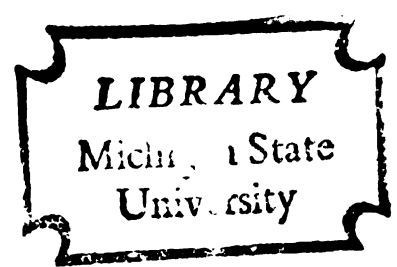


MANAGEMENT, TECHNOLOGY AND BEHAVIOR
OF WORK GROUPS

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CHARLES A. DRAKE
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This is to certify that the
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ABSTRACT

MANAGEMENT, TECHNOLOGY AND BEHAVIOR OF WORK GROUPS

By

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This dissertation examines the impact various variables associated with the technical structure of a work setting have on the potential relationship between supervisory style and the attitudes and behavior of industrial work groups. Continued emphasis on the social system at the expense of the technical structure has encouraged and confused the advocates of a "one best method" of supervision. This research explores the assumption that supervision is an integral part of an organization in operation and whatever characteristics the organization may have will influence the appropriate style of supervision.

The hypotheses presented suggest that as work groups employ highly skilled and educated personnel in non-repetitive task environments where work load and performance are difficult to measure there will be a strong and consistent positive association between "participative management" systems and the dependent variables: job

satisfaction, commitment to organization goals, group integration, and congruence between personal objectives and group goals. It is also argued that as the technical structure of a work group gives rise to more repetitive task procedures and measures of work load and performance become more precise, the parameters for appropriate styles of supervision become much larger, reducing the occurrence of strong and consistent positive associations between "participative management" systems and the dependent variables mentioned.

Although a number of control variables introduced in the research do seem to influence the strength of correlations observed, the hypotheses in general were supported. The research concludes that the variance in technical structure within an industrial organization is sufficient to influence the appropriate style of supervision and its consequence on worker morale and commitment to the organization. From the data presented it may be argued that the principles of participative management are positively associated with high morale and performance in work groups characterized by non-routine technical structures. However, in work groups characterized by opposing technical structures such associations are less frequent and more likely the product of chance.

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Charles A. Drake

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CHAPTER I

ORGANIZATIONAL THEORY AND MANAGEMENT BEHAVIOR

In recent years there has been an increasing interest in the technological structure of work organizations. Such an interest has its roots in the work of Marx, Weber, and other early social theorists, but has remained dormant through the "industrial relations revolution." Marx recognized that certain forms of cooperation are dependent on the development of distinct combinations of technical innovations.¹ In "Capitol" he comments:

. . . technology discloses man's mode of dealing with nature, the process of production by which he sustains his life, and thereby also lays bare the mode of formation of his relations, and of the mental conceptions that flow from them.

However, what may have been obvious to Marx has long been neglected by the industrial sociologist in his effort to better understand the consequence variable patterns of social relations are having on the work organization. Therefore, this research was undertaken with the expressed goal to better understand the effect technology, or the technical structure of the work environment, is having on super-subordinate relations in a given industrial work group.

The development of this concern with the technical structure of a work group, in contrast to the behavioral patterns of a work group, has a precedent in the study of organization theory. That is, the early models of formal organization were primarily concerned with structure and the rational consequence organization design was having and would have on its functioning. Man was a tool to be placed within such structure and provide the medium through which it would function. Behavior, therefore, was pre-programmed by the organizational design and a thorough knowledge of this design was sufficient data to understand the functioning of formal organizational systems. Organizations were viewed as power structures; rational values legitimated them, trained experts ran them and the principle of hierarchy prescribing a position relation between rank of a unit and its power defined their shape.²

This perspective is first noticed in the work of Saint-Simon who pointed to the fact that the organization of the future would no longer rest upon coercion and force for compliance to organizational goals, and that the administrator's authority would no longer be based upon birth or heredity. He maintained that the administrator's authority would rest upon the possession of developed skills and "positive" (scientific) knowledge.³

However, it was not until Max Weber that Saint-Simon's vision received scholarly codification. Both men stressed

the importance of scientific knowledge and expertise for the modern organization and they were both concerned with the way in which modern organization affects the development of society.

Weber approached the problem of bureaucracies by first discussing the more general concept, corporate group, which he defined as "a social relationship which is either closed or limits the admission of outsiders by rules . . . and . . . its order is enforced by the action of specific individuals whose regular function this is . . ."⁴ Weber's characterization of bureaucracies is but an extension of his concept of a corporate group. He views bureaucracies as an "ideal type" and delineates six characteristics of the modern bureaucratic structure. First, the principle of "fixed and official jurisdictional areas," which are generally ordered by rules; "by laws of administrative relations." Second, the principle of "hierarchy" and of levels of "graded authority." This leads to a firmly ordered system which is characterized by super-subordinate relations. Third, the principle of "contractual agreement," which is preserved in its original form. Fourth, the principle of "specialized office management," usually requiring a good deal of expert training. Fifth, the principle of "official jurisdiction," pointing to the fact that an office within the bureaucratic structure, when fully developed, usually demands the full working capacity of the person holding that office.

Finally, the principle of regulation, referring to the fact that participants in a bureaucratic structure follow general rules which are stable, exhaustive, and which can be learned.⁵

The rational or mechanistic model of organizations associated with the work of Weber is also characteristic of the "scientific" manager's approach to men in organizations. Where the concern may have been different from Weber's, the focus was the same; an attempt to investigate the effective use of human beings in industrial organizations, and to analyze the interaction between the characteristics of human, social, and task environments created by the organization.⁶ The "scientific management group" described the characteristics of the human organism in the organizational setting as one might describe a machine for performing a comparatively simple task. In applying this model the organization is viewed as an "instrument," rationally conceived for the realization of expressly announced group goals. Its structures are deliberately established for the efficient realization of these goals. Behavior within the organization is seen as being consciously and rationally administered, and changes in organizational patterns are viewed as planned devices to improve the level of efficiency.

The early work in organization theory represents only one level of analysis for the study of organizations, as was quickly pointed out by critics of the mechanistic approach.⁷ An alternative level of analysis is found when

the investigator is interested in explaining individual behavior within the context of organizations. The organization is viewed as the environment, and the investigator explores the impact of social psychological variables or processes as reflected in the behavior of individuals.⁸

Just as the more structural model of Weber, Marx, and others can be traced to the work of Saint-Simon, the behavioral or social psychological approach can be traced to the work of Comte. That is, Comte chose to focus on spontaneous and informal patterns of organizations.⁹ As Gouldner points out, this focus on the more spontaneous mechanisms common to all groups made a most important contribution by facilitating the discovery of so-called informal organizations.¹⁰ However, where the behavioral scientist may have been aware of the existence of informal systems and their impact on organizational behavior, it was not until the work of Mayo, that the pendulum of research began to swing in this direction.

With the well-known Hawthorne studies and the report of observations made in the bank-wiring room a distinction was made between the formal and informal organization of positions and behavior in industry.¹¹ Concessions were made to the formal organization, grudgingly perhaps, in reaction to the extreme technical rationalism of the scientific-management movement whose position was very much in vogue at the time of the Hawthorne experiments. Concessions made, the formal organization was almost completely

ignored. Researchers began giving close attention to the unofficial conduct of workers, the aim being to interpret the system of evaluation through which workers assessed each other's positions in the work group and to identify how these evaluations became expressed in their day-to-day relations. Their work demonstrated that the processes of evaluation and interaction were tied to the particular task of these men, however, the technical nature of the work was ignored or treated as an incidental referent for rules of conduct emerging from within the group. It may have been that in focusing research on a single case investigators could not recognize that the technical organization of production might constitute a systemic constraint on the possibilities in the development of social groupings.¹²

The study of work organizations from this perspective suggested that once men are together at work for whatever reason, they will develop patterns of interaction much in excess of the requirements of the job imposed on them by management. However, the system of relations that develops is bounded by authority, that is, by the demands transmitted through foremen and inspectors for getting work done efficiently. Where the internal system may develop mutual obligations for recognition, help, and sociability, and these are to some extent incompatible with the demands of the external system, the sanctions employed are intended to

prevent an excess of sociability that would produce interference from the supervisor.

With an increasing awareness of this informal system, management theorists began to focus on techniques which would make effective use of its influence. The crucial link between the formal organizational design and the informal grouping was the supervisor. Therefore, research was undertaken to help isolate the supervisory techniques that would be most effective in the management of work groups. The assumption being made is that there exists a "one best method" of supervision and if properly employed the probable conflict between the formal and informal systems could be minimized. However, the research which followed was not supportive of this general assumption, and despite the claims of the Human Relations school of thought, research continued to demonstrate that where supervision may be a crucial link in determining the social structure of a work group, both formal and informal, there exist certain structural variables which must also be taken into account.

One of the first attempts to deal with this problem is reported in Leonard Sayles' work, Behavior of Industrial Work Groups, where he raises the question of why certain patterns of leadership are accepted without so much as a question in one work group and cause a "flurry of excitement" and tension in an adjacent group. He postulates that

the technology and structure of the organization are the "architects" of the work group; constructing with the materials of human interaction a variety of types of groups.¹³ He also suggests that while changes in leadership ability and supervision may effect changes in the behavior of work groups, it may be that "characteristics" of the work group restrict severely the supervisor's range of behavior. Therefore, Sayles raises a crucial question about the structure of the work group and the appropriate patterns of supervision to produce the desired results. His work, however, is incomplete in that it does not identify what supervisory techniques are most successful in different group structures. What Sayles does, after the development of a typology of work groups based upon certain behavioral characteristics, is to examine the structural characteristics of different work groups, in an effort to determine what kinds of structural characteristics are associated with what kinds of behavioral characteristics. An example would be his "erratic group" identified by the following behavioral characteristics:¹⁴

- (1) Easily inflamed
- (2) Poorly controlled pressure tactics, behavior is inconsistent
- (3) Quick conversion to good relationship with management
- (4) Highly centralized leadership
- (5) Active in organization phase of Union

The above behavioral characteristics were found to be associated with the following structural characteristics:

- (1) Middle or high status jobs
- (2) Worker control over job performance
- (3) Indispensable operations
- (4) High similarity of economic interests

Sayles, upon reflection, points out that all the relevant variables (structural) associated with the behavior of work groups are related to the technological system designed by the company to organize the work process. He comments:¹⁵

We are in the habit of attributing these (persistent industrial relation problems) to individual worker and manager characteristics and to the quality of the work environment. . . . However, this study suggests that the social system erected by the technological process is also a basic and continuing determinant of work group attitudes and actions.

Sayles' contention that the behavior of work groups is dependent upon the social system erected by the technology of the organization and that this social system intervenes with the strict relationship between technology and performance of work group behavior is not surprising. It would appear that some authors have accepted the validity of this notion so completely that they have ignored the technical system altogether. However, just as the social system may intervene in the relationship between technology and the work group, so may technology intervene in the relationship between the social system and work group behavior. This emphasis on the social system at the expense of the technical structure has encouraged and confused the advocates of a "one best method" of supervision. Dubin suggests, and it is the intent of this research to explore further,

the alternative assumption that supervision is an integral part of an organization in operation and whatever characteristics the organization may have will influence the style of supervision that is appropriate.¹⁶

The problem becomes to investigate and understand how technology influences the relationship between style of supervision and behavior of work groups. More specifically, we are asking whether authoritarian managers are more or less successful in the supervision of research groups as opposed to business information groups or manufacturing groups. We are also concerned with those variables associated with the technology of a group which influence this relationship. It is believed that the answers to these questions and their corollaries will amplify our understanding of organizations and the development of theory.

FOOTNOTES - CHAPTER I

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2. T. K. Hopkins, "Bureaucratic Authority: The Convergence of Weber and Barnard," in Complex Organization, ed. by Amitai Etzioni (New York: Holt, Rinehart and Winston, 1964), p. 82.
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4. R. Scott, "Theory of Organizations," in Handbook of Modern Sociology, ed. by Robert Faris (Chicago: Rand McNally and Co., 1964), p. 486.
5. Hans Gerth and C. W. Mills, From Max Weber (New York: Oxford University Press, 1946), pp. 196-98.
6. James G. March and Herbert A. Simon, Organizations (New York: John Wiley and Sons, Inc., 1958), p. 11.
7. Robert K. Merton, Social Theory and Social Structure (Glencoe, N. Y.: Free Press, 1957), pp. 50-54; Selznick, "Foundations of the Theory of Organizations," American Sociological Review, XIII (1948), 25-35.
8. Scott, op. cit., p. 489. Scott, in his discussion of levels of analysis, identifies first the behavioral level exemplified by the works of March and Simon; second, the "structural" level as represented by the work of Udy and Weber; finally, the "ecological" level represented by the work of Selznick and his study of the Tennessee Valley Authority.
9. Gouldner, op. cit., p. 404.
10. Ibid., p. 407.
11. F. J. Roethlisberger and W. J. Dickson, Management and the Worker (Cambridge: Harvard University Press, 1939), pp. 377-548.

12. Martin Meissner, Technology and the Worker (San Francisco: Chandler Publishing Co., 1969), p. 4.
13. Leonard Sayles, The Behavior of Industrial Work Groups (New York: John Wiley and Sons, Inc., 1958), p. 2.
14. Ibid., pp. 41-93.
15. Ibid., p. 93.
16. Robert Dubin, et. al., Leadership and Productivity (San Francisco: Chandler Publishing Co., 1965), p. 4.

CHAPTER II

REVIEW OF THE LITERATURE AND DEVELOPMENT OF HYPOTHESES

A large portion of the literature in industrial sociology has focused on the structure of influence within organizations. This is not surprising, given the fact that most theories in the area of formal organizations are addressed to the same range of problems; the determinants of stable structures of compliant actions.¹ Various terms and concepts, more or less well defined, are used by different theorists in working in this area, e.g., "democratic leadership," "general supervision," "theory Y management," "participative management," etc. However, a common theme to much of the theory and research on organizations is the question (at the individual level of analysis); "What is the extent an individual can influence what he and other members do; their performance and satisfaction?" Phrased at the organizational level of analysis, the question becomes: "What effect does the structure of influence within organizations have on the attitudes and behavior of its members?" On the basis of considerable research and even more theory and speculation, various authors have proposed rather definite

answers to these questions. Likert, McGregor, and Argyris, some of the more vocal and influential, if not articulate authors, state rather conclusively that increased influence by organizational members on decisions affecting their jobs will result in higher productivity and satisfaction; and they argue rather polemically that organizations ought to be restructured to take this fact into account.²

Other authors, Dubin, Woodward, Sayles, Perrow, Litwak and Meissner, less polemic in tone, argue that the relationship between the influence structure and the behavior of industrial work groups is not at all clear and that other variables, particularly those related to the technology of the group must be taken into account.³ This chapter will review and critically examine the research and theory concerned with the above debate and develop the hypotheses being considered in this study.

Leadership Theory

The early Lippit and White studies were very influential in giving direction to much of the subsequent research in the area of leadership theory.⁴ In their first publication two experiments were described. In one, two groups of five eleven-year-old children were led by the same person playing a democratic role with one group and an autocratic role with the other. In the second experiment there were four groups of five eleven-year-old boys and four different leaders. Every six weeks each group received a

different leader employing a different leadership style. The leadership styles employed were: "democratic"--low goal and means control, high stimulation of group procedures; "autocratic"--high goal and means control, low stimulation of group procedure; and "laissez-faire"--low everything. The results indicated that democratic leaders were efficient, with high motivation and a good deal of originality. Autocratic leaders had morale problems and their group demonstrated considerable hostility. Finally, groups with laissez-faire leaders got less work done and it was of a poor quality in comparison to the others.

In another classic experiment reported by Lewin, he tries to demonstrate that group decisions are more effective than lectures in bringing about desired behavior patterns.⁵ In this study six groups of Red Cross nursing volunteers served as subjects. Three groups received lectures linking the use of certain foods to the war effort and describing their nutritional value. The other three groups were led by Alex Bavales in a discussion concerning the same material. A follow-up revealed that three percent of the women who heard the lecture, versus thirty-two percent of those participating in the discussion, reported serving one of the meals during the weeks following the experimental treatments.

These early studies by Lewin, Lippit and White suggested the importance of style of leadership in influencing

the morale and performance of social groups. Much of the research that followed was concerned with testing the validity of this hypothesis and determining what variables may have an influence on such a relationship.

Misumi conducted research in Japan to determine the influence cultural variables might be having on the results reported by Lippit and White.⁶ His research compared two groups of ten and eleven-year-old Tokyo school boys under democratic and autocratic leadership. The results were very similar to those of Lippit and White. The "morale," "friendliness" and "satisfaction" were reported to be highest in the democratic group. In regards to the quantity and quality of work, the results were somewhat different. In terms of quality of work, the autocratic group was rated highest with the democratic group rated next and the laissez-faire group was last.

Day and Hamblin attempted to study the effects of closeness of supervision in a laboratory simulation of an assembly line.⁷ The subjects were freshman and sophomore female college students, and they manipulated closeness of supervision by varying the detail in the instructions given the subjects by their "supervisor." Highly significant results in the predicted direction were obtained. Productivity was twenty-five percent lower under close supervision. In addition, aggressive feelings, measured by post-experimental questionnaires, toward both co-workers and the

supervisor were higher under close supervision. The authors interpreted the results as representing frustration of ego-needs produced by close supervision. They give credit to Gouldner for this interpretation; however, the influence of Lewin is also apparent.

Shaw attempts to reduce the confusion in findings in leadership theory by introducing the concepts of independence and saturation.⁸ Independence refers to the degree of freedom with which a member may operate and saturation refers to the communication requirements imposed on a group member. In this study, male undergraduates were divided into four-man groups in different communication nets under authoritarian and democratic leadership. As predicted, problems were solved faster with fewer errors under authoritarian leadership, but satisfaction was higher under democratic leadership. Shaw argues that independence will correlate positively with efficiency and morale, but after a certain optional point saturation tends to counteract these favorable effects. In addition, morale is influenced more by independence than saturation, while performance is influenced more by saturation than independence.

The concepts are related to leadership style in that authoritarian leadership tends to decrease independence and thus decrease morale, while increasing saturation and thus increasing performance. Non-authoritarian leadership should increase independence and thus increase morale, while decreasing saturation and thus decreasing performance.

The research discussed has obviously produced mixed results, and certainly no clear relationship between supervision and performance has been established. However, even if the results were all consistent, there are several methodological problems common to these studies which would make interpretation of the results obtained extremely difficult. First, with the exception of Lewin, Lippit and White, the groups investigated were actually ad hoc aggregates of individuals, rather than stable groups, with past histories and future expectations. Second, the populations of subjects employed has been extremely limited and extrapolation is tenuous. All members of organizations are not children, housewives, or college students. Finally, the possibility of contamination through "experimenter effects," "demand characteristics," and/or "evaluation apprehension," seems particularly pronounced in laboratory studies of influence processes.

Several authors have attempted to overcome the problems mentioned above by replicating earlier laboratory studies in organizations. Coch and French in an article, "Overcoming Resistance to Change," report a study which was conducted at the main plant of the Harwood Manufacturing Company.⁹ The plant, located in Virginia, employed men and women at a ratio of about one to five, with a total employment of around six hundred. A problem facing the management at Harwood had been the "resistance" of employees to various

changes in methods and jobs. This resistance had been expressed in grievances about new rates, high turnover, low efficiency, restriction of output and aggression against management.

An experiment was designed to test the effectiveness of "participation" in overcoming such resistance. The design included four groups of seven to eighteen employees. In the "no participation group," change was implemented as usual. The employees were simply informed of the changes to take place. In the "participation through representation" group a meeting was held and the need for change was presented as dramatically as possible. After agreement was reached that change was necessary and possible, this group then chose several operators to help determine the new methods and piece rates and help in the training of other operators in the new methods. The procedure was the same for the two "total participation" groups, except that all operators helped to determine the new methods and rates.

Immediately after the change, all four groups displayed the usual decline in productivity. However, within a few days the representative and total participation groups "showed an unusually good relearning curve," with the participative group returning to standard production within two days after the change was implemented.

The study is a classic and is often referred to by sponsors of the human relations school. However, there are

a number of problems that are often overlooked. First, the subjects were mostly young rural women. Second, only in the two "participation" conditions was the dramatic demonstration of the need for change employed and the total participation groups were also the smallest. It would seem that the results obtained could be explained simply in terms of these variables. Finally, however, the data from the second change for the original "no participation group" is hard to interpret since the most "resistant" employees are very likely the ones who left after the original experiment.

A later study by French, et al. (1960) was designed to replicate the original Coch and French study in a different culture, using more careful methods and a more precise theory of participation.¹⁰ They defined participation (one of the few places a definition was found) as "interpersonal influence in mutual decision-making when the decisions involved have future effects on the participants." They also made a distinction between "psychological participation," or perceived influence, and "objective participation," or actual influence. The general hypothesis predicted positive relationships between participation and productivity, management relationships and job satisfaction. The effects of several conditioning variables were also discussed. Briefly, the authors hypothesized that the above relationships would vary with the legitimacy of participation, the resistance to the participation process, the

importance of the area of participation and the relevance of the decisions to the dependent variables.

The authors argue that increases in participation should increase productivity because the decisions involved would be of better quality and because workers would be more motivated to implement them. Participation should be related positively to management-worker relations because the mutual influence involved will lead to "promotively interdependence" goals and communality of goals, because the exchange of information involved will lead to greater understanding between the parties and because the implication that the workers are intelligent, competent and worthy should increase their perception of being valued. Finally, participation should be positively related to job satisfaction because worker's jobs should be improved in ways that are relevant to worker's needs and because participation directly satisfies various "ego-needs," such as the need to be valued and appreciated by others.¹¹

The study took place in a shoe factory located in Norway. Nine groups of four workers each were employed in the experiment which involved variations in the participation allowed to the group in decisions concerning seasonal changes in production. Two of the experimental groups were allowed "moderate participation," which consisted of participation in decisions about allocation of articles, length of training, division of labor and job assignment.

The other three experimental groups were given "weak participation," which involved making decisions about the allocation of articles only. The four control groups did not participate in any of these decisions.

The results revealed no significant differences between the experimental and control groups in productivity. The authors attribute this to the unimportance of the decisions, the low relevance of the decisions to productivity and to strong group norms restricting group productivity. Slight and generally non-significant differences in the predicted direction were obtained for the measures of labor-management relations and job satisfaction and some support was obtained for the postulated conditioning effects of legitimacy and resistance. Especially when the effects of the conditioning variables are considered, the authors interpret their results as being generally consistent with those of the Coch and French study. However, the theoretical treatment of these conditioning variables is far from adequate. All of the concepts are rather vague; legitimacy and resistance, the only two systematically assessed in the study, are especially vague. Legitimacy was defined as "the extent to which the parties involved consider it right and proper to engage in the decision-making process." Operationally, however, only the workers who thought they had too little participation were considered to perceive the process as illegitimate. It would also seem, to have any

predictive utility, the concept would have to be conceptually related to other concepts which would specify which classes of people would consider which types of participation legitimate in which situations. Resistance to change was handled less adequately. The concept was defined as "induced forces opposed to doing the new jobs that are not intrinsic to the new situation but are originated by management actions and depend on the manner of inducing the change." The relationship of this concept to legitimacy is unclear and, as in the case of legitimacy, an adequate theory would have to specify who would "resist" what participation under which conditions.

While there are other studies which have made use of the laboratory techniques in organizations,¹² most of the work in this area could best be classified as survey research. This technique offers the advantage of investigating the operation of many variables involved in any phenomenon of interest as they naturally occur. Since the 1940's, massive amounts of data concerning leadership processes in organizations have been gathered employing this technique. However, this review will only consider that research which has had the greatest influence in this area.

The study by Katz and Maccoby, and Morse (1950) was the first project carried out in the human relations program at the Survey Research Center, University of Michigan.¹³ The objectives were to discover: (1) employee attitudes related to productivity, (2) supervisory beliefs and practices related to productivity and (3) the interrelationships of the various dimensions of morale and their determinants. Only data bearing on the first two objectives was reported. The study was carried out at the home office of the Prudential Insurance Company; twelve section pairs which handled the same type of work with the same work organization but differed in their productivity were compared. All of the 419 non-supervisory and 73 supervisory employees were interviewed.

The supervisors of the high-producing sections reported spending more time in supervision per se--overseeing and planning the work of their staff--than the low-producing supervisors. The high-producing supervisors also were coded as less "production-oriented" and more "employee-oriented," and as employing less "close" and more "general" supervision than the low-producing supervisors. No theory was presented to explain or predict these results. The authors viewed this as an exploratory study, designed to identify possible hypotheses to be more fully explored in subsequent research. The main problem with the study is the heavy reliance placed on self-reports to measure supervisory practices.

As a result of some of the problems associated with survey research,¹⁴ several large-scale field experiments have been conducted. Although such studies are all but impossible to conduct with much scientific rigor, the amount of data collected and its implication for organizational behavior cannot be ignored.

Morse and Reiner's study was the first attempt to test the hypothesized positive relationship between participation and productivity and satisfaction through a large-scale field experiment.¹⁵ The theory stated that increased participation should increase satisfaction because the decisions reached will be more in line with rank and file needs and because participation is intrinsically satisfying. Increases in participation should increase performance because employees will be more motivated to implement decisions which they have influenced.

The experiment took place within a large department of an industrial organization engaged in routine clerical work. The "rank and file" decisions making power were increased in two divisions and decreased in two others. The experiment lasted for a year and a half. A "before" questionnaire was administered; a half year was spent in training supervisors; the experimental conditions were in effect for a year, and then an "after" questionnaire was administered. The results supported the hypothesis concerning satisfaction rather strongly. However, the

hypothesis concerning productivity was not confirmed. Morse and Reiner suggest that this may be due to the weak measures of productivity. Likert supports this idea by suggesting that the differential attitude changes would have resulted in the eventual superiority of the autonomy program had the experiment lasted for a longer period of time.¹⁶

Another field experiment was conducted by Seashore and Bowers. It also was concerned with the development of a comprehensive theory of leadership, organization, and interpersonal relations as they relate to the effective performance of organizations.¹⁷ The study was conducted during the period from 1958 to 1961, although the design of the experiment changed considerably during this time. The research site was a factory in Michigan employing some eight hundred individuals. The total factory participated in the experiment, with the initial design being that of the controlled experiment.

A pretest was taken in 1958, after which programs were initiated in the experimental groups to bring about the desired change. A post test was taken in July of 1958. No significant difference in performance could be attributed to the results of the experiment, and Seashore and Bowers argue, as does Likert for Morse and Reiner, that the reason for this was the length of time between measurement.

After this initial experiment, the study seemed to come apart. The company experienced considerable economic

difficulty and the research project was under pressure to produce. This had the effect of initiating the change programs into any and all departments throughout the company willing to participate in the experiment. Eventually the experiment was terminated in 1960. However, in December of 1961, one final measure was taken by the researchers at the request of the company. This was in a period of economic prosperity and no significant results in production could be attributed to the experiment. Seashore and Bowers do argue, however, that what differences were observed resulted from the research and feel that the results are supportive of their theory.¹⁸

The literature reviewed above is often more confusing than helpful. Setting aside the obvious lack of consistency in research findings and trying to identify the phenomenon under investigation is a very onerous task. While it is evident that the research reviewed pertains to the influence exerted by members of different organizational levels, the precise relationship between "democratic leadership," "participation," "general supervision," is not at all clear. Very few authors address themselves to these problems. Control, defined as "any process in which a person determines, that is, intentionally affects, the behavior of another person, group, or organization," is obviously the broadest term.¹⁹ Also, it would seem that participation, defined as "influence exerted in joint decision-making when the decisions have future effects on those

making them,"²⁰ is a very narrow concept. The problem is that these terms are often used as if they referred to more or less unidimensional, well understood phenomena, when, in fact, as the Bennett and Pennington studies demonstrate, "group decision," a specific type of participation, actually involves several rather poorly understood variables.²¹ Recognition of this problem has led Likert to talk about "management systems," characterized by certain modes of behavior along different dimensions. He identifies six such dimensions, each with numerous modes of manifestation.²² In attempting to conceptualize supervision for purposes of this research, four of the six dimensions developed by Likert seem appropriate. They are: (1) the character of motivation employed in the supervision of subordinates. This is defined as the manner in which motives are used, ranging from fear and threats of punishment to reward systems of employee compensation developed through group participation. (2) The character of communication employed in a work group. This is defined as the amount and directional flow of communication within the work group. (3) The character of decision-making employed in a work group. This refers to the level within a work group at which decisions are formally made. (4) The character of interaction and influence processes. This refers to the amount of cooperative teamwork and extent to which subordinates may influence methods and activities of their work group.²³ The remaining

two characteristics identified by Likert, goal setting and control process, although influenced by the behavior of the supervisor, are more often determined by general company policy and procedure and therefore have been excluded from this conception of supervision. In an attempt to avoid the problems of conceptualization regarding the nature of management systems, attention is given to variables which directly influence the character of the control structure.

Technology

The review of the literature up to this point suggests that there may be a number of variables which are influencing the possible relationship between the management structure and the attitudes and behavior of work groups. One such variable which is always present, but not often taken into account in the research discussed, is the technology of the work situation. Part of the reason is found in the way the concept has been used in research. Therefore, how it has been defined and its relationship to leadership theory must be considered before it can be conceptualized for purposes of research.

The difficulty in coming to a consistent conceptualization of technology is better understood if we look at the scope of the concept as it has been defined by others. In Ellul's Technological Society, it is clear that he views technique and technology as interchangeable concepts. He defines these concepts in such broad terms as to encompass

all of human behavior and values.²⁴ Buckingham narrows the concept somewhat when he defines technology as analogous to the concept science, but both men have used the concept to refer to such a wide range of phenomena that it is difficult to make use of it for empirical research.²⁵ However, technology is most often defined as the processes employed by a work group to achieve its major objectives.²⁶

In the work of Blauner and Meissner, the concept, technology, has been more carefully defined.²⁷ Blauner refers to technology as the physical objects and technical operations employed by an industry in turning out goods and services produced. Where his concern is primarily with the manual and machine operations, he also includes the technical "know-how" and mechanical skills involved in production.

The problem in Blauner's research is to identify the consequences different "technologies" have on a worker's feelings of alienation. His research suggests that different operations employed in the production of goods and services influences the occurrence of alienation among workers. He identifies how the "technologies" of textile and auto industries are more conducive to feelings of alienation than are the "technologies" of the printing and chemical industries. His work clearly demonstrates the importance of technology in influencing the attitudes and behavior of workers in different industrial environments. However, Blauner suggests that even within the same industry there

may be different technological processes and it would be reasonable to assume that just as technology must be considered to understand differences in workers' attitudes and behavior between industries, it must also be considered to understand differences among workers within any particular industry.²⁸

Meissner, in his work Technology and the Worker, calls the "technical conditions" of work, technology. Technology, therefore, consists of tools, machines, parts, and materials; the equipment used to move these parts and materials from place to place as well as the buildings which house these things and the people working with them. Technology also includes the manifestation of the ideas of those who planned a process and the means of facilitating it, whether implicit in the design or expressed in instructions, which make known the requirements for making the design work in attaining planned ends.²⁹ He identifies the general questions with which his research is concerned; first, "What is the nature of industrial technology and the demands it makes on the performance of its immediate users?" and second, "Where does the social behavior of workers adapt to the constraints of technology and its demands?" The problem, however, is formulated from empirical generalizations inferred from existing data of published reports. The data was analyzed independently of the expectations and conclusions of the reporting authors. Meissner's discussion concerning the

production process and the management structure is particularly relevant to this research. Like Blauner, he identifies four levels of over-all technical conditions and then points to the fact that such differences in the technical structure greatly influence the social organization of the behavior of workers.³⁰ This influence was reported at both the "tool level" and "control level" of the technical structure.³¹ Meissner argues that successively greater demands on management are related to the requirements of integrating increasingly more differentiated and interdependent production units.³² The importance differentiation has on the nature of the influence structure will be considered again in more detail.

Where the work of Buckingham, Ellul, Blauner and Meissner has all been concerned with the impact technology is having on an industrial environment, the work of Blauner and Meissner is most relevant for this research. Their work provides a conceptualization of technology which is helpful in two ways. First, the concept is given a referent--tools, machinery, as well as the "know-how" which accompanies such equipment--therefore allowing any work situation to be described in terms of its "technology." Second, their work suggests the notion that the technology of a work place is a determining factor with regards to variables used to describe the process of work. Therefore, Sayles' contention that such variables as the precision

with which work load and performance can be measured, similarity of jobs within a work group, and the degree to which work is indispensable in the functioning of the plant, are determined by the technology of the work group, is consistent with Blauner and Meissner's conception of technology.³³

It is obvious from our discussion that the impact technology per se has on the influence structure is not at all clear. However, there have been a number of studies identifying variables associated with the technical structure of a work group which seem to be having an effect on the potential relationship between management systems and attitudes and behavior of work groups. A review of such research will provide us with the technological variables to be considered in this research.

Technology and Leadership Theory

In 1951 Katz, Maccoby, Gurin and Floor attempted to replicate the findings of their earlier work (1950) in a markedly different situation.³⁴ The work groups studied were railroad maintenance crews of the C & O Railroad Co. The workers were all men from small towns or farms, with a median education level from fifth to eighth grade. Thirty-six pairs of work groups, judged comparably on technical work conditions but different on performance, were chosen for study. Interviews were conducted with all of the 298 workers and 72 foremen involved in the study. As in the insurance study, the high-producing foremen were "better

able to differentiate their role as leader" and were described by their subordinates as more "employee-oriented" than the low-producing foremen. The insurance study's results concerning closeness of supervision, however, were not replicated. There was no relationship between productivity and closeness of supervision in this study. The authors attempt to explain this inconsistency in terms of the different technologies involved. Methods were sufficiently standardized in the insurance company, they argue, and close supervision could not provide much technical help and represented only a threat and annoyance to the clerks. Since the work of the railroad crews was less routinized, however, close supervision could contribute to the technical proficiency of the crew and this contribution apparently "cancelled out" any detrimental effects of close supervision on worker motivation. This negative finding is often overlooked in summaries of the early survey research studies³⁵ and the authors' hypothesis concerning the effects of technology has not been investigated in more recent research nor included in the theory resulting from their research.³⁶

A later study which also gives emphasis to technology and its influence in the behavior of workers is reported by Sayles (1958).³⁷ In this study the author requested from management and the union examples of work groups that had been consistent in their behavior over relatively long

periods of time, even through changes in supervision as well as management policies. As the data was accumulated and reviewed Sayles was able to describe not one, but a variety of work groups. The groups differed from each other particularly in the way they dealt with any problem they might have had to face. Four such groups were identified; i.e., apathetic, erratic, strategic and conservative. Sayles reports that a group's behavior in a plant is a product of its "inherent ability to function in a certain way."³⁸ Its behavior over time is seen as predictable because the range of alternative means of reacting is severely limited. In identifying these determining characteristics, the following variables are mentioned: (1) the precision with which management can measure work load and pace for the group; (2) similarity of jobs within the group; (3) the relative size and importance of the group; and (4) the degree to which their work is indispensable in the functioning of the plant.

In commenting on these variables, Sayles contends that they are all related to the technological system designed by the company to organize the work process. The degree of independence or dependence among workers in the flow of work, the number and similarity of jobs concentrated in any one location, the indispensability of any part to the whole, the extent to which work loads and output standards can be accurately defined, and even the promotional

ladders and status relationships are determined to a large extent by the kinds and quantity of equipment skills and plant layout utilized. Therefore, the work of Sayles clearly suggests the importance of technology in trying to understand the attitudes and behavior of industrial work groups.

Chinoy's work on the Automobile Workers and the American Dream also points to the importance of the technical nature of the work in the development of leadership skills.³⁹ The study was an attempt to explore how automobile workers "live out their version of the American Dream" in a world in which there is a palpable disparity between their experience and the prevalent myth. However, as a result of his discussion regarding a worker's concern with the physical and psychological demands of jobs in the factory, attention is directed to the influence the technical structure of a work setting may have on the relationship between a supervisor's behavior and the attitudes of his workers. Chinoy comments:

While men recognized that a considerate and understanding foreman could turn up anywhere, even in final assembly, and that a nagging crotchety authoritarian foreman might be found in the department with the best jobs, there was a wide-spread feeling that off-production jobs were more likely to be blessed with good supervision than were those in production divisions. This feeling came not from any apparent superiority in the quality of foremen in off-production departments, but from differences in the character of work assignments and the resulting differences in the responsibilities of supervision. In production departments foremen are chiefly concerned with seeing that workers maintain standards

which are set on the basis of systematic job analysis. The line foreman can see whether work is coming through that meets inspection standards. Quality is determined by the speed of the line. The supervisor of machine operations has a constant record of the volume of output from each machine with which to appraise workers' efforts and efficiency. Failure to meet job standards will quickly invite criticism and possibly threats or sanctions from the foreman. But in off-production jobs, as we have seen, the foreman does not usually have such sharply defined standards against which to check performance. He assigns the work to be done, and as long as it is completed adequately in what seems to be a reasonable time, workers need not fear supervisory criticism."⁴⁰

This discussion by Chinoy would suggest that the precision with which management can measure work load and performance on the job has a consequence for the range of supervisory behavior that will influence both workers' attitudes and their performance on the job. This finding is also supported by the work of Walker and Guest in their study of men on the assembly line.⁴¹

Other work which suggests that technology may influence the relationship between style of supervision and behavior of work groups is found in the research conducted by the Tavistock group in England; especially in the work of Joan Woodward.⁴² In her monograph, Management and Technology, Woodward was concerned with the effect different kinds of technology have on the relationship between management and organization. Research conducted on over 91 percent of the manufacturing firms with more than 100 employees in South Essex indicated that technical methods were the most important factors in determining organizational

structure and for setting the tone of human relations inside the firm. Woodward concludes that whether leadership must be directive, participative, or laissez-faire, depends on conditions determined by the technological structure which exists within the company.

Woodward also pointed out that management theorists have tried to develop a "science" of administration relevant to all types of production.

One result is that new techniques, such as operations research and the various tools of automation have been regarded as aids to management and to industrial efficiency rather than as developments which may change the very nature of management.⁴³

This point was also made by Dubin when he comments:

The growing body of evidence speaks loudly for the idea that in the supervision of industrial and commercial work, highly varied practices prove successful in given work settings. Nevertheless, students of industrial administration still seek a 'one best method' of supervision much as the originators of scientific management and work rationalization were captivated by the hope that individual work task could be standardized in a 'one best method' . . .⁴⁴

The alternative assumption is that supervision is an integral part of an organization in operation. Whatever characteristics the organization may have will influence the styles of supervision that are appropriate. Supervision is seen by Dubin as an integral part of a functioning organization and inevitably reflects the features that make types of organizations unique.⁴⁵

Woodward and Dubin are not alone in their contention that technology may be an intervening variable in the relationship between supervision and behavior of work groups.

The work of Pelz, Litwak, Thompson, Bates, Harvey, Burack, Wilson and Perrow offers support for this contention.⁴⁶

Pelz, in a study of a large industrial concern whose parts were classified into several groups; those dealing with non-uniform events (scientists and engineers) and those working with relatively uniform events (central staff and manufacturing), found that among those in occupations dealing with non-uniform tasks, there was a higher correlation between their motivation to work and productivity when they were free to make their own decisions.⁴⁷ In contrast, however, among those working on uniform tasks, there was a higher correlation between motivation and productivity when they were restricted in making decisions. The study once again points to the nature of the task as a determining variable in the style of supervision that may be appropriate.

Litwak, in an article on bureaucratic models, maintains that there are differential efficiencies in organizational structure depending on whether the task is uniform or not.⁴⁸ That is, whether the Weberian model of bureaucracies, or the human relations approach is appropriate in the study of organizations, depends on the nature of the task and the character of technology employed. This results in Litwak's suggesting a third model to study organizations characterized by non-uniform task environments. A summary of the three models is presented in Table 2:1.⁴⁹

TABLE 2:1.--Characteristics of three models of bureaucracy.

Characteristic	Weber's Model	Human Relations	Professional Model
1. Impersonal Relations	Extensive	Minimal	One Part Extensive One Part Minimal
2. Appointment on Merit	Extensive	Extensive	Extensive
3. A Prior Specification of Job Authority	Extensive	Minimal	One Part Extensive One Part Minimal
4. Separation of Policy and Administrative Decisions	Extensive	Minimal	One Part Extensive One Part Minimal
5. General Rules to Govern Relations not Specified by Above Dimensions	Extensive	Minimal	One Part Extensive One Part Minimal
6. Specialization	Extensive	Minimal	One Part Extensive One Part Minimal

Litwak's argument for the third model rests with the notion that individuals faced with non-uniform events which are not clearly covered by rules are insecure. In such situations, an individual needs colleague support if he is to perform efficiently. The third model allows for this support.

Thompson and Bates, in a study of "Technology, Organization and Administration," explore some of the ways in which technology, as a variable, may impinge on organization and on administration.⁵⁰ They focus on four types of organizations: the mining enterprise, the manufacturing organization, the hospital and the university. These organizations are compared with respect to three broad functional areas of administration: the setting of objectives or policy formulation, the management of resources, and execution.

The authors found that in the mine and factory, which rely heavily on mechanical aspects of the technology, authority is allocated primarily as control over the mechanical operation and takes the form of authority over people to the extent that behavior is disciplined to the requirements of the mechanical operation. However, in the hospital and university, the heavy reliance on professional abilities means that authority is exercised primarily with reference to people lacking the mechanical referent to bolster authoritative behavior; the university and hospital must depend upon agreement or consensus backed by professional standards and ethics. As a result of the differing

technologies of the four types of organizations identified, the authors suggest that where the problems of management may be similar, the emphasis placed on each varies considerably.

Harvey's research attempts to demonstrate the fact that the technological factor is one of the most important to consider when formulating explanatory and/or predictive propositions about variations in organizational structure.⁵¹ Data were gathered on 43 industrial organizations and the findings reported clearly indicate the presence of a relationship between organizational technology and a number of aspects of organizational structure. The findings also lead Harvey to postulate that a socio-technical orientation would be helpful in understanding what kinds of technical and organizational conditions serve to enhance rationality in some circumstances and to impede its operation in others. That is, the technology variable, in connection with other aspects of organizational structure, serves to establish a rudimentary typology of socio-technical organization, and the use of this typology may provide a useful analytic tool for the investigation of a number of organizational processes, including decision-making.

Elmer Burack, in a study of industrial management in various production systems, discusses some of the implications of technological modifications and improvements on industrial management in two types of advanced manufacturing

systems displaying flow characteristics and designated "process and quasi-process" systems.⁵² He found that in the "process" system, as exemplified by the producer of prepared meats, the interplay of marketing and technological forces resulted in increased organization complexity associated with the growth in the scale of operation. In the other companies studied, there was a flattening of organizational structure and a simplification of supervisory relationships. He concluded that technological change influences the authority structure of organizations and may go beyond that to influence the appropriate behavior of authorities in different organizational systems.

Wilson, in research reported in the American Journal of Sociology, argues that the appropriate pattern of management is dependent on an individual's adaptation to organizational roles.⁵³ His research tests the hypothesis that "co-operative adaptations are associated with participative management." Co-operative--in which personal goals pursued by the individual coincide with the goals others expect him to pursue as part of his role, and "adaptations" should operate as an intervening variable between patterns of management and subordinate's relations with supervisors and peers.

The study, conducted on three housing units of a correctional institution, reports findings consistent with previous research in the tendencies for inmates to have better

relations with staff and closer relations with peers under participative management than under "bureaucratic supervision." However, the research suggested that a major factor influencing subordinate's task performance is the nature of the decisions for which they themselves are responsible. At one extreme, an individual's adaptation is less influential in determining his role performance than such factors as the rewards and punishments supervisors can employ, the norms of his peer group, and his personal expectations about these matters, derived from past experience, since external conformity is, in a large part, sufficient for adequate performance of routines. At the other extreme, a subordinate may be called upon to exercise continuously a high degree of discretion in order for the activities of the organization to be successful. In such a case, the subordinate's type of adaptation can be very important. Thus, the importance of patterns of management in affecting subordinate's task performance should depend, in large part, upon the kinds of decisions subordinates have to make, and, consequently, no simple general relation between patterns of management and performance can be anticipated.⁵⁴ These considerations point to the importance of differences among organizations in terms of structures of decision-making, which, as Perrow has argued, are strongly affected by the technologies of organizational activities.⁵⁵

There have been numerous other studies which have taken into account the variable, technology, in the study of organizational phenomena.⁵⁶ However, the literature reviewed suggests a number of variables created by the "technology" of an organization which seems to influence any potential relations between the management system and attitudes and behavior of work groups. First, the precision with which management can measure work load and performance has been mentioned by Chinoy (1955), Sayles (1958), and Burack (1967), as having an influence on the consequence management behavior has on worker sentiment and behavior. Second, the degree of skill required to perform a particular task has been identified by Woodward (1958), Sayles (1958), Dubin (1965), and Thompson and Bates (1958), as also influencing the management system and the nature of its structure. Finally, the repetitive nature of the task is also viewed as influencing the appropriate patterns of management employed in a work group (Katz, Maccoby, Gurin, and Floor, 1951; Pelz, 1960; Litwak, 1962; and Wilson, 1968). These variables taken together, represent what, in this study, will be called the character of technology.

Hypothesis

The literature reviewed is helpful in suggesting the manner in which different dimensions of the technical structure may effect any potential relationship between the influence structure and the attitudes and behavior of social

groupings. However, before hypotheses are developed, the variables dependent upon the influence structure need to be identified. There are few instances in the literature where any theoretical linkage between supervisory style and attitudes of social groups has been developed. French, in his research (1960) argues that supervisory style, conceptualized as it is in this research, influences job performance, communality of super-subordinate goals, job satisfaction, and overall commitment to the work situation.

Other literature reviewed would not support the supervisory style and job performance relationship suggested by French, but would support the notion that the other variables mentioned are directly influenced by supervisory behavior.

Therefore, the hypotheses which follow are concerned with how the "character of technology" intervenes between supervisory style and the variables suggested by French and others.

The literature discussed in relation to technology and leadership theory is helpful in identifying the manner in which the different dimensions of technology, such as "amount of differentiation," are associated with "concerted activity" within a work group (Sayles, 1958). This notion of differentiation suggests the first hypothesis. That is, if differentiation is viewed as having at least two dimensions;⁵⁷ task differentiation--the division of labor associated with the completion of a particular task, and person

differentiation--specialization, usually the product of extended education and training, where individuals are employed for their technical expertise as it relates to the accomplishments of certain organizational goals, it may be argued that a proliferation of occupational specialties--person specialization--results in an undermining of hierarchical authority.⁵⁸ Therefore, in making decisions, supervisors must consult the job occupants of the appropriate specialties, thus sharing decision-making with the specialists. This is not only necessary for the supervisor, but is expected of the role occupant.⁵⁹ This suggests the following hypothesis:

1. The greater the degree of skill required to perform a particular task, the stronger the negative association between:
 - a. "aggressive authoritarian" style of supervision and organizational goal identification.
 - b. "aggressive authoritarian" style of supervision and job satisfaction.
 - c. "aggressive authoritarian" style of supervision and integration of the work group.

Although the above hypothesis allows the argument that the greater the amount of "person specialization," the greater the need for "group participative" styles of supervision, the literature reviewed does not justify the converse. It appears, however, that as work groups become less "person specialized," they become more "task specialized," characterized by precise measures of work load and performance. This observation suggests the following hypotheses:

2. The more precisely work load and performance can be measured within the work group, the less likely we are to find an association between:
 - a. style of supervision and job satisfaction.
 - b. style of supervision and organizational goal identification.
 - c. style of supervision and integration of the work group.
3. The more repetitive the nature of the task of individual members within the work group, the less likely we are to find an association between:
 - a. style of supervision and job satisfaction.
 - b. style of supervision and organizational goal identification.
 - c. style of supervision and integration of the work group.

The hypotheses being considered suggest that a number of structural variables determined by the technology employed in a work group are having an effect on the degree of any potential relationship between supervisory style and attitudes and subsequent performance of work groups.

Summary

The early work of leadership theorists suggests the notion that democratic or participative styles of leadership are more conducive to high morale and overall performance than aggressive authoritarian styles of leadership. This proposition was tested under all types of research conditions; from the laboratory experiment (Lippitt and White), to the large field experiment (Seashore and Bowers). The results, although generally in the predicted direction, have

been far from conclusive. This inconsistency in findings, coupled with further research, suggests the notion that the technological structure of a social grouping is an intervening variable influencing any relationship between leadership behavior and group morale and performance. Research concerned with this problem suggests a number of variables associated with the technology of a group which need to be taken into account in postulating the impact of the influence structure on the behavior of social groups. The hypotheses being considered in this research attempt to accomplish this objective.

FOOTNOTES - CHAPTER II

1. Whether you begin with the mechanistic or rational models of organizations identified in the work of Weber, Urwick, Taylor, etc., or with the "natural system" approach identified in the work of Barnard, Parsons, Gouldner, and Merton, attention has been given to the problem of authority viewed as a problem of compliance. Gerth and Mills, op. cit., pp. 196-240; March and Simon, op. cit., pp. 36-47; P. Blau and R. Scott, Formal Organizations (Chicago: University of Chicago Press, 1962), pp. 27-59. Selected writings from the above authors are found in A. Etzioni, ed., Complex Organizations (New York: Holt, Rinehart and Winston, 1964), pp. 1-99; C. Barnard, The Functions of the Executive (Cambridge: Harvard University Press, 1938); R. Scott, "Theory of Organizations," in Handbook of Modern Sociology, ed. by R. Faris (New York: Rand McNally, 1964), pp. 485-529.

2. R. Likert, New Patterns of Management (New York: McGraw Hill, 1961); R. Likert, The Human Organization (New York: McGraw Hill, 1967); Douglas McGregor, The Human Side of Enterprise (New York: McGraw Hill, 1960); Chris Argyris, Personality and Organizations (New York: Harper and Row Publishers, 1964). Other authors: V. Vroom, "Some Personality Determinants of the Effects of Participation," Journal of Abnormal Social Psychology, LIX (1959), 322-27; are less polemic in tone and more reserved in their judgments, but argue along the same lines.

3. Joan Woodward, Management and Technology (London: Her Majesty's Stationery Office, 1958); Dubin et al., op. cit.; Charles Perrow, "A Framework for the Comparative Analysis of Organizations," American Sociological Review, XXXII (1967), 194-208.

4. R. K. White and R. L. Lippitt, Autocracy and Democracy (New York: Harper Brothers, 1960). In addition to its historical significance, two main points should be emphasized concerning these studies. First, the possibilities for observer bias were great. The coding procedures employed did not focus exclusively on behavior, but rather called for considerable inference concerning the mental states of the subjects. Second, the findings concerning "morale" and interpersonal relations were much more pronounced and consistent than they were for group output.

5. K. Lewin, "Group Decision and Social Change," in Readings in Social Psychology, ed. by G. E. Swanson, T. M. Newcomb, and E. L. Hartley (New York: Holt, Rinehart and Winston), pp. 459-71. Other studies which attempted to define the Lewin approach are: E. B. Bennett, "Discussion, Decision, Commitment, and Consensus in Group Decisions," Human Relations, VII (1955), 251-72; D. F. Pennington, F. Haravey, and B. Bass, "Some Effects of Decision and Discussion in Coalescence, Change and Effectiveness," Journal of Applied Psychology, XLII (1958), 404-05.
6. J. Misuimi, "Experimental Studies on Group Dynamics in Japan," Psychologia, II (1959), 229-35.
7. R. C. Day and R. L. Hamblin, "Some Effects of Close and Primitive Styles of Supervision," American Journal of Sociology, LXIX (1964), 499-510.
8. M. E. Shaw, "A Comparison of Two Types of Leadership in Various Communication Nets," Journal of Abnormal Social Psychology, L (1955), 127-34.
9. L. Coch and J. R. R. French, "Overcoming Resistance to Change," Human Relations, I (1948), 512-32.
10. J. R. R. French, "An Experiment on Participation in a Norwegian Factory," Human Relations, XIII (1960), 3-19.
11. Ibid.
12. J. Levine and Butler, "Lecture Versus Group Decisions in Changing Behavior," Journal of Applied Psychology, XXXVI, 29-33. In this study, Levine and Butler compared the effectiveness of lecture and group decision in getting supervisors in a large manufacturing plant to reduce the "halo" in their subordinate evaluations. The results indicated that supervisors participating in the group decision changed their ratings in the desired directions, while those in the lecture and control group did not. L. C. Lawrence and P. C. Smith, "Group Decision and Employee Participation," Journal of Applied Psychology, XXXIX (1955), 334-37. This study attempts to investigate the effects of the discussion and decision elements in "group decisions." The results are inconclusive.
13. D. Katz, N. Maccoby, and N. C. Morse, "Productivity, Supervision and Morale in an Office Situation," Survey Research Center, University of Michigan, 1950. (Unpublished.)

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25. Walter Buckingham, Automation (New York: New American Library, 1961). Buckingham maintains that science is knowledge, systematized and formulated to discover general truths. Technology is science applied to the industrial arts. While science is concerned with understanding, technology is concerned with practical uses. Technology includes the development of the tools that permit the specialization of labor according to varying abilities.

26. Freedman, op. cit., p. 137. Marx comments: "Technology discloses man's mode of dealing with nature. The process of production by which he sustains his life, and thereby also lays bare the mode of formation of his social relations, and of the mental concepts which flow from them." Parsons defines the term in a similar manner when he comments: "Three levels of the organization of rational action in action systems may be distinguished. The first of these, the most elementary, is that involving the motivation of resources for the attainment of a single given goal by an individual or a collectivity. This is essentially what, in The Structure of Social Action, was called technology." T. Parsons, The Social System (New York: The Free Press, 1951), p. 549; T. Parsons, The Structure of Social Action (New York: The Free Press, 1937). Thompson also views technology as activities employed to achieve a desired outcome. He comments, "To the extent that the activities thus dictated by man's beliefs are judged to produce the desired outcome, we can speak of technology." James Thompson, Organizations in Action (New York: McGraw Hill, 1967), p. 163.

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CHAPTER III
RESEARCH DESIGN AND OPERATIONALIZATION
OF CONCEPTS

Introduction

In this chapter the design of the research and the selection of a sample will be discussed. We will also operationalize the variables identified in the last chapter and discuss the construction of indexes to measure the style of supervision and the dependent variables.

This research is concerned with the impact of technical structure on the relationship between supervisory style and the attitudes and subsequent behavior of industrial work groups. To accomplish the numerous objectives associated with organizational development and growth, work specialization and differentiation have become a necessary part of any industrial organization. As a result, the manufacturing and support functions of any industry are organized for the accomplishment of complimentary goals which determine an organization's success and the probability of its survival. Such diversity in objectives and goals among the different functions within a large industrial corporation provides sufficient variation in the technological structure

to test the hypotheses introduced in the preceding chapter. That is, the hypotheses being considered require a sample of industrial work groups representing sufficient variation in technical structure to identify what consequence it may be having, if any, on the relationship between supervisory style and the attitudes and morale of work groups.

The Research Design

The site for this research was selected because of its availability and rather isolated condition with regard to other industry. Although most of the research concerned with the impact of technology on industrial work groups has been comparative in nature¹ this study's concern is with the variations in technology within an industrial organization and not between industrial organizations. Therefore the somewhat isolated conditions observed are considered consistent with the research objectives and insignificant with regard to the findings of the research.

The industrial organization being studied was founded in 1897 and has grown to become one of the top five chemical companies in the country. Its main plant, where the research was conducted, is located in a small midwest community of about 30,000 inhabitants. It is the major employer and has dominated the economy of the community almost from its inception. However, while the organization may reside in a small community, it represents probably the biggest

chemical operation in the United States in terms of employees (about 10,000) and turns out upward of 400 products.

Changes in the production technology because of increased technological innovation have been fairly continuous during the history of the organization with the direction of change being toward increasingly automatic operations. This has created a unique labor force in comparison to other small cities. There exists a high proportion of professionals and a sharp decline in the use of operatives and laborers. Table 3:1 presents the occupational distribution for the labor force of the community in which the organization is located.²

TABLE 3:1.--Occupational distribution for the labor force of the community in which organization resides.

Labor Force	1940 (Percent)	1960 (Percent)
Professional and Technical	19.2	28.7
Managers, Proprietors and Officials	9.0	10.4
Clerical and Sales	17.6	21.9
Craftsmen	14.4	13.8
Operatives	20.3	12.0
Private Household Workers	5.9	4.0
Service Workers	7.9	7.0
Laborers	5.7	2.2

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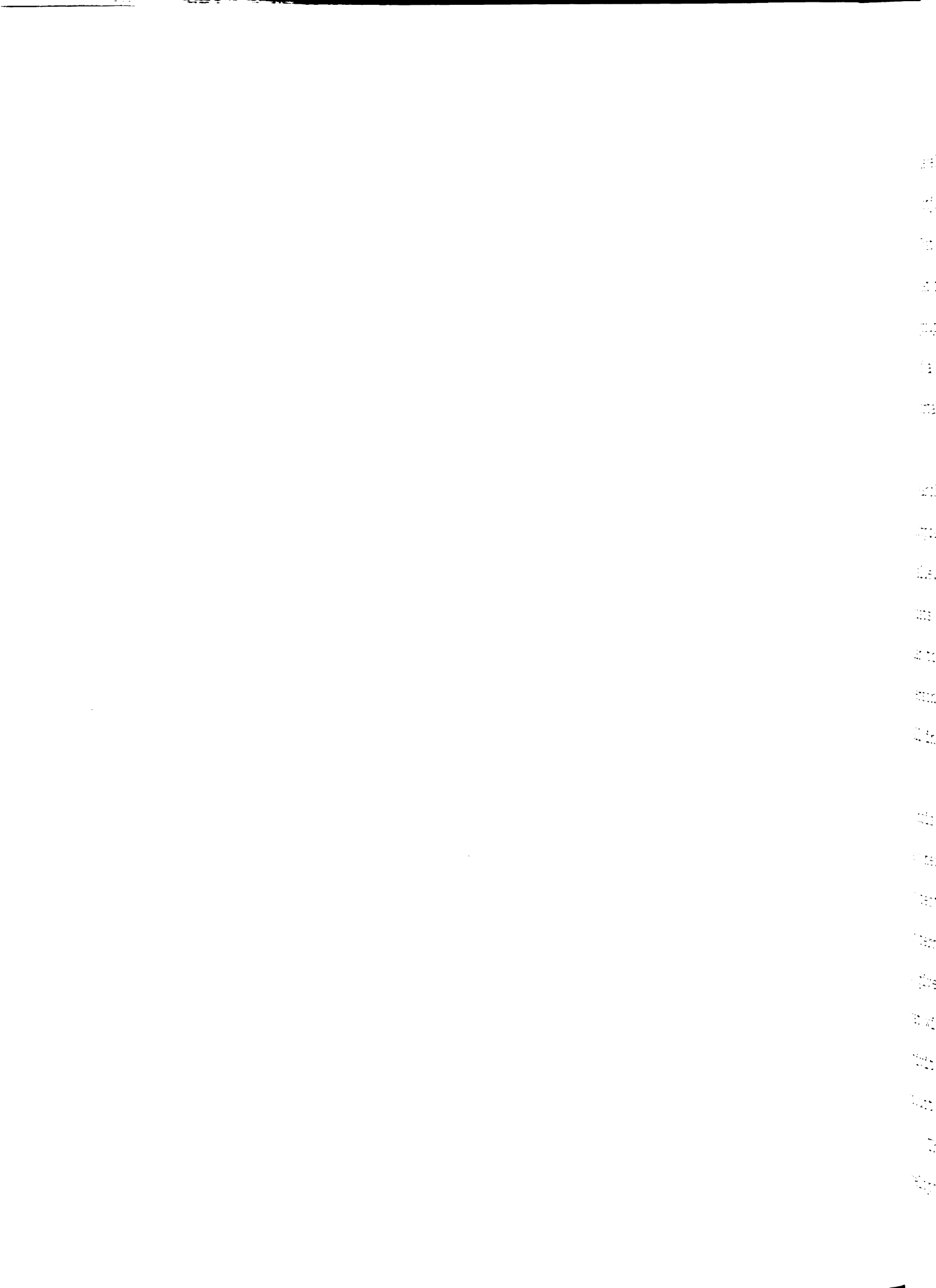
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Proceeding on the assumption that wide variations in the character of technology can be identified within an industrial organization, top management personnel were interviewed to help select a sample of work groups which would provide such variation. It was noted that the technology of a work group is often a product of the task under consideration and that work groups organized for the accomplishment of complimentary yet very different objectives do provide a significant variation in the character of technology employed. The specific hypotheses in this research call for variations in technology along dimensions of (1) the precision with which work load and performance can be measured; (2) the degree of skill and training required to perform a particular task; and (3) the repetitive nature of the task.

Although some variation along each of these dimensions may be observed between any two work groups, it was evident that significant differences along these dimensions of technology do exist between corporate or organizational functions. That is, the technology of the Research and Development function is considerably different than the technology of an Accounting or Business service function.

To better understand how the industrial functions included in this research represent different technology in terms of the dimensions being considered, a brief discussion of the work process for each functional area is presented.



The work of the research and technical service and development groups is best understood if it is viewed in conjunction with the development process of a new product. That is, a product that will eventually be placed on the market is developed in stages with the role of the research groups being most important at the early stage and the work of a technical service and development group being most important in the later stages.

The first stage generally consists of exploratory research undertaken with the expressed goal of developing a compound or potential product substance with some commercial value. The work itself is performed by professional scientists conducting experiments in a research laboratory similar to what may be found in any university setting. The personnel making up the research groups in this study are all involved in such work.

The second stage in the process of product development consists of exploring the utility and market potential of any new compound that is developed. This involves a series of tests to determine the properties of the new substance in terms of its present competitors. Also, consideration is given to whether the product can be produced at a price that will allow it to compete in the current market. These activities are performed by the research groups where the product was originally developed.

The third stage involves the technical service and development groups and consists of a series of tests under

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simulated field conditions to determine how the product will act once placed on the market. These groups usually consist of chemists or technical personnel who are capable of supplying the techniques of their science to assess the value and utility of any product.

The fourth stage also involves the technical service and development groups and is primarily a marketing activity involving pricing the product and identifying potential customers. This often involves demonstrations of the product under various conditions in an effort to highlight its value for the user.

The final stage constitutes the commercial aspects of product development. That is, placing the product on the market and providing technical service or assistance to customers making use of the product.

The first two stages primarily involve the research groups and the work of highly trained professional scientists. The next three stages involve the technical service and development groups made up of technical personnel with business and marketing interest. Both the research and the technical service and development groups may be considered "product development groups" but there consist very different requirements for group membership and there is considerable variance in the activities performed.

The business service groups are made up of accounting, industrial relations, legal, patent and business information

service groups. These groups represent considerable variance along the dimensions of technology being considered in the study. Beginning with the latter, business information service groups, their personnel provide essentially two services for the company. One involves the operation and maintenance of the computer systems as they exist throughout the company; the other the development of more efficient information systems and programming work. This includes solving problems that relate to information systems employed as well as recommending and instituting change wherever advisable. The technology for these groups, at least at the operations level, is similar to any man-machine technical system such as the textile industry described by Blauner.

Of the remaining business service groups, the technology in controller's groups is the farthest removed from what is found in the product development groups. Within the controller groups a distinction can be made between the groups servicing the manufacturing division and the corporate enterprise. The former are all cost accounting groups involved almost as much in chemistry as accounting. Their work consists of pricing chemical products and the maintenance of records that indicate the direction of such prices, not only for the present company but for the industry in general. In the corporate accounting groups there is a much broader range of activities represented. Concern is with the financial activities of the company in general and the development of more efficient accounting systems.

The patent groups are involved in providing the company with three general services: (1) Patent attentions work where they prepare and process patent applications; (2) Patent opinions and reports where agents study patents to determine their validity and where the company's behavior will infringe on the rights of others; and (3) Licensing, where the company takes license from someone else instead of doing its own research. These agents are highly trained; however, their work is often very routine in nature.

The legal department represents the most autonomous of business service groups. Its membership is highly trained and often works as much with the company as for the company. Its staff represents specialists in different areas of law and the supervision and direction of work is left to the individual lawyers.

The manufacturing groups represent one product area for the company. In this instance it is agricultural product production. The groups consist of all supervisory personnel from the shift foreman to the plant superintendent. A plant superintendent will usually have an assistant superintendent, a technical engineer and five to seven foremen who report directly to him. This structure constitutes a "work group" for the manufacturing functions. Seven such groupings were included in the research. Where the nature of the work in these groups is primarily supervisory, we do have the climate of the production system influencing any

potential relationship between supervisory style and the "character" of the groups considered.

The Sample

Once the functional areas had been decided upon, it was necessary to secure a sufficient number of groups to ensure a perceived variation in style of supervision. The sample was selected through consultation with management and attention was given in selecting groups that were representative of other groups providing the same service to the company. The groups, therefore, were not randomly chosen but were selected because of their technology and willingness to participate in the research. The sample consists of sixty-six groups representing various task and technological systems throughout the company. The distribution is as follows:

<u>Function</u>	<u>Number of Groups</u>
Research (T. S. & D. + Research)	24
Legal	2
Patent	5
Manufacturing	7
Industrial Relations	2
Controllers (Corp. & Div.)	15
Business Information Services	11

The research and legal groups represent highly differentiated, non-repetitive task environments, whereas the

controllers and business information groups represent less differentiated more repetitive task environments. The remaining groups fall somewhere on a continuum between the two extremes.

The sample included 533 individual respondents representing the 7 functions under investigation. A distribution is presented in Table 3:2.

TABLE 3.2.--Number of individual respondents in each industrial function.

Individual Function	Respondents
Corporate Accounting	75 (14.07%)
Division Accounting	34 (6.38%)
Business Information Services	123 (23.08%)
Research	155 (29.08%)
Industrial Relations	20 (3.75%)
Manufacturing	77 (14.45%)
Legal	16 (3.00%)
Patent	33 (6.19%)
Total (100.00%)	533

Included in the sample were a total of 462 males and 71 females. Eighty-five per cent of the sample were married with only approximately two per cent being divorced or separated. More than 70 per cent of the sample have two or more children with the average number of children being 3.06. The mean age of the sample is 32 years; however the distribution is bimodal with 44 per cent of the sample under

30 years of age and 29 per cent of the sample over 40 years of age. The average income for the sample is \$11,000 per year with over 90 per cent of the respondents making over \$8,000 per year. The high income is partly understood by the fact two-thirds of the sample have graduated from college. The mean response with regard to length of time with the company was a little over 4 years; however once again the distribution was bimodal with 44 per cent of the sample having worked for the organization less than 5 years and 29 per cent having worked for more than 10 years. Over a third of the sample had been employed by the organization directly out of school. In summary, we have a well-educated, predominantly male sample representing the major industrial functions of a large chemical company. Demographic and other characteristics of the sample are summarized in Table 3:3.

The Measurement of Variables

Character of Technology

To operationalize "character of technology," attention was given to the variables being considered as a product of the technological structure mentioned in Chapter II. Where technology is being defined as the physical objects and technical operations employed by an industrial work group in turning out the goods and services produced, the variables "precision with which work load and performance can be measured," "degree of skill required to perform a

TABLE 3:3.--Selected demographic characteristics (sex, age, marital status, education, income).

Sex									
	Male			Female			Total		
N	461			72			533		
%	86.5			13.5			100.00		
Age									
	20 or under	21-30	31-40	41-50	51-60	61 & over	N.R.	Total	
N	25	212	143	98	49	5	1	533	
%	4.7	39.8	26.8	18.4	9.2	.9	.2	100.00	
Marital Status									
	Married	Never Married		Divorced or Separated		No Res.		Total	
N	454	70		8		1		533	
%	85.2	13.1		1.5		.2		100.00	
Education									
	Some H.S.	H.S. Grad	Some Col.	Col. Grad	M.A.	Ph.D.	N.R.	Total	
N	6	66	106	196	78	79	2	533	
%	1.1	12.4	19.9	36.8	14.6	14.8	.4	100.00	
Income									
	Under 8,000	8,000 to 11,999		12,000 to 15,999		16,000 & up		No Res.	Total
N	69	206		152		99		7	533
%	12.9	38.6		28.5		18.5		1.3	100.00

particular task," and "the repetitive nature of the activities," also need to be defined and operationalized.³

Precision with which work load and performance can be measured refers to the exactness with which management can measure the amount and quality of work being done. Interviews with management personnel provided the major source of information regarding how precise work load and performance could be measured. It was reported that in certain research groups there are very few measures as to how much work is being done and the quality of work is often determined by reference to instances where new products have been developed and proven successful in terms of profits. This same difficulty in measurement of work load and performance exists within the legal department and is somewhat evident in manufacturing groups where respondents occupied positions above the rank of foreman. However, in accounting and business service groups more exact measures of work load and performance are available. The "man-machine" type technology which characterized much of the work routine for the accountant at the entry level position provides precise measures of work load and performance that are easily developed and assessed. This same condition also exists in the Business Information Service groups where the primary function is the maintenance of computer systems developed to improve the operations of various departments throughout the company. The other functions included within the sample

would vary along this dimension and fall somewhere between these two extremes.

Degree of skill required to perform a particular task refers to the amount of education and training necessary for admittance into the work group. The study concerned itself primarily with white collar employees, and therefore the education level required usually included some college experience or training beyond high school. The research groups required the greatest amount of education with 39 per cent of the respondents having received the Ph. D. degree. Membership in the legal department in most instances required a law degree. However, in the business service and accounting groups less formal training is required. In the B. I. S. groups better than 66.7 per cent had not graduated from college and in the accounting groups 59.2 per cent had not. Of the corporate accountants 56 per cent had not graduated from college whereas in division accounting 82.4 per cent had received a college degree. It should also be noted that accountants coming into industry right out of school do not qualify for a C. P. A. This suggests that the industrial accountant has somewhat different career objectives than the professional accountant who chooses the alternative career of working with a public accounting firm.

The repetitive nature of the task refers to whether a job requires the employee to perform a similar task hourly, daily, etc.; or whether the job requires a variety of behavior determined by circumstance. Again management

interviews were very helpful in identifying the kinds of activities characteristic of different jobs. Also the researcher had occasion to interview a number of employees with regard to their particular task and these interviews supported descriptions provided by management. That is, the work described by the accounting and business group was more repetitive in nature than the kinds of activities required of the other functions being considered.

In summary, the independent variable "character of technology" is identifiable for any work group focusing on the dimensions of work load and performance, repetitive nature of the task, and the amount of skill and training required for membership. In this research variations in these variables are provided by including in the sample a wide variety of groups organized around different tasks and employing different technologies. The groups included were recommended by management personnel judged best qualified to differentiate work groups along the dimensions being considered. These recommendations were verified by interviews with employees from groups similar to those included in the sample.

Style of Supervision

Supervision is a generally defined process where an individual is responsible to oversee or direct the actions of others. In this research "style of supervision" includes certain behavioral characteristics associated with this

process. The characteristics being considered are: (1) the nature of the decision-making process; (2) the nature of communication between superior and subordinate; (3) the nature of interaction and influence between superiors and subordinates; and (4) the motivational forces employed.

Likert argues that the principle of supportive relationships, which underlines his whole theory of management systems, specifies conditions that lead to a full and efficient flow of all relevant information in all directions throughout the group. It also calls for an exercise of influence comparable with the flow of information. This efficient flow of communication and exercise of influence throughout the organization has important consequences for decision making. Ideally, under such a system, all the relevant information and technical knowledge in the organization on a particular problem flow to the points where decisions are to be made. Likert argues that this condition uses fully and in an additive manner all motivational forces which are accompanied by favorable attitudes. It is therefore argued that an organization should be outstanding in its performance if it has competent personnel; if it has leadership which develops highly effective groups and achieves within such groups effective communication and influence; if it has decentralized and coordinated decision making; and if it has high performance goals coupled with high motivation. These variables: decision making, communication, the interaction influence process and motivation

are those being considered in this research⁴ and appear to be a product of the "style of supervision" which characterizes any work group.

The nature of decision making process is defined as the level in the work group at which decisions are formally made. This variable is measured by questionnaire items designed to identify the amount of freedom in decision making as opposed to having all decisions cleared with supervision. Items included also indicate the extent to which supervisors are willing to make use of subordinate expertise in the solution of problems relevant to the work group. The items included in the index employed in analysis and the extent to which they intercorrelate are presented in Table 3:4.

The nature of the communication process is defined as the amount and directional flow of communication within the work group. Respondents were asked a number of questions designed to indicate the extent of communication within a work group and whether it is perceived as sufficient for the accomplishment of group goals. The items included in the index employed in analysis, and extent to which they intercorrelate, are presented in Table 3:5.

The interaction influence process is defined as the amount of cooperative teamwork and extent to which subordinates may influence methods and activities of their work group. This variable is also measured by questionnaire

TABLE 3:4.--Rank order correlations between items included in measuring the nature of decision making.

Items	2-23	2-24	2-25	2-39
2-23	100			
2-24	*.61	100		
2-25	*.59	*.69	100	
2-39	*.33	*.40	*.56	100

*Indicates $P < .05$.

N = 66.

- 2-23 How are objectives set in your department?
1. Objectives are announced with little opportunity to raise questions or comment.
 2. Objectives are announced and explained and an opportunity is given to ask questions.
 3. Objectives are drawn up, but are discussed with subordinates and sometimes modified before being used.
 4. Specific alternative objectives are drawn up by supervisors and subordinates are asked to discuss them and indicate which they think best.
 5. Problems are presented to those persons who are involved and the objectives felt to be the best are then set by the subordinates and the supervisor jointly, by group participation and discussion.
- 2-24 People at all levels usually have "know how" that could be useful to decision-makers. To what extent is information widely shared in your department so that those who make decisions have access to all available "know how?" (Five point extent scale)
- 2-25 When decisions are being made, to what extent are the persons affected asked for their ideas? (Five point extent scale)
- 2-39 When your supervisor has problems related to the work, to what extent does he use group meetings to talk things over with subordinates and get their ideas? (Five point extent scale)

TABLE 3:5.--Rank order correlations between items included in the index measuring nature of communication.

Items	1-52	1-53	2-16
1-52	100		
1-53	*.69	100	
2-16	*.38	*.33	100

*Indicates $P < .05$.
N = 66.

- 1-52 To what extent are you given the information necessary to do your job in the best possible way? (Five point extent scale)
- 1-53 To what extent is the information you get about what is going on in other departments adequate or sufficient for your needs? (Five point extent scale)
- 2-16 To what extent do persons in your work group keep each other informed about important events and situations related to your work? (Five point extent scale)

items which identify the amount of emphasis placed on a "team" approach to problem solving and the extent to which members of the same work group are willing to exchange opinions and ideas. The items included in the index employed in analysis, and the extent to which they inter-correlate, are presented in Table 3:6.

Motivational forces employed in the supervision of subordinates are defined as the manner of motives used, ranging from fear and threats of punishment to reward systems of employee compensation developed through group participation to secure employee performance and compliance with regard to organizational goals. To measure this dimension of supervisory behavior employees were asked to respond to questionnaire items which have proven successful in other research at measuring this same dimension.⁵ However, before the items were included in the indexes employed in analysis, rank order correlations were computed on item rankings to determine the extent of inter-correlation. These are presented in Table 3:7.

The Dependent Variables

There are four dependent variables being considered in this research. Taken together they comprise what is being called "character of work groups." In our review of the literature in the area of leadership theory and personnel management it appeared that these variables have continually been related to style of supervision and the task and

TABLE 3:6.--Rank order correlations between items included in the index measuring the interaction influence process.

Items	2-17	2-26	2-27	2-40
2-17	100			
2-26	*.66	100		
2-27	*.63	*.55	100	
2-40	*.54	*.35	*.36	100

*Indicates $P < .05$.

N = 66.

2-17 How much do persons in your work group encourage each other to work as a team? (Five point extent scale)

2-26 How much do persons in your work group emphasize a team goal? (Five point extent scale)

2-27 To what extent do persons in your work group exchange opinions and ideas? (Five point extent scale)

2-40 Which of the following best describes the manner in which most problems between departments are generally resolved?

1. Little is done about these problems--they continue to exist.
2. Little is done about these problems--they work themselves out in time.
3. The problems are appealed to a higher level in the organization--but often still are not resolved.
4. The problems are appealed to a higher level in the organization and are usually resolved there.
5. The problems are worked out at the level where they appear through mutual effort and understanding.

TABLE 3:7.--Rank order correlations between items included in the index measuring character of motivation.

Items	1-24	1-25	1-54	2-21	2-22
1-24	100				
1-25	*.59	100			
1-54	*.50	*.36	100		
2-21	*.44	*.34	*.28	100	
2-22	*.42	*.38	*.25	*.64	100

*Indicates $P < .05$.

N = 66.

1-24 To what extent do you enjoy performing the actual day-to-day activities that make up your job? (Five point extent scale)

1-25 To what extent are there things about working here (people, policies, or conditions) that encourage you to work hard? (Five point extent scale)

1-54 To what extent do you feel your pay is related to how much you help this company be successful? (Five point extent scale)

2-21 In your department to what extent do people work hard to find satisfaction in a job well done? (Five point extent scale)

2-22 In your department to what extent do people work hard to meet the expectations of others? (Five point extent scale)

and technology of an organization.⁶ The prevailing assumption is that such variables influence the overall performance of a work group and thus influence the production of an organization.⁷ The variables being considered are: (1) job satisfaction, (2) commitment to organizational goals, (3) congruence of organizational goals with personal goals, and (4) integration of the work group. There are few instances in the literature where the theoretical ties between the above variables and the independent variables being considered have been articulated; however, in the French (1960) study, it is argued that increases in "participation" should increase productivity because the decisions will be better and because employees will be more motivated to implement them. (Participation as defined by French includes the independent variables making up style of supervision in this research.) Participation should relate positively to management worker relations because the mutual influence involved will lead to "promotively interdependent" goals and communality of goals; because the exchange of information involved will lead to greater understanding between the parties; and because the implication that the workers are intelligent; competent and worthy should increase their perception of being valued. Finally, participation should be positively related to job satisfaction because worker's jobs should be improved in ways that are relevant to worker's needs and because participation

directly satisfies various "ego-needs" such as the need to be valued and appreciated by others.⁸ The argument put forth by French represents the rationale for the relationship between the independent variables being considered in this study.⁹

The variable job satisfaction is defined as acceptance or agreement with the structure and functioning of the work environment. It is measured by questionnaire items designed to indicate the extent of satisfaction with different aspects of the work environment. The items included in the index employed in analysis, and the extent to which they intercorrelate are presented in Table 3:8.

Commitment to organizational goals is defined as the extent to which workers identify the achievement of organizational goals as being important. This variable was measured by employee response to questionnaire items developed to identify the importance respondents place on the achievement of organizational objectives. The items included in the index employed in analysis, and the extent to which they intercorrelate, are presented in Table 3:9.

"Congruence of organizational goals with personal goals" is defined as the extent to which workers identify the achievement of organizational goals as consistent with the achievement of personal goals. The measurement of this variable was also dependent on employee response to questionnaire items developed to identify employee's perception

TABLE 3:8.--Rank order correlations between items included in the index measuring job satisfaction.

Items	1-26	1-33	1-34	1-35	1-36	1-37	1-38	1-39	1-41	1-51
1-26	100									
1-33	*.45	100								
1-34	*.40	*.37	100							
1-35	*.67	*.40	*.52	100						
1-36	*.45	*.42	*.41	*.53	100					
1-37	*.52	*.46	*.39	*.46	*.68	100				
1-38	*.46	*.48	*.20	*.38	*.63	*.66	100			
1-39	*.39	*.47	*.62	*.44	*.67	*.63	*.51	100		
1-41	*.54	*.32	*.53	*.59	*.65	*.54	*.44	*.51	100	
1-51	*.59	*.46	*.59	*.75	*.56	*.49	*.43	*.54	*.60	100

*Indicates $P < .05$.

N = 66.

- 1-26 How much do you look forward to coming to work each day? (Five point scale)
- 1-33 How satisfied are you with the company? (Five point scale)
- 1-34 How satisfied are you with the group you work with? (Five point scale)
- 1-35 How satisfied are you with the kind of work you do? (Five point scale)
- 1-36 How satisfied are you with the recognition you receive for your work? (Five point scale)
- 1-37 How satisfied are you with your chances for promotion? (Five point scale)
- 1-38 How satisfied are you with your pay? (Five point scale)
- 1-39 How satisfied are you with the supervision you receive? (Five point scale)
- 1-41 How much does your job give you an opportunity to do the things for which you are best trained? (Five point scale)
- 1-51 To what extent do you find your work satisfying and interesting? (Five point scale)

TABLE 3:9.--Rank order correlations between items included in the index measuring commitment to organization goals.

Items	1-27	1-28	1-56
1-27	100		
1-28	*.50	100	
1-56	*.55	*.51	100

*Indicates $P < .05$.
N = 66.

1-27 To what extent do you feel a responsibility for the success of the company? (Five point extent scale)

1-28 To what extent do you have a feeling of loyalty toward this company? (Five point extent scale)

1-56 To what extent is this company successful in getting you to contribute to its effectiveness? (Five point extent scale)

of the consistency between personal and organizational objectives. The items included in the index employed in analysis, and the extent to which they intercorrelate, are presented in Table 3:10.

TABLE 3.10.--Rank order correlations between items included in the index measuring the congruence of organizational goals with personal goals.

Items	1-29	1-55	2-28
1-29	100		
1-55	*.53	100	
2-28	*.53	*.39	100

*Indicates $P < .05$.

N = 66.

- 1-29 To what extent is your present job consistent with your career goals and objectives? (Five point extent scale)
- 1-55 To what extent does this company do a good job of meeting your needs and goals as an individual? (Five point extent scale)
- 2-28 To what extent are your goals as an individual compatible with the objectives of your work group? (Five point extent scale)

The final dependent variable being considered is the amount of integration of the work group. This is defined as a worker's perception of work group behavior and how comfortable he is in working close with his fellow workers in the solution of common problems. The measurement of this variable is dependent on response to questionnaire items

developed to indicate the degree to which respondents identify with their work group and perceive other members working together. The items included in the index employed in analysis, and the extent to which they intercorrelate, are presented in Table 3:11.

TABLE 3:11.--Rank order correlations between items included in the index measuring integration of the work group.

Items	2-29	2-30
2-29	100	
2-30	*.45	100

*Indicates $P < .05$.
N = 66.

2-29 When you have a problem on your job, how free do you feel to call on others in your work group to help you with it? (Five point scale)

2-30 How much do you really feel a part of your work group? (Five point scale)

Summary

This research is concerned with studying the impact of technology on the relationship between supervisory style and the attitudes and behavior of industrial work groups. To accomplish this a large corporation in the midwest was contacted and its management agreed to participate in the study by providing a sufficient number of work groups, representing various technological structures, to test the hypotheses outlined in the previous chapter.

The sample selected included sixty-seven groups representing seven industrial functions. Respondents were all "salary" workers employed in white collar positions. It is still argued, however, that because of vast differences in the nature and process of work between groups included in the sample, the necessary variance in the "character of technology" is present. The groups selected, therefore, provided a suitable sample to test for the relationships under investigation.

The independent variable "character of technology" was operationalized and measured by interviews with management personnel, whereas the independent variable "style of supervision" was operationalized and measured by questionnaire items. The indexes used in analysis were constructed previous to the research and restructured based upon the intercorrelation of items after the questionnaire had been completed.

FOOTNOTES - CHAPTER III

1. Perrow, op. cit., 194-208; Litwak, op. cit., 177-184; Blauner, op. cit., entire book; Woodward, Industrial Organization . . ., op. cit.

2. W. A. Faunce and Donald A. Clelland, "Professionalization and Stratification Patterns in an Industrial Community," American Journal of Sociology, LXXII (1967), 343. The study by Faunce and Clelland described in this article focuses on the community in which the industrial organization for the present research is found. Table 3:1 in this research is, therefore, an adaptation of a similar table found in their research on the page indicated.

3. W. J. Goode and P. R. Hatt, Methods in Social Research (New York: McGraw Hill, 1952), pp. 237-338. These authors discuss the legitimate use of experts in establishing scale measurements in a given area in which the scale applies. This is the method employed in this research to differentiate groups along the variables being considered in the "character of technology."

4. Likert, New Patterns of Management, op. cit., Chs. 8 and 13.

5. The items used in the questionnaire to measure the dimensions of supervision being considered were either taken from questionnaires previously used by the survey research center at the University of Michigan to measure these same variables, or were constructed from the description of the variables as they are developed in Chapter 14 of Likert's New Patterns of Management.

6. A. Zaleznik, C. R. Christensen, and S. J. Roethlisberger, The Motivation, Productivity, and Satisfaction of Workers (Boston: The Plimpton Press, 1958); Victor H. Vroom, Work and Motivation (New York: John Wiley and Sons, 1964).

7. French, op. cit., 3-19; Likert, New Patterns of Management, op. cit.; Vroom, Work and Motivation, op. cit.

8. French, op. cit., 17-19.

9. This argument is also developed by Likert, New Patterns of Management, op. cit.; Tannenbaum, Control in Organizations, op. cit.; Vroom, Work and Motivation, op. cit.

CHAPTER IV

MANAGEMENT, TECHNOLOGY AND THE WORK GROUP

Introduction

In the last chapter the variables under investigation were operationalized and the sampling procedure and design of the research was discussed. In this chapter the hypotheses will be tested and the findings discussed. However, before discussing the data as it relates to the hypotheses being tested, some of the preliminary analysis undertaken and its significance for the research will be made clear.

Preliminary Analysis

It may be argued from the data presented in Chapter III that the questionnaire items used in construction of the different indexes, measuring the dimensions of supervision being considered, do intercorrelate sufficiently to justify their use. However, this tells us nothing about the extent of intercorrelation between the indexes used to measure the dimensions of supervision under investigation. Therefore, Spearman's rank order correlations were computed on the supervisory indexes from the total sample of sixty-six groups. The data are presented in Table 4:1. The results

suggest that the variables being considered do intercorrelate sufficiently to be considered dimensions of interdependent, if not similar phenomena. This suggests that employees who perceive their supervisors as motivating them in a manner consistent with the principles of participative management are also likely to perceive the decision-making processes, the communication processes, and the interaction-influence processes of their work group as being consistent with the principles of participative management.

TABLE 4:1.--Intercorrelations (s) of indexes used to define "style of supervision."

	Motivation Index	Communication Index	Decision Making Index	Interaction Influence Index
Motivation Index	100			
Communication Index	*.48	100		
Decision Making Index	*.45	*.64	100	
Interaction Influence Index	*.59	*.70	*.63	100

*P < .05.

N = 64.

Similar correlations were computed for the dependent variables to judge the extent to which workers indicating high job satisfaction were also committed to the organizational objectives and perceived these as consistent with their own objectives. The final dependent variable included is the amount of group integration. The results are presented in Table 4:2.

TABLE 4:2.--Intercorrelations (r_s) of indexes used to measure dependent variables.

	Job Satisfaction Index	Commitment to Organization Index	Consistency Between Organization and Personal Goal Index	Group Integration Index
Job Satisfaction Index	100			
Commitment to Organization Goal Index	*.77	100		
Consistency Between Organi- zation and Personal Goal Index	*.72	*.61	100	
Group Integration Index	*.48	*.50	*.41	100

*P < .05.

N = 64.

The results indicate that the above variables are highly correlated with the weakest correlations being observed between the group integration index and the other dependent variables.

The data presented in Tables 4:1 and 4:2 are what might have been expected, i.e., different dimensions of the same phenomenon would intercorrelate to some extent. It is reasonable to expect that supervisors who successfully create a work climate where subordinates enjoy performing the actual day-to-day activities that make up their job and work hard to meet the expectations of others would also encourage workers to keep each other informed about important events and situations related to their work, etc. Also, it would seem consistent for workers reporting high job satisfaction to perceive the objectives and goals of their work group to be consistent with their own and therefore have some commitment to the achievement of these objectives.

The preliminary analysis also included analysis of the sample to determine the distribution of selected demographic characteristics while controlling for the different industrial functions considered. There are six variables controlled: sex, marital status, length of time with the company, education, age, and income.¹ The data are presented in Tables 4:3 through 4:8.

TABLE 4:3.--Sex distribution by functional area.

	Corporate Acct.	Division Acct.	B.I.S. Acct.	Legal & Patent	Manufacturing	Research	TS & D	I.R.
Male	44	32	90	47	77	79	74	19
%	58	94.1	73.2	95.9	100	100	97.4	95
Female	31	2	33	2	0	0	2	1
%	42	5.9	26.8	4.1			2.6	5
Totals	75	34	123	49	77	79	76	20
%	100	100	100	100	100	100	100	100

$\eta = 533$

TABLE 4:4.--Marital status distribution by functional area.

	Corporate Acct.	Division Acct.	B.I.S. Patent	Legal & Manufacturing	Research	TS & D	I.R.
Married %	55 73.3	29 85.3	92 74.8	46 93.9	71 92.9	72 91.1	69 90.8
Single %	17 22.7	4 11.8	29 23.6	3 6.1	6 7.8	5 6.3	6 7.9
Divorced or Separated %	3 4.0	1 2.9	2 1.6	0	0	1 1.3	1 1.3
Widowed	0	0	0	0	0	0	0
No Response %	0	0	0	0	0	1 1.3	0
Total %	75 100	34 100	123 100	49 100	77 100	79 100	76 100

n = 533

TABLE 4:5.--Length of time with company distribution by functional area.

	Corporate Acct.	Division Acct.	B.I.S. Patent	Legal & Patent	Manufacturing	Research	TS & D	I.R.
Less than 6 mo. %	5 6.7	3 8.8	3 2.4	0	1 1.3	2 2.5	1 1.3	0
6 mo. - 2 yr. %	19 25.3	11 32.4	41 33.3	11 22.4	14 18.2	19 24.1	14 18.4	1 5
3 - 5 yr. %	15 20	11 32.4	30 24.4	6 12.2	16 20.8	12 15.2	13 17.1	5 25
6-10 yr. %	10 13.3	3 8.8	15 12.2	6 12.2	7 9.1	9 11.4	20 26.3	4 20
More than 10 yr. %	25 33.3	6 17.6	34 27.6	26 53.2	39 50.6	37 46.8	28 36.8	10 50
No Response %	1 1.3	0	0	0	0	0	0	0
Total %	75 100	34 100	123 100	49 100	77 100	79 100	76 100	20 100

n = 533

TABLE 4:6.--Education distribution by functional area.

	Corporate Acct.	Division Acct.	B.I.S. Patent	Legal & Manufacturing	Research	TS & D	I.R.
Some High School %	0	0	0	6 7.8	0	0	0
High School Grad. %	19 25.3	0	35 28.5	9 11.7	1 1.3	1 1.3	1 5
Some College %	23 30.7	1 2.9	47 38.2	15 19.5	4 5.1	13 17.1	2 10
College Grad. %	32 47.7	28 82.4	26 21.1	35 45.5	27 34.2	35 46.1	6 30
Master's Degree %	1 1.3	5 14.7	13 10.6	12 15.6	15 19	14 18.4	8 40
Ph. D. %	0	0	2 1.6	0	31 39.2	13 17.1	3 15
No Response %	0	0	0	0	1 1.3	0	0
Total %	75 100	34 100	123 100	77 100	79 100	76 100	20 100

n = 533

TABLE 4:7.--Age distribution by functional area.

	Corporate Acct.	Division Acct.	B.I.S. Patent	Legal & Patent	Manufacturing	Research	TS & D	I.R.
20 and Under %	11 14.7	0	12 9.8	0	1 1.3	0	1 1.3	0
21 - 30 %	29 38.6	23 67.6	59 48	10 20.4	28 36.4	30 38.0	26 34.2	7 35
31 - 40 %	14 17.3	9 26.4	30 24.4	13 26.5	20 26	23 29.2	31 40.8	4 20
41 - 50 %	15 20	2 5.9	18 14.6	12 24.5	12 15.6	17 21.5	15 19.7	7 35
51 - 60 %	6 8	0	4 3.3	12 24.5	15 19.5	8 10.1	3 3.9	1 5
61 and Over %	1 1.3	0	0	2 4.1	1 1.3	0	0	1 5
No Response %	0	0	0	0	0	1 1.3	0	0
Total %	75 100	34 100	123 100	49 100	77 100	79 100	76 100	20 100

n = 533

TABLE 4:8.--Income distribution by functional area.

	Corporate Acct.	Division Acct.	B.I.S.	Legal & Patent	Manufacturing	Research	TS & D	I.R.
Under \$7,999 %	28 37.3	1 2.9	38 30.9	0	1 1.3	0	1 1.3	0
\$8,000 to \$11,999 %	30 40	22 64.7	62 50.4	2 4.1	37 48.1	18 22.8	29 38.2	6 30
\$12,000 to \$15,999 %	10 13.3	11 32.3	15 12.2	19 38.7	28 36.4	35 44.3	28 36.9	6 30
\$16,000 and Over %	5 6.7	0	8 6.5	28 57.2	10 13	23 29.1	18 23.7	7 35
No Response %	2 2.7	0	0	0	1 1.3	3 3.8	0	1 5
Total %	75 100	34 100	123 100	49 100	77 100	79 100	76 100	20 100

n = 533

Included in the total sample were 71 females and 462 males. However, the great majority of the females were in two functional areas: corporate accounting and business information services. In the corporate accounting groups the female respondents constitute 42 per cent of the sample and in the B. I. S. groups they constitute 22 per cent of the sample. To determine if the response reported by males was sufficiently different from the response of females, chi squares (X^2) were computed on each of the indexes while controlling for sex. The results suggest that females are more likely to see the decision-making and motivation processes as consistent with the canons of participative management than males. They are also more likely to be committed to organizational goals and perceive their personal goals as consistent with those of the organization. However, in terms of the communication process, interaction influence process, job satisfaction, and group integration there was no significant difference in response for males or females. The differences in response patterns for males and females are consistent throughout the indexes being considered and therefore not very likely to influence the extent to which the independent variable "style of supervision" intercorrelates with the dependent variables.

There are 454 married and 70 single persons included in the sample, however, two-thirds of the single respondents are found in the two functional areas: corporate accounting

and business information services. To determine if marital status is associated with different patterns of response to the index being employed, a chi square was computed on each index while controlling for marital status. No significant difference in response was found.

The majority of the sample have worked for the company for less than ten years. The accounting and business information service groups have a higher percentage of their membership in this situation than any of the other functional areas considered. Chi squares were computed to determine if length of time with the company is associated with variations in response to the indexes used to measure supervision and the dependent variables.

The results suggest that respondents who have been with the company for less than six months or more than ten years are less likely to see supervision along any of the dimensions considered as being participative in style; and are also more likely to rank low on the job satisfaction index, commitment to organizational goal index, and the congruence between personal and organizational goal index. It may be argued, however, that where length of time with the company had an influence on the pattern of response for an index, this pattern was consistent across indexes and is therefore not likely to influence the strength of the rank order correlations between the supervisory variables and the dependent variables.

The sample distributes itself along the variable age and length of time with the company in a similar manner (Tables 4:7 and 4:5). The greatest proportion of respondents under thirty are found in the accounting and business information service functions. The largest proportion of the sample over fifty are found in the legal (29 per cent), manufacturing (21 per cent), and research (10 per cent) functions. To determine if differences in age are influencing the response to the indexes being considered, a chi square was computed for the eight indexes while controlling for age. The results were much the same as those observed for length of time with the company and are interpreted in the same manner.

The mean income for the sample is approximately \$11,200 annually. The distribution of income in Table 4:8 corresponds very closely with the distribution of education in Table 4:6. That is, the functional areas with the largest proportion of workers making under \$7,999 annually is found in the corporate accounting and business information service groups. These areas also have the highest percentage of workers who have received no more than a high school education. The legal and patent groups have the highest percentage of workers making over \$16,000 annually (57 per cent), with the research groups having one of the next highest (29 per cent). The personnel in these two areas also were the most likely to have received a graduate degree.

To determine if differences in income and education are associated with different patterns of response to the index items being considered, a chi square was computed for the eight indexes while controlling for income and education. The results suggest that there is a significant association between these variables. It appears that low income and education are more likely to see managers as non-participative and are also more likely to fall at the lower end of the continuum with regard to the dependent variables. This suggests that while these variables are having an influence on response patterns, it is in the same direction for all the indexes considered.

The final control considered in the preliminary analysis involved a Kruskal Wallis one-way analysis of variance (H) to test the null hypothesis that there was no difference in the distribution of supervisory traits throughout the different industrial functions included in the study. If the null hypothesis is supported it can be argued that we are as likely to find a participative management style in a research group as we are in a business group. Such a condition existing throughout the sample lends greater support to the contention that the variance in correlation between "style of supervision" and "character of work groups" is, in fact, influenced by the "character of technology" as it has been defined in this research. If this variance in supervisory traits does not exist throughout

the sample it may be argued that the industrial areas represented are not comparable on the dimensions under investigation, and therefore any variance in the strength of correlations may be attributed to the unique distribution of supervisory behavior and therefore not necessarily influenced by the technical structure. This analysis was completed and the "H" values observed are reported in Table 4:9.

TABLE 4:9.--"H" values for indexes used to measure dimensions of supervision: communication, decision-making, interaction influence, and motivation; and the dependent variables: job satisfaction, commitment to organizational goals, consistency between individual and group goals and group integration.

	<u>H Value</u>	<u>Sign. Level</u>
<u>Supervisory Indexes</u>		
Communication	9.8046	.20
Decision-making	10.0111	.20
Interaction Influence	8.3132	.30
Motivation	5.3987	.70
<u>Dependent Variables</u>		
Job Satisfaction	7.2917	.50
Commitment to Organization Goals	7.6675	.50
Consistency Between Individual and Group Goals	1.8056	.98
Group Interaction	5.6997	.70

Significant at .05 level $H \geq 14.07$.

N = 66.

The data presented in Table 4:9 support the null hypothesis of no difference in the distribution of supervisory traits while controlling for industrial function. The highest significance level observed was .20, and this only occurred for two indexes: communication and decision-making.

In summary we have observed that the supervisory indexes intercorrelate sufficiently to consider them dimensions of the same phenomenon--style of supervision. The analysis further suggests that the dependent variables intercorrelated sufficiently to argue that workers in groups reporting high satisfaction are committed to organizational goals and find them consistent with their personal objectives. The analysis also revealed that selected demographic characteristics are not evenly distributed throughout the industrial functions represented in the research. Therefore, chi squares were computed on all the variables considered: sex, marital status, education, income, length of time with the company, and age, while controlling for the variance along the four supervisory and four dependent variable indexes. The results suggest that age, length of time with the company, sex, income, and education are significantly associated with different patterns of response to the indexes employed in the research. However, in most instances these variables are associated with similar patterns of response across all the indexes considered and are more

likely to contribute to positive rank order correlations between the indexes than to reduce the amount of correlation observed. Therefore, what bias is introduced by these variables should make it more difficult to find support for the hypothesis under investigation rather than negate any support that may be observed.

Finally, a Kruskal Wallis one-way analysis of variance was computed to determine the distribution of supervisory traits throughout the different industrial functions being considered. The results suggest that the range of supervisory behavior is perceived as being similar throughout the industrial functions being considered.

Testing the Hypothesis

The first hypothesis developed in Chapter II suggests that as work groups employ highly skilled and educated personnel in non-repetitive task environments where work load and performance are difficult to measure there will be a strong and consistent positive association between "participative management" systems and the dependent variables: job satisfaction, commitment to organization goals, group integration, and congruence between personal objectives and group goals. It is also argued in the second and third hypothesis that as the technical structure of a work group gives rise to more repetitive task procedures and measures of work load and performance become more precise, the parameters for appropriate styles of supervision become much

larger and we, therefore, are less likely to find a strong and consistent positive association between "participative management" systems and the dependent variables being considered.

To test the hypotheses attention is given to the strength of correlations between the dimensions of supervision being considered in this research and the dependent variables; while the "character of technology," as it is represented by industrial function, varies from repetitive, easily measured tasks to non-repetitive tasks with weak measures of work load and performance. It is argued that the variance between the industrial functions along the dimensions of technology being considered, is sufficient to isolate the effects of these structural variables on the hypothesis, and that the variance in supervisory behavior within the industrial functions considered is sufficient to identify the extent to which "participative management" styles of supervision correlate with the dependent variables in work groups characterized by different technical structures.

The technology of the research groups included in the research is representative of non-repetitive, highly skilled tasks with weak measures of work load and performance requiring highly trained and specialized personnel. Using rank order correlations, the indexes used to measure the different dimensions of supervision were intercorrelated

with the indexes used to measure the dependent variables. The results are presented in Table 4:10. They are supportive of the first hypothesis, with fourteen of the sixteen correlations being significant at the .05 level. This suggests that participative management systems in technical structures similar to those represented by the research groups studied tend to have high positive correlations with attitudes and perceptions of workers as measured by the dependent variables.

The technology of the Business Information Service groups is intended to represent a repetitive work situation where precise measures of work load and performance are available and requirements for group membership are less harsh than what is observed in most of the other industrial functions considered. That such differences do exist between the two functional areas is supportive by the observation that only 6.4 per cent of the research personnel interviewed in the study have not graduated from college; whereas 66.7 per cent of the Business Information Service personnel interviewed in the study have not received a college degree. At the other end of the continuum, 39.2 per cent of the research personnel have received a Ph. D. degree and only 1.6 per cent of those working in the Business Information Service groups have received this degree.

The rank order correlations between the dimensions of supervision and the dependent variables for the Business

TABLE 4:10.--Rank order correlations between "style of supervision" and character of work groups for the research function.

Character of Work Group	Style of Supervision			
	Motivation Index	Communication Index	Interaction Influence Index	Decision Making Index
Commitment to Organizational Goals	.70	.62	.50	.63
Job Satisfaction	.77	.84	.72	.76
Congruence of Individual and Group Goals	.71	.72	.68	.61
Group Integration	.26	.78	.67	.68

Significant at .05 level rs > .564

N = 11

Information Service groups are presented in Table 4:11. The results reported are supportive of hypotheses two and three. That is, in general, the correlations observed are weak with only four of the sixteen correlations significant at the .05 level. The only dimension of supervision that consistently intercorrelates well with the dependent variables is the motivation index. It may also be observed that this index continually correlates well with the dependent variables independent of industrial functions. The reasons for this are not clear; however, the implication this may have on the research will be discussed in the final chapter.

A comparison of the findings for the research and Business Information Service groups supports the argument that the technical structure of a work group is a determining variable in the success of any pattern of supervision and its impact on the overall morale and perceptions of a work group. The differences in the strength of the correlations observed between the dimensions of supervision and the dependent variables for the research and Business Information Service groups can best be explained by reference to the differences in the repetitive nature of the tasks performed and the extent to which management can assess work load and performance. These variables coupled with the differences in education and training are supportive of the argument that technological structure is an intervening

TABLE 4:11.--Rank order correlations between "style of supervision" and character of work groups for the B. I. S. function.

Character of Work Group	Style of Supervision		
	Motivation Index	Communication Index	Interaction Influence Index
Commitment to Organizational Goals	.80	.24	.27
Job Satisfaction	.65	.58	.35
Congruence of Individual and Group Goals	.60	.26	.33
Group Integration	.51	.32	.11
Decision Making Index			
			.44
			.55
			.40
			.42

Significant at .05 level $r_s > .564$.

N = 11

variable influencing the appropriate patterns of supervision in work groups.

Similar correlations as those computed for the research and Business Information Service groups were calculated for all the remaining functions discussed with the exception of the legal and industrial relations departments. The small number of groups in each of these areas did not allow them to be considered independent of the other areas. The results are presented in Tables 4:12 through 4:15. It is evident from the data that no other area outside of research has consistently high correlations between supervisory style and the dependent variables.

The technical service and development groups, Table 4:12, have very erratic correlations between the variables considered, and only four of the sixteen correlations are significant at the .05 level. However, the discussion of the technical service and development groups in Chapter III indicated that their major activities occur at the third, fourth and fifth stages in product development, and at this stage of product development the character of technology has moved away from exploratory research activities characteristic of stages one and two, to the more repetitive kinds of tasks associated with preparing a product for market distribution and consumption.

The manufacturing groups, Table 4:13, also have a wide range of variance between the correlations observed.

TABLE 4:12.--Rank order correlations between "style of supervision" and character of work groups for the TS & D function.

Character of Work Group	Style of Supervision			
	Motivation Index	Communication Index	Interaction Influence Index	Decision Making Index
Commitment to Organizational Goals	.66	.41	.35	.19
Job Satisfaction	.78	.43	.38	-.02
Congruence of Individual and Group Goals	.88	.29	.63	.24
Group Integration	.30	.43	.26	.00

Significant at .05 level $r_s > .506$.

N = 13

TABLE 4:13.--Rank order correlations between "style of supervision" and character of work groups for the manufacturing function.

Character of Work Group	Style of Supervision		
	Motivation Index	Communication Index	Interaction Influence Index
Commitment to Organizational Goals	.67	.57	.68
Job Satisfaction	.85	.67	.81
Congruence of Individual and Group Goals	.64	.39	.27
Group Integration	-.10	.16	.60

Significant at .05 level rs > .714.

N = 7

TABLE 4:14.--Rank order correlations between "style of supervision" and character of work groups for the patent function.

Character of Work Group	Style of Supervision		
	Motivation Index	Communication Index	Interaction Influence Index
Commitment to Organizational Goals	.71	-.26	.66
Job Satisfaction	.90	.41	.80
Congruence of Individual and Group Goals	.20	.23	.46
Group Integration	.35	-.15	-.35

Significant at .05 level $r_s > .90$.

N = 5

TABLE 4:15.--Rank order correlations between "style of supervision" and character of work groups for the accounting function.

Character of Work Group	Style of Supervision		
	Motivation Index	Communication Index	Interaction Influence Index
Commitment to Organizational Goals	.70	.70	.60
Job Satisfaction	.77	.48	.41
Congruence of Individual and Group Goals	.88	.38	.33
Group Integration	.12	.43	.52

Significant at .05 level rs > .456.

N = 15

One variable which may account for this is the different supervisory levels represented in the manufacturing groups. In almost all of the other functions included in the study the respondents consisted of non-supervisory personnel; however, in the manufacturing area all of the respondents have some supervisory responsibility. The groups were made up of personnel taken from the middle-management level consisting of shift foreman, assistant superintendent, technical engineer and plant superintendent, for a total of eight to ten individuals. Where it may be argued that the technology and work structure of the shift foreman is repetitive and easily measured, this would hardly be the case for the technical engineer or the assistant superintendent. Therefore, the results for the manufacturing area hardly support or negate the hypothesis being considered.

The patent groups have the weakest correlations between the variables being considered. Only one of the sixteen correlations presented is significant at the .05 level. The work in this area is often repetitive in nature, with precise measures of work load and performance available; however, it does require well trained and highly qualified personnel. It may have been argued that the strong positive correlations between variables in the research groups resulted from the well-educated technical staff that makes up these groups. However, the findings for the patent groups who have a higher proportion of their personnel at

the upper end of the educational continuum would not support this conclusion. This observation lends support to the alternative conclusion that the technical variables associated with the work task are responsible for the differences in the correlations observed for these two functions.

Finally, the data presented in Table 4:15 for the accounting groups would suggest that the principles of participative management as measured by the four supervisory variables are well correlated with the dependent variables being considered. Since the accounting area should represent a technical structure considerably different than that observed in the research area, these findings would seem to negate the arguments presented earlier in support of the hypothesis. However, there are two radically different accounting activities represented in the data. One is the traditional record keeping or bookkeeping activities of the division cost accounting groups and the other is the management and accounting activities for the corporate structure. Therefore, before concluding that the correlations reported for the accounting groups in general are not supportive of the hypothesis being considered, control must be maintained for the differences in technical structure introduced by the different activities of the division and corporate accounting groups. The correlations observed after controlling for the differences in the division and corporate accounting groups are presented in Table 4:16 and 4:17.

TABLE 4:16.--Rank order correlations between "style of supervision" and character of work groups for the division accounting.

Character of Work Group	Style of Supervision			
	Motivation Index	Communication Index	Interaction Influence Index	Decision Making Index
Commitment to Organizational Goals	.44	.74	.63	.63
Job Satisfaction	.55	.54	.21	.21
Congruence of Individual and Group Goals	.82	.18	.01	.01
Group Integration	-.14	.53	.66	.66

Significant at .05 level $r_s > .741$.

N = 7

TABLE 4:17.--Rank order correlations between "style of supervision" and character of work groups for the corporation controllers.

Character of Work Group	Style of Supervision			
	Motivation Index	Communication Index	Interaction Influence Index	Decision Making Index
Commitment to Organizational Goals	.67	.70	.40	.61
Job Satisfaction	.75	.48	.42	.46
Congruence of Individual and Group Goals	.95	.59	.71	.56
Group Integration	.28	.39	.06	.27

Significant at .05 level $r_s > .643$.

N = 8

The differences in correlations presented suggest that we are more likely to find participative management practices significantly correlated with the dependent variables in the corporate accounting groups than in the division accounting groups.

These differences may result from some variance in personal characteristics of the membership of these different accounting areas. However, what differences are observed are not in the expected direction. That is, 42 per cent of the employees in the corporate groups are female, as opposed to 6 per cent of the personnel in the division accounting groups. Also 56 per cent of the membership of the corporate accountants have not received a college degree; whereas 97 per cent of the division accountants included in the sample have graduated from college. This suggests at least two interpretations; first, it may be as suggested by the hypothesis that the repetitive nature of the work in the division accounting groups and the precision with which work load and performance can be measured does widen the parameters for successful styles of supervision. However, it may also be the case that participative management practices are unlikely to bring about the desired effects in well trained work groups performing repetitive kinds of activities. Whichever explanation is offered, the data reaffirms the importance of technology and work structure variables in determining the appropriateness of any style of supervision.

The data presented, although offering a general picture of what type of technical structure and work activity is most responsive to participative management practices, does not allow for careful comparisons between any of the functional areas studied except research and the Business Information Service groups. This problem in part arises because of the differences in sample size drawn from each of the functional areas represented in the study. Therefore, one way it may be overcome is by drawing random groups from the research area equal in number to those already existing for the corporate and division areas. This would allow us to test the notion that higher positive correlations should be observed between the dimensions of supervision and the dependent variables for the research groups than for the accounting groups. A table of random number was used to draw a sample of eight and seven groups from the research sample included in the study. The correlations found are presented in Tables 4:18 and 4:19. Keeping in mind the differences in division and corporate accounting groups, a comparison of Tables 4:16, 4:17, 4:18 and 4:19 suggests that the research groups are most likely to have strong positive correlations between the variables considered. The division accounting groups are the least likely to produce such correlations.

A comparison of eight research groups with eight corporate accounting groups reveals that the research groups

TABLE 4:18.--Rank order correlations between "style of supervision" and character of work groups for the random sample of research groups.

Character of Work Group	Style of Supervision			Decision Making Index
	Motivation Index	Communication Index	Interaction Influence Index	
Commitment to Organizational Goals	.46	.72	.67	.70
Job Satisfaction	.90	.74	.72	.76
Congruence of Individual and Group Goals	.90	.54	.70	.59
Group Integration	.46	.83	.74	.74

Significant at .05 level $r_s > .74$.

N = 7

TABLE 4:19.--Rank order correlations between "style of supervision" and character of work groups for the random sample of research groups.

Character of Work Group	Style of Supervision			
	Motivation Index	Communication Index	Interaction Influence Index	Decision Making Index
Commitment to Organizational Goals	.51	.58	.41	.56
Job Satisfaction	.83	.82	.67	.82
Congruence of Individual and Group Goals	.85	.46	.54	.54
Group Integration	.21	.81	.73	.66

Significant at .05 level $r_s > .64$.

N = 8

are somewhat more likely to have significant correlations between the dimensions of supervision and the dependent variables: eight of the sixteen correlations for the research group as opposed to five of the sixteen correlations for the accounting groups. However, in the division accounting groups only two of the sixteen correlations presented are significant at the .05 level as opposed to seven of the sixteen correlations observed for the seven research groups considered. It is also observed that 94 per cent of the correlations between the variables for the research groups are higher than the correlations observed for the division accounting groups. This supports the conclusion that participative management styles of supervision are more likely to be significant and highly correlated with the dependent variables in work groups characterized by non-repetitive tasks with only indirect measures of work load and performance.

The hypotheses suggest that the character of technology influences the appropriateness of management style independent of industrial function. Therefore, industrial functions representing independent non-repetitive work situations in contrast to industrial functions representing repetitive, non-independent work situations should produce higher correlations between the dimensions of supervision being considered and the dependent variables of this research. To test this conclusion groups representing the

research and legal departments of the organization were compared against groups representing the patent, accounting and Business Information Service departments. The data are presented in Tables 4:20 and 4:21.

In Table 4:20, representing the research and legal departments, we find fifteen of the sixteen correlations or 94 per cent are significant at the .05 level. In contrast, the data in Table 4:21, representing a random sample of the patent, accounting and Business Information Service groups, reveals that only 31 per cent of the correlations are significant at the .05 level. This supports the notion that the technology of a work group creates a structure which influences the appropriateness of styles of supervision and their impact on the attitudes and perceptions of workers.

Summary

After an attempt to identify what consequence a number of demographic variables have on the response patterns recorded for the dimensions of supervisory style and the dependent variables, attention was given to testing the major hypotheses. It is argued that as the "character of technology" of an industrial function varies, the strength of r 's correlations between the dimensions of supervision being considered and the dependent variables will also vary. Work groups whose technical structures call for repetitive task situations with precise measures of work load and

TABLE 4:20.--Rank order correlations between "style of supervision" and character of work groups for the legal and research.

Character of Work Group	Style of Supervision			
	Motivation Index	Communication Index	Interaction Influence Index	Decision Making Index
Commitment to Organizational Goals	.62	.63	.59	.57
Job Satisfaction	.65	.80	.69	.63
Congruence of Individual and Group Goals	.65	.72	.73	.70
Group Integration	.16	.79	.66	.70

Significant at .05 level $r_s > .50$

N = 13

TABLE 4:21.--Rank order correlations between "style of supervision" and character of work groups for the random selection of B.I.S., acct. and patent groups.

Character of Work Group	Style of Supervision			
	Motivation Index	Communication Index	Interaction Influence Index	Decision Making Index
Commitment to Organizational Goals	.69	.01	.11	.21
Job Satisfaction	.81	.44	.24	.07
Congruence of Individual and Group Goals	.66	.12	.15	.31
Group Integration	.36	.30	.52	.74

Significant at .05 level $r_s > .50$.

N = 13

performance are likely to be associated with weak or erratic r 's correlations between style of supervision and the dependent variables.

The data reported in this chapter are supportive of this conclusion. It is observed that the weakest inter-correlations occurring between the dimensions of supervision and the dependent variables are found in the Business Information Service, patent, and division accounting groups. The strongest correlations between the dimensions of supervision and the dependent variables are found in the research and legal groups included in the study. It is argued that the variance in degree of correlations observed between these functional areas is in part a product of the technical structure represented by each. The implications of this argument and plausibility are discussed in the final chapter.

FOOTNOTES - CHAPTER IV

1. Another variable which was taken into account but not reported in the analysis was the variance of group size across industrial function. Although there was considerable variance in size between the manufacturing and division accounting groups, there was very little variance between the B. I. S., research, legal, and patent groups. Therefore, the variable was not believed to be influencing the correlations reported in the analysis.

CHAPTER V

SUMMARY AND CONCLUSIONS

Introduction

In this chapter the significance of the findings from the research must be fitted into the larger body of evidence from which it emerged. Hopefully this involves modifying as well as extending some of the prevailing assumptions and ideas which dominate the area of research being considered. It is, therefore, the intent of this chapter to review and interpret the findings of this research as they have significance for the larger body of evidence concerned with technology, management and organization theory.

Technology

There have been few general theoretical statements regarding technology and structure. The two which have the most relevance for the material discussed in this research are Perrow's paper on "A Framework for the Comparative Analysis of Organizations" and Litwak's essay on "Models of Organizations That Permit Conflict." Both authors discuss the impact of "routine" and "non-routine" technologies

in determining the appropriate form of social structure for productive formal organizational structures.¹ The dimensions of routine and non routine technical structures have been included in this research. The attempt to identify industrial functions where technical structure varies with respect to the repetitive nature of the task and the extent to which work load and performance can be measured, introduces this dimension.

However, the work of Litwak and Perrow is concerned with identifying the technical structure for an organization in total and thus developing a comparative model from which the impact of the technical structure can be studied. This research is concerned with identifying differences in the technical structure within an organization and the impact this may be having on what has been called the social or behavioral structure. It is argued that this notion of routine and non routine technical structures coupled with the degree of education and training required for membership into a work group will influence the success of certain behavior patterns supported by the human relations movement.

To test this argument the research included different industrial functions which were identified by management personnel as being representative of different technical structures. Work groups with non repetitive tasks, weak measures of work load and performance, and requiring highly

educated and professional personnel, were represented by the research and legal departments. Within such technical structures it was observed that "participative management types," measured by the four dimensions of supervisory behavior being considered, were very likely to be associated with the most satisfied, integrated and committed work groups. Work groups with repetitive task structures, characterized by precise measures of work load and performance, and allowing considerable variation in the educational and professional requirements for membership, were represented by the Business Information Service and Accounting departments. It was observed, for the Business Information Service groups, that the associations between participative management styles of supervision and the dependent variables were generally insignificant. While the differences in correlations between the dimensions of supervision and the dependent variables for the research and Business Information Service work groups may be attributed to some factor not taken into account by the research, it is the position of this research that much of this difference in findings is a result of the difference in the technical structure of the work group. However, while the findings for the research and Business Information Service groups are in the predicted direction and may be offered in support of the hypotheses being tested, this is not as clearly the case for the findings with regard to the other industrial areas considered.

In the accounting area which was also to represent the repetitive, precisely measured work environment, it was observed that the association between participative management styles of supervision and the dependent variables, although not as strong as research, were sufficiently in that direction to offer only weak support, if any for the hypotheses. However, when the division and corporate accounting groups were compared against each other and the activities of the two areas differentiated along the dimensions of technology being considered, the data reported, in general, was more supportive of the hypotheses. That is, the division accounting groups were reported by management to be characterized by more repetitive task situations and their work load and performance more easily measured than was the case for the corporate accounting groups which in some instances included top management personnel in the accounting area.

It was observed, however, that the reported general education level was higher in the division accounting groups than in the corporate area. This suggests that of the three measures of technical structure taken into account, precision with which work load and performance can be measured, and repetitive nature of the task may be sufficient to broaden the parameters of successful styles of supervision and produce the differences in results observed between the functional areas discussed thus far.

This notion finds further support in the results observed for the patent department. The personnel included in the study from the patent department have a high percentage of their membership who have received graduate training (65 per cent), however, the nature of their work is repetitive and subject to precise measurement of work load and performance. While it may be argued that the latter two variables support wide variations in acceptable patterns of management, the education variable would hypothetically narrow the range of acceptable management styles to include the practices of participative management. The results of the rank order correlations between the dimensions of supervision and the dependent variables are not supportive of the participative management position and reaffirm the importance of the task structure variables included in the "character of technology."

The other functional areas included in the research but not considered representative of the dimensions of technology being considered are the manufacturing and industrial relations functions. In the manufacturing groups the respondents are all supervisory personnel, as has been noted in previous chapters, and therefore their response is likely influenced by the level of management they represent. However, the results would not support the argument that participative managers are any more successful in influencing the extent of correlation between the dimensions of supervision and the dependent variables than more aggressive

management styles. The industrial relations groups have not been included in the research because the number of groups representing this area was too small for purposes of analysis.

In summary it is argued that the results of this research reaffirm the importance of variables associated with the technical structure of a work group in influencing the appropriateness of certain behavior patterns and their impact on the morale of workers and their commitment to organization objectives. Where previous research has characterized the technology of a total industrial setting and then argued the impact this has on individual behavior, the link between these variables has never been very clear. To argue that the routine technical structures of the auto industry are more responsive to a "Weberian form of bureaucratic structure" does not deal with the problem of variations in technical structure within the auto industry.²

Where Perrow argues that "types of organizations--in terms of their function in society--will vary as much within each type as between types; and therefore some schools, hospitals, banks and steel companies may have more in common because of their routine character than routine and non routine schools, routine and non routine hospitals and so forth," this research argues that within a given organization the variation in technology is as great as between organizations. Therefore, the need to be aware of differences in technical structure between organizations in

determining the "socially optimum form of organizational structure" is no greater than the need to be aware of differences in technical structure within organizations to determine the "socially optimum form of organizational structure."³

Supervision

To move from a discussion of the technical structure to a discussion of the influence structure of organizations is more reasonable than it may appear at first. There have been a number of attempts to identify the appropriate patterns of management, within a given technical structure, associated with the most productive and profitable organization.⁴ However, this research is concerned with the appropriateness of the pattern of management developed by the "human relation school" and exemplified in the work of Rensis Likert. The first approximations of the human relations school are summarized for us by Bennis in the following non-independent factors.⁵

1. Leadership and authority are seen as emergent factors.
2. Organizations are seen as an organism rather than a machine.
3. The group rather than the individual is the area of focus.
4. Unanticipated consequence rather than overdetermined systems, which thus hampers prediction, are considered.
5. Power stems from norms reinforced by the group and is emerging overtime.

6. Similarity of interests between supervisors and subordinates.
7. The doctrine of implied consent instead of external incentives.
8. The role of the leader is concerned with coordinating and transacting relations among groups and of being responsible for personal growth and development of his membership.
9. Social reality established by anchoring judgments in some reference group.

These factors coupled with Likert's "general principle of supportive relationships" constitute the elements of management theory having the greatest impact on management systems in organizations today.⁶ It is almost impossible to find a middle or top manager in industry that has not heard of "Theory Y" management or "participative management." This universal awareness and concern for the appropriate management style has perpetuated the myth of a "one best method" of supervision. It is the validity of this myth that this research has been concerned with in trying to develop and support the alternative assumption that supervision is an integral part of an organization in operation and whatever characteristics the organization may have will influence the style of supervision that is appropriate.

That the sponsors of participative management are aware of its relative nature is indicated by Likert's comment, "supervision is . . . always a relative process. To be effective and to communicate as intended, a leader must always adapt his behavior to take into account the expectations, values, and interpersonal skills of those with whom

he is interacting."⁷ However, the variables identified as influencing the success and acceptability of different management practices are all associated with the perceptual and personal qualities of individuals. That is, Likert identifies the perception by the subordinate of the supervisory act or interaction, the relationship between these perceptions and the expectations, values and interpersonal skills of the subordinate, and the personality of the supervisor, as being variables likely to influence the appropriateness of supervisory behavior.⁸

The nature of these variables supports the observation that while those interested in human relations in organizations have continually toyed with technology as an independent variable, they have done so with mixed feelings and reluctance, since it appears to jeopardize some implicit values of this school of thought.⁹ This research, however, has been concerned with the impact "character of technology" may be having on the success of different management practices within a given industrial structure. Previous research can be offered that supports the notion that whether supervision should be authoritarian, democratic or laissez-faire is dependent on the technology and task of the organization being supervised.¹⁰

However, while this notion is offered as conclusive or with considerable validity, it has not been made clear under what technical conditions different patterns of supervision will be successful. It is difficult to argue that

employees will not respond positively to a more humane treatment by their supervisors or that participation in decisions that govern one's well being will not increase commitment to those decisions. However, it would seem reasonable to argue that under certain technical or structural conditions the expectations with regard to the behavior of supervisors are different and therefore the parameters of acceptable supervisory style are greater. This argument is supported by Chinoy's observation that men recognized a "considerate and understanding foreman could turn up anywhere, even in final assembly; and that a nagging crotchety authoritarian foreman might be found in the department with the best jobs." However, the feeling was that off-production jobs were more likely to be blessed with "good supervision." This came not from any apparent superiority in the quality of foremen in off-production departments, but from differences in the character of work assignments and the resulting differences in the responsibilities of supervision.¹¹

Dubin, focusing upon the separation of supervisory behavior from other influences that affect productivity, suggests two general possibilities: (1) "On the assumption that supervision accounts for a fixed and sizeable proportion of the variation in output, comparisons may be made between different kinds of supervision to see which has the highest positive correlation with productivity"

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and (2) "You may ask 'under what circumstances does supervision make more or less difference than do other factors affecting productivity?'"¹² However, the observations made by Chinoy and the argument of this research suggest a third question that may be asked: "Under what technical and structural conditions are the expectations of employees inconsistent with the principles of participative management and therefore supportive of other management systems?" This question focuses attention not on the circumstances where supervision may or may not make a difference on factors affecting productivity, but, assuming that supervision does influence such factors, asks under what structural conditions are the expectations of employees supportive of different management systems.

Admittedly the data presented in this research are not conclusive on this point. They do, however, suggest that when the variables used to identify "character of technology" in this research, take the form of routine task with precise measures of work load and performance, the extent to which participative styles of supervision are likely to be positively correlated with the dependent variables, job satisfaction, commitment to organization objectives, congruence between individual and group goals, and group integration, is greatly reduced. It fails, however, to identify what technical conditions are conducive to what management style, with the exception of participative

management practices, represented in the different dimensions of supervision considered, being strongly correlated with the dependent variables in work settings involving non repetitive tasks, and characterized by weak measures of work load and performance.

The research is, therefore, a contribution in management theory in that it goes beyond the notion of a "one best method" of supervision and attempts to identify, in the dimensions of technology, work structure variables that influence subordinate's expectations with regard to management practices, and therefore have a determining effect on the appropriate style of supervision to significantly influence work group morale and productivity.

Organization Theory

It was pointed out in the first chapter that the crucial link between the formal organizational design and the informal social structure is the supervisor. The importance of the supervisor as a medium to bring about congruence between formal and informal structures helps us understand the attention the role of supervision has received by behavioral scientists concerned with the structure and functioning of organizations.

It is through such a concern that the relative appropriateness of different models of organizations has been made obvious.¹³ The work of Perrow, Pelz, and Litwak clearly establishes the importance of the technical

structure and its influence on the appropriateness of different models for the study of organizations. These authors argue that the nature of the work and the type of task to be performed are variables determining the structure and functioning of formal organizations. Therefore, if the organization is to be studied as a rational impersonal system with extensive specialization, or as a complex set of social relations characterized by a minimum of impersonal relations and specializations is dependent on the task and technical structure.

This research suggests, however, that these differences in the technical structure used to differentiate organizations are as great within any large scale industrial organization. Therefore, rather than argue from the structure of the organization to the nature of predominant social relations within an organization, it would be valuable to identify these intrinsic differences within the organization's technical structure and the impact they have on the nature of social relations and subsequent behavior of organization members.

Hopefully, the research presented in this dissertation helps provide a link between the structure and subsequent behavior of individuals within formal organizations. The position taken in the research is that of a structuralist with the fundamental premise being that social structure conditions the concrete behavior of individuals and

groups. The research has attempted to move from an analysis of social organization on its own level, structural, by focusing on the "character of technology," to an analysis of interpersonal relations, by considering the dimensions of supervisory behavior, to an analysis of individual attitudes and behavior as represented in the dependent variables of the research.

The current tendency in the study of organizations is for the sociologist to either lose his traditional concern for social organization by making role and individual behavior the focus of attention or to focus on the structure of organizations for comparative purposes and ignore the differences in structure within the organization. This research is focused at the more intermediate level; maintaining the perspective of a structuralist, the attempt is made to identify more clearly the link between social structure, interpersonal relations and subsequent behavior. Hopefully, a better understanding of this relationship will amplify our theory and suggest new avenues for research.

FOOTNOTES - CHAPTER V

1. Perrow, op. cit., 194-208; Litwak, op. cit., 177-84.
2. Litwak, op. cit., 181.
3. Perrow, op. cit., 206.
4. Burns and Stalker, op. cit.; Woodward, Management and Technology, op. cit.
5. W. G. Bennis, "Leadership Theory and Administrative Behavior," Administrative Science Quarterly (June, 1959-March, 1960), 359-401.
6. Likert, New Patterns of Management, op. cit., pp. 223-33.
7. Ibid., p. 95.
8. Ibid., Ch. 7.
9. Perrow, op. cit., 206.
10. Woodward, Management and Technology, op. cit., pp. 1-50; Dubin, op. cit., pp. 12-16.
11. Chinoy, op. cit., pp. 34-36. An interpretation to Chinoy's observation which may have relevance to this research is found in the importance assigned to previous experience in shaping workers expectations with regards to appropriate styles of supervision.
12. Dubin, op. cit., p. 6.
13. D. Granick, The Red Executive (New York: Doubleday and Co., 1961); Etzioni, A., A Comparative Analysis of Complex Organizations (New York: The Free Press, 1961).

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APPENDICES

MICHIGAN STATE UNIVERSITY
DEPARTMENT OF SOCIOLOGY
EAST LANSING, MICHIGAN

Dear Employee:

We are making a study of the way people here feel about their jobs. The purpose is to learn how different organizations accomplish their work and what makes a company a good place to work.

What you say on this questionnaire is completely confidential. DO NOT SIGN YOUR NAME. All questionnaires will be taken to Michigan State University, and no one in the company will ever see anyone's answers. We do not want to know who you are, but we do want to know how people in different jobs and departments feel about things. For these reasons we have included a few questions about your background.

The findings of the study will be presented collectively and the results made available to your work group.

This is not a test. There are no right or wrong answers. You can help best by just answering the way that fits you best.

1. Questions can, for the most part, be answered by putting a check mark (✓) by the answer that seems the best for you.
2. Please answer the questions in order. Do not skip around.
3. If there is something you don't understand, please ask about it.

Charles Drake
Department of Sociology
Michigan State University

ABOUT YOURSELF

1. What is your sex? CHECK ONE:
- ____(1) Male
____(2) Female
2. What is your marital status? CHECK ONE:
- ____(1) Married
____(2) Single
____(3) Divorced or Separated
____(4) Widow or Widower
3. How many children do you have? WRITE IN NUMBER:
- ____Child (Children)
4. How much schooling have you had? CHECK ONE:
- ____(1) Some high school
____(2) High school graduate
____(3) Some college
____(4) College graduate
____(5) Master's degree
____(6) Doctorate
5. How old are you? CHECK ONE:
- ____(1) 20 years or under
____(2) 21-25 years
____(3) 26-30 years
____(4) 31-35 years
____(5) 36-40 years
____(6) 41-50 years
____(7) 51-60 years
____(8) 61 years or over
6. At what age do you think you will retire from this company? WRITE IN NUMBER:
- ____Years old
7. For whom did you work before coming to this company?
WRITE IN EMPLOYER:
- _____

8. How long have you worked for this company? CHECK ONE:

- ☐ (1) Less than 6 months
- ☐ (2) 6 months - 2 years
- ☐ (3) 3 - 5 years
- ☐ (4) 6 - 10 years
- ☐ (5) More than 10 years

9. What is your annual income from this company? CHECK ONE:

- ☐ (1) Under \$6,000
- ☐ (2) \$6,000 to \$7,999
- ☐ (3) \$8,000 to \$9,999
- ☐ (4) \$10,000 to \$11,999
- ☐ (5) \$12,000 to \$13,999
- ☐ (6) \$14,000 to \$15,999
- ☐ (7) \$16,000 to \$17,999
- ☐ (8) \$18,000 or more

10. To what extent do you enjoy performing the actual day-to-day activities that make up your job? CHECK ONE:

- ☐ (1) A very little extent
- ☐ (2) A little extent
- ☐ (3) Some extent
- ☐ (4) A great extent
- ☐ (5) A very great extent

11. To what extent are there things about working here (people, policies, or conditions) that encourage you to work hard? CHECK ONE:

- ☐ (1) A very little extent
- ☐ (2) A little extent
- ☐ (3) Some extent
- ☐ (4) A great extent
- ☐ (5) A very great extent

12. How much do you look forward to coming to work each day?

- ☐ (1) Very much
- ☐ (2) Much
- ☐ (3) Somewhat
- ☐ (4) Little
- ☐ (5) Not at all

13. To what extent do you feel a responsibility for the success of the company? CHECK ONE:

☐ (1) A very little extent
☐ (2) A little extent
☐ (3) Some extent
☐ (4) A great extent
☐ (5) A very great extent

14. To what extent do you have a feeling of loyalty toward this company? CHECK ONE:

☐ (1) A very great extent
☐ (2) A great extent
☐ (3) Some extent
☐ (4) A little extent
☐ (5) A very little extent

15. To what extent is your present job consistent with your career goals and objectives? CHECK ONE:

☐ (1) A very great extent
☐ (2) A great extent
☐ (3) Some extent
☐ (4) A little extent
☐ (5) A very little extent

ABOUT YOUR JOB

16. What is your present job title?

JOB TITLE

17. How long have you been working at your present job? CHECK ONE:

☐ (1) Two months or less
☐ (2) Three to five months
☐ (3) Six to eleven months
☐ (4) One to two years
☐ (5) Over two years

18. How satisfied are you with the following? CHECK ONE IN EACH LINE:

	Very greatly satisfied	Very satisfied	Somewhat satisfied	Slightly satisfied	Not at all satisfied
(a) With the company	☐	☐	☐	☐	☐
(b) With the group I work with	☐	☐	☐	☐	☐
(c) With the kind of work I do	☐	☐	☐	☐	☐
(d) With the recognition I receive for my work	☐	☐	☐	☐	☐
(e) With my chances for promotion	☐	☐	☐	☐	☐
(f) With my pay	☐	☐	☐	☐	☐
(g) With the supervision I receive	☐	☐	☐	☐	☐

19. Would you rather stay on your present job or change to another job? CHECK ONE:

☐ (1) Very much prefer to stay on present regular job
☐ (2) Somewhat prefer to stay on present regular job
☐ (3) No preference one way or the other
☐ (4) Somewhat prefer to change to another job
☐ (5) Very much prefer to change to another job

20. How much does your job give you an opportunity to do the things for which you are best trained? CHECK ONE:

☐ (1) No chance at all
☐ (2) Very little chance
☐ (3) Some chance
☐ (4) Fairly good chance
☐ (5) Very good chance

21. Different people want different things out of their jobs. How important are each of the following for you? CHECK ONE ANSWER IN EACH LINE:

	Very great importance	Great importance	Some importance	Slightly important	Not important at all
(a) Having an easy job	☐	☐	☐	☐	☐
(b) Getting along with my supervisor	☐	☐	☐	☐	☐
(c) Working with people I like	☐	☐	☐	☐	☐
(d) Being secure in my job	☐	☐	☐	☐	☐
(e) Good chance to do interesting work	☐	☐	☐	☐	☐
(f) Good benefits (vacations, sick pay, retirement, etc.)	☐	☐	☐	☐	☐
(g) Good chance to use my skill and ability	☐	☐	☐	☐	☐

22. Identify which item in question 21 is most important to you and which is least important. WRITE IN ITEM:

_____ Most important

_____ Least important

23. To what extent do you find your work satisfying and interesting? CHECK ONE:

☐ (1) A very little extent
☐ (2) A little extent
☐ (3) Some extent
☐ (4) A great extent
☐ (5) A very great extent

24. To what extent are you given the information necessary to do your job in the best possible way? CHECK ONE:

☐ (1) A very little extent
☐ (2) A little extent
☐ (3) Some extent
☐ (4) A great extent
☐ (5) A very great extent

25. To what extent is the information you get about what is going on in other departments adequate or sufficient for your needs? CHECK ONE:

☐ (1) A very little extent
☐ (2) A little extent
☐ (3) Some extent
☐ (4) A great extent
☐ (5) A very great extent

26. To what extent do you feel your pay is related to how much you help this company be successful? CHECK ONE:

☐ (1) A very little extent
☐ (2) A little extent
☐ (3) Some extent
☐ (4) A great extent
☐ (5) A very great extent

27. To what extent does this company do a good job of meeting your needs and goals as an individual? CHECK ONE:

☐ (1) A very great extent
☐ (2) A great extent
☐ (3) Some extent
☐ (4) A little extent
☐ (5) A very little extent

28. To what extent is this company successful in getting you to contribute to its effectiveness? CHECK ONE:

☐ (1) A very great extent
☐ (2) A great extent
☐ (3) Some extent
☐ (4) A little extent
☐ (5) A very little extent

ABOUT YOUR WORK GROUP

29. How long have you been working with most of the members of your present work group at this company? CHECK ONE:

- ☐ (1) Two months or less
☐ (2) Three to five months
☐ (3) Six to eleven months
☐ (4) One to two years
☐ (5) Over two years

30. To what extent do persons in your work group keep each other informed about important events and situations related to your work? CHECK ONE:

- ☐ (1) A very little extent
☐ (2) A little extent
☐ (3) Some extent
☐ (4) A great extent
☐ (5) A very great extent

31. How much do persons in your work group encourage each other to work as a team? CHECK ONE:

- ☐ (1) A very little extent
☐ (2) A little extent
☐ (3) Some extent
☐ (4) A great extent
☐ (5) A very great extent

32. In your department, to what extent do people work hard for the following? CHECK ONE ANSWER IN EACH LINE:

	Very little extent	Little extent	Some extent	Great extent	Very great extent
(a) To keep their jobs	☐	☐	☐	☐	☐
(b) To make money	☐	☐	☐	☐	☐
(c) To seek promotions	☐	☐	☐	☐	☐
(d) To find satisfaction in a job well done	☐	☐	☐	☐	☐
(e) To meet expectations of others	☐	☐	☐	☐	☐

33. How are objectives set in your department? CHECK ONE:

- ☐ (1) Objectives are announced with little opportunity to raise questions or comment
- ☐ (2) Objectives are announced and explained and an opportunity is then given to ask questions
- ☐ (3) Objectives are drawn up, but are discussed with subordinates and sometimes modified before being used
- ☐ (4) Specific alternative objectives are drawn up by supervisors, and subordinates are asked to discuss them and indicate which they think best
- ☐ (5) Problems are presented to those persons who are involved, and the objectives felt to be the best are then set by the subordinates and the supervisor jointly, by group participation and discussion

34. People at all levels usually have "know-how" that could be useful to decision-makers. To what extent is information widely shared in your department so that those who make decisions have access to all available "know-how?" CHECK ONE:

- ☐ (1) A very little extent
- ☐ (2) A little extent
- ☐ (3) Some extent
- ☐ (4) A great extent
- ☐ (5) A very great extent

35. When decisions are being made, to what extent are the persons affected asked for their ideas? CHECK ONE: .

- ☐ (1) A very little extent
- ☐ (2) A little extent
- ☐ (3) Some extent
- ☐ (4) A great extent
- ☐ (5) A very great extent

36. How much do persons in your work group emphasize a team goal? CHECK ONE:

- ☐ (1) A very little extent
- ☐ (2) A little extent
- ☐ (3) Some extent
- ☐ (4) A great extent
- ☐ (5) A very great extent

37. To what extent do persons in your work group exchange opinions and ideas? CHECK ONE:

☐ (1) A very little extent
☐ (2) A little extent
☐ (3) Some extent
☐ (4) A great extent
☐ (5) A very great extent

38. To what extent are your goals as an individual compatible with the objectives of your work group?
CHECK ONE:

☐ (1) A very great extent
☐ (2) A great extent
☐ (3) Some extent
☐ (4) A little extent
☐ (5) A very little extent

39. When you have a problem on your job, how free do you feel to call on others in your work group to help you with it? CHECK ONE:

☐ (1) I feel very free to call on them
☐ (2) I feel quite free to call on them
☐ (3) I feel fairly free to call on them
☐ (4) I don't feel free to call on them
☐ (5) I don't feel at all free to call on them

40. How much do you really feel a part of your work group?
CHECK ONE:

☐ (1) I very much feel a part of my work group
☐ (2)
☐ (3) I somewhat feel a part of my work group
☐ (4)
☐ (5) I do not feel a part of my work group

41. In general how much influence does each of the following groups have on what goes on in your department?
CHECK ONE ANSWER IN EACH LINE:

	Very little influence	Little influence	Quite a bit of influence	A great deal of influence	A very great deal of influence
(a) First line supervisors	☐	☐	☐	☐	☐
(b) Top managers	☐	☐	☐	☐	☐
(c) Non-management employees	☐	☐	☐	☐	☐
(d) Your immediate supervisor	☐	☐	☐	☐	☐
(e) Yourself	☐	☐	☐	☐	☐

ABOUT YOUR SUPERVISOR

42. How long have you been working for your present supervisor?

- ☐ (1) Two months or less
☐ (2) Three to five months
☐ (3) Six to eleven months
☐ (4) One to two years
☐ (5) Over two years

43. To what extent are those above you receptive to your ideas and suggestions? CHECK ONE:

- ☐ (1) A very little extent
☐ (2) A little extent
☐ (3) Some extent
☐ (4) A great extent
☐ (5) A very great extent

44. To what extent do people in your work group try to see that their supervisor and his superiors get full and accurate information about work problems? CHECK ONE:

____(1) A very little extent
____(2) A little extent
____(3) Some extent
____(4) A great extent
____(5) A very great extent

45. When your supervisor has problems related to the work, to what extent does he use group meetings to talk things over with subordinates and get their ideas? CHECK ONE:

____(1) A very little extent
____(2) A little extent
____(3) Some extent
____(4) A great extent
____(5) A very great extent

46. Which of the following best describes the manner in which most problems between departments are generally resolved? CHECK ONE:

____(1) Little is done about these problems--they continue to exist
____(2) Little is done about these problems--they work themselves out in time
____(3) The problems are appealed to a higher level in the organization--but are often still not resolved
____(4) The problems are appealed to a higher level in the organization and are usually resolved there
____(5) The problems are worked out at the level where they appear through mutual effort and understanding

47. How well does your supervisor do the following:

	Very well	Well	Average	Needs improvement	Not well at all
(a) Planning and scheduling of work	☐	☐	☐	☐	☐
(b) Indicating clearly when work is to be done	☐	☐	☐	☐	☐
(c) Assigning the right job to the right man	☐	☐	☐	☐	☐
(d) Inspecting and following up on the work that is done	☐	☐	☐	☐	☐
(e) Getting people to work well together	☐	☐	☐	☐	☐
(f) Getting individuals to do the best they can	☐	☐	☐	☐	☐
(g) Giving recognition for good work done	☐	☐	☐	☐	☐
(h) Letting people know where they stand	☐	☐	☐	☐	☐

48. Thinking only about the people who report to your supervisor, how much do they agree among themselves in their opinions about the company and the job?

CHECK ONE:

- ☐ (1) No agreement
☐ (2) Little agreement
☐ (3) Some agreement
☐ (4) A good deal of agreement
☐ (5) Complete agreement

49. If you were offered another job at this company doing the same type of work but under a different immediate supervisor, how would you feel about moving? CHECK ONE:

☐ (1) I would strongly prefer to stay where I am
☐ (2) I would somewhat prefer to stay where I am
☐ (3) I would have a hard time deciding
☐ (4) I would somewhat prefer to accept the other job
☐ (5) I would strongly prefer to accept the other job

50. How well does your supervisor know the technical side of his job--the operations and procedures for which he is responsible? CHECK ONE:

☐ (1) He knows the technical parts of his job extremely well
☐ (2) Very well
☐ (3) Fairly well
☐ (4) Some well and others not so well
☐ (5) Does not know the technical parts of his job at all well

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