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*Administrative Science Quarterly*, Vol. 29, No. 4. (Dec., 1984), pp. 499-517.

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*Administrative Science Quarterly* is currently published by Johnson Graduate School of Management, Cornell University.

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# Groups in Context: A Model of Task Group Effectiveness

Deborah L. Gladstein

This study tests a comprehensive model of group effectiveness with 100 sales teams in the communications industry. Results indicate that traditional theories of group effectiveness match the implicit theories of team members. These theories account for 90 percent of the variance in team satisfaction and self-reported effectiveness but none of the variance in the teams' sales performance. The findings suggest that theories of group effectiveness need to be revised to include the way in which teams manage interactions across their boundary and the impact of the organizational context. •

Task groups form a link between the individual and the organization. They function either to accomplish or undermine diverse organizational goals (Newton and Levinson, 1973) and to fulfill or frustrate individual needs not met by the formal organization (Verba, 1978). As task forces, project teams, and quality circles become more prevalent in the corporate world (Huseman, Loge, and Freshley, 1977; Hackman and Oldham, 1980) it becomes increasingly important that we understand the factors that determine high performance and group-member satisfaction (Mills, 1979; Goodman, Atkin, and Ravlin, 1982; Katz, 1983).

Despite this need, research on groups has become relatively dormant (Goodstein and Dovico, 1979). The study presented here is an attempt to meet this need. It was carried out in an organization that wanted to increase team performance and satisfaction in order to better meet increased competition in the environment. Some teams were performing quite well, while others were having problems meeting objectives. Proposals to combat these problems ranged from team building to structural reorganization. The author, working with a team of researchers and consultants, was trying to help top management decide on an intervention by determining which variables were most predictive of team effectiveness.

Simultaneously, this was an opportunity to contribute to the literature on groups by integrating prior research into a comprehensive model and testing its ability to predict ongoing organizational team effectiveness. Integrating prior research entailed pulling together different sets of variables representing the same construct. For example, researchers have examined task and maintenance process behaviors from a variety of perspectives. If task behaviors as defined by theorists of decision making are combined with task behaviors as defined by theorists of boundary spanning, does this larger set of task-process behaviors still relate strongly to itself? Does it still relate more strongly to itself than to a set of maintenance process behaviors and still predict group effectiveness? If not, can the study of one sample organization suggest alternative ways of conceptualizing group process? Similarly, group effectiveness can be represented by performance and satisfaction (see Hackman and Morris, 1975). Do the same set of variables predict both these components of effectiveness?

Differences in group effectiveness cannot be attributed solely to the behaviors used to accomplish the group's task, however. Group members bring different levels of experience to the

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The author would like to thank Susan Ashford, J. Richard Hackman, Nora P. Reilly, and the associate editor and anonymous reviewers at ASQ for their helpful commentary on earlier drafts of this paper.

task and exist in different organizational settings. The model tested here is comprehensive in that it includes variables from different levels of analysis. The model is tested using the LISREL IV structural equation modeling program (Jöreskog and Sörbom, 1980), which goes beyond bivariate studies by testing all relationships simultaneously. The question here is whether process behaviors account for any of the variance in group effectiveness when group composition, group structure, and organization-level variables are also considered.

Finally, the sample in this study consists of ongoing organizational groups rather than the laboratory subjects or sensitivity groups often used in small-group research (Goodstein and Dovico, 1979). Results should help us to discover whether findings found in laboratory experiments or human relations training are generalizable to organizational work teams. Is the supportiveness found in those studies associated with effectiveness in this sample organization? Are task behaviors more important in a context in which task performance is rewarded?

## **MODEL OF TASK GROUP EFFECTIVENESS**

### **Process-effectiveness Relationships**

In the model tested here (see Figure 1, below), group effectiveness is viewed as the major output of small-group behavior. Effectiveness has three components: group performance, satisfaction of group-member needs, and the ability of the group to exist over time (Hackman and Morris, 1975). The model, which is based on an early McGrath (1964) model, predicts that group process leads to effectiveness. Group process is the intragroup and intergroup actions that transform resources into a product. Process behaviors are either maintenance behaviors (Bales, 1958) that "build, strengthen and regulate group life" or task behaviors that enable the group to "solve the objective problem to which the group is committed" (Philp and Dunphy, 1959: 162). Several theoretical schools hypothesize relationships between group process and effectiveness.

The humanistic school has concentrated primarily on maintenance functions in the group. More specifically, this school is characterized by a normative approach that encourages openness and smooth interpersonal relations (Likert, 1961) in order to improve effectiveness. Important variables would include open communication, supportiveness, and a lack of interpersonal conflict (Collins and Guetzkow, 1964; Argyris, 1966; Dyer, 1977; Kiesler, 1978; O'Reilly and Pondy, 1979).

Other theorists have concentrated on task functions in their discussion of group process. Decision theorists have identified behaviors that improve group performance, such as weighting individual inputs according to knowledge and skill and discussing performance strategies for novel problems (Pounds, 1969; Van de Ven, 1974; Hackman, Brousseau, and Weiss, 1976; Hoffman, 1979). Boundary management, the handling of relationships with other groups or individuals who provide inputs or absorb outputs from the group, is another task function that has been stressed as a predictor of effectiveness by open systems theorists (Katz and Kahn, 1978), by those studying boundary spanners (Tushman, 1977; Roberts and

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O'Reilly, 1979), and by those in the Tavistock school who study autonomous work groups (Cummings, 1978a).

It is predicted that groups that exhibit maintenance behaviors, good decision-making skills, and communication with external groups with which they are interdependent will be more effective. The question is whether these relationships will hold when group composition and organizational variables are also considered.

### **Task as a Moderator**

The relationship between group process and effectiveness is not constant, but is thought to vary with the nature of the task to be performed (Roby and Lanzetta, 1958; Hackman and Morris, 1975; Herold, 1980). For example, flexible communication patterns are associated with high-performing groups only when the task is uncertain (Tushman, 1977). Similarly, the discussion by group members of alternative performance strategies relates to performance only when the task is complex (Hackman, Brousseau, and Weiss, 1976). If the task is simple, group members can use standard operating procedures, and discussion of work methods is not necessary.

Tasks can be categorized with the information-processing approach (Lawrence and Lorsch, 1967; Thompson, 1967; Galbraith, 1977). The dimensions identified in this approach are task complexity, task interdependence, and environmental uncertainty. These dimensions determine the information-processing requirements of the task. In order to be effective, the group must have an information-processing capacity that matches the information-processing requirements of its task (Driver and Streufert, 1969; Galbraith, 1973; Tushman and Nadler, 1979). Those process variables that increase information-processing capacity will be more predictive of group effectiveness with complex tasks requiring a high degree of interdependence and in a highly uncertain market than they will with tasks that are simple, requiring little interdependence among group members and in a more certain market. It is predicted that open communication, discussion of performance strategies, and boundary management will increase information-processing capacity.

### **Structure, Process, and Effectiveness**

Group structure is one of the constructs that plays a double role in the model; it influences effectiveness both directly and then indirectly. The indirect link to effectiveness is achieved through the influence of group structure on group process. When individuals are grouped and arranged in a particular way they will behave differently than a group structured in a different way (Becker and Baloff, 1969). For example, groups with clear goals are more likely to communicate openly than groups with unclear goals (Kiesler, 1978).

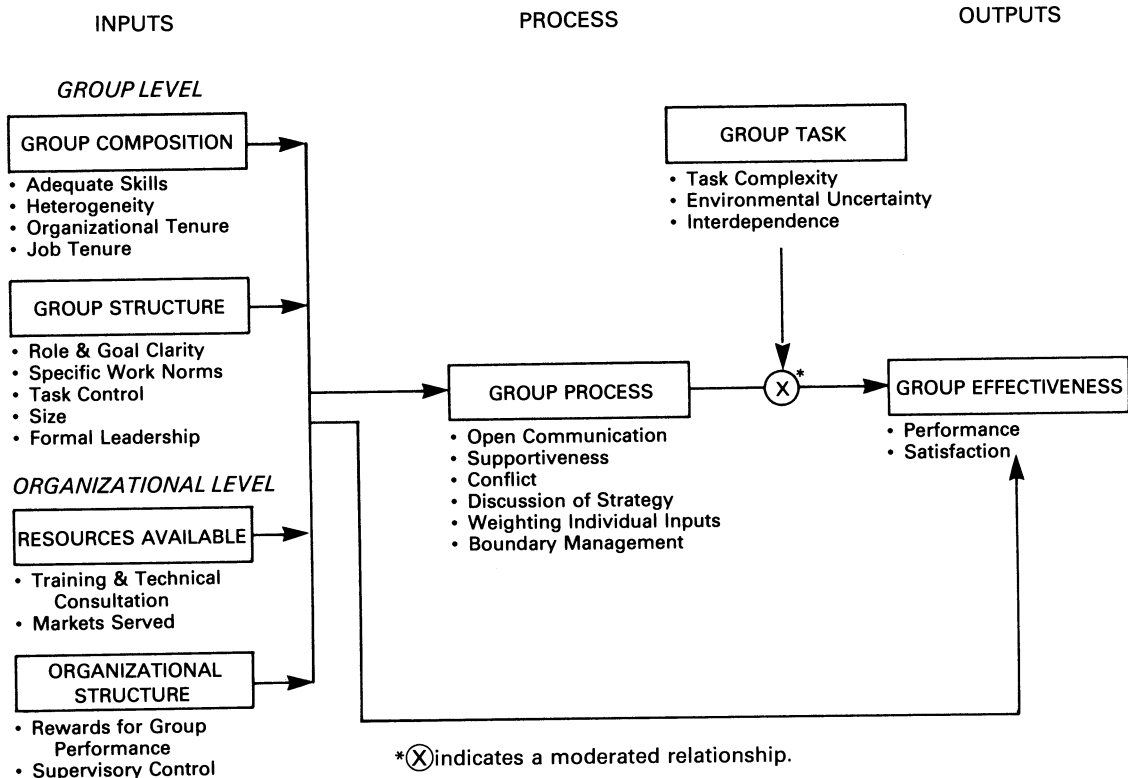
Group-level researchers have not always made a clear distinction between process and structure. A clearer distinction appears in research at the organizational level of analysis, in which structure is viewed as the relatively stable arrangements among people, expressed in terms of division and specialization of work and methods of coordination and control (Perrow, 1967; Payne and Pugh, 1976; Connor, 1980; James

and Jones, 1976). Structure is thus distinct from process, which defines specific modes of interaction between two points in time (Hackman and Morris, 1975). Structure is also distinguished from any pattern of activity that becomes stable, such as a pattern of affective responses, that does not deal with coordination and control.

The organizational theorists' definition of structure suggests several group-level variables as measurable indicators of group structure. These are the group's size, the clarity of its goals and member roles, specific norms about how to go about doing the work, task control, and formalized leadership. Goal and role clarity and specific norms about work are similar to the organization-structure-variable structuring of activities. Both the group and organizational level variables refer to the degree to which employee behavior is specified by routines, procedures, and prescribed roles (Pugh et al., 1968; Kiesler, 1978). Task control refers to the degree of control or authority a group has over its internal work processes (Cummings, 1978b; Hackman and Oldham, 1980). This research tests whether structure, in the form of size, clear roles, goals and work norms, task control, and leadership has a stronger direct impact on effectiveness or a stronger indirect effect through the mediation of increased task and maintenance process behaviors.

### Exogenous Constructs

There are several exogenous latent variables, or constructs, that have various relationships with structure, process, and effectiveness. Group composition and organizational context variables need to be included to specify the model more fully.



**Figure 1. General model of group behavior: Constructs and measured variables.**

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This allows us to test for both individual and contextual characteristics as antecedents of group behavior in organizations (Sutton and Rousseau, 1979).

Aspects of group composition that are believed to affect process and effectiveness are: skills needed to perform the task, group heterogeneity that assures positive interaction, and experience with the job or organization that assures a group's knowledge of standard operating procedures (Schutz, 1966; Shaw, 1971; Sutton and Rousseau, 1979; Hackman and Oldham, 1980). Contextual variables that are predicted to affect structure, process, and effectiveness include supervisory behavior, rewards for group performance, training availability, and market growth.

## **METHODOLOGY**

### **Description of Groups**

The task groups in this study were from the marketing division of an organization in the communications industry. Their primary task was to sell communications equipment. The groups, formed in January 1980, consisted of two to six members each. Each group always included a salesperson and an implementor, who made sure that the communications systems got installed. Some groups had other implementors and systems designers to do technical work if the group was assigned to a market that required more complex systems. The salesperson was designated by the formal organization as the team leader, although he or she was at the same hierarchical level as the other team members.

As part of a structural reorganization at the time that the groups were formed, the sales territory of the organization was divided into specific markets. Some of these markets had a concentration of large businesses that required complex systems; others had many small businesses that required simpler systems. The number of employees assigned to market groups depended on the needs of the market to be served. Group members were sometimes housed in the same office area, sometimes dispersed throughout an office building, and sometimes located in different states, so that they communicated by visits or teleconferencing. Groups interacted differently. Some groups worked together in planning customer strategies, blurring job distinctions to get the work done. For example, one group spent the half hour prior to meeting a customer discussing the customer's outside interests and planning how to start the meeting by talking about those interests, then leading up to the usefulness of their communications system. Other groups had members who made separate visits to the customer, with periodic consultation with one another on what happened. Still other groups had most of their customer interaction at scheduled equipment demonstrations that customers came to; some had very little interaction at all.

Group members received a commission based on the amount of revenue the group brought in above a specified objective determined at the start of each year. The salespeople had the largest proportion of their salary based on commission, while the implementors and systems designers had a lesser percentage. The commission of employees who were in several

groups was either based on the average revenue of the groups they worked with or was tied to division revenue. Although the relationship was not formally coordinated, group members had to work through a separate service division to ensure that orders were completed.

### **Data and Sample**

The two chief sources of data used in this study were a questionnaire sent to all employees in the marketing division and records of actual sales revenue for each marketing team. In addition, archival data, naturalistic observation of work groups, a workflow analysis, and interviews provided further descriptive information about the groups. A second questionnaire was administered to organization members outside the groups studied, in order to get an independent evaluation of the growth of markets to which the groups were selling.

The main questionnaire contained items measuring group effectiveness, group process, group task, group structure, group composition, and organizational structure and resources. The questions were seven-point Likert scale items, some from a team questionnaire being developed by Hackman (1983), some from the Group Effectiveness Survey (Nadler, 1975), the Michigan Assessment of Organizations Questionnaire (Survey Research Center, 1975), and Litwin and Stringer's (1968) Climate Questionnaire, some questions used by Van de Ven and Ferry (1980), and other questions developed by the author.

The main questionnaire was distributed to all employees in the marketing division in April 1980. An estimated 1,000 to 1,100 individuals received the questionnaire and 661 sent them back, for a return rate of approximately 60 percent. The number of respondents was proportional to the number of employees in each sector and job title. As a check on response bias a *t*-test and chi-square test were carried out to compare the distributions of revenue for respondents and nonrespondents. Results of both tests were nonsignificant. This provides some limited support that response bias was minimal.

In order to capture ongoing organizational teams — defined as a set of interdependent individuals who view themselves as a group and perform a task defined by the organization (Hackman and Oldham, 1980) — I selected for inclusion groups from which there were at least two responses for two- or three-person groups, three for four- or five-person groups, and four for six-person groups. Some teams, particularly those with geographically dispersed members, could not reciprocally identify members. These teams were excluded from the sample. Ninety-seven managers, who did not work on teams, were excluded, as were respondents who worked in many different teams. The final sample consisted of 326 individuals representing 100 intact teams.

### **Construct Measurement**

**Group effectiveness.** This construct was represented by two sets of variables: group performance and group-member satisfaction. Group performance was measured by second-quarter revenue each team brought in above the standard set at the start of the year for each team. The standard varied with the market served. Group members also rated their own performance on the questionnaire. A scale with measures of perform-

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ance in problem solving, decision making, and getting the work done was constructed to represent performance. Table 1 lists all major constructs, associated measured variables in the form of scales, and coefficient alphas.<sup>1</sup>

Table 1

### The Lists of Constructs, Associated Measured Variables and Coefficient Alphas for Scales

	$\alpha$	K
<b>Group effectiveness</b>		
Sales revenue	—	1
Self-reported performance	—	1
Satisfaction	.90	4
Satisfaction with the team	—	1
Satisfaction with meeting customer needs	.77	2
General satisfaction with extrinsic rewards and work	.74	5
<b>Group process</b>		
Intragroup processes	.90	10
Boundary management 1	.80	6
Boundary management 2	.42	2
Boundary management 3	—	1
<b>Group task</b>		
Environmental uncertainty 1		1
Environmental uncertainty 2		1
Task complexity 1		1
Task complexity 2		1
Interdependence		1
<b>Group structure</b>		
Role and goal clarity	.77	3
Norms	—	1
Task control	.49	2
Size	—	1
Task leadership	.92	7
Maintenance leadership	.94	7
Leadership influence upward	—	1
<b>Group composition</b>		
Adequate skills	—	1
Heterogeneity	—	1
Organizational tenure	—	1
Job tenure	—	1
<b>Organizational inputs</b>		
Rewards	.61	2
Supervisory task leadership	.91	10
Supervisory maintenance leadership	.97	14
Supervisory influence upward	—	1
Skill development	.89	5
Training and technical consultation	.55	2
Market growth	—	1

Group-member satisfaction was measured by three scales: team satisfaction, work satisfaction, and satisfaction with serving the customer. The first corresponds to satisfaction with being a team member, the second to satisfaction with the job, the compensation system, the method of evaluation, advancement, and workload; and the third to satisfaction with dealing with the customer and meeting customer needs.

**Group process.** This construct was represented by two sets of variables: maintenance behaviors as articulated by the humanistic school and task behaviors as articulated by the decision-making and the boundary-management theorists. Maintenance behaviors were assessed by three scales: open communication of ideas and feelings, supportiveness, and low interpersonal conflict. Task behaviors were assessed by five

<sup>1</sup>

The actual questions that were asked are available from the author upon request.



scales: (1) weighting individual inputs by knowledge and skill, (2) discussion of performance strategies in novel situations, (3) managing the boundary with those groups in which interaction was required prior to the installation of equipment, (4) managing the boundary with those groups in which interaction was required during and following the installation of equipment, and (5) managing the boundary with those groups in which interaction was necessary for special projects. These boundary interactions were those considered the most important by team members who were interviewed and are referred to here as boundary management 1, 2, and 3, respectively.

**Group task.** This construct was designed to separate tasks along an information-processing continuum. The task variables — task complexity, environmental uncertainty, and task interdependence — did not correlate highly with one another ( $\bar{r} = .09$ ), however, so one scale was not formed. The use of a single information-processing dimension had to be abandoned in favor of treating each task variable separately. In all there were five separate measures of information-processing requirements used: two measures of environmental uncertainty, two of task complexity, and one of interdependence.

**Group structure.** This construct included a set of variables corresponding to the definition of structure borrowed from organization theorists. Size was measured as the number of members in the group that all members cross-identified. Scales were constructed from questionnaire items to assess role and goal clarity, task control, norms about how to do work, and formal leadership. Leadership comprised task leadership, maintenance leadership, and the extent of leadership influence upward. Group members rated the leadership behavior of the salesperson who was the designated formal leader.

**Group composition.** This construct was composed of four variables: group members' perceptions of adequacy of skills and abilities, the degree of heterogeneity, and the group-mean amounts of job tenure and organizational tenure.

**Organizational inputs.** The organizational input constructs were organizational structure and resources. It was impossible to test for the impact on groups of all organizational structure variables of interest, since the study was carried on in only one organization. Groups did belong to different subunits, however, that differed in some characteristics. The scales used to operationalize organization structure were the extent to which rewards were given for group performance, supervisory task and maintenance leadership, supervisory influence upward in the organization, and the extent to which supervisors aided in skill development. Group members rated the supervisory behaviors of the subunit managers to whom they reported. Organizational resources were determined through scales measuring the degree of training and technical consultation available and the growth of the market assigned to the group.

## RESULTS

### Effectiveness, Process, and Structure Constructs

The model portrays a set of endogenous and exogenous latent variables or constructs. Group effectiveness, group process, and group structure were all endogenous variables of central

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interest to this study. Before testing the relationships between constructs, however, the relationship of the measured variables to their underlying latent construct was tested. If the scales representing each measured variable all were highly related, these results would indicate that different theoretical schools may be using different names to describe the same concept. If, however, the scales were very dissimilar, the results of testing the full model would be distorted by pooling all scales together under one name. Furthermore, if the measures were unrelated, the question was, which measures would best represent the construct?

**Group effectiveness.** The effectiveness scales formed two clusters that were not significantly correlated. Actual sales revenue was one cluster, and subjectively rated performance and satisfaction were the other. Sales revenue did not correlate significantly with any other group-effectiveness scale, while the satisfaction scales were all highly correlated with each other ( $p < .001$ ). Satisfaction scales also correlated highly with subjectively rated performance ( $p < .001$ ). Therefore, for the remaining analyses, actual sales revenue was considered a separate construct from the combined subjectively rated satisfaction and performance construct, and separate analyses predicting each construct were done.

**Group process.** The group-process scales formed two clusters, intragroup processes and boundary management, not the predicted maintenance and task processes. Each cluster was significantly related to the other, but the average correlation between clusters ( $\bar{r} = .16$ ) was lower than within clusters (intragroup,  $\bar{r} = .65$ ; boundary management,  $\bar{r} = .38$ ). Furthermore, when the scales were input into a varimax rotation factor always using the eigenvalue-greater-than-one rule as a cutoff for factors and orthogonal rotation, two factors emerged that explained 78 percent of the variance. The intragroup scales had an average loading of .79 on the first factor and an average loading of .13 on the second factor. The boundary management variables had an average loading of .32 on the first factor and .86 on the second factor.

**Group structure.** The group structure scales formed three clusters: size, leadership, and structuring of activities. Size did not correlate significantly with any other scales ( $\bar{r} = .04$ ) and did not load on any factor; therefore it was viewed as a separate exogenous variable. The other scales all correlated with one another positively at varying magnitudes. The strongest relationships existed between the leadership scales ( $\bar{r} = .51$ ), suggesting that leadership may be a separate cluster from roles, goals, norms, and task control (together called structuring of activities).

**Endogenous variables.** The endogenous variables were separated into smaller component parts based on the correlations between variables within each component. Confirmatory factor analysis also indicated that a multicomponent representation of group process and group structure — in which process was represented by boundary management and intragroup processes, and structure was represented by structuring of activities, leadership, and size — achieved a better fit than a model with unitary process and structure constructs ( $p < .01$ ). Table 2 lists the factors resulting from this analysis.

Table 2

**Final Set of Factors Determined by Confirmatory Factor Analysis**

Original construct	Construct components	Variables
Group process	Intragroup process	Open communication, supportiveness, conflict, weighting, discussion of strategy.
	Boundary management	Degree of misunderstanding with external groups.
Group structure	Size	Size.
	Leadership	Leadership activities.
	Structuring of activities	Goal and role clarity, norms about work procedures, task control.
Group effectiveness	Performance	Actual sales revenue.
	Subjective effectiveness	Questionnaire ratings of group effectiveness and member satisfaction.

**Task as a Moderator**

The model predicts that group task characteristics moderate the process-effectiveness relationship. More specifically it predicts that open communication, discussion of performance strategies, and boundary management are more highly related to group effectiveness when the task has high information-processing requirements than they are when a task has low information-processing requirements, because these process behaviors should help the group members communicate both with each other and with external groups. This communication increases information-processing capacity. Separate analyses were run for each of the five measures of information-processing requirements (two measures of environmental uncertainty, two measures of task complexity, and one measure of interdependence). Median splits along each measure were performed, and zero-order correlations between process and effectiveness measures were run for those groups above and below the median. Fischer's *r*-to-*z* transformations were used to determine if the two correlations were significantly different. Results indicated that the task variables did not moderate the process-effectiveness relationship, and therefore these variables were dropped from subsequent analysis.

One explanation for the lack of the moderator effect is that in this study there was insufficient variance in the task. Data indicate that task complexity, as measured by the degree to which there are frequent exceptions from standard operating procedures on the job and the extent to which information needed to do the task is changing, had means and standard deviations of 3.42 (.828) and 4.03 (.655), respectively (on a scale of 1–5, with 5 being "to a very large extent"). Group members also indicated that frequent interaction between group members (3.94 on a 5-point scale, with 5 indicating "strongly agree") was necessary for successful task accomplishment. These data indicate that the tasks had high information-processing requirements; they did not span a continuum from high to low. Despite the results of this study, task cannot be ruled out as an important factor in understanding group

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behavior, as suggested in prior research (Herold, 1980; Zander, 1977; Allen, 1984; McGrath, 1984).

### Testing the Model

The model contained both endogenous and exogenous latent variables. The endogenous variables or constructs were process, group structure, and effectiveness. Following the results from the confirmatory factor analysis, there were five endogenous variables: intragroup processes, boundary management, leadership, structuring of activities, and effectiveness (with sales revenue and the combined subjectively rated performance and satisfaction scale each tested separately). The exogenous variables were: rewards, training, supervision, skills, mix, job tenure, organizational tenure, market growth, and size. These exogenous variables were not pooled together to form the larger level constructs, group composition, organizational structure, and resources, because they were not all highly correlated. Thus, their impact might be determined more clearly by looking at each measure individually. What is lost in this approach, however, is an understanding of the relationships among the endogenous and exogenous constructs.

### Relationships among Endogenous Variables

The model specifies three relationships among the endogenous variables: between structure and process, process and effectiveness, and structure and effectiveness. A more complex set of relationships is needed, however, with a five-factor model. The five-factor model and the associated betas are given in Figure 2.

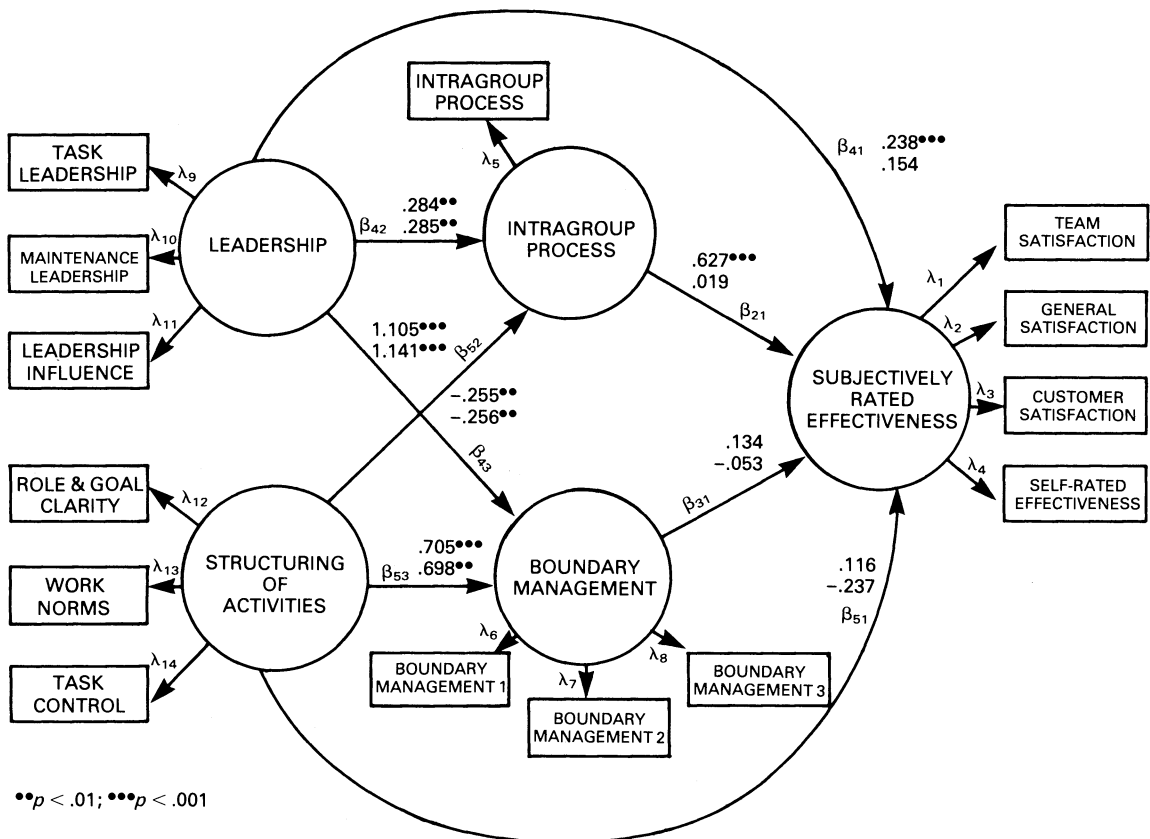


Figure 2. The full model: Relationships between endogenous variables.

The upper numbers correspond to the model that uses self-rated performance and satisfaction scales as the effectiveness measure, while the lower numbers correspond to the model that uses sales revenue as the effectiveness measure.

### Relationships among Endogenous and Exogenous Latent Variables

The exogenous latent variables were predicted to lead, in varying ways, to structure, process, and effectiveness. Again, revisions had to be made when the five-factor model was used. Table 3 reports the resulting LISREL gamma coefficients, which relate exogenous and endogenous latent variables.

Table 3

**Gamma Coefficients: Estimates of Relationships between Endogenous and Exogenous Variables**

Endogenous Variables	Exogenous Variables										
	Rewards	Training	Supervision			Skills	Mix	Job experience	Organizational experience	Market growth	Size
Revenue	-	-	-	0	0	-	-	0	X	X	0
Subjective effectiveness	-	X	-	0	0	-	-	0	X	-	0
Intragroup processes	X	-	-	-	-	-	0	-	0	0	X
Boundary management	0	-	0	0	0	-	X	-	-	0	-
Leadership	X	0	-	-	-	-	-	0	-	-	-
Structuring activities	X	-	0	0	0	-	X	X	0	0	X

Note: X = Significant ( $p \leq .05$ ); 0 = parameter fixed at 0; - = No significant results.

Combining the results of beta and gamma estimation, the following results were obtained:

Self-reported effectiveness =  $f$  (intragroup process, leadership, training, organizational experience).

Sales revenue =  $f$  (<organizational experience>, market growth).

Intragroup process =  $f$  (leadership, structuring of activities, <rewards>, <size>).

Boundary management =  $f$  (<leadership>, structuring of activities, <skill>).

Leadership =  $f$  (rewards).

Structuring of activities =  $f$  (rewards, skill, mix, size).

<> indicates negative relationships.

## 2

In structural equation modeling, several criteria, .05 and .10, have been used to determine the minimal probability level for acceptable fit. A better fit is achieved if the results are not significant, because one is testing the null hypothesis that the residuals do not differ from zero (Wheaton et al., 1977).

The self-rated effectiveness model reaches a  $\chi^2$  of 345.11 with 276 degrees of freedom, falling well within the required 2:1 ratio deemed appropriate for exploratory studies (Wheaton et al., 1977). The significance level, however, is only .003, falling way below the .1 that indicates an adequate fit.<sup>2</sup> The first model has a 1.05 result on the Tucker-Lewis measure

that indicates a good model specification. The second model has a  $\chi^2$  of 176.16 with 208 degrees of freedom, achieving almost a 1:1 ratio, and has a probability level of .95. The goodness-of-fit measures indicate that the model represents the data.

Psi values indicate the extent of unexplained variance in each of the endogenous latent variables. Self-rated effectiveness and structuring of activities had small residual variances (.079, .137), intragroup processes and boundary management had more (.200, .269), and leadership and revenue had high residual variance (.793, .804), indicating that they were not well explained.

Results show that much of the variance in self-reported effectiveness could be explained by intragroup processes, leadership, training, and organizational tenure. Little of the variance in sales revenue (.20) was explained, but that which was explained was predicted by market growth and organizational tenure, rather than by group member interactions or structure. The test of the full model showed that structure, in the form of clear roles, goals, work norms, task control, and leadership related directly to both aspects of process (intragroup processes and boundary management), while size related only to intragroup processes. Thus, there is limited support for the structure-process-effectiveness relationships. Group composition and organization-level variables also played an important role in the results. Organizational experience was related to self-reported effectiveness and sales revenue, while skill level and degree of heterogeneity were associated with structuring of activities. Rewards influenced leadership and structuring of activities, while training related to self-reported effectiveness.

## DISCUSSION

This research set out to integrate prior findings on group performance, to incorporate those findings into a comprehensive model of group behavior and to test whether these prior findings generalize to a field setting, rather than being artifacts of the laboratory and sensitivity groups in which many group-level studies were done. The applied objective was to determine which variables had the most influence on effectiveness, so that effectiveness could be improved. Three results stand out as particularly important to theory development and team management.

### Predicting Group Effectiveness

The variables shown to influence self-reported effectiveness read like a textbook on team building. Group ratings of open communication, supportiveness, active leadership, training, and experience in the organization were all positively associated with group ratings of satisfaction and performance. In initial interviews, group members actually verbalized their internal models of effectiveness and stressed communication and trust. These same variables, however, had little or a negative impact on actual sales revenue. It appears that individuals have implicit models of how certain modes of group process "should" benefit performance and attribute good outcomes to the group when the appropriate process has been instituted.

This attributional process is similar, but not identical, to that found by Staw (1975) in his examination of the direction of causality between group characteristics and performance. Staw found that knowledge of performance data leads people to assign an entire set of characteristics to groups. These characteristics or stereotypes are implicit models of group effectiveness, consisting of cohesiveness, motivation, openness to change, low interpersonal conflict, and high task conflict. Group observers were more likely to attribute these characteristics to groups that they thought were high performers than to those thought to be low performers (Staw, 1975).

This attributional process could not have been used in the teams in this study, since actual performance, in the form of sales revenue, was not known when group members rated their group's behavior. These teams may have followed an attributional process more similar to that described by Calder (1977) in his study of leadership. Calder argued that individuals have implicit theories of what makes a leader. When they see all or even a few of these behaviors they attribute leadership status to that person. Similarly, groups are labeled high performers when they exhibit the process characteristics thought to be linked to performance. Once this implicit theory is activated it is used to interpret additional behaviors such that they are consistent with the theory. The theory is also used to provide cognitions about the group when information is not available.

The most striking finding of this research is that these implicit theories do not seem to correspond to what is actually affecting performance. Group members were attributing sales to their own interaction and experience, when it was market growth, low experience levels, and other unidentified variables that were determining sales revenue. The lack of experience may have been associated with the marketing orientation of the new employees, who were recruited to increase the marketing emphasis of the company. The implications are clear for both researchers and management. More accurate theories of the characteristics that are associated with performance need to be developed and communicated to employees. While our former theories may have been adequate for simple laboratory tasks, they are not adequate for the more complex, interdependent tasks in the organization studied. Our former theories seem to match the implicit theories of group members. By clinging to these theories, we perpetuate and reinforce the implicit theories held by employees rather than searching for more accurate ones.

The groups in this study assumed that both components of effectiveness, performance and satisfaction, were highly related and predicted by the same variables. If, as other studies have shown (Mahoney and Weitzel, 1969; Tsui, 1981), different constituencies (employees and owners, for example) have different, often unrelated criteria of effectiveness (e.g., satisfaction and profit), these differences need to be made explicit and the predictors of each criterion need to be examined. Self-reported effectiveness and satisfaction are positively influenced by intragroup process variables, leadership behavior, training, and experience. Open communication, supportiveness, fair weighting of individual inputs, and discussion about how to do the work help group members feel good about their

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jobs and their team. This satisfaction and self-reported effectiveness may be related to revenue attainment in the long-run, to turnover, and to other attitudes necessary in the work environment. Thus, though these variables may not predict performance, they are associated with other important outcomes.

An alternative explanation for the lack of association between group process and sales revenue is that an insignificant time lag existed. That is, the positive impact of open communication, discussion of strategy, leadership, and training might not be present as early as the second quarter but show up later in the year. Unfortunately, the data were not available to test this. Also, it may be that, in the process of negotiating revenue targets, a group may be assigned an unrealistically high objective. In this situation, the group's internal behavior may influence sales performance positively but not enough to compensate for the overly high objective (remember, sales are measured by the amount above a set objective). It may be, however, that the ability to negotiate a low sales objective is the largest link to performance for these teams.

## **Group Process Revised**

The group process construct formed two components, intragroup processes and boundary management. This finding was unexpected, since a subset of variables was chosen from different theoretical orientations to represent task and maintenance behaviors. Yet group members saw the behaviors necessary to interact with the organizational environment as separate and distinct from internal activities. This finding poses a whole new set of questions for group researchers: What kinds of activities need to go on across group boundaries? Who participates in these activities? Under what conditions are these activities needed? Do these activities relate to performance? How do intragroup processes and boundary activities relate to one another?

The groups in this study, like many other organizational groups, needed to procure resources and information, manage interdependencies, and transfer group output to others (Alderfer, 1976). While boundary spanning activity has been linked to group performance (Aldrich and Herker, 1977; Cummings, 1978b) and organization-level theorists have discussed coordination and technology transfer between groups (Quinn and Mueller, 1963; Galbraith, 1973), these concepts have rarely been included in models of group behavior and development. Yet group members who work well together may not be aware of the need, or have the ability, to transfer information and enthusiasm for their work to outsiders. Thus, the work that they start may ultimately not get completed. This failure will in turn influence their intragroup behavior.

Group leaders may be focusing on internal variables like cohesiveness when they should be allocating more time to negotiating favorable objectives or promoting group outputs to top management. Top management support may then foster cohesiveness. Clearly, in organizational settings many groups cannot work in the isolation enjoyed by groups in a laboratory setting. These groups need to manage their boundaries and adapt to their organizational environment. Future research can help to articulate the range of boundary behaviors needed to



meet various environmental demands. Even if a new set of boundary-process behaviors is found to relate to performance, changes in process behaviors cannot be made in isolation. The predicted relationship between group structure and process was well supported by the data. The degree of structuring of activities (roles and goals clarified, norms set for how to do the work, and team control over work), the behavior of the team leader, and size influenced both intragroup processes and boundary behaviors. Process changes alone are unlikely to be successful, while structure continues to mold process. For example, if poorly defined roles and goals lead to conflict in the group, then teaching the group skills in managing conflict is only a partial solution. The underlying cause of the conflict has not been dealt with. Furthermore, this intervention encourages group members to attribute the source of conflict to their own behavior (lack of skill in conflict management) and may limit their ability to attribute the source of conflict to the structure or to organization-level variables.

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Although the groups in this study appear to have had an internal locus of control (they considered their effectiveness to be a function of their own behavior and structure), external organizational variables in this study influenced effectiveness either directly or indirectly. Market growth was positively related to sales revenue, which reinforces the importance of strategic planning in choosing appropriate markets. Internally it must be recognized that groups that are assigned to markets do not have complete control over their output, and team building probably will not boost sales in a stagnant market.

Rewards, in the form of pay and recognition, had their largest influence on how the group leader behaved and how the group set itself up to work. Rewards were positively associated with goal and role clarity, task control, work norms, and leadership task and maintenance activities. One subunit director who had high rankings for rewarding groups reinforced the link between rewards and outcomes. She showed pictures of vacation spots to specify the exotic places to which group members could go with bonuses from big sales. Again, the behavior of those outside the group, at a different hierarchical level, was molding the group. Finally, training and technical consultation were positively associated with self-reported effectiveness. These findings make it apparent that small-group research suffers from a lack of attention to the interplay between the group and its particular organizational environment. Although group studies have been categorized as a tightrope between sociology and personality (Back, 1979), the group usually is conceptualized as a context variable affecting individual reactions. The behaviors needed for the group to adapt to the organizational environment and the organizational context variables that mold group behavior are often ignored. In a broader conceptual scheme, the organization could be examined as a context variable influencing group behavior.

### **Future Research**

This study has some inherent weaknesses that limit the generalizability of the findings and the validity of the results. The study was correlational, relying on one-time self-report mea-

asures to represent most constructs. Since the questionnaire was administered to group members before actual performance was known, the direction of causality between group process and sales measures is not at issue. Other relationships were not tested with this time lag, however, which limits our capacity to make directional causal statements. In addition, the use of self-report measures raises the question of how much of the explained variance is common-method variance and how much is true variance.

Experimentation and observation of group development over time would be useful in confirming the causal directions predicted here. Future research can be designed to evaluate the validity of the self-report measures. Group structure measures need to be checked against more objective indicators of structure. Verbal protocols of high-performing and low-performing groups would indicate whether the measured variables adequately represent the process behaviors that influence both objectively measured and subjectively rated effectiveness. Multimethod measurements of the major constructs using observation, behaviorally anchored scales, group surveys, and individual surveys filled out by a perceptive member of each group might be compared to get a more accurate picture of group behavior. Finally, comparisons of groups doing a variety of tasks in different organizations need to be done to better articulate how task demands and organization-level variables influence groups.

Much of the earlier research on groups used a theoretical lens that rested on the group's boundary and focused inward. This study has integrated some of these traditional theories and tested them with intact teams in an organization. The results underscore the necessity of studying groups in context. When the lens is moved outward, internal group behaviors are seen as a complement to cross-boundary behaviors that help teams to meet environmental demands; the organization is seen to influence those internal behaviors by providing opportunities and constraints. Studying groups in context is a complex and difficult task, but as teams become more prevalent in the corporate arena the need for this kind of research is ever increasing.

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