

CONTRASTING MODELS OF LIBRARY WORK GROUP PERFORMANCE

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The performance of 43 library work groups was assessed by means of supervisor's ratings. Characteristics of the groups' tasks, membership, leadership, structure, and process were measured by averaging their members' responses to factors of the *Work Group Survey*. Subsets of groups were formed by classifying the 43-group population into "professional" vs. "nonprofessional" samples. Correlates of group performance were determined for each. In the professional groups, the unique correlates of performance were (1) expertise, (2) mature interpersonal processes, and (3) task goal clarity. In contrast, the correlates of performance in the nonprofessional groups were (1) performance-contingent rewards, (2) member retention, (3) supervisory behavior, and (4) workflow efficiency. The implications of these findings for both organization theorists and change agents are discussed.

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Organizational development (OD)—as a process, technology, and profession—has been practiced for a generation. Most scholars would agree that OD began when Kurt Lewin founded the Research Center for Group Dynamics in 1945 (Huse, 1975). Today, OD remains largely an industrial phenomenon.

Although comprehensive models for postsecondary organizational development have been described (Bergquist and Shoemaker, 1976), they remain largely untested. Lindquist (1978, p. 16) offers this assessment of research on organizational development in academia: "(these studies) offer little more than anecdotal evidence or one-person (often one heavily involved person) case reports that their approaches actually bring about change. Rather, we must trust that strategies developed in business work in higher education despite debatable evidence that they have much effect

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upon change anywhere.” Lindquist then offers a theory of organizational development in academic settings—a theory which remains untested.

Significant progress in applying OD to postsecondary institutions requires advances in several areas: (1) Theories of change, such as those proposed by Bergquist and by Lindquist, need to be tested empirically so that change processes can be managed effectively. (2) Theories of organizational performance need to be framed and tested to help organizational members and managers diagnose their organizations. (3) Institutional researchers, change agents, managers, and scholars must begin to work together both to conduct this research and to facilitate change within their institutions.

This paper hopes to contribute to all three goals by: (1) presenting two empirically derived models which identify correlates of performance in two types of library work group; (2) discussing the implications of the models for researchers, change agents, and library managers; (3) documenting the work of an action research team working to assess library performance and to plan and manage change.

LITERATURE REVIEW

Most research into organizational performance employs an institutional or individual level of analysis (Sears, 1977). Yet industrial experience suggests that the work group is one of the most fertile arenas for change (Dyer, 1978). Since the time of Lewin, a prodigious amount of research has focused upon how to make work groups more productive, satisfying to their members, and adaptive to change. What can this literature tell us about designing more effective groups?

Several authors have proposed models of group performance: that is, theories which identify input, structure, and process variables hypothesized to affect group outcomes. The first was proposed by Cattell (1948). Cattell stimulated a stream of research to develop instruments and concepts for the description and comparison of “real world” groups: e.g., Cattell, Saunders, and Stice (1953); Borgatta, Cottrell, and Meyer (1956); Hemphill (1956); Golembiewski (1962); Findikian and Sells (1966); Pheysey and Payne (1970). However, with the exception of Pheysey and Payne (1970), none of these authors attempted to test hypothesized links between group variables and group performance outcomes.

In a later seminal work, Stogdill (1959) reviewed the literature and specified a general model of work group effectiveness. More recently, Rosen (1973) proposed another model for the analysis of work unit performance. Cattell, Stogdill, and Rosen posed an important question: What characteristics of group composition, structure, and process are the *major*

correlates of group outcomes? The question cannot be answered, because all three models remain untested.

Unlike the general theorists, most students of group performance have limited their models to manageable subsets of variables. For example, Bales (1970) studied the effects of membership composition. Zander (1971) related performance to goal-setting and motivational processes. Collins and Guetzkow (1964) treated decision making, and Hoffman (1979) studied problem solving processes.

Other researchers have limited their investigations to certain types of group. Herbst (1962) studied autonomous teams of coal miners. Bare (1980) proposed a model for the study of academic departments. Hackman and Oldham (1980) proposed a model of self-organizing group performance.

Group performance has been studied within two other paradigms: the psychology laboratory and the mathematical. Davis (1969) proposed a model of group performance based upon laboratory studies. Reviews of laboratory research are provided by Shaw (1976) and Zander (1979). Shiflett (1979) provides a recent mathematical treatment. Neither of these paradigms has produced results directly applicable to the study of "real world" group performance.

One must conclude that no general model of work unit performance has been validated empirically. Of course, the problems of such research are formidable: (1) the need for large samples of groups representing a wide range of types, (2) the need to measure a large number of variables, (3) the difficulty of analyzing the interactive and/or compensatory effects of input, structure, and process variables upon outcomes, and many others.

One attempt to cope with the complexities of such research was conducted by Bare (1976). This study identified the correlates and moderators of group performance in a sample of 84 ongoing work units drawn from six types of institutions. The research identified 35 task, member, leadership, structure, and process dimensions which varied significantly across the 84 groups and presented an empirically derived descriptive model which explained 41 percent of performance variance. The three statistically independent correlates of group performance were: group attraction, morale, and contingency of rewards upon performance.

However, Bare's moderator analysis showed that the salient correlates of group performance varied markedly between subsets of groups having different task and membership characteristics. For example, participation in decision making was a weak correlate ($r = .23, p = .04$) of performance across the 84 groups. But, when the population was divided into two 42-group samples, participation emerged a negative correlate ($r = -.52, p = .001$) of performance in groups of older workers performing routine tasks, and a positive correlate ($r = .59, p = .001$) in groups of younger

workers performing nonprogrammable tasks! He concluded that future research should try to identify those performance predictors which are *uniquely* linked to group task and environment—i.e., the *sine qua nons* of success for discrete *types* of group.

METHOD

Analytic Framework

Clearly, some correlates of group performance depend uniquely upon group task or fundamental mode of work organization. For example, Table 1 presents a typology of academic library work units. The cells classify groups according to whether their task is fundamentally programmable or problem-solving in nature (Lynch, 1974), and whether their output is an individual (parallel) or collective (serial) product. The model suggests that effective "teamwork" is critical only to the performance of groups engaged in collaborative problem solving (Cell A), and not to those operating machine-integrated systems (Cell B), those solving problems individually (Cell C), or those performing individual service functions (Cell D). Similarly, workflow efficiency, professional competence, and the ability/motivation to perform "bureaucratic" roles are hypothesized to be uniquely problematic, and hence especially salient, predictors of performance in the other three types of group.

Due to a limited sample size, the research described in this paper does not attempt to test Table 1 entirely. Rather, as described subsequently, professional and problem solving groups (Cells A and C) are compared to groups of nonprofessionals performing routine tasks (Cells B and D).

Research Procedure

The contrasting models of library group performance were derived during the course of a major organization development project in the Rutgers University library system. The OD effort employed a survey-guided methodology in which questionnaire data were fed into group problem solving and change planning workshops (Nadler, 1977).

The *Work Group Survey* (Bare, 1976) was used to measure relevant characteristics of the 43 work groups in the library system. Member perceptions were averaged to derive scores for each group on a variety of descriptive dimensions.

Evaluations of the performance of each group were secured from the group's supervisor. Then, separate correlational models were derived to relate group structure, process, and leadership scores to the supervisors' performance evaluations within subsets of groups classified as "profes-

TABLE 1. Typology of Academic Library Groups.

Nature of Group Product	Nature of Performance Program	
	Non-programmable Task	Programmable Task
Collaborative	Cell A: Group problem solving and decision making	Cell B: Technology-integrated processing
	Groups: Management staffs, committees, task forces	Groups: Technical services units
	Membership: M.L.S. librarians, executives	Membership: Technical specialists
Individual	Key predictor: Effective group interaction process	Key predictor: System, workflow design and control
	Cell C: Individual problem solving and professional service	Cell D: Routine, "bureaucratic" service
	Groups: Reference units	Groups: Circulation units
	Membership: M.L.S. librarians	Membership: Clerical workers, library assistants
	Key predictor: Professional competence	Key predictor: Reliable role performance

sional” vs. “nonprofessional.” These models contrast dramatically—an important finding for both the researcher and change agent dealing with similar kinds of groups.

Survey Instrument. The intervention employed the *Work Group Survey*. Bare (1976) describes the development and validation of the *Work Group Survey* in 84 work groups drawn from six organizations: (1) a bank, (2) a capital goods manufacturer, (3) an alternative school, (4) a vehicle manufacturer, (5) a university, and (6) a hospital.

The *Work Group Survey* is an item pool. The pool encompasses five content categories or panels: (1) task characteristics, (2) leadership behaviors, (3) membership characteristics, (4) group structure and process, and (5) group performance outcomes.

Score Computation. The group is the unit of analysis. The questionnaire asks the members of each group to respond to questions that describe the task, processes, and performance of that group. In effect, the members of each group function as participant observers, describing their group in terms of questionnaire dimensions called “factors.”

The factors are sets of interrelated questions which describe discrete aspects of group functioning. The scores provided by the member-observers on each dimension were averaged across the number of respondents from each group to produce a group score on each factor.

Sample. The staff of the library system encompasses 345 persons, organized into 43 work units. These 43 intact groups are components of eight separate libraries. The groups perform typical reference, circulation, technical services, and administrative tasks. By intensive follow-up, responses were secured from 329 individuals: a response rate of 95 percent.

The “professional” subset contained ten arts college research, reference, or information service units, four law college reference units, a special collection unit, and the following central staff groups: system cabinet, administrative council, central office, computer center, central technical services, and central cataloging. The “nonprofessional” subset contained seven arts college technical services units, six circulation units, three serials, documents, or periodical units and one order unit, plus these central staff groups: precataloging, automated cataloging, catalog maintenance, central order department, and central order-processing department.

Data Analysis

Factor Analysis. Responses by the 329 employees to each panel of questions in the *Work Group Survey* were factor analyzed to verify that they clustered into homogeneous scales as expected. In each case, the type PA2 factoring procedure of the SPSS FACTOR computer program was em-

ployed with VARIMAX rotation.

The extracted factors generally correspond to the hypothesized factor structure. Table 2 presents two questions which illustrate the content of each factor.

Measurement of Group Performance. The dependent variable, group performance, was measured by having the supervisor of each work group respond independently to the same nine items used to gather the members' perceptions of group performance. The validity of this measurement was tested by comparing supervisor ratings with group performance ratings provided by the top executive staff of the library system, with the averaged evaluations of each group's members, and with group absence rates.

The supervisors's group performance score correlated with the members' scores $r = .52, p = .001$. The supervisor's group performance score correlated $r = 0.31, p = .02$ with the averaged ratings of each work group's performance secured from the eight members of the library system's top executive staff and $r = -0.29, p = .06$ with group absence rates calculated over the preceding six-month period.

Correlation Analyses. Several correlation analyses were performed. The first related the task, member, leader, group structure, and process scores to the supervisors' group performance index across the full population of 43 groups. Table 3 presents the unique correlates of group performance in the professional and non-professional subsets. In all analyses, the SPSS PEARSON CORR procedure was employed.

DISCUSSION

Professional groups are composed predominantly of M.L.S. librarians working on relatively nonroutine tasks. The strongest correlate of performance in these groups is the perceived competence of the group members (Table 3). Of course, this finding does not demonstrate that competence *causes* group performance. Causality may flow either way between the correlated variables. Perhaps effective groups simply are better able to attract high-caliber members.

Three correlates of performance in the professional groups tap related but distinct aspects of interpersonal processes in the groups. Group intimacy (friendship bonds) tends to be stronger in higher-performing groups. The prevalence of "negotiated order" (Mott, 1972) in these groups means that their members have achieved a relatively high level of interpersonal process maturity: giving personal feedback, sharing feelings, discussing roles, plans, and problems among themselves. An absence of factionalism (hostile subgroups) confirms this impression. Perhaps interpersonal process efficiency contributes to task efficiency by minimizing "process loss-

TABLE 2. Typical Questions from the Work Group Survey.

Factor and Two Typical Items	No. of Questions
<p><i>Group Performance</i></p> <p>“On the basis of your experience and information, how would you rate your group performance? Circle one: 1. Poor, 2. Fair, 3. Good, 4. Very good, 5. Excellent”</p> <p>“The quality of our work is high.”</p>	9
<p><i>Performance-Reward Contingency</i></p> <p>“Members are rewarded for their efforts upon behalf of the group.”</p> <p>“It pays to work hard in this group.”</p>	4
<p><i>Group Intimacy</i></p> <p>“Members of the group are personal friends.”</p> <p>“Certain members of the group discuss their personal affairs among themselves.”</p>	4
<p><i>Factionalism</i></p> <p>“There is a tendency for some members of the group to combine against other parts of the group.”</p> <p>“Certain members of the group are hostile to other members.”</p>	4
<p><i>Member Competence</i></p> <p>“Members are fully qualified for their jobs.”</p> <p>“The group is staffed with competent persons.”</p>	3
<p><i>Prevalence of Negotiated Order</i></p> <p>“Group members give one another feedback about how individual behavior affects group results.”</p> <p>“Group members communicate their plans and problems to one another.”</p>	4
<p><i>Member Age & Service</i></p> <p>“How many years have you been employed by Rutgers?”</p> <p>“How many years have you been in your present work group?”</p>	3
<p><i>Member Professionalization</i></p> <p>“Circle the highest level of education you have completed:</p>	3

TABLE 2 (Continued)

Factor and Two Typical Items	No. of Questions
1. Elementary school, 2. Some high school, 3. High school, 4. Some college, 5. College, 6. Some graduate school, 7. Graduate degree.”	
“What is your current job category? 1. Library Assistant I or II, 2. Library Assistant III, 3. Library Assistant IV, 4. Library Supervisor, 5. Librarian I or II, 6. Librarian III, 7. Librarian IV or V.”	
<i>Member Job Satisfaction</i>	6
“I enjoy the type of work I do.”	
“I am satisfied with my supervisor.”	
<i>Task Physical Impediments</i>	1
“Our workplace is too: (circle all that apply) 1. Poorly equipped, 2. Crowded, 3. Dirty, 4. Badly laid out, 5. Dimly lighted, 6. Noisy.”	
<i>Task Programmability</i>	4
“Performing our task requires little thought.”	
“Our task requires no creativity.”	
<i>Task Goal Clarity</i>	4
“The group goal is clear to every member.”	
“We are certain about goals and priorities.”	
<i>Task Growth Opportunity</i>	4
“My job gives me a chance to develop my talents.”	
“Working in this group gives me a chance to learn valuable job-related skills.”	
<i>Supervisor Staffing</i>	6
“S/he hires the most competent people available.”	
“S/he hires people who fit well with job requirements.”	
<i>Supervisor Training</i>	4
“S/he provides opportunities to learn on the job.”	
“S/he encourages participation in formal training programs.”	

TABLE 2 (Continued)

Factor and Two Typical Items	No. of Questions
<i>Supervisor Rewards Management</i>	3
“S/he makes sure good performers are the first to be promoted.”	
“S/he rewards good performance.”	

es” (Davis, 1969) in the more effective work units. Of course, it may be that more effective groups simply develop mature interpersonal process because their members can afford to divert some energies from task accomplishment to group maintenance activity.

The association between task goal clarity and professional group performance suggests that shared goals enhance performance of nonprogrammable tasks, again perhaps by reducing wasted effort.

The nonprofessional groups are composed of more modestly educated workers involved in routine technical and service tasks. The strongest correlate of group performance in this milieu is not member expertise, but performance-contingent rewards. In groups where appropriate role performances can be programmed in advance, motivating the desired behavior appears to be one key to group success.

Growth opportunity, the extent to which the group provides opportunities to learn on the job, is the second highest correlate of performance in the groups performing programmable tasks. Growth opportunity may enhance performance by building skills or motivation.

The importance of both skill development and motivation in nonprofessional groups is highlighted by the unique links between supervisory staffing, training, and reward practices and performance of these groups (Table 3).

The higher turnover typical of the nonprofessional groups could account for these findings. High-performing nonprofessional groups are those which most efficiently teach and motivate the specialized role performances required of their members. Turnover is the principal threat to reliable role performance, and hence group productivity. Thus, the supervisor’s staffing, training, and motivating activities are uniquely important.

Reward systems which provide “payoffs” for performance help the supervisor motivate her group and encourage member retention. Job designs which provide the challenge, development and psychological satisfactions desired by “white collar” staff also encourage retention.

This hypothesis gains some indirect support from two additional findings

TABLE 3. Correlates of Library Group Performance.

	Professional (n = 21)	Nonprofessional (n = 22)
<i>Membership Variables</i>		
Competence	.68***	.16
Age & service	-.34	.42*
Job satisfaction	-.05	.47*
<i>Group Variables</i>		
Intimacy	.67***	.30
Negotiated order	.56**	.24
Factionalism	-.63**	-.27
Performance-reward contingency	-.20	.58**
<i>Supervisory Variables</i>		
Training	.04	.52**
Staffing	.17	.46**
Rewards management	.04	.41*
<i>Task Variables</i>		
Goal clarity	.50**	.26
Growth opportunity	.13	.50**
Physical impediments	-.18	-.48**

* $p = .05$, ** $p = .01$, *** $p = .001$

in Table 3. The discovery that average member age and length of service are uniquely related to performance in the nonprofessional group confirms the importance of retaining job-related knowledge and abilities in these groups. Similarly, the finding that member job satisfaction is a key performance correlate in nonprofessional groups also suggests that high-performing groups are those which best retain and motivate their members. Of course, we cannot be certain that member satisfaction causes group performance. Perhaps, belonging to high-performing groups simply leads workers to define their jobs as more satisfying. In any event, the important finding is that job satisfaction is a key performance correlate in nonprofessional, but not in professional groups.

Absence of physical impediments to efficient workflow also correlates with group performance in units performing programmable tasks. The finding that "poorly equipped, crowded, dirty, badly laid out, dimly lighted, or noisy" work environments impede task performance needs little explication. However, once again, causality is uncertain. Perhaps efficient

physical layout of work activity enhances the performance of groups performing simple tasks. Then again, perhaps effective groups simply can spare more time for "cleaning up the area" or can command more efficient facilities than less effective groups.

Overall, the correlates of group performance in the professional problem solving groups emphasize (1) application of in-place professional expertise, (2) mature interpersonal processes, (3) task goal clarity, and (4) the absence of supervisory or work-flow related influences. In contrast, the correlates of performance in groups of nonprofessionals performing routine tasks highlight (1) member motivation via performance-contingent rewards, (2) member retention, (3) workflow efficiency rather than interpersonal process efficiency, and (4) salient links between supervisory behavior and group outcomes (see also Bare, 1978).

These findings suggest a "fit" model of group performance consistent with the task environments of the two types of group (Steiner, 1972). Performance in the professional groups involves a group process which efficiently interfaces competent individual problem solvers with an unpredictable environment and with one another. Effective performance of the routine tasks by the nonprofessional workers involves motivating specified worker behavior, facilitating on-the-job learning, and removing workflow barriers to task accomplishment. The role of the supervisor in meshing less-expert workers with task requirements, training them, and rewarding performance-relevant behavior is salient. In each subset of groups, a unique pattern of process appears to enhance the fit between worker characteristics and task demands.

The present study provides some suggestive clues to the change agent. The data link professional group performance with effective recruitment, goal setting, and interpersonal processes. Interventions focused on improved staffing, conflict resolution, group goal setting and problem solving, and interpersonal skills development might "pay off" in less-effective professional groups. In contrast, interventions involving improved workflow efficiency, tighter performance-reward contingency, job enrichment, on-the-job training, and supervisory role training appear relevant in less-effective nonprofessional groups.

Of course, we are a long way from articulating a fit theory of group performance appropriate to ongoing work units, much less validating prescriptive models to guide organization development. Still, this paper records some progress in the development of instruments and methods and provides quantitative cross-sectional models of performance for two basic types of library work group.

Fortunately, improving group performance does not depend entirely upon better theory. Data of the type gathered in this study can be used by

work units to plan self-directed performance improvement activities. Typically, the data are returned to the group during organization development workshops. During these workshops, each group analyzes the survey results, discusses opportunities and problems, and produces plans for constructive change. In a sense, the survey and outcome data stimulate the groups to develop their own "theories" of performance, and to plan improvements accordingly.

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