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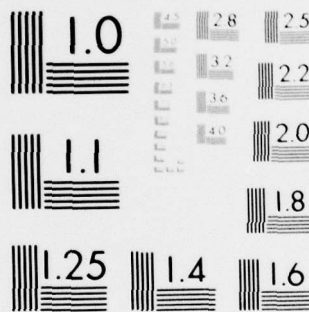
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IMPROVING INDIVIDUAL AND GROUP  
PERFORMANCE EFFECTIVENESS

Final Report for ONR Contract  
N00014-75C-0269 (NR 170-744) to  
Yale University

J. Richard Hackman  
Principal Investigator  
October, 1979

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) → This Report focussed on: (1) development of theories of how jobs and tasks affect people in organizations, including ways to redesign work and work systems to improve individual work effectiveness, and (2) assessment of the impact of social relationships on work attitudes and behavior, especially how group interaction processes influence work team effectiveness. Research findings are summarized, and citations are provided of technical reports and publications in which research results are reported in detail.		

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IMPROVING INDIVIDUAL AND GROUP PERFORMANCE  
EFFECTIVENESS: FINAL REPORT

J. Richard Hackman  
Principal Investigator  
Yale University  
October, 1979

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This report summarizes research carried out under ONR Contract N00014-75C-0269, NR 170-744 to Yale University. The report has three major sections: (a) accomplishments, (b) failures, and (c) citations of contract-supported publications.

Accomplishments

Research carried out with contract support has focused on two general research tasks: (1) the development of conceptual understanding of the ways that jobs and tasks affect people in organizations, including specification of strategies for improving the productive effectiveness of individuals through the redesign of work and work systems; and (2) assessment of the influence of interpersonal relationships on work attitudes and behavior, with special emphasis on how the interaction process that takes place among members of work groups affects team effectiveness. Throughout, the research has involved (1) development of basic theory about the phenomena being addressed, (2) construction of diagnostic or evaluation methodologies for examining those phenomena as they exist in organizational settings, and (3) use of these conceptual and methodological tools to develop and test strategies for improving individual and organizational effectiveness. Brief descriptions of research findings are provided in the paragraphs to follow. The accomplishments of the research can be more completely assessed, however, by perusal of the scientific articles listed. These reports are the tangible products of the

research program and provide the most appropriate basis for assessing the worth of the research activities.

Task effects on motivation and productivity

The key research activity in this area has been the development (with Greg R. Oldham, now of the University of Illinois) of a new theory of work motivation that specifies how the attributes of tasks and the personal characteristics of organization members interact to affect attitudes and behavior at work. The theory specifies the conditions under which individuals will experience internal motivation to perform high quality work, and at the same time improve their task-relevant knowledge and skill. Based on this theory, a set of methodological tools have been developed and validated, and now are in wide use in diagnostic studies prior to work redesign activities and in evaluation research on the effects of job and organizational change programs. Among the most extensive and successful uses of these materials is a multi-unit work redesign program conducted in the U.S. Air Force by Denis Umstot (Wright-Patterson Air Force Base) and William Rosenbach (U.S. Air Force Academy). Evaluation studies conducted by the principal investigator and his associates have resulted both in empirical papers and in essay reports that attempt to identify the circumstances under which work redesign is (and is not) a viable strategy for personal and organizational change.

Technical reports of the research summarized above are listed below. The published versions of all technical reports are cited in the bibliography at the end of this document, and the citation number is provided following each technical report listed below.

Hackman, J. R., Oldham, G. R., Janson, R. & Purdy, K. A new strategy for job enrichment. T. R. No. 3, Dept. of Administrative Sciences, Yale University, 1974. (Bibliography item #16)

Hackman, J. R. & Oldham, G. R. The Job Diagnostic Survey: An instrument for diagnosing the motivational potential of jobs. T. R. No. 4, Dept. of Administrative Sciences, Yale University, 1974. (Bibliography item #13)

Hackman, J. R. & Oldham, G. R. Motivation through the design of work: Test of a theory. T. R. No. 6, Dept. of Administrative Sciences, Yale University, 1974. (Bibliography item #14)

Frank, L. L. & Hackman, J. R. A failure of job enrichment: The case of the change that wasn't. T. R. No. 8, Dept. of Administrative Sciences, Yale University, 1975. (Bibliography item #2)

Hackman, J. R. On the coming demise of job enrichment. T. R. No. 9, Dept. of Administrative Sciences, Yale University, 1974. (Bibliography items #4 and #5)

Oldham, G. R., Hackman, J. R. & Pearce, J. L. Conditions under which employees respond positively to enriched work. T. R. No. 10, Dept. of Administrative Sciences, Yale University, 1975. (Bibliography item #19)

Seeborg, I. S. The influence of employee participation in job redesign. T. R. No. 12, School of Organization and Management, Yale University, 1976. (Bibliography items #21 and #22)

Hackman, J. R., Pearce, J. L. & Caminis, J. Effects of changes in job characteristics on work attitudes and behaviors: A naturally-occurring quasi-experiment. T. R. No. 13, School of Organization and Management, Yale University, 1976. (Bibliography item #17)

Brousseau, K. R. Effects of job experience on personality. T. R. No. 14, School of Organization and Management, Yale University, 1977. (Bibliography item #1)

Oldham, G. R., Hackman, J. R. & Stepina, L. Norms for the Job Diagnostic Survey. T. R. No. 16, School of Organization and Management, Yale University, 1978. (Bibliography item #20)

Oldham, G. R. & Hackman, J. R. Work design in the organizational context. T. R. No. 17, School of Organization and Management, Yale University, 1978. (Bibliography item #18)

Interpersonal relationships in teams and organizations

Two conceptual developments provided the basis for contract-supported empirical work in this area. The first was a systematic review of ways that groups in organizations affect the beliefs, attitudes and behavior of individual organization members, with special emphasis on the conditions under which groups facilitate (vs. impair) the motivation and commitment of members to achieve group and organizational goals. This work treats individuals as co-actors in a social environment. The second conceptual framework (developed with Charles G. Morris, University of Michigan) examined social interaction within interacting teams, where members work interdependently to accomplish a group task. This framework specifies how the characteristics of group tasks and the social processes that take place among members interact to affect group task effectiveness. Two streams of research activity have grown from these conceptualizations. The first has been the development and test of certain strategies for intervening into the on-going interaction process of groups to increase team effectiveness and member satisfaction; the second (and less fully developed) involves specification of the attributes of effective self-managing work groups in organizations--i.e., groups that have the resources, skill and motivation to proceed with work toward a team objective with little on-going monitoring and direction by organizational management.

Technical reports of the research summarized above are listed below. As before, the published versions of all reports are cited in the bibliography of this document, and the citation number is provided following each report listed.

Hackman, J. R. Group influences on individuals in organizations.  
T. R. No. 1, Dept. of Administrative Sciences, Yale University, 1973.  
(Bibliography item #6)

Kaplan, R. E. Managing interpersonal relations in task groups: A study of two contrasting strategies. T. R. No. 2, Dept. of Administrative Sciences, Yale University, 1973. (Bibliography item #3)

Hackman, J. R., Weiss, J. A. & Brousseau, K. Effects of task performance strategies on group performance effectiveness. T. R. No. 5, Dept. of Administrative Sciences, Yale University, 1974. (Bibliography item #9)

Hackman, J. R. & Morris, C. G. Group tasks, group interaction process, and group performance effectiveness: A review and proposed integration.  
T. R. No. 7, Dept. of Administrative Sciences, Yale University, 1974.  
(Bibliography item #11)

Hackman, J. R. The design of self-managing work groups. T. R. No. 11, School of Organization and Management, Yale University, 1976. (Bibliography item #7)

Hackman, J. R., Brousseau, K. R. & Guzzo, R. Designing interventions to improve the task-appropriateness of group interaction process. Technical Report in preparation.

In addition, two publications resulted from contract-supported research on groups and interpersonal relationships that were not issued as technical reports. These are "Interventions into group process: An approach to improving the effectiveness of groups" by J. R. Hackman and R. E. Kaplan (Bibliography item #10), and "Group process and group effectiveness: A re-appraisal" by J. R. Hackman and C. G. Morris (Bibliography item #12)

Integration of research and theory regarding the design of work for individuals and for groups

As research progressed on the separate "task design" and "group process" themes reviewed above, it became increasingly evident that these themes relate to and are dependent upon one another--and that their intersection has a good deal to do with broader questions of organizational design and change.

As the contract-supported research neared its conclusion, two integrative reports were prepared. The first, a book-length monograph, attempts to systematize and extend existing knowledge about the design of work, with special emphasis on the psychological and social factors that affect (and are affected by) the way work is structured and managed. While primarily a scholarly undertaking, non-scientific case studies and observational data are discussed as appropriate, to flesh out and enrich the scientific findings presented and conceptual directions proposed. Throughout, the focus is on knowledge that can be used--either to further scientific understanding of the effects of work on people and social systems, or as a basis for planned change aimed at improving organizational productivity and the quality of work experiences of organization members.

The second integrative piece is an essay, directed at both scholars and practitioners, that extrapolates from the research findings into the future. The article ventures some predictions about changes in work and organizational design in the decade to come; draws out some implications of those changes for people, for organizations and for society; and suggests what may have to happen if the (fairly gloomy) outcomes anticipated are to be averted.

These reports are:

Hackman, J. R. & Oldham, G. R. Work redesign. Reading, MA: Addison-Wesley, 1980. (Bibliography item #15)

Hackman, J. R. The design of work in the 1980s. T. R. No. 15, School of Organization and Management, Yale University, 1978. (Bibliography item #8)

### Failures

Four planned research tasks were not successfully completed, one because empirical results obtained (from a multi-stage data collection effort) simply defied meaningful interpretation, and three because satisfactory settings for data collection could not be found. Each of the four failures is described briefly below.

1. Extending the theory of work motivation through work design to include the social characteristics of jobs. It was expected that it would be possible to measure reliably (a) the social attributes of jobs (e.g., the degree to which collaborative and interdependent work is required, opportunities for forming and maintaining personal friendships in the workplace, and so on); (b) differences among individuals in their need for social satisfactions in the workplace; and (c) different types of social satisfactions actually experienced at work. A preliminary conceptual scheme was devised explicating the anticipated relationships among these classes of variables, and linking them to previous work on the motivating properties of individual and team tasks. Unfortunately, after three major data collection efforts and extensive analyses and revisions of data collection devices, it was necessary to conclude that either the measures developed were seriously flawed, the theory on which the measures were based was faulty—or, perhaps most likely, both.

2. Applying and testing the theory of work motivation in settings where job complexity is extremely high (e.g., some Air Traffic Control jobs) and/or where the organizational level of the job incumbents is high (e.g., some kinds of managerial and professional work). This research was intended to test the "upwards" generality of the theory--to see, for example, if there is such a thing as a job that has too much built-in motivating potential. Unfortunately, despite considerable preliminary exploration, it was not possible to find organizational settings appropriate for the research objectives.

3. Conducting a large-scale field experiment on work redesign as a change strategy within an operating unit of the U.S. Navy. This objective, initiated by line officers of the Navy through the Office of Naval Research, was seriously pursued. One set of explorations focused on naval research laboratories, another on anti-submarine units. Despite a large number of research days and exploratory trips, and despite the active support and involvement of the scientific officer for the contract, it was not possible to negotiate entry into either of the organizations to conduct the field experiment.

4. Conducting multi-method diagnostic and change studies of intact work teams in organizations. Following from the theory reported in bibliography items #7 and #15, the planned research was initially to assess how work team productivity is affected by the interaction among (a) the design of the team as a social unit (e.g., group size, composition, hierarchical structure), (b) the attributes of the task and technology with which the team works, and (c) properties of the group norms and the group interaction processes that emerge as the team carries out its task. Then, following the

diagnostic studies, field experimental work was planned in which existing work teams would be redesigned to heighten their effectiveness and/or new work teams would be created. While initial research activities (specifically involving the development of theory-based diagnostic methodologies) were highly promising, we simply ran out of contract time before full-fledged diagnostic and change studies could be conducted.

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