bernard 1976, 1979; Bernard and Killworth 1977; Bernard, Killworth, and Sailer 1980, 1982; Bernard, Killworth, Sailer and Kronenfeld 1984; referred to here as BKS), have

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indicated little overlap between informants' reports and behavioral observations of network interactions.

Romney and Faust (1983), in a reanalysis of the BKS tech data, showed that informant accuracy depends on the degree of interaction with the group; those that interacted more frequently with group members reported more accurately on group behavior ($r = 0.52$). In a further reanalysis of all four BKS data sets, Romney and Weller (1984) showed that informant accuracy has an even stronger relationship with informant reliability (the correlation of each informant's responses to the group aggregate) ($0.79 \leq r \leq 0.98$). Freeman and his collaborators (Freeman and Romney 1987; Freeman et al. 1987) have shown that although informants may not be very accurate in their reports on who was present at a particular event, their reports are biased in the direction of long term patterns and do accurately reflect the usual and regular behaviors of group members. Still other studies have argued that the correspondence between cognitive and behavioral data is dependent on the generalizability of the cognitive measures used (Johnson and Miller 1986). These studies have sparked interest in a whole range of matters concerning cognition and social structure, and raise the question of what kinds of social structure people are able to report accurately.

Most of the earlier work on cognition and social structure has focused on an ego's perception of his or her immediate sociometric relations, particularly in triads (Heider 1958), and its effect on the formation, development and maintenance of various social relations (e.g., balance theory). More recently, there have been studies (Burt 1982; Johnson 1986) using the idea of "perceived social similarity" to explain the individual actions of actors in a network as in, for example, the adoption of innovations. The determination of "perceived social similarity" in these particular instances is based on more traditional types of sociometric data (e.g., who are the people you talk to most often?). Similarities are determined on the basis of the relational properties of an actor's ties without any direct querying as to the actor's own judgement of his social similarity to others in the network. Krackhardt (1986) has broadened this inquiry into the perceptions of networks to include an actor's perception of the social relations among other participants in the network as well as his own. Thus, this approach assesses an actor's perception of the entire structure of the network. Krackhardt argues that data of this type can be used to

investigate questions concerning the symmetry between an actor's perception of his network position and his position as perceived by other network actors, the effects of network position on the perception of structure, and the effects of network position on agreement with others on network structure.

This article focuses on the last of these concerns: the relationship between social position and agreement with others on social structure. We address this concern by answering three questions about the group. The first is social: what is the group's social structure? The second is cultural: how is knowledge of the social structure distributed? The third and most important is integrative: what is the relationship between the sharing of knowledge and the similarity of individuals?

2. Ethnographic background

The individuals that are the focus of this paper were all employed in the office of the Vice Chancellor for Academic Affairs at a moderate

Table 1
Ranks and responsibilities of the office actors.

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- (1) Vice Chancellor
 - A Vice Chancellor for Academic Affairs (academic budget, faculty personnel policies, and coordination of most schools' activities)
 - (2) Professional staff
 - G Assistant to the Vice Chancellor (budget and personnel matters)
 - O Assistant Vice Chancellor for Academic Support (student academic problems and summer school administration)
 - P Assistant to the Vice Chancellor (curriculum and catalogue revisions)
 - (3) Support staff
 - B Secretary to the Vice Chancellor (administrative secretary)
 - C Clerk typist (word processing)
 - E Office manager (budget)
 - F Account technician (budget)
 - K Clerk typist (receptionist)
 - (4) Graduate students
 - D, H (computer consultants)
 - (5) Undergraduate work-study students
 - J, N (assistants to the Vice Chancellor's secretary)
 - I, L, M (filing, word processing, and photocopying)
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sized east coast university during the fall of 1986. Table 1 presents a list of those actors and their responsibilities. The offices of the Vice Chancellor (actor A) and of his administrative secretary (B) and her two work-study student assistants (J, N) are on the first floor of the main administration building near the offices of other major administrators. The professional and support staff occupy a cluster of offices on the second floor. Those involved in managing academic budgets (E, F, and G) work closely with each other in the central open area of the office cluster. The other support staff (C, K) and students (D, H, I, L, M) who have offices on this floor also tend to congregate in this area. The other professional staff (P, O) and the actors on the first floor (A, B, J, N) have less contact with this core group.

3. Data collection and transformation

Data were collected from every actor in the office in four types of procedures. Two of these, the triad test and the pile sort task, elicited unconstrained judgements of the similarities among all the actors in the office. In the triad test, informants were asked to judge which of three actors was the most different from the other two. This test used a balanced incomplete block design (Burton and Nerlove 1976) in which each pair of the 16 actors occurred in exactly two triad sets. The total of 80 distinct triads were presented in different random orders to all informants. In the pile sort, informants were asked to sort the names of actors into as many piles as they wished according to which they thought were most similar to one another. Informants were also asked to rank order other actors by their importance as sources of work related advice and again by their importance as sources of advice on important personal matters. For both of these advice rankings, each informant was treated as his or her own best source of advice.

Data on the perceived structure of the group (proximities among actors) were prepared as follows. In the triad test, the number of times a pair of actors was regarded as more similar to each other than to the third actor was summed across all informants. In the pile sort, the number of times a pair of actors was placed in the same pile was summed across all informants. In the work and personal advice rank order tasks, for every pair of informants I and J, I's rank in J's advice ranking is added to J's rank in I's advice ranking, thereby summing

each advice rank matrix with its transpose. In addition, each actor was assigned a status rank of 1 (the vice chancellor) to 5 (undergraduate), as indicated in Table 1. Status proximities were measured as the absolute value of the difference in status rank.

Data on the knowledge shared among informants on the social structure (agreement among actors) were prepared as follows. For triads and pile sort data, interinformant agreement was calculated with the Pearson r between individual similarity matrices. For personal and work advice rank orderings, interinformant agreement was calculated with the Pearson r between individual rank orders.

4. Analysis

4.1. *Social proximity: Perceived structure of the group*

There are a number of possible sources of structure to guide informants' responses to the various tasks we gave them. First, informants could have based their responses on the relative statuses of the actors in the office, since all actors occupied one of five hierarchical ranks in the organization. A second possible basis for informants' responses were the role relationships between actors in the office. There are several types of these relationships: (a) the relationship between actors in the flow of control linking supervisors and subordinates; (b) the relationship between actors in the flow of information linking sources and sinks of work knowledge; and (c) the relationship between actors in the flow of social support linking counselors and the counseled.

The different tasks presented to informants tapped different aspects of the office structure. In the triad test and the pile sort tasks, informants apparently based their judgements of the similarity of actors principally on the basis of the relative statuses of the actors, the first source of structure mentioned above. This is illustrated in the multidimensional scaling of the triad test and pile sort proximity data shown in Figures 1 and 2 respectively. It appears that the two tasks emphasize different distinctions in the office hierarchy. In the triad test, the most important distinction is that between students on the left of the Figure 1, and staff to the right. The distinctions between graduate and undergraduate students and between professional and support staff are not so clear. In contrast, informants' responses to the

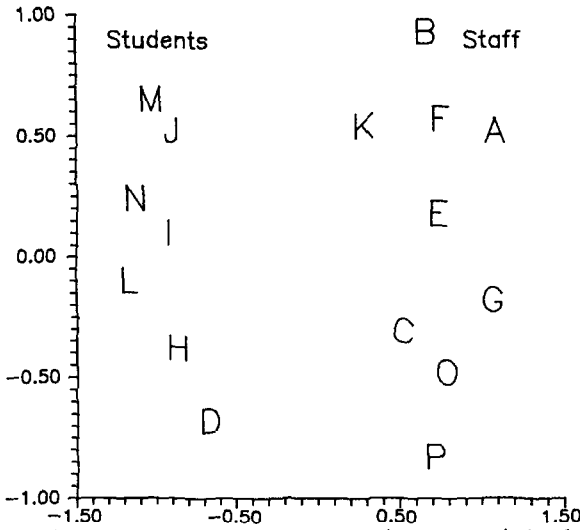


Fig. 1. Multidimensional scaling of the triad test proximity data.

pile sort task not only preserved the distinction between students and staff but also clearly delineated the distinctions among students and among staff, as shown in Figure 2.

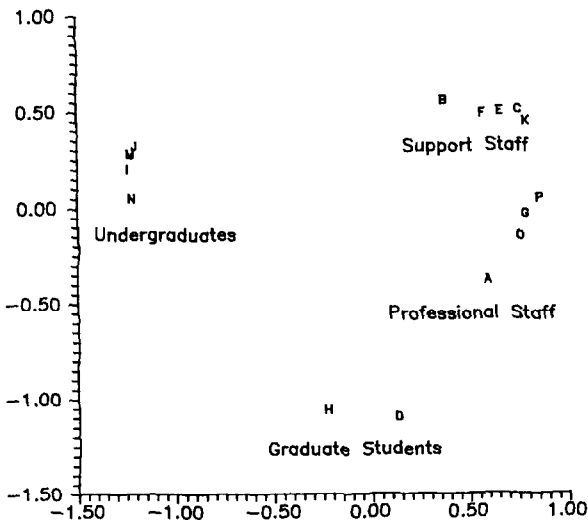


Fig. 2. Multidimensional scaling of the pile sort proximity data.

Informants' work and personal advice rankings appear to reflect the second source of structure, the flow of information and social support through the office. Figure 3 illustrates the flow of information through the office by showing every actor's first choice in seeking work related advice. Figure 4 illustrates the flow of social support through the office by showing every actor's first choice in seeking personal advice. The flows of information and support can be summarized as follows. First, advice tends to circulate at the same rank or flow downhill: students seek advice from support staff, support staff seek advice from other support staff or from professional staff, and professional staff seek advice from other professional staff (with one exception). Second, the two types of advice seeking are highly multiplex, people tend to seek work advice and personal advice from the same sources. However, students are less multiplex than staff, a number of them seek work related advice from E, the office manager, and personal advice from C, the word processor. Actor G, the assistant to the vice chancellor and his 'ear,' serves as the most important source of both work and personal advice for fellow staff members.

The three major points we have made so far concerning the social structure of the office are supported by the pattern of correlations

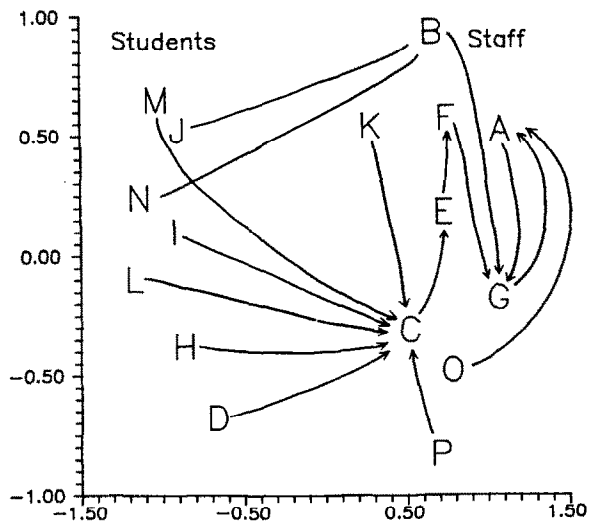


Fig. 3. Actors' first choices in seeking work advice.

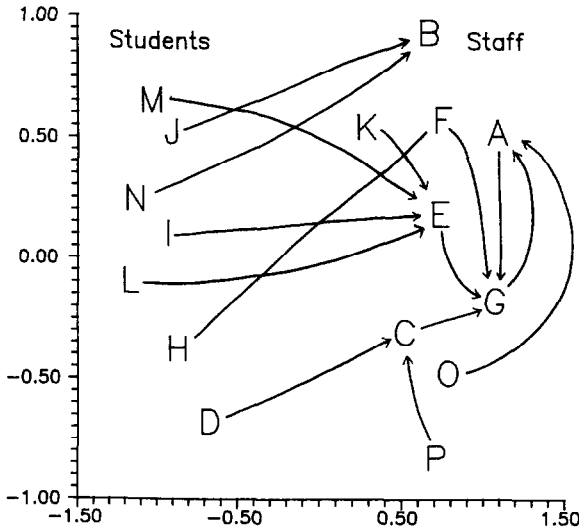


Fig. 4. Actors' first choices in seeking personal advice.

Table 2
Comparison of proximity and agreement measures on four tasks. ^a

Status prox.		8.3**	7.8**	6.6**	4.2**	1.9*	1.1	7.3**	3.4**
Triad prox.	0.78		8.3**	6.8**	4.8**	1.5	0.4	7.1**	4.4**
Pile prox.	0.73	0.78		6.1**	3.8**	0.6	0.6	6.5**	3.2**
Person prox.	0.59	0.60	0.54		7.9**	2.3*	1.1	8.1**	5.7**
Work prox.	0.37	0.39	0.32	0.80		2.4**	1.3	6.1**	6.2**
Triad agree	0.14	0.09	0.04	0.26	0.35		1.9*	3.7**	3.0**
Pile agree	0.08	0.02	0.04	0.13	0.19	0.42		2.4*	2.6*
Person agree	0.64	0.58	0.55	0.81	0.69	0.51	0.35		5.5**
Work agree	0.28	0.32	0.25	0.61	0.79	0.51	0.47	0.68	
Status prox.		Triad prox.	Pile prox.	Person prox.	Work prox.	Triad agree	Pile agree	Person agree	Work agree

^a This table compares nine symmetric matrices of relationships among the 16 office actors tasks ($N = 120$ pairs). Pearson r is presented below the diagonal, QAP z (Hubert and Schultz 1976) is presented above the diagonal. Monte Carlo simulation, as described by Hubert and Schultz (1976), was used to gauge the extent to which the pairs of matrices were more similar than would be expected by chance. Matrices that are more similar than randomly permuted pairs in 950 or more of 1000 trials are starred with a single asterisk while those that are more similar than randomly permuted pairs in 990 or more of 1000 trials are starred with two asterisks. These correspond to one-tailed probabilities of 0.05 and 0.01 respectively.

among the proximity matrices, as shown in Table 2. First, the triad test and the pile sort proximities correlate highly with each other ($r = 0.78$) and with status proximities ($0.73 \leq r \leq 0.78$); people appear to be judged similar to each other on the triad test and the pile sort primarily on the basis of similarity of status. Second, the triad test, pile sort, and status proximities correlate moderately highly with personal advice proximities ($0.54 \leq r \leq 0.60$) and less highly with work advice proximities ($0.32 \leq r \leq 0.39$); people tend to seek advice from people of the same (or just higher) status. Third, the work advice and personal advice proximities also correlate highly with one another ($r = 0.80$); the flows of information and social support are highly multiplex.

4.2. Cultural agreement: Shared knowledge of group structure

There appears to be a fairly consistent pattern of sharing of knowledge of the social structure. As shown in Table 2, the correlations among the agreement matrices, are moderately high from task to task ($0.42 \leq r \leq 0.68$), indicating a fair degree of convergence from task to task. In other words, people who agree on one task are likely to agree on the others.

In addition, the responses to the triad test and the pile sort (but not the advice rank orderings) appear to fit the cultural consensus model (Romney et al. 1986). This model is a formalization of the insight that agreement reflects shared knowledge, some individuals know the cultural system better than others (Boster 1985), and hence that individual knowledge levels can be estimated from interinformant agreement. Minimum residual factor analysis was used to check whether the four agreement matrices fit the consensus model. If a matrix fits the model, there should be a single factor solution such that there are no negative scores on the first factor and the first latent root (the largest eigenvalue) should be large in comparison to all other latent roots. The patterns of agreement in triad test and the pile sort apparently fit the model: there are no negative scores on the first factors, and the first latent roots are 6.7 and 10.2 times larger than the next largest latent roots. However, the patterns of agreement on the personal advice and work advice rank responses apparently do not fit the model: there are negative scores on the first factors (4 and 2) and the first latent roots are only than 2.3 and 2.5 times larger than the next largest latent roots. This is intuitively reasonable: while one might expect a consensual answer to who is most similar to each other, it is less reasonable to

expect a consensual answer to whom to seek advice from, since advice is a preference order rather than a statement of the way the world is. In short, the patterns of agreement that on logical grounds should fit the cultural consensus model do fit it and those that on logical grounds should not fit the cultural consensus model do not.

Furthermore, competence (knowledge level as indicated by the cultural consensus model) is correlated with status in both the triad test ($r = 0.66$) and the pile sort ($r = 0.52$) and competence in the triad test is correlated with competence in the pile sort ($r = 0.47$). In other words, individuals with high status tend to agree more often with others on both similarity judgement tasks than do individuals with low status. This point is also evident in an inspection of the rank order of actors by competence. The actor with the highest competence is a graduate student in Sociology who had completed a social network study of the office. The fact that he is closest to the group consensus can be interpreted as an indication that social scientists do indeed learn something about group culture. The other actors with the highest competency on these tests are all professional staff and support staff. At intermediate levels of competence are the rest of the professional and support staff with a few students, while undergraduates predominate at the lowest level of competence.

4.3. Culture and society: The relationship of agreement and proximity

Finally we come to the key question of the relationship of cultural sharing to social structure. One might expect the individuals who are perceived as similar would interact with each other more frequently and share knowledge to a greater extent than people who are judged as dissimilar. In other words, one might expect that the judged similarity of people would have some bearing on the pattern of distribution of knowledge. As seen by examining the correlations between the agreement and the proximity matrices in Table 2, this expectation is not borne out. There is very little relationship between agreement and proximity for the triad test and for the pile sort test ($0.02 \leq r \leq 0.09$). The correlations between pile sort agreement and proximity on the advice rankings are also negligible ($0.13 \leq r \leq 0.19$), while the correlations between triad agreement and proximity on the advice rankings are modest but significant ($0.26 \leq r \leq 0.35$). The strongest relationships in the table are the correlations between personal advice rank agree-

ment and the proximity matrices. Individuals who chose similar sets of other actors as sources of personal advice tend to be perceived as similar ($0.55 \leq r \leq 0.58$) and have similar statuses ($r = 0.64$). The correlations between work advice rank agreement and the triad and pile sort proximity matrices are weak but still significant: individuals who chose similar sets of other actors as sources of work advice also tend to be perceived as slightly more similar ($0.25 \leq r \leq 0.32$) and have slightly more similar statuses ($r = 0.28$). In sum, individuals that are regarded as similar to each other are not necessarily those that agree with one another ($0.02 \leq r \leq 0.09$). However, individuals who seek advice from one another tend to be regarded as similar to one another ($0.32 \leq r \leq 0.60$) and agree with each other slightly more often on the triad test ($0.26 \leq r \leq 0.35$) than those who do not seek advice from one another.

5. Discussion and conclusions

In order to explore the relationship between perceived social similarity and agreement with others in those similarity judgements, we posed three questions: what is the group's social structure?, how is cultural knowledge of the social structure distributed?, and what is the relationship between the sharing of knowledge and the perceived similarity of individuals? In answer to the social question, we found that informants judge the similarities among office actors in both the triad test and the pile sort largely on the basis of status; status, triad, and pile sort proximities are all highly correlated. We also found that people seek both work and personal advice from the same sources, usually others at the same or just higher rank as themselves; work and personal advice proximities are highly correlated with each other and are moderately correlated with status, triad, and pile proximities. In answer to the cultural question, we found that differential knowledge of social proximities is correlated with status; high ranking individuals are closer to the cultural consensus on the similarities among the office actors than low ranked individuals. Finally, in answer to the integrative question, we found that the judged similarities among individuals are largely unrelated to the agreement among individuals on the triad test and the pile sort. Although the high-ranking individuals do agree quite highly with one another, low ranking individuals (e.g., undergraduates) do not have an alternative model of the social structure. This greatly weakens

the relationship between agreement and proximity. The social network variables (the seeking of personal advice and work advice) lie somewhere between the triad and pile sort proximities and agreement on these same tasks. These social network variables apparently reflect both the statuses of individuals and their role relations as they exchange knowledge and understanding of the social order.

Our overall conclusions from these results is that the proof of the pudding is in the eating. A strong expectation about the outcome of this research was not borne out: individuals who were judged as similar did not agree with each other more often than those who were judged dissimilar. Another important finding was not anticipated: differential knowledge of the social structure is clearly related to rank within the office. However, the proper interpretation of why high status individuals seem to have a better knowledge of the office structure is less clear. There are several possibilities: high status individuals have spent a greater length of time in the office, they probably have greater maturity at gauging social similarities, and their relationships are more multiplex with fewer conflicting bases for a decision. It is also possible that self-interest affects informants' responses; after all, a classification of actors by status flatters those on top but not those on the bottom. It is interesting to note that the high competence individuals are not necessarily those that interacted highly with other group members; actors A and P, who are relatively peripheral to group interactions, had higher competences than actors C, E, and G, who are far more central. This suggests yet another possible interpretation: high competence individuals (A, P) may be those with an optimal amount of information. Those with more information about the interrelations of office actors (the network stars: C, E, and G) have more to distract them from a cultural consensus based on status rather than interaction, those with less information (the students: I, J, L, M, N) have not grasped the culturally relevant dimension of difference among office actors and fall even further from the consensus. Given this diversity of interpretations, it appears that before we can make general statements about the relationship of cultural sharing to social structure, much more empirical work must be done.

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