"THE INTERPERSONAL STRUCTURE OF DECISION MAKING: A SOCIAL COMPARISON TO ORGANIZATIONAL CHOICE"

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The Interpersonal Structure of Decision Making: A Social Comparison Approach to Oganizational Choice[1]

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The Interpersonal Structure of Decision Making: A Social Comparison Approach to Organizational Choice

Under what circumstances does social information affect choices? A recent test of social information processing theory showed little effect of anonymous social cues on choices of brief tasks (Kilduff & Regan, 1988). But from the perspective of social comparison theory (Festinger, 1954) people faced with important and ambiguous decisions, such as the choice of an organization to work for, are likely to make their choices in the context of what others perceived to be similar to themselves are doing. For a cohort of MBA students, the relationships between patterns of social ties and patterns of interviews with recruiting organizations were analyzed. The results showed that students who perceived each other as similar, or who considered each other to be personal friends, tended to interview with the same organizations. These correlations remained significant even controlling for similarities in job preferences and similarities in academic concentrations. The research places the individual decision maker in a social context often ignored by normative approaches such as expectancy theory.

That people are influenced in their attitudes and behavior by what other people say and do is a truism of human existence, affirmed by writers throughout recorded history. For example, Adam Smith, declared that "the countenance and behaviour of those [we live] with...is the only looking glass by which we can, in some measure, with the eyes of other people, scrutinize the propriety of our conduct" (quoted in Bryson, 1945, p. 161). Perhaps George Herbert Mead (1934, p. 171) summarized this perspective most succinctly in his remark that the individual only becomes a self "in so far as he can take the attitude of another and act toward himself as others act."

Despite the apparently decisive effects that social comparisons can have on individuals' attitudes and behavior, decision-making research has been generally silent concerning social influences on choices. Both the normative models, such as expected utility theory (e.g., Becker, 1976), and the descriptive models, such as prospect theory (Kahneman & Tversky, 1979), consider individual decision makers in splendid isolation from the force-field of influences that surround them. As a recent survey of social network analysis points out: "In the atomistic perspectives typically assumed by economics and psychology, individual actors are depicted as making choices and acting without regard to the behavior of other actors" (Knoke & Kuklinski, 1982, p. 9).

A good example of scholarly neglect of social influences on behavior occurs in the area of organizational choice. The study of the process by which individuals choose organizations to work for has been dominated by an expectancy theory approach that has spent "two decades worth of research debating the question of multiplicative versus

additive model usage" (Rynes & Lawler, 1983, p. 633; for reviews of organizational choice research see: Schwab, Rynes, & Aldag, 1987; Wanous, Keon, & Latack, 1983). The research described in this paper complements expectancy theory's exclusive focus on the individual decision maker by analyzing how the social context influences peoples' choices of organizations. The research is notable in that it focuses on the freely-chosen behaviors of a cohort of graduating MBAs for whom the organizational choice decision is both ambiguous and crucially important.

Within the framework of social comparison theory (Festinger, 1954), the research used new developments in social network analysis to study the search behavior of a class of MBAs over a five month period. The behavioral dependent variable consisted of student bids for job interviews with recruiting organizations. The focus on actual behavior differs from previous studies that have relied on self-reports for both dependent and independent variables (e.g., Tom, 1971; Vroom, 1966). The study was designed to enrich the model of solitary decision makers that has dominated the investigation of organizational choice for over twenty years.

The study builds directly on previous work that raised the question: under what conditions might social cues be expected to produce long-lasting main effects on behavior (Kilduff & Regan, 1988)? The present research seeks to test the prediction that freely chosen behaviors will be significantly influenced by information provided through interpersonal networks. In looking at how real decisions about

future employment are made, the research tries to answer the question: under what conditions does social information matter?

Social Comparison Theory and Organizational Choice

Although studies of social influences on organizational choice are virtually non-existent we do know that people generally acquire information about jobs through their informal networks of friends, family, and acquaintances rather than through official sources such as advertisements or employment offices (Granovetter, 1974; Reynolds, 1951; Schwab, 1982; Schwab, Rynes, & Aldag, 1987, pp. 135-138). It would seem likely, therefore, that people rely on these same networks for help in evaluating potential employers.

The present research uses social comparison theory as a framework to study the effects of social networks on the organizational choice process. According to Festinger's (1954) formulation of social comparison theory: 1) human beings learn about themselves by comparing themselves to others; 2) they choose similar others with whom to compare; and 3) social comparisons will have strong effects when no objective non-social basis of comparison is available, and when the opinion is very important to the individual (see Goethals & Darley, 1987, for a recent review of social comparison research).

Most tests of social comparison theory have been laboratory experiments (e.g., Latane, 1966; Suls & Miller, 1977). Such research has generally neglected "the larger social context in which the social comparison process operates" (Pettigrew, 1967, p. 248). A recent survey of research reported that, "we are just beginning to study how SE

[social evaluation] works in the context of real-world social networks" (Gartrell, 1987, p. 61).

One of the reasons for the relative absence of real world social network research within the framework of social comparison theory has been the lack of appropriate statistical procedures. When relations between people are the unit of analysis, the observations become systematically intercorrelated. Most standard techniques, such as least squares analysis of variance, assume independent observations. Recently, social network statisticians have developed non-parametric significance tests for the analysis of structurally autocorrelated data (e.g., Baker & Hubert, 1981; Krackhardt, 1987b).

These are powerful techniques for the testing of hypotheses drawn from social comparison theory, as Gartrell (1987) has recently pointed out. The question remains: why is social comparison theory a useful framework within which to study the organizational choices of MBA students?

The answer is that social comparison processes, concerning both academic and social prowess, are intense for MBAs at prestigious schools of business. These students are in transition between their previous careers as engineers, waitpersons, students, etc., and their new careers as executives. They spend two years constructing new identities for themselves through continuous socialization by peers drawing on the culture of the business school (cf. Van Maanen, 1983). During these two years, many students are relatively isolated from their families and previous social contacts. Further, the ambiguity of the organizational choice decision itself in the absence of any clear-cut scale on which to

compare organizations, together with the importance of the decision in terms of future career success, makes organizational choice one more arena in which social comparisons can be expected to operate. The student's second year in the MBA program is dominated by the question: which organization should I join? The organizational choice decision is the culmination of two years of social and academic training.

For these reasons -- the intense socialization pressures, the openness to social influences during identity reconstruction, the nature of the choice decision -- we can expect social comparisons to significantly influence choices. As Festinger's theory would predict, the critically important and ambiguous organizational choice decision is likely to trigger the search for social information that will help evaluate the alternatives and reduce uncertainty.

Hypotheses

Friends and Organizational Choices

Much research has focused on social influence processes between friends and acquaintances (e.g., Coleman, Katz, & Menzel, 1966; Festinger, Schachter, & Back, 1950; Granovetter, 1974; Krackhardt & Porter, 1985; Newcomb, Koenig, Flacks, & Warwick, 1967). From a social comparison perspective, friends are readily available as comparison others. People are hypothesized to shape their opinions and decisions through direct discussion with these important members of their social circle.

Hypothesis 1. Compared to pairs who are not friends, pairs who are friends will have similar patterns of organizational choices.

Structural Equivalence and Organizational Choices

A perspective that disputes the relevance of friendship to social comparison has focused on comparisons between people who occupy similar positions in the social network (e.g., Lorrain & White, 1971). These individuals are competing with each other to maintain and enhance their social positions. They are therefore keen to adopt attitudes and behaviors that they see their rivals using successfully. Those who are structurally equivalent in the network are hypothesized to "put themselves in one another's roles as they form an opinion" (Burt, 1983, p. 272). Influence proceeds through symbolic communication between these equivalent actors.

The structural equivalence perspective, then, denies that direct social interaction between competing individuals is relevant to the process of opinion or behavior conformity. In structural equivalence research, those individuals who have the same, or similar, relations with other individuals are considered equivalent, whether or not they interact with each other (Burt, 1987). As Knoke and Kuklinski (1982, p. 60) point out, "structural equivalence procedures for partitioning a set of network actors do not require any members of the equivalent subset to maintain relations with each other."

Hypothesis 2. Compared with those pairs of individuals who are less structurally equivalent, those pairs of individuals who are more structurally equivalent will have more similar patterns of bidding behavior.

Perceived Similarity and Organizational Choices

Some structural equivalence research explicitly assumes that individuals identified by the researcher as equivalent perceive each other as such. As Burt (1982, p. 178) has asserted: "[An actor's] evaluation is affected by other actors to the extent that he perceives them to be socially similar to himself." This assumption has proved necessary in order to explain how structurally equivalent individuals in a social system influence each other. Interpersonal influence is hard to explain if individuals interact neither personally nor cognitively.

In order to transform objective stimuli into subjective perceptions, Burt uses Stevens' (1957; 1962) law of psychophysics. Perceived similarity is calculated as a power function of objective similarity. But as Krackhardt (1987a, p. 112) has pointed out, the use of a simple translation formula to generate subjective social perceptions from so-called objective stimuli is questionable. There is no evidence that Stevens' law applies outside the domain of physical stimuli such as temperature and weight. The implication is that "those studying cognitive networks should...measure perceptions of networks directly" (Krackhardt, 1987a, p. 113).

The present research, motivated by Festinger's (1954) emphasis on perceived similarity, pioneers the technique of directly asking people to name those they perceive to be especially similar to themselves. Compared with the various operationalizations of the structural equivalence concept (e.g., Breiger, Boorman, & Arabie, 1975; Burt, 1976; White & Reitz, 1983) the direct measure of similarity is closer to the subjective perception emphasized by social comparison theory.

Hypothesis 3. Compared to pairs who don't perceive each other as similar, pairs who do perceive each other as similar will have similar patterns of organizational choices.

Controlling for Alternative Explanations

Job Choice Versus Organizational Choice

In the organizational choice literature, job choice is typically confounded with organizational choice. As a recent review has pointed out (Schwab, Rynes, & Aldag, 1987, pp. 130-131): "most researchers have not made any serious attempts to differentiate the two constructs." The result has been that two very different types of choices have been treated as one. Whereas job choice involves the selection of one type of job rather than another (e.g., product brand management rather than human resources management), organizational choice involves the selection of one organization rather than another (IBM rather than AT&T).

In the present research, the dependent variable was similarity in bids for interviews with organizations. Clearly, in bidding for an interview with an organization a person is also bidding for a particular type of job. For example, two people may both bid for interviews with all organizations that are recruiting in investment banking. Their bidding patterns will be identical because they want the same types of jobs, not because they want to work for the same organizations.

Fortunately, in the present research, it was possible to control for the effects of similarities in job preferences. Extensive information on the job preferences of all individuals was collected prior to the beginning of the recruiting season (these data are more

fully described in the method section below). Thus it was possible to focus on the question: over and above similarities in the kinds of jobs people prefer, is there any evidence of social influences on organizational choices?

Academic Concentration Versus Organizational Choice

Research in friendship formation has shown that individuals select each other initially because of: a) proximity (Festinger, Schachter, & Back, 1950); and b) overlapping personal constructs used to anticipate events (Duck, 1973). MBA students who choose the same academic concentrations are likely to have increased opportunities for interaction (they take the same classes), and are likely to be trained to use similar cognitive frames for making sense of the business world.

Students with the same majors, then, are more likely to become friends (and to see each other as similar) than students with different majors. But students with the same majors are also likely to interview for the same jobs. Two friends may have similar bidding behaviors not because of any interpersonal influence concerning choices of organizations, but because they both happen to be finance majors.

By controlling for the two alternative explanations, the question being posed reduces to: do people who are friends (or who perceive each other as similar) but who have different majors and different job preferences make similar organizational choices? This question is posed more formally in the different parts of hypothesis 4 below.

Hypothesis 4a. Compared to pairs who are not friends, pairs who are friends will have similar patterns of organizational choices, even controlling for similarities in job preferences and academic concentrations.

Hypothesis 4b. Compared with those pairs of individuals who are less structurally equivalent, those pairs of individuals who are more structurally equivalent will have more similar patterns of bidding behavior, even controlling for similarities in job preferences and academic concentrations.

Hypothesis 4c. Compared to pairs who don't perceive each other as similar, pairs who do perceive each other as similar will have similar patterns of organizational choices, even controlling for similarities in job preferences and academic concentrations.

Method

Sample

The sample consisted of a class of 209 second-year MBA students at Cornell University and excluded non-residents who were ineligible to work in the United States. The average age of respondents was 27, and 70 per cent were male. Eighty-seven per cent of the sample completed mail questionnaires. Demographic factors had no apparent effect on how long people took to return questionnaires, or whether they returned questionnaires at all. In an analysis of variance, with time of response as the dummy dependent variable, there were no significant effects of gender, age, academic concentration, or amount of full-time work experience. (Non-respondents were coded as a separate response group in this analysis.) Of the 181 people who completed

questionnaires, 11 people either did not participate in the bidding (7 people) or were excluded because they were foreign exchange students (4 people). Both questionnaire and behavioral data were available for a total of 170 people, or 81 per cent of the original sample.

The MBA Bidding Process

Organizational choice in the present study was operationalized as those organizations students tried to interview with over the five month recruiting period. The business school used a computerized bidding system under which each student could spend a total of 1300 points bidding for interviews with the 119 organizations that recruited at the school. In general, those students who made the highest bids for particular interview slots were automatically selected. The bidding data were sensitive to student preferences over a five month period, and the collection of the data was unobtrusive. Thus it was possible to monitor the behavioral preferences of subjects, and to compare, for example, the degree of bidding overlap between pairs of friends compared to pairs of non-friends. (For more details of the bidding system, see Kilduff, 1988).

Measures

Independent Variables

Friendship and perceived similarity. Friendship was measured by asking subjects to look carefully down a list of second-year MBAs and place checks next to the names of people they considered to be personal friends. Subjects were also asked to look carefully down a list of second-year MBAs and place checks next to the names of people they considered to be especially similar to themselves. A pair of

individuals was considered to be a friendship pair (or a similar pair) if at least one member of the pair nominated the other member as a friend (or as a similar).

Social comparison theory stresses the importance of the individual's own perception of similarity. Therefore, the sociometric questions allowed individuals to nominate choices on the basis of personal definitions of friendship and similarity rather than on the basis of researcher-imposed constructs (c.f. Kelly, 1955). For example, the directions for nominating similar others were as follows:

> For each of us, there are people whom we regard as similar to ourselves and people whom we regard as dissimilar to ourselves. Please look carefully through the names of the MBAIIs below, and check the name of each individual who you think is especially similar to yourself.

The friendship and perceived similarity data were arranged into matrices of size 170 x 170, with cell entries of '0' or '1'. For example, a '1' in a cell formed by the intersection of row 110 and column 83 in the friendship matrix meant that person 110 had nominated person 83 as a personal friend. The matrices were then symmetrized using the rule that, if either member of a pair nominated the other, then the pair was considered to be a friendship pair (or a similar pair).

Structural equivalence. Structural equivalence was operationalized as the similarity in patterns of relations with other individuals in the friendship network. Thus, a pair of individuals who had exactly the

same ties to other individuals (even though they had no ties to each other) would have a score of zero, indicating no difference in their structural positions. A pair of individuals who had very different ties to other actors in the system would have a large difference score.

The difference scores were calculated as continuous measures in a Euclidean social space using the following formula (taken from Knoke & Kuklinski, 1982, p. 61), where the distance between actors d_{ij} and d_{ji} equals the square root of the sum of squared differences across all third actors q:

$$d_{ij} = d_{ji} = \left[\sum_{q=1}^{N} (Z_{iq} - Z_{jq})^2 + (Z_{qi} - Z_{qj})^2 \right]^{1/2}$$

The difference scores were calculated with input from the matrix of friendship ties, and were arranged in a Euclidean distance matrix of size 170 x 170. The score in any particular cell indicated how dissimilar the pair of individuals were with respect to their relations with others. (Direct ties between the two individuals were ignored in order to get a pure measure of Euclidean distance: see the discussion in Knoke & Kuklinski, 1982, pp. 60-69.) Thus a large score indicated that the two individuals were friends with different people, whereas a score of zero indicated that they were friends with the same people.

Control Variables

Any observed effects of friendship, similarity, and structural equivalence on bidding similarity might be due not to social influences

but to either overlapping job preferences or overlapping academic concentrations. Fortunately, information on preferences and majors was collected as part of the placement process at the business school.

For each individual it was possible to construct a vector of job preferences composed of zeros and ones, indicating, for each of 16 job categories, whether or not the student had shown a preference for that type of job. A job preference correlation matrix was created by calculating the Pearson correlation coefficients between the vectors of all pairs of individuals. This matrix contained information on how similar pairs of individuals were with respect to their job preferences.

In order to create a matrix that would show which pairs of individuals had the same majors, a list of seven categories of MBA majors was derived from the academic concentrations claimed on student resumes. The MBA students overwhelming chose two majors: finance (chosen by 56 per cent), and marketing (chosen by 26 per cent). In the few cases where it was impossible to identify an academic concentration from the available evidence, the students were categorized under miscellaneous.

For each student, then, it was possible to allocate a number from 1 to 7 indicating the focus of his or her studies. A majors similarity matrix was then created, of size 170 x 170, with cell entries of one indicating that two individuals had the same major, and cell entries of zero indicating that the two had different majors. This matrix was used to control for similarity in academic concentration in the regression analyses.

Analyses

Multiple Regression and the Quadratic Assignment Procedure (QAP)

The basic analysis can be expressed as a multiple regression equation with five regressors and one dependent variable, where **Y** is the bidding correlation matrix, **Pref** the preference correlation matrix, **Maj** the majors similarity matrix, **Euc** the Euclidean distance matrix, **Sim** the perceived similarity matrix, **Fr** the friendship matrix, and ε the matrix of error terms:

$$Y = \beta_0 + \beta_1(Pref) + \beta_2(Maj) + \beta_3(Euc) + \beta_4(Sim) + \beta_5(Fr) + \varepsilon$$

Ordinary least squares (OLS) analysis is not appropriate for these data because the error terms are autocorrelated within rows and columns. The OLS procedure requires that the observations be independent, whereas observations concerning all possible pairs in a social network exhibit systematic dependence. A solution to the problem of how to test the significance of the βs in a multiple regression equation when the data are structurally autocorrelated has been demonstrated by Krackhardt (in press) and will be followed here.

Step 1: Multiple regression. The procedure will be illustrated by showing how the significance of the β for the friendship matrix was calculated. In the first step two multiple regressions were calculated, with bidding similarity (Y) and friendship (X_5) as the dependent variables, and job preferences (X_1), majors (X_2), Euclidean distance (X_3), and perceived similarity (X_4) as the independent variables.

$$Y = \beta_0 + \beta_1(X_1) + \beta_2(X_2) + \beta_3(X_3) + \beta_4(X_4) + \varepsilon$$

$$X_5 = \beta_0 + \beta_1(X_1) + \beta_2(X_2) + \beta_3(X_3) + \beta_4(X_4) + \varepsilon$$

Step 2: Calculate residuals. The second step involved calculating the residuals, that is, the variance in Y and X_5 not explained by the regressors X_1, X_2, X_3, and X_4. The predicted value Y_{1234} was subtracted from the observed value Y. Similarly, the predicted value $X_{5.1234}$ was subtracted from the observed value of X_5.

$$Y^*_{1234} = Y - Y_{1234}$$

$$X^*_{5.1234} = X_5 - X_{5.1234}$$

Step 3: Calculate beta between matrices of residuals. In the third step, the simple regression coefficient between the two matrices of residuals Y^*_{1234} and $X^*_{5.1234}$ was calculated. As Krackhardt (in press) has pointed out, this coefficient β^*_5 will always be exactly the same as the β_5 in the multiple regression model above.

Step 4: Test significance of beta using QAP. Once the β between the two matrices of residuals was calculated, the Quadratic Assignment Procedure (QAP) was used to assess whether or not this β was

significant. The QAP procedure provided a nonparametric test of whether the two matrices were significantly related. This test was designed to deal with dyadic observations that are systematically interdependent (see Baker & Hubert, 1981; Hubert & Golledge, 1981; Hubert & Schultz, 1976; Krackhardt, 1987b).

Krackhardt (in press) has shown that each β in the multiple regression can be calculated as the simple regression between the residuals on Y and the residuals on the appropriate X variable. For each β thus calculated, the QAP test can assess its significance. This method, then, allows the researcher to conduct a hierarchical multiple regression analysis, introducing each of the independent variables one at a time, and controlling for spurious effects.

Insert Table 1 about here

Summary of Research Variables

This section has described the two main sources of data for this study, how the research variables were measured, and how the results were analyzed. An overview of the research is provided in Table 1. Briefly, the computerized bidding system provided the raw data from which it was possible to calculate how closely each person's bidding behavior overlapped with every other person's. The pair-wise bidding correlation was the dependent variable of the research. Information concerning the independent variables (friendship links, perceived similarity, and structural equivalence relationships) was derived from

questionnaire responses. Because the research was relationship rather than attribute centered, the significance of the unstandardized regression coefficients was assessed by the Quadratic Assignment Procedure, a nonparametric test specifically designed for systematically interdependent data.

Results

There are four main questions which this research tries to answer. First, did pairs of friends tend to bid for interviews with the same organizations? Second, did pairs who perceived each other as similar tend to bid for interviews with the same organizations? The third question asks whether structurally equivalent pairs tended to choose the same interviews: did those pairs with similar patterns of friendships tend to bid for interviews with the same organizations? Finally, which of these independent variables -- friendship, perceived similarity, structural equivalence -- was most important as a predictor of bidding correlations?

In testing these hypotheses, two alternative explanations for the results were considered. First, the job choice explanation: in bidding for interviews with organizations, people were also bidding for particular types of jobs: investment banking, marketing, etc. Their preferences for 16 types of jobs were therefore controlled for in the multiple regression analysis presented here. The second alternative explanation focuses on academic concentrations in the MBA program: perhaps those individuals in the same academic fields -- finance, operations management, etc., -- tended to bid for the same interviews.

Again, the effects of this variable were statistically controlled for in the multiple regression context.

Descriptive Statistics

As Table 2 shows, the median number of friends chosen was 13, compared to a median of 3 chosen as especially similar, with each student choosing from 169 possible names. The social networks were, then, quite sparse. Table 2 also shows that the mean number of organizations bid for was 19.66 (out of 119 available). The mean number of successful bids (those that resulted in interviews) was 16. The 84 per cent success rate indicates that the bidding system was not characterized by cut-throat competition. There was little apparent

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Insert Table 2 about here

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incentive, in fact, for friends to collude in spreading their bids among different organizations.

Table 3 shows that, comparing mean correlations, people's job preferences were over twice as similar (r=.181) as their bidding behavior (r=.076). The base rate for bidding similarity was, then, quite low. In fact, the median bidding correlation between pairs of individuals was only .042. The next section looks at the effects of the independent variables on bidding correlations.

Insert Table 3 about here

Tests of Hypotheses 1, 2, and 3

Were friends, relative to non-friends, more similar in their patterns of bidding behavior, as suggested by the first hypothesis? The answer is yes, as column 3 in Table 4 shows. The correlation between the friendship matrix and the bidding correlation matrix was highly significant ($Z=11.59$, $p<.0001$, 2-tailed).

Insert Table 4 about here

Hypothesis three predicted that, relative to non-similars, those who perceived each other as similar would tend to bid for the same interviews. This hypothesis was also strongly supported: the correlation between the perceived similarity matrix and the bidding correlation matrix was highly significant, as column 4 in row 1 of Table 4 shows ($Z=13.05$, $p<.0001$, 2-tailed).

Structural equivalence, however, appeared to be unrelated to bidding behavior. Contrary to the prediction in hypothesis two, those individuals who were friends with the same other people were no more alike in their patterns of bids than those individuals who were friends with different people ($Z=-0.08$, ns).

The results, then, of the significance tests shown in Table 4 offer strong support for hypotheses one and three: friends, compared to non-friends, and similars, compared to non-similars, tended to bid for interviews with the same organizations.

One of the questions raised by the relatively high correlation of .33 between friendship and perceived similarity in Table 4 is: are

friendship and perceived similarity different constructs, or are they alternative measures of the same sociometric tie? To answer this question satisfactorily, however, requires a multiple regression analysis in which the unique effects of each variable can be determined. The multiple regression approach is further necessitated by the strong support Table 4 reveals for some alternative explanations of the results attributed to friendship and perceived similarity. Those individuals who had similar job preferences, or who had the same majors, tended to bid for the same organizations. These tendencies were quite strong. The correlation between similarity of preferences and bidding similarity was .40 ($Z=32.08$, $p<.0001$, 2-tailed), whereas the correlation between overlapping majors and bidding similarity was .35 ($Z=23.43$, $p<.0001$, 2-tailed).

The control variables, then, were the most powerful predictors of bidding similarity. The question arises, were friendship patterns and perceived similarity perceptions significantly correlated with bidding similarity, even controlling for the effects of the control variables, as suggested by hypothesis four? To answer these questions a hierarchical multiple regression analysis was performed in which it was possible to assess the significance of each variable while controlling for the effects of other variables.

Multiple Regression Analysis of Hypothesis 4

Hypothesis four predicted significant main effects of friendship, structural equivalence, and perceived similarity on bidding similarity, controlling for similarities in job preferences and MBA majors. The

results of a hierarchical multiple regression analysis of this hypothesis are presented in Table 5.

These results confirm the pattern revealed by the bivariate tests. Friends tended to bid for the same organizations, and those who perceived each other as similar tended to bid for the same organizations. Further, there was no support for the prediction that

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Insert Table 5 about here

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those who were more structurally equivalent would have more similar patterns of bidding behavior.

The first model in Table 5 confirms that those who had either similar job preferences or similar majors tended to bid for the same organizations. The Z scores for preferences (Z=19.119) and majors (Z=11.371) indicate strongly significant relationships between bidding similarity and both similarity of preferences and similarity of majors ($p < .0001$). The control variables, then, were good predictors of overlapping patterns of bidding among the MBA cohort, confirming the pattern uncovered by the bivariate analyses. How well did the independent variables do in predicting similarities in bidding beyond what might be expected from a knowledge of similarities in job preferences and majors?

The second model in Table 5 shows that, relative to non-similars, those who perceived each other as similar were significantly more likely to bid for interviews with the same organizations, even controlling for similarities in preferences and majors ($Z=8.503$, $p < .0001$). Friends,

too, had similar patterns of bids, relative to non-friends, even when the control variables were included in the analysis ($Z=5.787$, $p < .0001$) as model 3 shows. Model 4, however, indicates that structural equivalence failed to predict bidding similarity when the control variables were included in the regression ($Z=-0.856$, ns), replicating the finding from the bivariate analysis. Apparently, pairs who had similar patterns of friendship ties were not significantly more similar in their choices of organizations than pairs who had different patterns of friendship ties.

Model 5 shows that friendship ($p<.0001$) and perceived similarity ($p<.0001$) remained significant when all three independent variables plus the two control variables were entered into the regression simultaneously (2-tailed test). In other words, friendship and perceived similarity had independent main effects on bidding similarity. This was true despite the fact that friendship choices and choices of similar others were significantly intercorrelated.

Because friendship and perceived similarity were measured on the same zero/one metric (i.e., a pair were either friends or not, either similar or not), the unstandardized beta weights could be directly compared as measures of how important the variables were in predicting bidding similarity (Krackhardt, in press). As model 5 in Table 5 shows, the β for similarity (0.047) was more than twice as large as the β for friendship (0.021). Therefore, in trying to predict bidding similarity, knowing which pairs of individuals perceived each other as similar was more than twice as useful as knowing which pairs of individuals were friends.

Model 5 in Table 5 also shows that structural equivalence remained insignificant in the full model (Z=-1.026, ns). The negative sign of the beta coefficient indicates that the relationship, although insignificant, was in the predicted direction: those pairs with large Euclidean distance scores (because the individuals were connected to very different sets of friends) were less similar in their bidding behavior than those pairs with small Euclidean distance scores (who tended to have the same friends).

Summary of Results of Multiple Regression Analysis

The tests of hypothesis 4 indicated, as expected, that people with similar job preferences and similar academic concentrations tended to choose the same organizations with which to interview. More interesting is the finding that individuals who perceived each other as similar members of the MBA cohort tried to interview with the same organizations. This result remained significant even controlling for the powerful effects of overlapping job preferences and academic concentrations. Further, the perceived similarity effect was independent of and considerably more significant than the effect of friendship. Finally, structural equivalence, which is often used as a measure of perceived similarity, failed to predict bidding similarity, although the effect was in the expected direction.

Discussion

The results indicate strong support for the predictions of social comparison theory. As predicted, friends made similar organizational choices, and those perceived as similar made similar choices. The significance tests remained highly significant even controlling for both

similarities in academic concentrations, and similarities in job preferences over a large range of different job categories.

One of the surprises of this research was the failure of structural equivalence to predict patterns of homogeneity in bidding behavior. The ineffectiveness of the structural equivalence explanation stands in contrast to recent work showing the marked superiority of structural equivalence over explanations based on friendship and acquaintainceship ties (Burt, 1987). The general argument made in favor of structural equivalence has been that the perception of similarity is crucial to the diffusion of influence, and that perceived similarity may have little to do with direct social interaction. This general argument is certainly supported by the present research, but the most effective operationalization of perceived similarity was based on the direct perceptions of the individual, rather than on structural equivalent estimates of relative positions in the friendship network.

The relative superiority of perceived similarity over friendship and structural equivalence must be kept in perspective. The best predictors of bidding homogeneity were not the sociometric variables, but job preference similarity and similarity of majors. In this research, the social influence variables operated on the margins of choices, perhaps determining which organizations, of those offering the particular jobs the students were interested in, would be selected for bids.

This rather peripheral role of social influences should not, however, lead us to dismiss them as unimportant. This research has examined social influences only at the very end of a long decision process. The same kind of analysis could be applied to the actual

choices of job preferences and MBA majors. These previous choices restrict the extent to which later choices can be influenced by social or other forces. But these previous choices may themselves have been influenced by friends, rivals, and family.

Research Implications

Unprogrammed Decision Making

Organizational choice was selected by Soelberg (1967) as a paradigmatic example of the kind of unprogrammed, non-routine decision-making that is so little understood and yet which "forms the basis for allocating billions of dollars worth of resources in our economy every year" (1967, p. 20). Whereas routine decision making, such as the management of inventories, production schedules, and mark-up pricing, has been successfully simulated on computer programs, strategic decision making, involving mergers, the purchase of new equipment, and the development of new products, continues to defy simple modelling.

Rather than join the search for programs to simulate such complexity (cf. Mintzberg, Raisinghani, & Theoret, 1976), the research described here has looked at the process of social comparison by which decision makers may reduce complexity. Previous research has suggested that, in making complex and ambiguous decisions, people rely on social information (Pfeffer, Salancik, & Leblebici, 1976, p. 228), but how this social information is diffused has remained obscure in the absence of data matching patterns of decisions with patterns of influences. One contribution of the present research has been to test three competing explanations for the observed effects of social influences on decision making (friendship, perceived similarity, and structural equivalence)

and to provide support for both a social interaction explanation based on friendship, and a symbolic interaction explanation based on perceived similarity.

Insert Figure 1 about here

Figure 1 provides an overview of how the present research can dovetail with previous work that has focused on individual decision makers. Typically research within the expectancy paradigm treats the question of how people come to acquire decision criteria and perceptions of organizations as irrelevant (e.g., Vroom, 1966, p.213). The present research suggests that the choice of criteria and decision alternatives can be influenced by friends and similar others. A large number of interviewing organizations may be whittled down to a more managaeable choice set, and evaluated on one or two dimensions, on the basis of what others in the social network are saying and doing, rather than on the basis of exhaustive library research into the advantages and disadvantages of each possible company.

The selection of viable alternatives has long been recognized as one of the most difficult steps in decision making (Gordon, Miller, & Mintzberg, 1975, p. 12). Optimal policies for choosing among complex alternatives demand involved computations that exceed the abilities of most decision makers (Shepard, 1964; Slovic & Lichtenstein, 1971). Instead of performing the complex calculations suggested by normative theories of choice such as expectancy theory and subjective utility theory, people may use a social similarity matching heuristic of the

form: She is similar to me; She likes IBM; Therefore I will probably like IBM. This simple rule of thumb -- choose on the basis of what similar others do -- will, in most cases, simplifiy complex decisions by reducing the set of available alternatives to a manageable number.

Social influences can affect not only the selection of alternatives but also the selection of criteria used to justify choices. According to the elimination-by-aspects model (Tversky, 1972), people faced with an important decision choose among alternatives by successively eliminating those possibilities that don't include certain aspects. Clearly, the aspects that are used to eliminate alternatives can be suggested by persuasive others.

Social Information Processing

The present research offers a possible answer to questions posed by a recent test (Kilduff & Regan, 1988) of Salancik and Pfeffer's (1978) social information processing theory. How do we reconcile our intuitive belief that social influences are important determinants of people's actions with the evidence that social information has little effect on choices? What does it mean to claim that people process social information?

The passive connotations of the processing metaphor itself has perhaps led research away from a focus on the active selection of information sources in an environment overflowing with information. The MBA student trying to choose interviews, like the manager trying to allocate resources, is not short of data upon which to base decisions. The Career Services Library alone has information on every organization that recruits on campus. The problem is one of information overload,

rather than information scarcity. The struggle is to simplify the decision making by reducing the amount of information analysis. Friends and similar others, according to the present research, may perform the valuable function of validating and evaluating potential alternatives. The individual, in searching for such evaluative opinions, is an active agent rather than a passive processor.

Research within the processing paradigm has downplayed the significance of task content as a determinant of attitudes and perceptions (e.g., O'Reilly & Caldwell, 1979). But, from the perspective of social comparison theory, the more trivial the content of the task, the less necessity there is to seek comparative information about other people's reactions. The drive for social comparison is unlikely to be triggered by the kinds of relatively unimportant and fleeting tasks used in most tests of the social information processing model (see Thomas & Griffin, 1983, for a review).

Future Research

One of the questions raised by the present research is the exact nature of symbolic social comparison. Can people derive social comparison information by imagining themselves in the roles of similar others with whom they do not interact? How useful is this information in terms of reducing ambiguity and facilitating choice compared with social comparison information from friends?

The research also raises the question of the unintended consequences of action: what happens when social comparisons threaten the validity of one's dearly held beliefs about one's choice of organization, or one's choice of job? What if the information one seeks increases rather than

decreases ambiguity? Does this lead to more intensive information search, in an effort to resolve ambiguity, or does it lead to less information search, in an effort to reduce potential confusion?

Another important unanswered issue concerns the efficient use of information: do social networks promote or hinder the efficient allocation of scarce resources? The data base used for the present research could provide some evidence on this question by looking at whether, for example, friends tended to systematically overbid or underbid in conjunction with each other. A correlation matrix, showing how similar each pair was with respect to deviations from an optimal bidding strategy, could be correlated with the friendship matrix to examine the hypothesis that biases in judgment tend to be validated by the friendship network.

Conclusion

The research reported in this paper supports the conclusion that, even in conditions approaching those of perfect information and equal opportunity, social networks may have considerable influence on freely-chosen behaviors. Going beyond the truism that attitudes and behaviors are socially influenced, this research specifies precise relationships between patterns of social ties and patterns of behavior. In a world in which the excess of information has become a burden to be borne rather than a resource to be treasured, the social network may be the primary channel for the diffusion of relevant, timely, and credible advice.

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Table 1

Summary of Research Variables

Variables	Source of Data	Operationalization
DEPENDENT		
Overlapping choices of organizations	Computerized bidding system	For each pair, the correlation between bidding patterns across 119 orgs
INDEPENDENT		
Friendship	Friendship questionnaire	For each pair, whether either person claimed the other as a friend
Structural equivalence	Friendship questionnaire	The Euclidean distance between each pair
Perceived similarity	Perceived similarity questionnaire	For each pair, whether either person claimed the other as similar
CONTROL		
Overlapping job preferences	MBA resume book	For each pair, the correlation across choices of 16 jobs
Overlapping majors	MBA resume book	For each pair, whether the individuals chose the same of 7 majors

Table 2

Summary Statistics for Number of Friends, Number of Similar Others, and Number of Bids

	Max[a]	Median	Mean	Range	S.D.
Similars	169	3	4.46	40	5.21
Friends	169	13	17.49	70	14.50
Bids	119	19	19.66	54	9.72

[a] Maximum number of friends, similars or bids that could be chosen.

Table 3

Means and Standard Deviations of Variables

Variables	Min	Max	Mean	S.D.
Bidding	-0.259	0.789	0.076	0.166
Equivalence	2.449	13.491	8.730	1.668
Friendship	0	1	0.146	0.353
Similarity	0	1	0.047	0.211
Majors	0	1	0.385	0.487
Preferences	-0.540	1	0.181	0.310

Note. The results are based on 28,730 dyadic observations.

[a] Pearson correlations.

[b] Euclidean distance scores.

[c] Each observation was either 0 or 1.

Table 4

Significance of Zero-Order Correlations Among Variables

Variables	1	2	3	4	5	6
1. Bidding						
r	-	-.01	.11	.10	.35	.40
Z	-	-.08	11.59**	13.05**	23.43**	32.08**
2. Equivalence						
r		-	.07	.00	.01	.00
Z		-	2.90*	-0.18	0.34	0.31
3. Friendship						
r			-	.33	.08	.11
Z			-	33.24**	4.67**	7.40**
4. Similarity						
r				-	.04	.07
Z				-	2.93*	6.91**
5. Majors						
r					-	.48
Z					-	22.05**
6. Preferences						
r						-
Z						-

Note. The Z scores were calculated by means of the Quadratic Assignment Procedure (QAP) and are based on 28,730 dyadic observations.

* $p < .005$ (2-tailed)

** $p < .0001$ (2-tailed)

Table 5

Five Multiple Regression Models Predicting Bidding Similarity Showing Unstandardized Beta Coefficients and Z Scores.

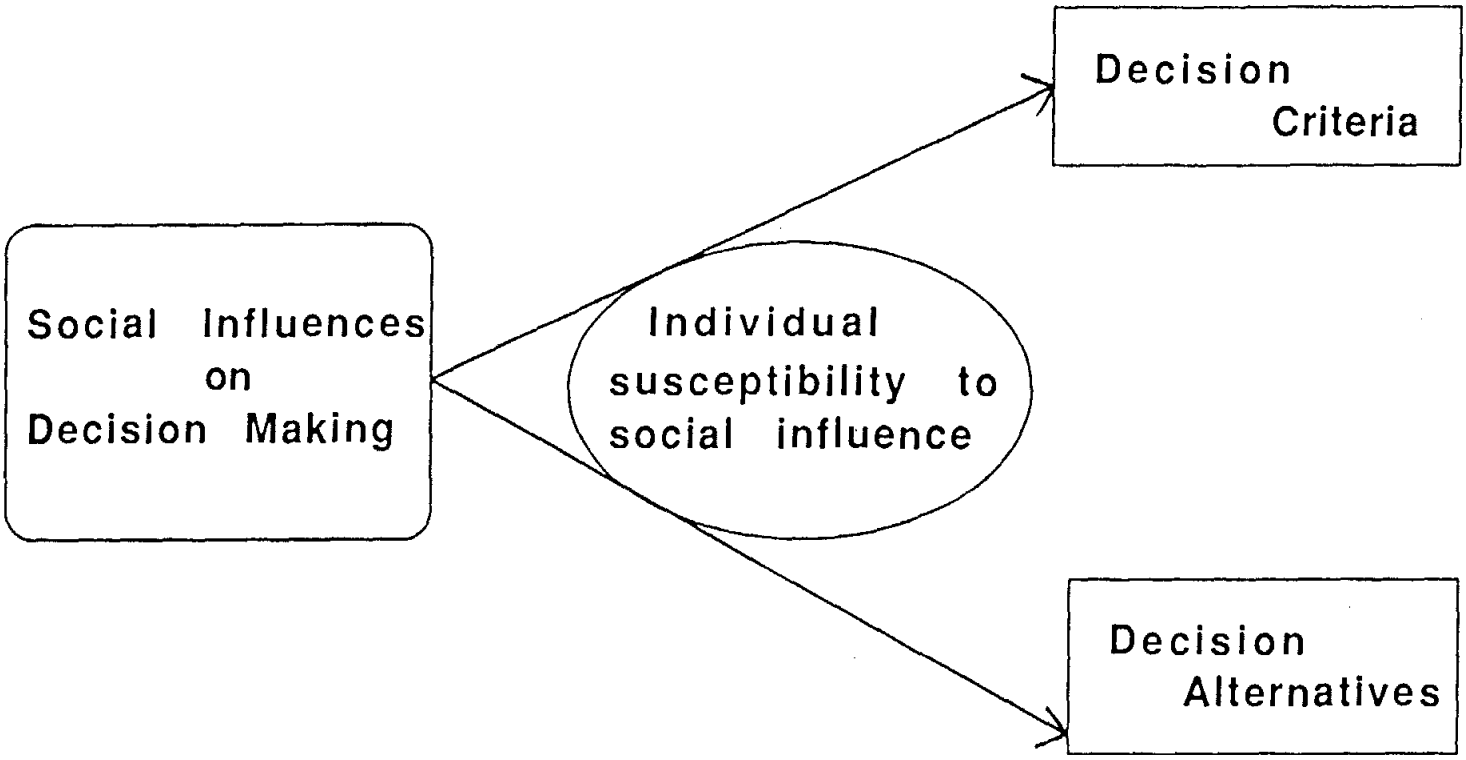
	Models				
Independent Variables	(1)	(2)	(3)	(4)	(5)
Equivalence					
β				-0.002	-0.002
Z				-0.856	-1.026
Friendship					
β			0.030		0.021
Z			5.787*		4.407*
Similarity					
β		0.059			0.047
Z		8.503*			6.675*
Majors					
β	0.072	0.072	0.071	0.072	0.072
Z	11.371*	11.420*	11.286*	11.348*	11.360*
Preferences					
β	0.160	0.157	0.157	0.160	0.156
Z	19.119*	18.895*	18.888*	19.094*	18.722*

Note. The Z scores were calculated by means of the Quadratic Assignment Procedure (QAP).

* $p < .0001$ (2-tailed)

Figure Caption

Figure 1. Model of how social information can influence choice criteria and decision alternatives.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