

## Differential Effects of Multiple Interventions in an Organization\*

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*An organization development effort spanning several years in one organization is reexamined in order to assess the differential effects of interventions. The findings illustrate how organizational change efforts can have different effects upon different groups within an organization. Significant differences among hierarchical levels of the organization are found in satisfaction with several aspects of the work environment, the most important finding being the relatively low levels of satisfaction among supervisory and technical workers. Supporting clinical data identify the lack of an integrated change program, the failure to adequately structure supervisors into change activities, and problems in the management of participation as possible sources of the differential effects. Recommendations for the design of interventions are made, and the conclusion is reached that there is a need for the application of more systemic models of change combined with more comprehensive measurement of the effects of interventions.*

Any planned change directed toward solving problems or facilitating growth may have unforeseen impact beyond what is originally intended. This is particularly true of changes attempted in organizations that have the characteristics of open systems with interdependent and interacting components (Katz & Kahn, 1966). Thus an issue in designing and evalu-

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ating programs of organizational change and development is identifying the complex and multiple outcomes that may result from interventions and understanding the implications of these outcomes.

### EFFECTS ARE NOT MONOLITHIC

Organization development programs tend to be composed of a number of smaller, distinct interventions aimed at different targets, including attitudes, behaviors, processes, or structures. Ideally these interventions are coordinated so as to build on each other and form an integrated program, but in practice, often this is not the case. There are times when interventions run at cross purposes and detract from the effectiveness of the total program. Interventions also tend to be targeted toward specific groups within an organization such as top management, supervisors, blue-collar workers, or others. Because of the systemic nature of organizations, however, any intervention aimed at one target is bound to have secondary and tertiary effects on surrounding components (be they attitudes, behaviors, or other groups); and these effects may be quite different from those assumed or planned. It is even possible that these more indirect effects, which may be positive *or* negative, in the long run may equal or outweigh the intended effect upon the immediate target.

While most reports of intervention have concentrated either on the assessment of changes in the target group alone or on the gross changes measured at the organizational level, accounts reporting differential effects of interventions have begun to appear in the literature. One example is a study (Lawler, Hackman, & Kaufman, 1973) which reported the multiple effects of a job enrichment intervention on line employees and supervisory personnel. The argument has been made that as much can be learned from these reports of differential effects (some of which may be termed intervention "failures") as can be learned from the so-called successes. In an attempt to augment that newly forming research tradition, this report does not concentrate on whether the intervention succeeded or failed, but on pinpointing the differential effects for different groups in the organization. It also considers the implications of these effects for understanding the impact of the total change program—with an eye also toward future program planning.

It will be suggested here that the effects of an intervention are not monolithic. In the case at hand a series of interventions, which has as a whole been considered successful, appears upon closer examination to

have had differential effects on different parts of the organization. Utilizing both clinical and questionnaire data, the study focuses upon the outcomes of the change program relating to the different levels of hierarchy and considers related issues in the design of participative intervention programs.

## BACKGROUND

The organization in which the OD activities took place is a small manufacturing company, which has five different plant locations within two geographically distant cities. The major operations of the company include the treatment and finishing of raw materials, the fabrication of parts, and the assembly of parts into finished products. These products are sold to original equipment manufacturers to be installed as standard sub-units in a number of larger assemblies. Depending upon seasonal variations, the firm employs approximately 500-600 individuals.

The organization is built around a system of workgroups which are at four different hierarchical levels. For purposes of statistical analysis, the top two levels were combined, thus creating three levels within the organization, as follows:

LEVEL 1—*Top and middle management*: White collar employees who have major managerial responsibilities (i.e., department or division heads, plant managers, etc.) and professionals in higher-level staff roles.

LEVEL 2—*Supervisory and technical employees*: First-line supervisors (foremen), technical/professional personnel (such as production or development engineers), and a small number of clerical personnel.

LEVEL 3—*Line production*: Employees engaged in nonsupervisory production activities including finishing or assembly operations.

Due to the nature of the work, the Level 3 (line production) employees are engaged in tasks characterized by a low degree of variety and autonomy, where many jobs are machine-paced and cycle times are as short as 5 seconds.

### Major OD Activities

The organization has a history of innovation, particularly in the areas of compensation and bonus systems. The organization development work

with which this paper is specifically concerned began in 1968 and was still in operation in early 1974 when the authors completed their work with the company. Much of the initial energy for the development efforts came from the chief executive of the organization, who had long been concerned about the quality of working life in his company; this concern for human issues in the organization was complemented by his frequent contacts with academics and researchers on the outside. The development program included a number of different activities designed to respond to needs and strains in the organization, as these strains became apparent. Thus the several interventions focused concurrently and sequentially on different groups and processes in the system at different times. Participation in all of the activities was entirely voluntary.

The program, which has been documented in detail elsewhere (Iman, 1972), involved two phases. During Phase One (1968 to late 1969), the focus was on management development and team building. During typical workteam development sessions, a supervisor's subordinates met to identify leadership behavior and planning problems which they saw as being created and perpetuated by their supervisor. After relevant problems were identified, the supervisor was brought into the session and presented with the problem list generated by his subordinates. The supervisor then formulated a plan of action to remedy the situation. The same process was followed for each subordinate member of the group. Several such team-building sessions were held throughout the organization. Concurrently, survey feedback activities began. Questionnaire data, which had been collected, tabulated, and handed back to supervisors at all levels, were available for consideration by each workgroup via the supervisor. A voluntary training program was provided to instruct supervisors in the uses of the survey data for the identification and solution of work-related problems. Supervisors were free to share or not to share the data with their subordinates. Some chose to have group meetings to discuss the data; others did not.

Phase Two began in late 1969 and included activities designed to make structural and policy changes affecting the whole organization. Thus the focus shifted to system development. Compensation procedures were a central issue. During this phase production workers chose to be paid salaries rather than hourly wages. At certain points pay adjustments, at many levels of the organization were made on the basis of peer evaluations. Emphasis was placed on increasing participation at all levels, although the most significant structural and decision-making changes

were seen at the nonsupervisory level. As previously noted, management was committed to involving production employees in many major decisions. Thus, face-to-face contact between management and production workers was quite frequent.

The decision to develop a structure which organized production operators into workteams with new organizational roles and responsibilities was implemented. Nonsupervisory employees were given greater autonomy and decision-making power in the performance of actual production activities. First-line supervisors, because of this structure, were encouraged to spend less time on specific task functions in the production areas and more time on broader management issues. Supervisors acted in various and changing capacities on many company-wide task forces.

During the period covered by Phases One and Two, the internal change agents in the personnel department were aided by an outside consultant from a major university, who worked with the organization for a period of approximately five years and took a major role in the total change effort. Both the internal and external change agents served largely as on-call process consultants and coach/counselors. They had frequent informal conversations with individual managers and, if invited, attended group sessions. Occasionally they made substantive proposals and took more directive roles in guiding the development process. Their usual stance, however, was one of responding to requests for help in specific situations.

The intervention activities continued under the umbrella of survey feedback, with repeated data collection in 1968, 1969, 1970, 1971, and 1973. Iman (1972) formulated a general evaluation of the program based on those data and his personal records and concluded that participation had been increased and organizational performance enhanced. Thus, this development effort has been considered an example of an effective program of organizational change.

The nature of the changes maintained over time can be illustrated by a few recent on-site observations, which are consistent with the earlier questionnaire-based general evaluation of the change activities. The major observable changes concerned the climate of the organization and the functioning of the workteam structures. The general atmosphere along the assembly line became one of informality, supportiveness, and teamwork. For example, it was observed that when a piece of machinery broke down, all of the line employees immediately became involved in determining the cause of the problem and fixing the machine. The

workteam structure also seemed to provide an opportunity for line employees to exercise discretion and to experience some autonomy in their jobs. Workers were involved in developing technological innovations on the floor and in making decisions within the workteam on production goals, hours to be worked, and more. On one occasion a workteam was observed working on Saturday, with no supervisor present, in order to meet a preset production goal; when the goal was met, the workers turned off their machines and left the plant.

Not all of the observed events in this organization were so favorable, however. Tape recordings of workteam meetings at the management level revealed unsolved issues and areas of friction. The tapes of one team contained segments indicating that the group had difficulty in arriving at decisions. A norm of consensus decision making seemed to exist; and even when large amounts of time were invested, the meetings often ended without a decision having been made.

### **CLINICAL DIAGNOSIS—HYPOTHESIS**

The first author was involved for a year in activities in this organization; his work began after the introduction of most of the intervention activities described above. His major role was as researcher, collecting and feeding back data to management and the internal change agents concerning a number of issues in the organization. The majority of these issues were only indirectly related to the major thrust of the various interventions and included such topics as management pay plans and job design. A secondary role involved informal sessions with the internal change agents concerning the development and design of a new round of survey feedback activities. During certain periods of the relationship, this individual was on-site about once every two weeks and participated in a number of activities, including discussions with the internal change agents, observation of team meetings, discussions with managers and employees, and observations of employees in production operations.

Based on this person's experiences, additional observations and discussion, and examination of the reports of the primary external change agent during the 1968-1972 period, it was possible for the authors to make a tentative clinical diagnosis of the nature and effectiveness of the change program. A general observation was that in fact an *integrated* change program did not exist. Rather, a large collection of different interventions had occurred over a period of several years. This series of

interventions had been successful at Level 3 (production workers). These employees appeared to be participating in decision making and experiencing more autonomy in day-to-day activities. As a consequence, they also appeared to be highly satisfied with their membership in the organization. *The interventions seemed to have had a different impact on the Level 2 (supervisory and technical) employees.* With Level 3 employees exercising more autonomy and participating more, Level 2 employees felt that the scope of their jobs was being narrowed and their roles were becoming more ambiguous. The OD activities had encouraged production employees to set their own goals, fix their own machines, make changes in production technology when an opportunity for innovation arose, and so on. This left foremen, production engineers, and similar workers believing that many of their traditional domains had been invaded. It appeared that these events were consequently leading to lower levels of satisfaction for Level 2 employees.

At Level 1 it was harder to determine the impact of the interventions. Problems seemed to exist concerning the processes of decision making and lack of clarity about group or organizational goals, particularly among the top managers. Yet it was not possible to determine whether they predated the interventions or were the result of them.

Based on these observations, a preliminary diagnosis was formulated:

*The interventions had been effective at Level 3 with resultant increases in levels of performance and satisfaction, but an unintended effect of participation was role ambiguity and dissatisfaction at Level 2. At Level 1, the program appeared to have had less of an impact than at Level 2 or 3, but no further diagnosis could be made.*

It was during this period of observation, discussion, and diagnosis that the authors were involved in collecting data (as part of the 1973 survey feedback program) and preparing it for feedback to the organization. The on-site observations and preliminary conclusions of the researchers stimulated a thorough examination of the new data to determine whether evidence existed to support the earlier diagnosis.

## **METHOD AND RESULTS**

### **Survey Data Collection**

As part of the survey feedback program all members of the organization were given a standardized questionnaire, the *Survey of Organi-*

zations (Taylor & Bowers, 1972). This questionnaire contains 112 items, most of which call for responses on a five-point Likert-type response scale, ranging from “(1) to a very little extent” to “(5) to a very great extent.” Additional items were added to the questionnaire. These items tapped perceptions regarding group goal-setting processes and were based on earlier research on role clarity and on goals in groups and their effects on motivation (Zander, 1971).

The questionnaires were handed out at work, and respondents returned them through a system of drop-boxes. The response rate for questionnaires was approximately 70 per cent, with a basically even response rate from all levels and functional areas of the organization. The respondents included 44 individuals from Level 1 (top and middle managers), 93 from Level 2 (supervisory and technical), 254 from Level 3 (line production workers), and 15 who did not indicate organizational level on their questionnaires. The total number responding was 406.

The investigation began by looking at the patterns of satisfaction among employees. The *Survey of Organizations* (SOO) provides seven specific measures of satisfaction. Included is satisfaction with workgroup, satisfaction with supervisor, satisfaction with job, satisfaction with the organization, satisfaction with pay, satisfaction with progress up until now, and finally, satisfaction with chances for future progress. These are combined into an unweighted Satisfaction Index, which provides an eighth measure. One feature of the data is the ability to compare scores with a set of national norms that are based on data collected from previous administrations of the SOO. It is therefore possible to compare the responses of members of this organization with the responses of employees at comparable levels in other organizations, based on the SOO sample (approximately 24,000 respondents from 57 organizational sites).<sup>1</sup>

### Results Across Organizational Levels

The scores on these eight measures of satisfaction are plotted for each of the three levels within the organization. The comparable scores from the national norms are also plotted. The results of these plots can be seen in Figure 1. The emergent pattern supports the hypothesized existence of problems at Level 2. Two specific sets of comparisons need to be made with these data in order to confirm the pattern. First, Level

<sup>1</sup> It should be noted that these norms actually reflect a specific subsample of all organizations—those organizations that have consented to have the SOO administered to their employees.



FIGURE 1.

*Satisfaction Levels for Management, First-Line Supervisors and Engineers, and Nonsupervisory Employees*

Key:

- 1 = Management
- 2 = First-line Supervisors
- 3 = Nonsupervisory Employees

- = Actual Score
- = National Norm (50th Percentile)

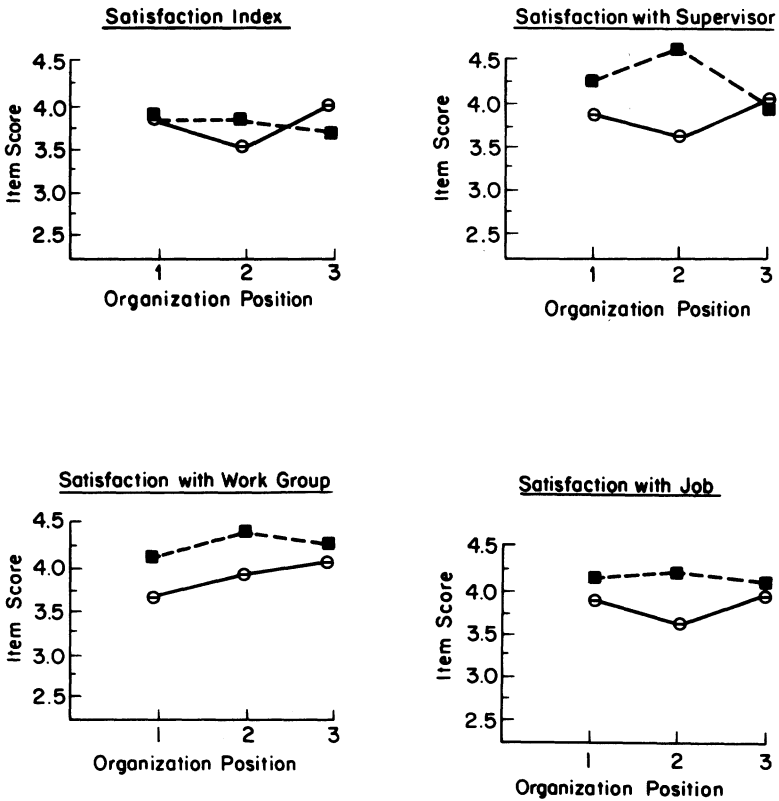
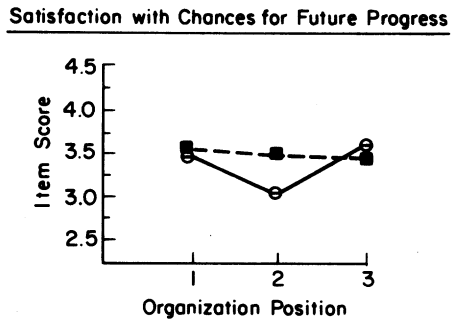
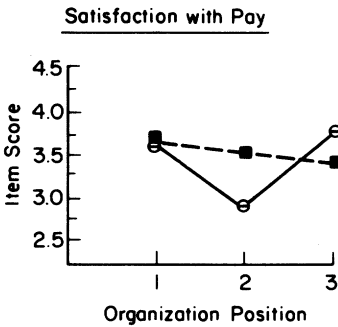
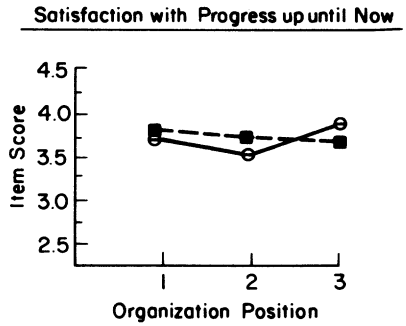
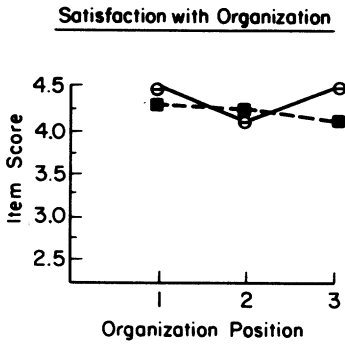


FIGURE 1 (continued)

Key:

- 1 = Management
- 2 = First-line Supervisors
- 3 = Nonsupervisory Employees

- = Actual Score
- = National Norm (50th Percentile)



2 should be compared with other levels within the organization. The second, and perhaps more important, analysis is the comparison of the levels relative to the national norms.

Looking first at the absolute comparisons, in six of the seven direct satisfaction measures, the Level 2 employees are the lowest scoring group within the organization. This pattern is, of course, reflected in the Satisfaction Index, where Level 2 is the lowest group. Although the between-groups differences are significant in only three of the eight measures (pay,  $p < .01$ ; future progress,  $p < .05$ ; Satisfaction Index,  $p < .05$ ), a consistent pattern emerges. This pattern is contrary to the normal pattern of a direct relationship between hierarchical level and satisfaction: i.e., the higher one is in the hierarchy, the more satisfaction. It reflects the effects of the intervention in terms of the relatively high degree of satisfaction at Level 3, and the relatively low degree of satisfaction at Level 2.

### **Compared with National Norms**

Comparing the three levels relative to the national norms, the Level 2 group has the widest negative gap between its responses and the national norms in six of the seven specific satisfaction measures. It also is the lowest group, relative to its norms, in the Satisfaction Index. The Level 2 scores are significantly different from the national norms ( $p < .01$ ) in six of the eight measures. This contrasts with Level 3, which is significantly ( $p < .05$ ) above the national norms in six of the eight measures (satisfaction with pay and with supervisor were not significantly different). At Level 1, only three of the eight measures are significantly different ( $p < .05$ ) from the national norms: satisfaction with supervisor, workgroup, and job.

Thus the pattern that emerges in this organization is one of important differences among the groups. While the interventions appear to have succeeded in bringing about a relatively high level of satisfaction at Level 3, the result has been low levels of satisfaction for Level 2. The impact at Level 1 has been unclear, with the satisfaction levels at or somewhat below national norms.

### **Effects on Decision Making and on Goal and Role Clarity at Different Levels**

The original clinical diagnosis went beyond the issue of satisfaction and pointed out other ways in which the three employee levels reacted

differently to their work situation. In particular, Level 2 (first-line supervisors and engineers) appeared to have different perceptions and feelings regarding decision-making practices, role clarity, and goal clarity. Thus, the next step in the analysis involved an examination of items relevant to these variables in order to determine empirically whether similar patterns of cross-level differences exist. The need for this step stemmed from the importance of understanding the more specific ways in which the interventions may have affected satisfaction.

The first set of items examined were those relating to the decision-making practices within the organization. It was felt that the impact of greater participation and autonomy for workgroups would affect perceptions about how decisions are made within the organization.

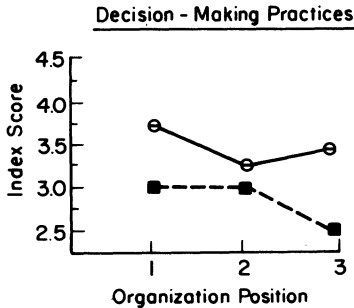
The Survey of Organizations contains an index of decision-making practices. This scale is composed of four items that tap the extent to which objectives are set jointly, whether decisions are made at the optimal organizational levels, whether employees are asked for their ideas, and whether decision-makers have access to all available "know-how." As shown in Figure 2, a pattern appears that is similar to the pattern found in the analysis of the satisfaction items. Level 2 has the lowest score on this index, and the between-groups differences are significant ( $p < .01$ ). Comparing the scores with the national norm, all three levels

FIGURE 2.

*Decision-Making Practices Reported by Management, First-Line Supervisors and Engineers, and Nonsupervisory Employees*

Key:

- 1 = Management
- 2 = First-line Supervisors
- 3 = Nonsupervisory Employees
- = Actual Score
- = National Norm (50th Percentile)



are significantly above the national norms for their groups ( $p < .01$ ); however, Level 2 has the smallest positive difference between its scores and the national norm score for similar employees.

The second set of items examined were those additional items developed to tap group goal and role processes. The clinical diagnosis predicted that Levels 1 and 2 would report less job and goal clarity than would Level 3. Four items were examined which relate to the issues of goal and role clarity. The four items tap the following dimensions: perceptions of how difficult workgroup goals are, how sure an individual is of his or her job, the extent to which an individual knows what his or her teammates' jobs are, and the clarity of workteam goals.

The scores on these items are shown in Table 1. Once again, when a comparison is made across the three levels, differences emerge. In all four measures, the between-groups differences are statistically significant ( $p < .01$ ). Level 3 has significantly higher scores than the other two groups on all of the measures. Those respondents at Levels 1 and 2 feel that their workgroup goals are harder, are less sure of their own jobs, and are less clear about their workteam's goals than workers at Level 3. Those at Level 2 stand out as being less sure of their teammates' jobs than those at the other levels. These comparisons indicate the same pattern regarding supervisors and technicians as compared with production workers that was seen in the different satisfaction measures. The relatively low scores at Level 1 also indicate problems, particularly in the area of clarity of workteam goals.

TABLE 1.

*Hierarchical Level Scores—Goal and Role Clarity<sup>a</sup>*

Questionnaire Item	Hierarchical Level Scores			F	Significant Comparisons
	1	2	3		
Workgroup goals are hard	3.93	3.98	3.48	18.02**	1 vs. 3** 2 vs. 3**
Sure of your own job	3.81	3.80	4.27	12.52**	1 vs. 3** 2 vs. 3**
Know what teammates' jobs are	3.74	3.34	3.87	11.81**	2 vs. 3** 2 vs. 1 & 3**
Workteam goals clear	3.00	3.12	3.53	9.42**	1 vs. 3** 2 vs. 3**

<sup>a</sup> Significance levels for contrasts were obtained using the Scheffé standard for post hoc comparisons.

\*\*  $p < .01$ .

## DISCUSSION

Several different patterns emerge from these analyses. After six years of multiple organizational interventions, the impact of the change work is seen as different at various levels within the organization.

The first pattern shows a major positive impact made on the line production workers. The work-related attitudes of this group are positive relative to the national norms and relative to other levels within the firm. The only major shortcoming of the intervention at this level seems to have been a failure to bring about a high level of satisfaction about the work tasks themselves: The interventions did not change the inherent repetitive and short-cycled nature of the work characteristic of this level. While participation did increase feelings of autonomy in the performance of jobs, the failure to change the structure of the work itself left workers with monotonous and routine tasks and jobs that involved working on only a small piece of the product rather than producing an entire product or subassembly. Clearly the change program could have made an even greater impact had it addressed the issue of job design. Despite these shortcomings, however, the overall effect appears to be positive at this level of the organization.

Second, the analysis reveals relatively negative attitudes among the supervisory and technical employees. These individuals report less job and goal clarity than do the nonsupervisory (production) employees. Compared both with other employees in the firm and with other employees in similar positions in organizations across the country, they are dissatisfied. The drop in attitudes at this level stands out, when contrasted with the general tendency for postintervention attitudes to become more favorable at higher levels in an organization (Porter & Lawler, 1965).

Third, there is moderate dissatisfaction among top and middle managers, apparently related to issues of goal clarity. This may be related to the intervention activities; but in retrospect it appears also to be a function of the styles of the particular managers involved. From an analysis of the clinical data, it appears that this problem probably predated the intervention work.

### Chain of Events

The data from the SOO appear to confirm the hypothesized chain of events which emerged from the earlier and more subjective diagnosis. The OD interventions resulted in high levels of autonomy and partici-

pation among production employees. This change, combined with the process of the interventions as well as the lack of integration among the various interventions, brought about feelings of role ambiguity and dissatisfaction with decision-making processes among the supervisory and technical personnel as they felt their traditional roles and decision-making prerogatives being invaded by the lower-level workers. These feelings, in turn, led to lower levels of satisfaction with their jobs, the organization, their pay, their progress, and with their supervisors. As a result, they feel a lack of clarity and support within what is for them an ambiguous environment.

There is some support in the research literature for this hypothesized pattern of events. The study by Lawler, Hackman, and Kaufman (1973) cited earlier reports the mixed success of a job redesign experiment due to problems arising from the behavior of supervisory personnel who felt their roles threatened by the intervention. In another intervention study (Lawler & Hackman, 1969), a participative approach was used to develop a new pay incentive plan. In a follow-up study (Schefflen, Lawler, & Hackman, 1971), it was found that in two of the three original participative groups the plan had been dropped despite favorable results (i.e., lowered absence rates). The supervisors in these groups, who had not participated in designing the new pay plans, felt neither ownership of nor commitment to the plans and thus discontinued the plans at the first opportunity. The conclusion is reached that long-lasting change can only be effectively brought about when the changes are accepted and owned by all those in the organization who are affected by new programs, including supervisors. Informal reports of interventions communicated to the authors by a number of practitioners and researchers indicate similar patterns. Interventions that are focused on increasing autonomy, influence, and participation of lower-level employees without taking account of the role changes or needs of employees one level higher have had similar results. At best such approaches yield fewer positive changes in the target groups. At worst, negative feelings and counterproductive behavior is stimulated among members of groups one level up in the hierarchy. Thus the pattern that emerges here seems to have been identified in the research and practice of other individuals in diverse organizations.

At the same time, it is important to qualify the findings and patterns identified here. The analysis has been based on *questionnaire* data obtained at one point in time and *clinical* data gathered intermittently over

the limited period of one year. The existence of a causal chain of events has not been statistically established. What can be said, however, is that there are patterns in the data which are consistent with the clinical observations and that these patterns indicate differential effects of the intervention activities.

## CONCLUSIONS AND RECOMMENDATIONS

The observations made and the data collected lead to conclusions about why the interventions in this particular organization led to different effects at various levels. These conclusions also serve as recommendations both for the practice of organization development and for research on planned change programs in organizations.

In general, the data indicate that the possibility exists for mixed effects in otherwise successful change programs. There are also indications that with a less integrated and coordinated collection of interventions, the risk of unintended or unanticipated differential effects becomes greater.

### Integration, Participation, and Evaluation

- Specifically, the first conclusion is that *effective change is brought about by planned, integrated interventions* which work consistently on a number of different behavioral and organizational targets. Many of the more successful change efforts have been characterized by such integration (e.g., Morse & Reimer, 1956; Marrow, Bowers, & Seashore, 1967; Beer & Huse, 1972). Such efforts also tend to be planned in advance, with OD by definition being *planned* organizational change (Beckhard, 1969; Bennis, 1966).

The interventions in the present case were more reactive in nature, with programs often being developed in an ad hoc fashion in response to specific problems rather than being planned out in advance on the basis of a comprehensive diagnosis. Their multiplicity and the lack of coordination of these change activities thus created new organizational strains. In the process of solving one set of problems related to lower-level influence in the organization, new problems related to role ambiguity arose at higher levels.

- Second, participation in decision making as a change-goal for lower-level employees should not be confused with a complete absence of



decision making by managers and supervisors. Much of the work in the area of leadership and decision making points to *the effectiveness of different degrees of participation and directiveness* in different situations and with different individuals (Tannenbaum & Schmidt, 1958; Vroom, 1959; Vroom & Yetton, 1973).

In this case, participation seems to have been confused with a new reluctance to make decisions, particularly by middle and upper management. This lack of direction resulted in the absence of clear group and organizational goals and some dissatisfaction among these managers.

- A third consideration is the process by which participation is increased. In theory, influence in an organization is not a "fixed pie," and *increasing participation can provide a way to increase the total size of the influence pie* (Tannenbaum, 1962). That is, it is possible to give one group more influence over their work environment without taking away influence from another group, thereby increasing the total amount of influence exercised in the organization. *Whether the size of the pie is increased, however, depends on the way in which participation is implemented.*

Where decisions are simply moved from one group to another, as in the Lawler and Hackman (1969) and the Lawler, Hackman, and Kaufman (1973) experiments, or as they were in the current case, total influence is not increased. If one group such as Level 3 gains, then another group such as Level 2 must lose.

Thus the process of increasing participation must either increase the number or scope of total decisions to be made or must include enough mutuality in decision making so that decisions can be shared by more than one group. This implies a need to include multiple levels in the process of increasing participation, rather than excluding groups other than the specific target group. It argues for making team building a collaborative effort for both supervisors and team members, not an activity where supervisors are excluded. In addition, the study indicates a need to consider how interventions aimed at increasing participation at lower levels may negatively affect the roles of supervisors and technicians. In this case and in the two similar studies cited here, these groups of employees emerged as particularly vulnerable to role problems resulting from participation.

- A fourth problem that often characterizes interventions into organizations is that of *overload*. In its enthusiasm to bring to bear as many resources as possible, an organization may contribute to a lack of coordination and integration of change efforts by having a confusing number of activities going on at the same time. The probability of mixed messages and lack of coordination is great in such a situation and creates additional strain by adding to the ambiguity of the environment.

At one point in this case at least five different university research groups and two outside consultants were involved in activities simultaneously. Although there was some coordination among several of the research groups that were from the same university, in general there was little integration of the different efforts. These outside resources were characterized by different styles, different intervention or research strategies, and different theoretical orientations.

- Fifth, *the current study underscores the need for measurement and evaluation as an integral part of change programs*—in diagnosis as well as in the planning stages of long-term interventions. Measurement also is important in the process of monitoring change and being sensitive to unintended or unanticipated effects of interventions.

The current study emphasizes that the assessment of change must move beyond the measurement of gross states of total organizational changes over time. Analyses need to consider changes within and across workgroups, units, departments, and hierarchical levels. The effects of change on different kinds of targets such as attitudes, behavior, process, or structure must also be assessed.

Significant patterns may exist at one level of analysis but be swallowed up in the total data relating to the larger organization. The effective determination of the multiple differential effects of any intervention is therefore dependent upon the analysis of data for *all* relevant targets or subgroups.

The present case underscores the overall need to adopt more sophisticated—systemic—approaches to the theory and practice of change in organizations. It is through a lack of attention to the complex second- and third-order relationships among events, issues, and groups in organizations that unanticipated differential effects occur. The present study thus supports the observation made by Katz and Kahn (1966) that much of the work in the area of change has run into problems because of

insufficient attention being directed toward the systemic properties of organizations.

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