

Effects of Changes in Job Characteristics on Work Attitudes and Behaviors: A Naturally Occurring Quasi-Experiment

J. RICHARD HACKMAN, JONE L. PEARCE, AND
JANE CAMINIS WOLFE

Yale University

The effects of changes in the motivational properties of jobs on work attitudes and behaviors were assessed in a quasi-experimental design. A number of clerical jobs in a metropolitan bank were redesigned because of a technological innovation. Changes were made without regard for the motivational characteristics of the jobs, and without cognizance by bank personnel that there might be motivational consequences of the changes. Some jobs were made more complex and challenging, some less so, and the motivational properties of still others were essentially unaffected. Measures of job characteristics, employee attitudes, and work behaviors were collected before and after the changes. Results showed that general satisfaction, growth satisfaction, and internal motivation were affected by changes in job characteristics. Satisfaction with the work context was not affected. Effects of the changes on absenteeism and performance depended on the strength of employee growth needs, which also tended to moderate attitudinal reactions to the changes. Contrary to expectation, employee growth needs themselves were not affected by the altered motivational characteristics of the jobs.

While considerable correlational evidence has accumulated showing relationships between the characteristics of jobs and the work attitudes and behaviors of jobholders, relatively few studies have assessed the causal impact of actual *changes* in job characteristics (for reviews, see Hackman, 1977; and Katzell & Yankelovich, 1975). Of the published studies that do examine the effects of jobs changes, most are evaluations of job enrichment or work redesign programs, in which changes are explicitly intended to improve employee attitudes and/or productivity.

Such evaluations can be very helpful in increasing knowledge about organizational change processes that involve the redesign of work. But they are of more limited use in furthering understanding of the impact of changes in job characteristics per se, for a number of reasons. First, because job enrichment (and similar programs) always aspire toward

This research was supported by the Organizational Effectiveness Research Program, Psychological Sciences Division, Office of Naval Research, under Contract No. N00014-75-C-0269, NR 170-744. Reproduction in whole or in part is permitted for any purpose of the United States Government. The authors wish to thank Louise McNulty and Jay Lowrey for their assistance in the design and execution of the research and the employees of the bank where the research was conducted for their cooperation. J. C. W. is presently at RCA.

improvement in the motivational makeup of jobs, both the range and the direction of alterations in job characteristics are necessarily restricted. In addition, and of more serious consequence, work redesign activities invariably involve numerous changes that extend well beyond alterations in job characteristics themselves, e.g., revision of compensation practices, placement and promotion policies, superior-subordinate relationships, and so on. While such nonjob changes may help ensure the success of a change project (and, indeed, may be instituted specifically to buttress and reinforce improvements made in the job itself), they also increase ambiguity about what actually *caused* any changes in work attitudes or behavior that are found. Finally, job enrichment programs may create strong expectations, by both managers and employees, that great benefits will derive from the change project. Such expectations may powerfully influence attitudes and behavior at work, independent of alterations in the makeup of the jobs themselves. Again, the effect is to reduce the certainty with which conclusions can be drawn from work redesign programs about the direct effects of changes in jobs.

The present study assesses the effects of changes in job characteristics in a setting where the confounding factors identified above are reduced. Because of certain technological innovations, the jobs of all employees in a large work unit in an organization were redesigned. It happened that the change had the effect of objectively "enriching" some of the jobs, of simplifying and routinizing others, and of leading to no significant change in the motivational characteristics of still others. Because the changes were undertaken solely for technological reasons, they were designed and implemented without regard to how "enriched" the jobs were initially. Moreover, neither managers nor employees held expectations that the motivational characteristics of the jobs would be altered; instead, all attention was focused on improvements in productivity anticipated from a more efficient and technologically sophisticated work flow.

Measurements of the objective and perceived characteristics of the jobs were taken both before and after the change, using the Job Diagnostic Survey (Hackman & Oldham, 1975). This instrument (which is described in more detail below) measures a number of job characteristics that have been shown to affect the work motivation and satisfaction of jobholders and provides a summary index of the complexity and challenge of a job (called the Motivating Potential Score, MPS). In addition, a number of outcome measures (including both affective and behavioral reactions to the work) were collected before and after the job changes were made.

Because the direction of the change in job characteristics differed for subgroups within the organizational unit, it was possible to form three groups of employees: those whose jobs increased in MPS as a result of the change, those whose jobs decreased in MPS, and those whose jobs were

minimally changed in MPS. This provided a relatively strong quasi-experimental design for assessing the effects of the changes in job characteristics on employee work attitudes and behavior (i.e., the reversed-treatment nonequivalent control group design, with pretest and post-test, supplemented with a no-treatment control, as described by Cook & Campbell, 1976).

In addition, the research setting allowed examination of two questions having to do with the relationship between the design of jobs and the need states of the people who perform them. The first question addresses the degree to which individuals' needs for growth moderate their reactions to "enriched" versus routine work. A number of researchers have found that people with high growth need strength (GNS) respond more positively (i.e., with higher motivation and satisfaction) to jobs high in motivating potential than do individuals with weaker GNS (Brief & Aldag, 1975; Hackman & Lawler, 1971; Hackman & Oldham, 1976; Oldham, 1976; Sims & Szilagyi, Note 2; Wanous, 1974; Zierden, Note 3). All of these studies, however, have employed static correlations between job characteristics and outcome measures. Because it has not yet been demonstrated that GNS can be used to predict the strength of employees' responses to *changes* in their jobs, the causal status of the concept remains unverified. It was possible to address this issue in the present study by assessing the degree to which initial GNS predicted the reactions of employees to the changes that subsequently were made in their jobs. Specifically, it was expected that individuals with high GNS (compared to low GNS employees) would respond with greater motivation and satisfaction when their jobs increased in motivating potential, and, by the same token, that high GNS employees would react more negatively if their jobs decreased in MPS as a result of the change.

The second question has to do with the degree to which employee needs for growth themselves are affected by changes in job characteristics. It frequently has been argued that long-term work on simple, routine tasks can reduce an individual's desire for personal growth and development (e.g., U.S. Department of Health, Education, and Welfare, 1973). While results of some investigations provide inferential support for this proposition (e.g., Kornhauser, 1965; Walker & Guest, 1952), there have been no studies in which measured need for personal growth has been shown to vary directly with changes in job characteristics. It was possible to carry out such a test in the present study, using GNS as an indicator of the level of desire for personal growth and MPS as an indicator of the overall "richness" of the work. The expectation is that change in MPS is directly related to change in GNS: that is, employees whose new jobs are lower in MPS than their original jobs should show a drop in desire for growth, while those whose jobs are improved should show an increase in GNS. It

should be noted, however, that for the expectation to be supported, the impact of the job changes on employee needs would have to take place in relatively short order, since the interval between the actual job changes and the postmeasures of need strength was only about 6 months.

METHOD

Research Setting and Subjects

The research was conducted in a department of a large metropolitan bank. It involved 49 clerical jobs that required little customer contact. One-hundred and thirty employees provided prechange data and 201 provided postchange data. Complete data for both the pre- and postchange periods were available for 94 employees. Median age of the employees was 32, ranging from 18 to 63 years. The median education level was high school diploma and ranged from having "some high school" to "holding a graduate degree." Sixty-seven percent of the participants were women.

Measures

Measures of all variables used in this study (except for performance and absenteeism) were collected using the Job Diagnostic Survey (JDS). All JDS variables are averages of several items, where 1 = low and 7 = high. Properties of the instrument (including descriptions of item format and content) are detailed by Hackman and Oldham (1974, 1975). Measure intercorrelations and internal consistency reliabilities for pre- and postchange data collected in the present research are reported by Hackman, Pearce, and Caminis (1976). Brief descriptions of the measures follow.

Job characteristics. The following five characteristics of jobs were measured.

1. Skill variety: the degree to which a job requires a variety of different activities in carrying out the work, which involve the use of a number of different skills and talents of the person.
2. Task identity: the degree to which a job requires completion of a "whole" and identifiable piece of work; that is, doing a job from beginning to end with a visible outcome.
3. Task significance: the degree to which a job has substantial impact on the lives or work of other people, whether in the immediate organization or in the external environment.
4. Autonomy: the degree to which a job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out.
5. Feedback: the degree to which carrying out the activities required by a job results in the individual obtaining direct and clear information about the effectiveness of his/her performance.

Following Hackman and Oldham (1975), these five characteristics were combined into a summary score (MPS) that reflects the overall potential of a job to prompt high internal work motivation and high quality performance. MPS ranges from 1 to 343 and is used throughout this study as a measure of how "enriched" jobs are.

Supervisory assessments were obtained for 25 of the jobs studied, and mean supervisory assessments were correlated with mean employee assessments using jobs as observations. The median correlation between the two sets of mean ratings is .49, indicating a moderate level of agreement between supervisors and employees about the characteristics of the jobs.

Individual growth need strength. The measure of growth need strength was obtained by asking JDS respondents to indicate "the degree to which you would like to have each (of six growth-enhancing conditions, such as "stimulating and challenging work") present in your job."

Outcomes. There were two groups of outcome measures: (a) indexes of employees' affective responses to their work, taken from the JDS, and (b) measures of absenteeism and performance effectiveness.

Affective responses. Measures of affective responses to the work were:

General satisfaction: global satisfaction with the job, as reflected in items such as "Generally speaking, I am very satisfied with this job."

Internal work motivation: the degree to which an individual experiences positive internal feelings when performing effectively on the job. A sample item is: "I feel a great sense of personal satisfaction when I do this job well."

Growth satisfaction: the degree to which an individual is satisfied with opportunities for growth on the job; for example, "The amount of personal growth and development I get in doing my job."

Context satisfaction: self-reports of satisfaction with (a) job security, (b) pay, (c) supervision, and (d) co-workers.

Behavioral reactions. Measures of behavioral reactions to the work were:

Rated performance: the most recent overall evaluation of each employee by his or her immediate supervisor. Employees were rated on a 5-point scale ranging from "unacceptable" (scored 1) to "outstanding" (scored 5). These ratings were obtained from bank records, and data were selected so that two performance assessments were obtained for each employee, one referring to the period immediately before the job changes were made and one for the period following the changes.

Absenteeism: these data also were collected from company records, for two 4-month periods, January–April 1974 (prior to the job changes) and January–April 1975 (after the job changes). The identical 4-month

periods were used to control for possible seasonal fluctuations in the absence rates. The absence data were coded in terms of the total occasions of absence for each employee in the 4-month periods.

Procedure

Prechange data collection. The JDS was administered to bank employees in April, 1974, 2 months before the planned change. At the time, employees knew nothing about what their redesigned jobs might be, although they did know that a change was being planned. Data collection for the present research was conducted wholly independently of the planned changes, and there was no indication that employees' expectations about the change were affected by the prechange data collection.

The questionnaire was administered to groups of employees, ranging from 7 to 15 at a time. Before completing the questionnaire, each participant was assigned an identification number (that appeared on a corner of the cover page of the questionnaire). Employees were told that the number was to be used by the researchers to match archival data with questionnaire responses. Employees were assured that their individual responses would be held in confidence and were given the option of not participating. Very few employees declined to complete the questionnaire.

Also in April supervisors of many of the employees completed the Job Rating Form (Hackman & Oldham, 1974) that measures the characteristics of a job as viewed by individuals who do not work on that job. The Job Rating Form consists of job descriptive items nearly identical in form and content to those in the JDS. Data from the Job Rating Form were used to compute the correlations between employee and supervisory perceptions of the job reported earlier.

Intervention. In June 1974 the department-wide intervention was implemented. Before the changes, much of the work of the department involved maintenance of a very large file of cards, on which bank records were kept and updated. The technical basis of the change involved a move from card to computer-tape storage of information, and as a result most jobs in the department were substantially altered. Many postchange jobs involved either checking data to ensure that it was free of errors before it was put onto tape or preparing the data to be read onto tapes.

None of the data collected by the researchers in April was available either to line management or to the support staff as they designed and implemented the changes in employee jobs. The jobs were redesigned solely to meet the new technical demands of the work.

Postchange data collection. The department required about 3 months to become accustomed to the new storage and data maintenance system. By November 1974 start-up "bugs" had been worked out and employees had become accustomed to their new jobs. At that time, the researchers

TABLE 1
MEANS AND STANDARD DEVIATIONS BEFORE AND AFTER THE JOBS WERE CHANGED

	Prechange		Postchange		<i>t</i>
	Mean	SD	Mean	SD	
Job characteristics					
Skill variety	3.81	1.46	3.33	1.47	3.03**
Task identity	4.92	1.25	4.77	1.22	0.85
Task significance	5.21	1.20	5.06	1.20	1.04
Autonomy	4.30	1.39	3.95	1.41	2.05*
Feedback from job	4.39	1.43	4.44	1.22	-0.33
Motivating potential score (MPS)	95.45	58.62	85.30	57.13	1.48
Reactions to the work					
General satisfaction	4.52	1.17	3.90	1.23	4.53**
Internal work motivation	5.48	0.93	5.21	1.02	2.52**
Growth satisfaction	4.51	1.25	3.87	1.26	4.65**
"Context" satisfactions					
Job security	4.67	1.20	4.10	1.29	3.55**
Pay	4.08	1.40	3.46	1.49	3.52**
Supervision	5.00	1.27	4.39	1.52	3.95**
Co-workers	5.20	1.09	4.85	1.00	3.06**
Behavioral measures ^a					
Absenteeism (4-month period)	2.87	3.85	2.91	5.35	-0.05
Rated performance	3.39	.75	3.47	0.74	-0.88
Individual growth need strength	5.55	1.16	5.38	1.45	1.44
<i>N</i>	94		94		

^a Because of missing data, *N*s for the behavioral measures range from 70 to 93.

* $p < .05$ (two-tailed).

** $p < .01$.

returned and readministered the JDS to employees. Procedures of administration of the postchange instrument were identical to those used in collecting prechange data.

RESULTS

Means and standard deviations for all measures, both before and after the jobs were changed, are reported in Table 1 for the 94 employees for whom both pre- and postchange data were available. All of the job characteristics except feedback had lower means after the change than before, two significantly so. Also, all means for employee affective reactions showed significant declines. There was little difference between pre- and postchange means for absenteeism and performance effectiveness.

Effects of the Job Changes on Work Attitudes and Behavior

The results in Table 1 suggest that the net effect of the changes on the motivation and satisfaction of employees was unfavorable. However, not

all jobs decreased in motivating potential as a result of the changes, and some jobs increased in MPS rather substantially.

There were 22 jobs for which a group of employees had their work redesigned as a unit, that is, for which two or more employees worked on the same job prior to the change, and worked on a common redesigned job after the change. Of these, the work of five groups was enriched by the change (the increase in MPS ranged from 28 to 103, with a median increase of 72), and the work of 12 groups was made more simple and routine by the change (the decrease ranged from -26 to -87, with a median decrease of -43). While the jobs of the remaining five groups also were redesigned, the changes did not significantly affect the motivating potential of the jobs (the change in MPS for these groups ranged from +11 to -13, with a median change of -2).

Pre- and postchange means for all variables are shown for these three groups of employees in Table 2. As expected, the means for the measures of job characteristics show that (a) all job characteristics (except task identity) increased for the "enriched" groups, (b) all job measures decreased for the "deenriched" groups, and (c) there were no consistent effects for the "control" groups (i.e., those for whom MPS neither increased nor decreased as a result of the change).

Predicted changes in reactions to the work were obtained. General satisfaction, internal work motivation, and growth satisfaction increased for "enriched" groups, decreased substantially for "deenriched" groups, and decreased slightly for control groups. Because the several context satisfactions are not viewed as being directly responsive to changes in the motivating potential of jobs, it was anticipated that the context satisfactions would *not* change as a function of the changes in jobs. The means in Table 2 show that all context satisfactions decreased slightly in all three conditions (except for a small increase in job security in the "enriched" condition), suggesting that there were some unfavorable effects of the change on satisfaction with the work context, but that these did not derive from changes in the motivating potential of the jobs themselves.

No significant effects were found for the measures of absenteeism and performance effectiveness, although it should be noted that the (nonsignificant) changes in absenteeism were contrary to prediction: absenteeism increased in the "enriched" condition, showed little change in the control condition, and decreased in the "deenriched" condition.

In sum, the results are consistent with the proposition that change in the motivating potential of jobs leads to changes in internal work motivation and growth satisfaction. As predicted, satisfaction with aspects of the work context appear to be minimally affected by changes in work content. Findings regarding the behavioral measures were unexpected: There were no significant relationships between change in MPS and rated perfor-

TABLE 2
PRE- AND POSTCHANGE MEANS AS A FUNCTION OF EXPERIMENTAL CONDITION

	Employees whose jobs were enriched by the change				Employees whose job were neither enriched nor "deennriched" by the change				Employees whose jobs were "deennriched" by the change				F ratio ^a	η^2
	Pre-change	Post-change	Difference		Pre-change	Post-change	Difference		Pre-change	Post-change	Difference			
Job characteristics														
Skill variety	3.17	4.33	1.17		3.61	3.54	-0.07		4.03	3.33	-0.69		5.50**	.18
Task identity	4.97	4.60	-0.37		4.65	5.17	0.52		5.21	4.49	-0.72		2.55	.09
Task significance	4.40	5.57	1.17		5.35	4.93	-0.43		5.63	4.92	-0.71		8.86**	.26
Autonomy	4.23	5.23	1.00		4.28	3.91	-0.37		4.77	3.75	-1.03		7.19**	.22
Feedback from job	3.70	5.14	1.43		4.13	4.43	0.29		4.84	4.04	-0.80		14.24**	.36
Reactions to the work														
General satisfaction	4.52	4.84	0.32		4.53	4.18	-0.36		5.76	3.85	-0.91		3.61*	.13
Internal work motivation	5.23	5.92	0.69		5.53	5.37	-0.16		5.79	5.17	-0.62		6.48**	.21
Growth satisfaction	4.70	4.94	0.24		4.44	4.19	-0.25		4.74	3.61	-1.13		5.85**	.19
"Context" satisfactions														
Job security	4.25	4.45	0.20		4.53	3.97	-0.56		4.64	3.92	-0.72		1.24	.05
Pay	4.05	2.95	-1.10		4.00	3.39	-0.61		3.68	3.44	-0.24		0.84	.03
Supervision	5.13	5.00	-0.13		4.85	4.42	-0.42		5.05	4.27	-0.79		0.81	.03
Co-workers	5.57	5.43	-0.13		5.15	4.70	-0.45		5.42	4.72	-0.71		1.26	.05
Behavioral measures ^b														
Absenteeism	2.44	5.78	3.33		2.94	3.69	0.75		3.96	1.56	-2.40		1.97	.08
Rated performance	3.63	3.50	-0.12		3.10	3.50	0.40		3.36	3.54	0.18		1.37	.07
Individual growth need strength	5.63	5.08	-0.55		5.34	4.93	-0.41		5.50	5.45	-0.05		0.74	.03
N				10			18					25		

^a Degrees of freedom = 2, 50 for all measures except for absenteeism and performance. Analysis of variance computed on pre-post differences.

^b Ns for the three groups of employees are 8, 16, and 25 for absenteeism and 8, 10, and 22 for performance.

* $p < .05$ (two-tailed).

mance effectiveness, and change in MPS was directly (rather than inversely) related to employee absenteeism.¹

Effects of the Job Changes on Employee Growth Need Strength

It was shown in Table 1 that the average growth need strength of all department employees was slightly lower after the change than before. It was expected, however, that employees whose jobs increased in motivating potential would increase in growth need strength, while those whose jobs decreased in MPS would show a corresponding decrease in GNS. Results in Table 2 clearly disconfirm that expectation; indeed, the drop in GNS was slightly *greater* for employees whose jobs were enriched than for those whose jobs deteriorated in MPS as a result of the change. While the finding regarding the direction of the relationship between change in MPS and change in GNS is very small and nonsignificant (the dynamic correlation is $-.06$), the fact that this relationship is near zero is in itself counter to the expectation that employee needs would "follow" changes in the motivating potential of their jobs.

The Moderating Effect of Growth Need Strength

It was predicted that individuals with strong needs for growth would be more responsive to changes in the motivating potential of their jobs than would individuals with relatively weak growth need strength. To test this prediction, dynamic correlations were computed (between change in MPS and change in the dependent measures) separately for employees high and low in GNS. The left-hand columns of Table 3 show these correlations for individual employees (comparing those in the top and bottom thirds of the GNS distribution). Analogous correlations are shown in the right-hand columns of the table for the 22 intact groups of employees, i.e., sets of individuals who worked on a common job before the change and a common redesigned job afterwards, split at the median of the distribution of average GNS scores.²

In general, results are in the predicted direction for general satisfaction, growth satisfaction, and internal work motivation: In each case, the relationship between change in MPS and change in the dependent measure is stronger for high GNS employees than for employees low in GNS. No systematic moderating effects were obtained for the measures of satisfac-

¹ As a supplementary analysis, dynamic correlations (Vroom, 1966) were computed between change in MPS and change in reactions to the job across all 94 employees. Results, not reported here, almost exactly parallel those reported in Table 2.

² The magnitude of the correlations obtained is generally higher for the group analysis than for the individual analysis, but this probably is a simple consequence of the higher reliability of the group data (scores of group members on each measure were averaged prior to analysis, thereby increasing the reliability of the measures used in that analysis).

TABLE 3
CORRELATIONS BETWEEN CHANGE IN MPS AND CHANGE IN DEPENDENT MEASURES,
SEPARATELY FOR EMPLOYEES HIGH AND LOW IN GROWTH NEED STRENGTH

	Individual analysis		Work group analysis	
	Low GNS	High GNS	Low GNS	High GNS
Reactions to the work				
General satisfaction	.16	.30	.48	.89***
Internal work motivation	.28	.48**	.53*	.63*
Growth satisfaction	.21	.40*	.56*	.76**
"Context" satisfactions				
Job security	.22	.16	.50	.41
Pay	-.24	-.19	-.24	-.07
Supervision	.05	.08	.11	.66*
Co-workers	.15	.03	.31	.42
Behavioral measures ^b				
Absenteeism				
(4-month period)	-.02	.55***	.05	.57*
Rated performance	-.49	.21 ^a	-.09	.32
N	27	28	11	11

^a Difference between the correlations for high and low GNS employees is significant at $p < .05$.

^b In the individual analysis, *N*s for absenteeism are 19 and 22 for low and high GNS, and for performance, 16 for both need strength groups.

* $p < .05$.

** $p < .01$.

tion with the work context. This was expected and is consistent with the results in Table 2 showing context satisfactions to be generally unaffected by changes in the motivating properties of jobs.

Of special interest are the findings for the two behavioral measures. Results for absenteeism show that change in MPS and change in absence rate are associated only for high growth need individuals and that the direction of this association is positive. This compounds the interpretive difficulties noted for absenteeism earlier in this paper, for it suggests the following.

1. For low GNS individuals, absenteeism is not much affected by whether the job is increased or decreased in motivating potential. In itself, this is consistent with expectation.

2. For high GNS individuals, enriching the work was associated with an increase in absenteeism, while "de-enriching" the work led to better attendance. This is consistent with the proposition of Hackman and Oldham (1976) and others that individuals high in GNS will respond more strongly to changes in the MPS of their work than will low GNS employees—but it is exactly opposite to the *direction* of the effect they predicted.

Results for the performance measure are generally supportive of expectations. It will be recalled from the unmoderated analyses reported previously that there was no significant association between change in MPS and change in rated performance. The results shown in Table 3 provide a possible explanation for that finding. Specifically, it appears that for low GNS individuals, performance tends to improve when jobs are simplified (and deteriorate when jobs are enriched). For high GNS individuals, however, the reverse is true: Performance gets better when the job gets better, and worsens when the motivating potential of the job decreases.

In sum, the results in Table 3 provide general support for the proposition that how people respond to changes in their jobs is conditioned by the strength of their need for personal growth and development. Although the magnitude of correlations obtained for high GNS employees was greater than that obtained for low GNS employees for all dependent measures (except for some of the context satisfactions, for which differential relationships were not expected), significant differences between correlations were obtained for only a few of the self-report measures. Results for the behavioral measures were of more substantial magnitude. These findings were consistent with prediction for the measure of work performance, but were opposite to prediction for absenteeism.

DISCUSSION

In general, the results show that changes in job characteristics do affect employee reactions to their work as predicted: Employees on jobs that increased in motivating potential gained in internal work motivation and growth satisfaction; the reverse was true for employees whose jobs deteriorated in motivating potential; and little change was obtained for employees whose work was redesigned in a way that minimally altered the MPS of their jobs.

These results are generally consistent with previous findings in which static correlational methods have been used to assess the relationships between job characteristics and employee reactions to their work. A special feature of the present study, however, is its focus on actual *changes* in job characteristics. Because the changes were made by organizational management without regard for the motivational properties of the work (and with no intent of altering those properties) employee expectations about possible improvements in their jobs were not raised. Moreover, neither compensation practices nor supervisor-subordinate relationships were redesigned as part of the change, contrasting frequent practice in job enrichment projects. For this reason and because it happened that the changes resulted in both increases and decreases in the motivating potential of various jobs, it is possible to treat the study as a naturally occurring quasi-experiment and to conclude that changes in the job characteristics were causally responsible for observed changes in the outcome measures. Such a conclusion must be made with caution, however, because changes

in other organizational systems (such as compensation or supervision) may have occurred concomitantly with the changes in job characteristics. While neither our quantitative nor our qualitative data suggest that any such changes were substantial, there no doubt were some, and they may have affected the outcome measures to some degree.

Context satisfactions were found to be generally unaffected by changes in job characteristics. This is not surprising, because there is no theoretical reason to expect that they should have been affected. Indeed, the fact that changes in context satisfactions generally did not covary with changes in job characteristics lends credence to the argument that changes in the outcome measures were *not* primarily a function of unnoticed alterations in the work context. Moreover, these results make it unlikely that the positive findings obtained for other self-report measures are merely manifestations of an overall change in employee satisfaction that resulted from the technological alterations.

While the differences are not statistically significant, it is noteworthy that (a) satisfaction with pay decreased the most for employees whose jobs were most enriched (Table 2), and (b) the correlation between MPS and pay satisfaction was more negative for individuals low in growth need strength than for those with strong growth needs (Table 3). It appears that when a job is motivationally enriched for people who do not care much about "growth" satisfactions, the result may be heightened dissatisfaction with the compensation that is received for work on the more complex, challenging job.

The effects of the job changes on the two behavioral measures were found to depend upon the growth need strength of the affected employees: Only when employees were grouped on the basis of their growth needs did substantial relationships emerge between changes in the job characteristics and the measures of employee performance and absenteeism. The more a job was enriched by the changes the more performance tended to improve for employees high in growth need strength and to *decline* for low growth need employees. Results for absenteeism, while statistically strong, are interpretively troublesome. For individuals with relatively weak needs for growth, absence rate was not much affected by whether their jobs improved or deteriorated in motivating potential; but for individuals with strong growth needs, the greater the improvement in the job, the *more* they were absent from work. We are at loss to explain why this should be so.³

³ It should be noted that the two behavioral measures, overall performance effectiveness and occasions of absence, are not ideal for testing the effects of changes in the *motivational* properties of the work. The performance measure does not distinguish between the quality and quantity of performance, even though the theory upon which the research was based specifies that improvements in MPS are more likely to lead to gains in performance quality than to increases in the quantity of work done (Hackman & Oldham, 1976). The measure of

While the moderating effects of growth need strength on the relationship between job changes and changes in general satisfaction, growth satisfaction, and internal motivation are consistently in the predicted direction, they are not of substantial magnitude. Only a few of the moderating effects for these measures are statistically significant. Moreover, the direction of all relationships between change in MPS and change in the dependent measures is positive, for individuals who have weak as well as strong needs for growth. So growth need strength seems to affect only *how* motivated and satisfied people will be when their jobs are improved. Not even individuals with very weak needs for growth, it appears, respond to enriching changes in their jobs with dissatisfaction and reduced internal motivation. (This conclusion contrasts the finding for actual work performance, for which the *direction* of the relationship between change in job characteristics and change in work behaviors was found to be moderated by employee growth need strength.)

Perhaps the most interesting finding regarding growth need strength was the failure to find any causal effect of change in the motivating potential of the jobs on employees' strength of desire for growth. It is possible, of course, that 6 months is not a long enough time for very real effects of jobs on growth needs to show themselves, or that the changes in jobs that were made in this experiment were not sufficiently large to show the effect. But the results reinforce the need for a causally unambiguous test of the often stated (but not yet proven) claim that an individual's need for growth is itself affected by the amount of challenge and complexity in the work that he or she does.

There are a number of restrictions on the generalizability and interpretability of the present study. The setting in which the research was conducted is unique in many respects: The changes involved clerks in a large metropolitan bank whose median educational level was a high school diploma, and the jobs were low both in the organizational hierarchy and in motivating potential (the average MPS prior to the change was about 100, which is more than one standard deviation below the national average for MPS reported by Hackman and Oldham, 1975). Whether the effects obtained here also would have been obtained in a different kind of organization, or for jobs that generally were more motivating to begin with is open to question.

It also should be noted that the primary measures of job characteristics

absenteeism does not distinguish between voluntary and involuntary absences, which compromises the usefulness of the measure as an index of employee satisfaction and motivation. Nevertheless, it appears that the impact of these difficulties is conservative, in that obtained relationships between the motivating properties of the work and the behavioral measures probably are less strong than would have been the case if the behavioral measures had been more motivationally "pure."

used in this research were the perceptions of the employees themselves. The quantitative descriptions of jobs provided by job incumbents and those provided by members of management show a moderate level of convergence, suggesting that the perceptual measures are not wholly removed from reality. Yet it also is the case that a person's perception of his or her job is no doubt caused by—as well as causal of—that individual's other reactions to the work and the organization, as recent findings of Seeborg (1976) and Rousseau (Note 1) have shown. Additional research on how perceptions of job characteristics are jointly affected by the objective properties of the job and the personal and social environment of the job incumbent is clearly called for.

Finally, although all changes in the characteristics and requirements of the jobs were made by management without regard for the initial motivational makeup of those jobs, it turned out (not surprisingly) that the jobs that initially were lowest in MPS tended to be improved by the changes and those initially highest in MPS were more likely to be reduced in motivating potential. While there is no reason to believe that this phenomenon confounded the results reported here, it does highlight the quasi-experimental character of the present research and reinforces the continuing need for true experimental studies of the effects of changes in jobs on the work attitudes and behaviors of the people who perform them.

REFERENCES

- Brief, A. P., & Aldag, R. J. Employee reactions to job characteristics: A constructive replication. *Journal of Applied Psychology*, 1975, **60**, 182-186.
- Cook, T. D., & Campbell, D. T. The design and conduct of quasi-experiments and true experiments in field settings. In M. D. Dunnette (Ed.), *Handbook of industrial and organizational psychology*. Chicago: Rand-McNally, 1976.
- Hackman, J. R. Work design. In J. R. Hackman & J. L. Suttle (Eds.), *Improving life at work: Behavioral science approaches to organizational change*. Santa Monica, CA: Goodyear, 1977.
- Hackman, J. R., & Lawler, E. E. Employee reactions to job characteristics. *Journal of Applied Psychology Monograph*, 1971, **55**, 259-286.
- Hackman, J. R., & Oldham, G. R. *The Job Diagnostic Survey: An instrument for the diagnosis of jobs and the evaluation of job redesign projects*. New Haven, CT: Technical Report No. 4, Department of Administrative Sciences, Yale University, 1974. (NTIS No. AD-779 828)
- Hackman, J. R., & Oldham, G. R. Development of the Job Diagnostic Survey. *Journal of Applied Psychology*, 1975, **60**, 159-170.
- Hackman, J. R., & Oldham, G. R. Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance*, 1976, **16**, 250-279.
- Hackman, J. R., Pearce, J. L., & Caminis, J. *Effects of changes in job characteristics on work attitudes and behaviors: A naturally-occurring quasi-experiment*. New Haven, CT: Technical Report No. 13, School of Organization and Management, Yale University, 1976. (NTIS No. ADA-037 090)
- Katzell, R. A. & Yankelovich, D. *Work, productivity and job satisfaction*. New York: The Psychological Corporation, 1975.
- Kornhauser, A. *Mental health of the industrial worker*. New York: Wiley, 1965.

- Oldham, G. R. Job characteristics and internal motivation: The moderating effect of interpersonal and individual variables. *Human Relations*, 1976, **29**, 559-569.
- Seeborg, I. S. *The influence of employee participation in job redesign*. New Haven, CT: Technical Report No. 12, School of Organization and Management, Yale University, 1976. (NTIS No. ADA-036 722)
- U.S. Department of Health, Education, and Welfare. *Work in America: Report of a special task force to the Secretary of Health, Education, and Welfare*. Cambridge, MA: MIT Press, 1973.
- Vroom, V. H. A comparison of static and dynamic correlational methods in the study of organizations. *Organizational Behavior and Human Performance*, 1966, **1**, 55-70.
- Walker, C. R., & Guest, R. H. *The man on the assembly line*. Cambridge, MA: Harvard University Press, 1952.
- Wanous, J. P. Individual differences and reactions to job characteristics. *Journal of Applied Psychology*, 1974, **59**, 616-622.

REFERENCE NOTES

1. Rousseau, D. Personal communication, 1977.
2. Sims, H. P., & Szilagyi, A. D. *Individual moderators of job characteristic relationships*. Unpublished manuscript, Graduate School of Business, Indiana University, 1974.
3. Zierden, W. E. *The person, the manager, the job: Interactive effects on job related satisfactions*. Unpublished doctoral dissertation, Yale University, 1975.

RECEIVED: April 15, 1977