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UNITED STATES AIR FORCE
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# AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

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# AN APPROACH TO THE INCORPORATION OF SOCIAL PSYCHOLOGICAL FACTORS IN WORK DESIGN

Richard V. Badalamente, Major, USAF

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Managers have been offered a wide variety of strategies for designing the work system. An increasing awareness of the importance of the human element in work systems, together with an increasing mastery over the purely technological elements of the system, has led to an emphasis on work design strategies which focus on human performance and organizational behavior as the pivotal consideration in system design. Emanating from the so-called "behavioral science school of management," these strategies include job

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20. enrichment or enlargement, job rotation, participative decision-making, management by objective, and sensitivity or T-group training, among others. Unfortunately, the zeal with which these strategies have been promoted has sometimes overshadowed the need for a systematic approach to work design so necessary if optimization is to be achieved. Thus, many potentially effective behavioral science strategies have had a discouragingly high failure rate in the corporate sector. This suggests the need to analyze in depth the assumptions inherent in these strategies concerning the determinants of human behavior. This report contains such an analysis. Employing an eclectic approach involving both empirical behaviorism and cognitive theory, three broad categories of management strategy--enrichment, involvement, and incentive--were broken down into behavioral correlates and inherent assumptions. These were arrayed in a series of behavioral taxonomies. These taxonomies were then employed to develop a set of propositions for incorporating social psychological factors in work design.

AU-AFIT-LS-4-77

# AN APPROACH TO THE INCORPORATION OF SOCIAL PSYCHOLOGICAL FACTORS IN WORK DESIGN

A School of Systems and Logistics AU-AFIT-LS Technical Report

Air University

Air Force Institute of Technology

Wright-Patterson AFB, Ohio

By

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November 1977

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## Introduction

Generally speaking, the emphasis of human factors has been on designing equipment and procedures a man can use effectively and reliably. The problem that remains is, of course, designing a job a man will do effectively and reliably (Swain, 1973). It is common to refer to this problem as one of "motivation." We employ this term to account for the selection, intensity, and persistence of behavior. Motivation, like "learning," is a construct--it is inferred from observable behavior. Consider, for example, the kinds of behaviors we might expect from a "motivated" worker: (1) he should produce at a rate equal to or greater than the standard; (2) his work should meet or exceed quality standards; (3) he should arrive at his workplace punctually; (4) he should coordinate his activities with others to facilitate the overall production process; (5) he should make suggestions for improving product design, process efficiency, etc.; and (6) he should express "satisfaction" with his job and the organization at large. In effect, our aim is to "cause" the worker to behave in these ways. Although there are those who balk at the term, we are dealing with behavior control. That is, in fact, what "management" is all about--controlling the behavior of inanimate and living systems.

According to Cleland and King (1972), "management is an ancient art--practiced in the distant past principally by kings, princes, prime ministers, clergymen, and generals, and in the more recent past by business executives and government bureaucrats" (p. 3). Over the years, various "mangement strategies" have evolved, largely based on untested assumptions about the "nature of man." Again, the aim has

been to control man's behavior in the task environment. Since we have learned something about the determinants of human behavior over the years, we should be able to explicate and test these assumptions to a greater extent than we have done in the past. This involves us with both empirical behaviorism, as exemplified by B. F. Skinner's (1953) treatment of operant behavior, and conscious experience, best reflected in the cognitive theories of such men as Lewin (1935) and Tolman (1932). In order to evaluate our alternatives with regard to various management strategies, or more precisely, for designing the work system, we must stipulate (1) the environmental conditions operative--i.e., components of the strategy under consideration; (2) the theoretical bases in human behavior underlying the proposal to structure the environment in a specified manner--i.e., behavioral correlates of the component; and (3) the necessary assumptions concerning conscious experience. For example, a "piece-rate" incentive plan has the principle of reinforcement as a behavioral correlate, and the major assumption is that a monetory outcome, or the level thereof, is reinforcing (there are, of course, other considerations that should be made--e.g., the "reinforcement schedule").

What we are doing by comparing work design components with their behavioral correlates is essentially the same thing that has already been accomplished to a large extent with conventional human factors data. Just as the relationships between stimuli and vision have been employed to evaluate alternative methods for visual information coding, the relationships between stimuli and social psychological aspects of behavior can be employed to evaluate alternative

methods for designing work systems. The result is a "behavioral taxonomy," which may be organized as follows: (1) any given management/work design strategy--e.g., job enrichment--is broken out into its essential components--e.g., "give the individual a complete, natural unit of work"; (2) the components are listed in a table and under each component are two columns--(a) behavioral correlates of the component, and (b) assumptions which are implicit in the combination of the component and its behavioral correlates. This arrangement is illustrated in figure 1.

The behavioral correlates employed in such a taxonomy will generally derive from four broad areas: (1) operant behavior, and specifically the Law of Effect; (2) cognitive theory, mostly the concepts of psychological force, valence, and expectancy; (3) the principle of feedback (KOR); and (4) principles of group behavior. The approach throughout will be eclectic, and this will be reflected in the variety of concepts included in the taxonomy. It should also be emphasized that not all the behavioral correlates that may be included in the taxonomy can be called "lawful relationships." Some are more "tentative" in nature, reflecting, in a manner of speaking, a hypothesis with a very reasonable degree of support.

With this general outline in mind, we will now proceed to

A BEHAVIORAL TAXONOMY FOR JOB-ENRICHMENT

| Behavioral Correlates | Assumptions |
|---|---|
| COMPONENT 1. Give the individual a complete, natural unit of work | |
| Behavior which is followed by positively reinforcing events has a higher probability of occurring under similar conditions in the future. | A complete, natural unit of work involves greater stimulus diversity to a degree preceived as reinforcing by the individual |
| etc. | etc. |

Fig. 1. Sample arrangement for a behavioral taxonomy of social psychological factors in work design.

develop taxonomies for job enrichment, involvement, and incentive. This will involve a detailed discussion of the components of each strategy, followed by the taxonomy itself.

## Enrichment

As delineated by Herzberg (1968), the essential components of job enrichment are: (1) remove controls while retaining accountability, (2) increase accountability for individual's own work, (3) give individual a complete, natural unit of work, (4) grant individual additional authority in his work activity, (5) make periodic reports directly available to the individual (rather than through the supervisor), (6) introduce new and more difficult tasks, and (7) assign individuals specific or specialized tasks enabling them to become "experts." According to the advocates of job enrichment, this strategy will lead to greater work motivation and, consequently, better performance. Although there is some disagreement on where it fits into the paradigm, job satisfaction is also thought to result from enrichment. The effects on motivation are said to derive from the "work itself," achievement, recognition for achievement, responsibility, and "psychological growth or advancement."

The enrichment strategy. The enrichment strategy is shown in figure 2. The interconnected ellipses in the middle of the figure represent the person-task interface. The task is broken out into content and context factors, with the former representing the "work itself," and having a direct effect on the person's "motivation." The individual's performance is considered to be a function of his motivation and abilities.

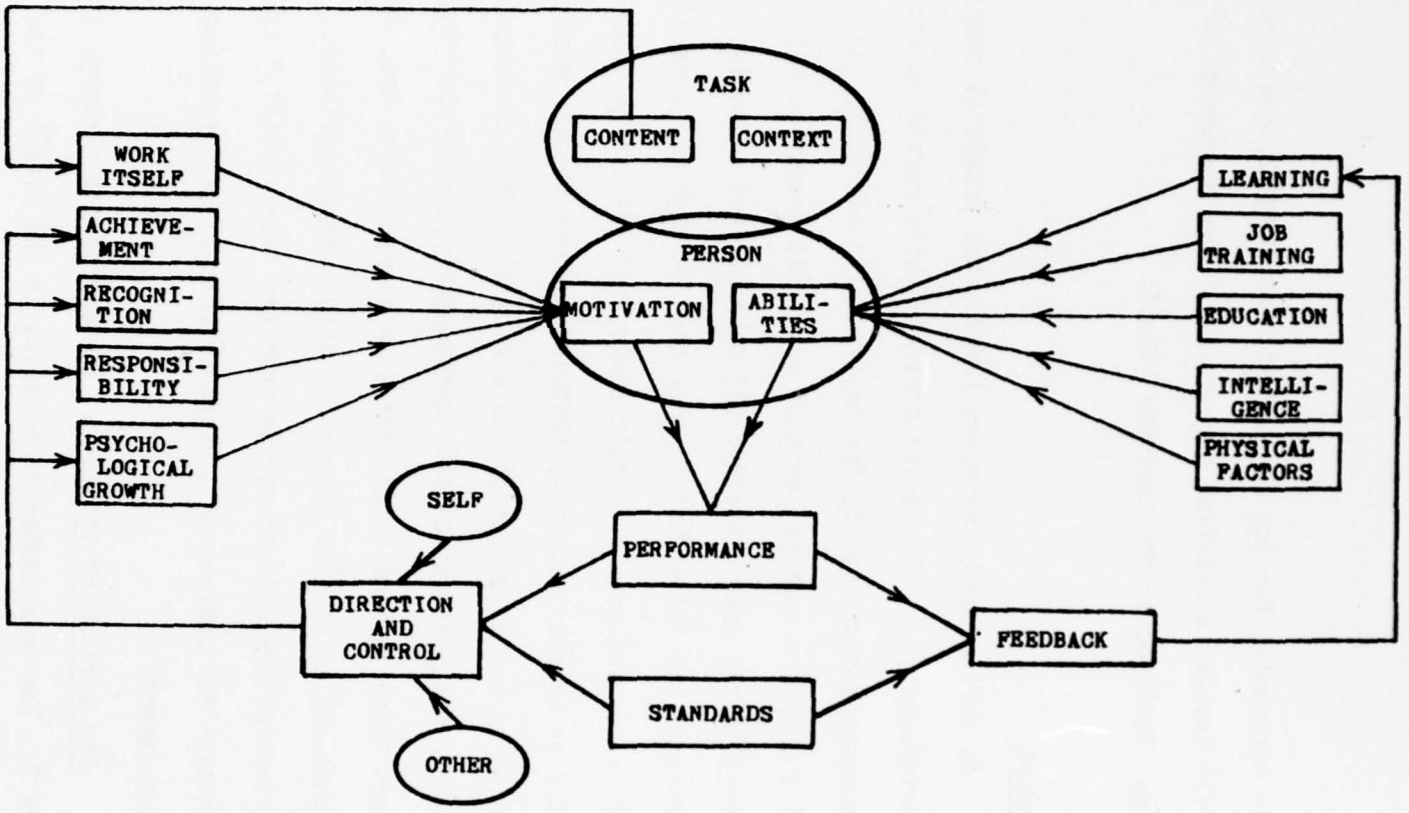



Figure 2. The task-person interface and the enrichment paradigm.

Direction and control (to the left) and feedback (to the right) derive from a comparison of the individual's performance with standards for performance. These standards may be formal organizational and task standards, group norms, and/or individual standards. Meeting these standards may give the individual a sense of achievement and result in recognition from superiors, peers, and/or "internal" recognition. Removing the degree of direction and control exerted by others, as opposed to self, can result in an increased sense of responsibility and "psychological growth." Feedback provides the means of learning and, in turn, improves one's task-related abilities.

In this section, we will attempt to "take apart" the enrichment strategy and explicate its concomitants and assumptions. Our unit of analysis will be the individual and our basis for analysis will be the operant paradigm, supplemented with some cognitive concepts.

The operant paradigm. As shown in figure 3, a simple application of the operant paradigm to task behavior can be used to illustrate the way task-related behavior may be shaped by its consequences; whether the behavior in question is congruent with task accomplishment (e.g., dependability, productivity, creativity) or incongruent (e.g., absenteeism, output restriction). For example, if the consequences of task congruent behavior are reinforcing to the individual, then the probabil-

ity of that behavior being emitted in the future under similar conditions is increased; if they are not reinforcing, the probability is decreased. The same reasoning applies to task incongruent behavior. These behavior domains, congruent-incongruent, are not mutually exclusive, although various modes within them are, e.g., productivity versus output restrictions. Further, there are generally reinforcing consequences (as well as aversive consequences) associated with behavior modes in both domains. High productivity, for example, may have a remunerative reinforcement as a consequence, while restriction of output may have a social reward as a consequence. Thus, the final effect will be a resultant of the weights, or magnitudes, of the various reinforcing and/or aversive consequences. Finally, the "psychological force" (PF) on the individual to engage in a particular mode of behavior (act i) in order to achieve a particular outcome j will be a function of his "expectancy" that i will lead to j, and the "valence" of j for him, i.e., PF=V x E (Vroom, 1964).

With these concepts in mind, let us go back and examine the concepts of figure 2 more closely. First, as Nord (1969) has stated, "The traditional view of motivation as an inner-drive is of limited practical and theoretical value" (p. 391). To say that a "sense of achievement" increases an individual's "motivation" for work performance is hardly illuminating. We must "operationalize" these terms if they

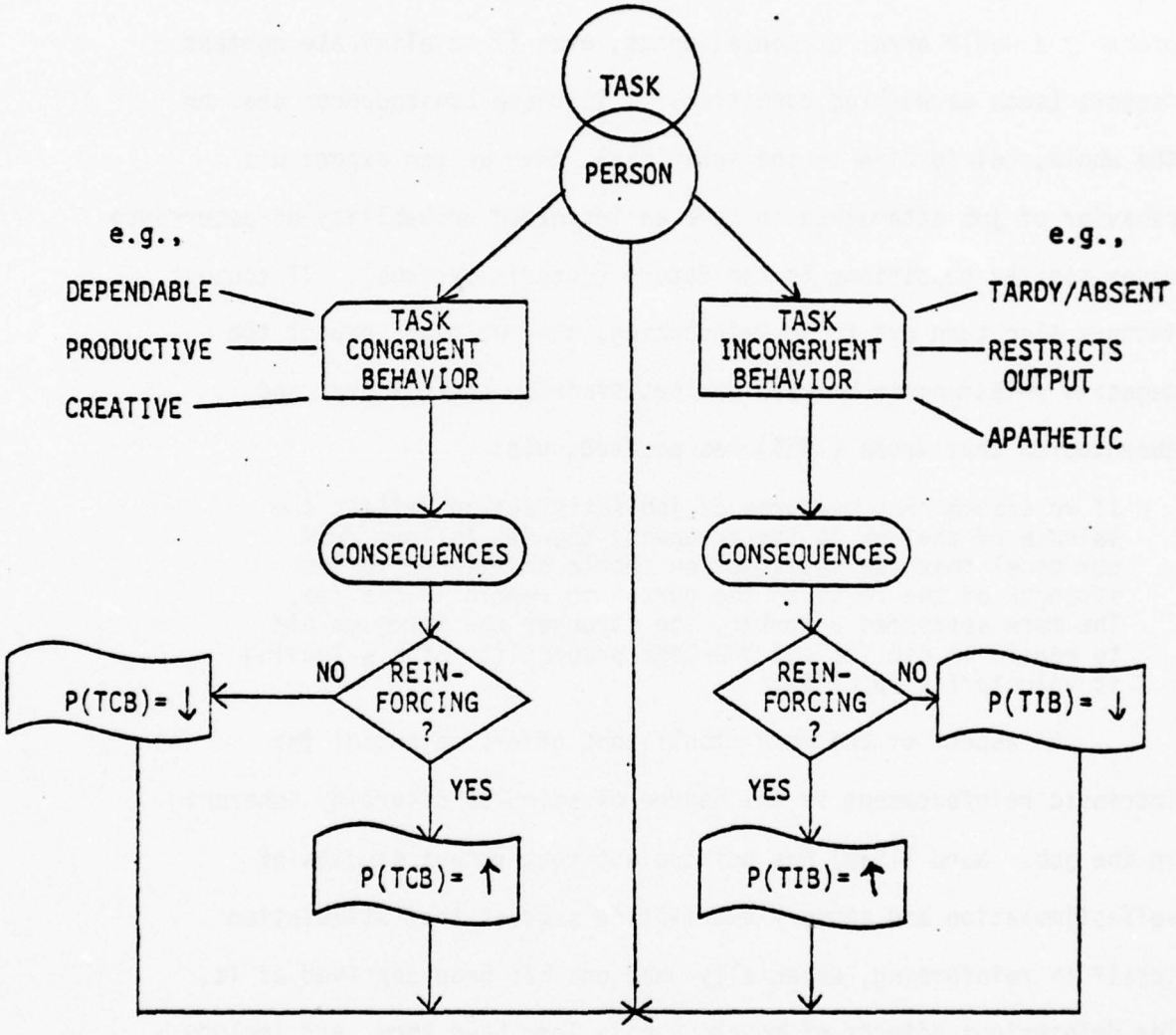



Fig. 3. Operant paradigm applied to task behavior

are to be useful. Let us simply say that the consequences of the individual's behavior effect the probability of that behavior's being emitted again under similar conditions in the future.

The work itself. Now the "work itself" is a consequence of the individual's behavior of showing up for his job. In fact, it is probably a whole array of consequences, even if we eliminate context factors (such as working conditions). If these consequences are, on the whole, reinforcing to the individual, then we can expect his behavior of job attendance to have an increased probability of occurrence under similar conditions in the future (ceteris paribus). If context factors also turn out to be reinforcing, then we might expect the negative relationship between job satisfaction and turnover and absenteeism that Vroom (1964) has posited, viz:

> If we assume that measures of job satisfaction reflect the valence of the job to its occupant, then it follows from our model that job satisfaction should be related to the strength of the force on the person to remain in his job. The more satisfied a worker, the stronger the force on him to remain in his job and the less probability of his leaving it voluntarily (p. 175).

An aspect of the work itself that offers potential for intrinsic reinforcement is the degree of stimulus diversity inherent in the job. Nord (1969) has pointed out that recent studies of self-stimulation and sensory deprivation suggest that stimulation itself is reinforcing, especially when one has been deprived of it. The deleterious effects of monotony have long been know, and include impaired thinking and perception, childish emotional responses, and possibly even hallucinations, among other things (Heron, 1957; Olds, 1956). The individual on a short time-cycle, repetitive job, who

finishes one trial, is faced with another identical trial as a consequence of his job behavior. Thus, the consequence of "sticking to the job" is likely to be boredom; hardly a reinforcing contingency. Individual differences may mediate the degree of stimulus diversity appropriate in a particular job for any given individual (Hulin, 1971); but beyond a certain point, any very simple, short time-cycle repetitive job will be perceived as monotonous by any normal individual. This is not to say that holders of such jobs may not express "satisfaction" with them. They may, but job satisfaction does not necessarily equate to satisfactory job performance.

Achievement. Other important aspects of the work itself are those design features that permit the full realization of the potentially reinforcing consequences of job performance--i.e., achievement, recognition, responsibility, and psychological growth. For example, in order for an individual to experience the consequence of achievement, it is necessary that his job offer a logistical, and/or mechanical, and/or intellectual problem which, relative to his capabilities, and in his view, is reasonably challenging. As Nord (1969) put it: "If a person is doing a job from which it is possible to get a feeling of achievement, there must be a reasonably large probability that a person will not succeed on the task" (p. 393). In addition to challenge, it is, of course, necessary that the job be designed so that it is readily apparent to the individual when he has achieved the task goal. One may term this a "motivating" aspect of feedback, but it is more to the point to say, simply, that to be reinforcing to the individual, consequences must first be perceived by the individual.

Achievement is also directly related to the degree of closure inherent in the job--i.e., the property of having a definite beginning and end. In this regard, the time pattern inherent in the job is important to an individual's sense of closure. Short time-cycle, repetitive jobs are unlikely to be perceived as n identical jobs per day, with n beginnings and n endings but, rather, as one continuous job with no discernible beginning or ending, except as provided by the time clock.

Recognition, responsibility, and psychological growth. When one is told exactly what to do and how to do it in his job and then watched over constantly to see that he does it, he is effectively denied the opportunity for achievement. Without achievement, recognition is meaningless. In such a situation, no responsibility is forthcoming. And psychological growth is thwarted. According to the advocates of job enrichment, it is necessary to emphasize self-direction and self-control (McGregor, 1960) and deemphasize direction and control by others (i.e., especially management). This approach calls for the decentralization of authority, less directive-type supervision, and the arrangement of organizational conditions so as to enhance individual and organizational goal congruence. It is necessary that one understand the importance of this latter requirement--i.e., the congruence of individual and organizational goals. McGregor (Ibid.) pointed out that man will exercise self-direction and control in the service of objectives to which he is committed and emphasized the importance of the consequences of experience on behavior. This viewpoint is, or course, consistent with the operant paradigm as we have presented it in figure 3.

There are any number of consequences of task behavior which can serve to influence the selection, intensity, and persistence of behavior ("motivation"). These consequences can be categorized in terms of their reinforcing properties as "instrumental," in the sense used by Vroom (1964) to mean that they have "valence" because of their expected relationship to other outcomes, and "consummatory," meaning that their reinforcing property is intrinsic. Our preceding discussion of the "work itself" and achievement concerned consummatory reinforcement.[1] On the other hand, the vast preponderance of arranged consequences in the business organization is instrumental. These include remuneration, promotion, and praise, among others.

It should also be noted that punishment and/or the threat of punishment is widely used in industry and constitutes an aversive consequence which, when withdrawn (or avoided), represents a negative instrumental reinforcement. In other words, an individual may be reinforced by the consequences of some task-related behavior (such as showing up for work) because it is "instrumental" in preventing the occurrence of an aversive consequence (such as being docked pay). The general limitations of punishment as an effective means of promoting desired behavior are worth putting in perspective here. First, punishment is only effective in suppressing undesired behavior and does not necessarily produce the desired response--e.g., the individual may decrease his absenteeism but loaf on the job. Second, punishment is only effective so long as the individual perceives the omnipresence and omniscience of the punishing agent. Thus, constant surveillance is a necessary corollary of punishment-based contingencies. Third,

punishment may lead to fear, anxiety, distrust, and even counter-aggression toward the punishing agent and/or its devices. A worker who is fined for failing to wear safety goggles while using a grinder may sabotage the equipment to "get even." For these reasons, positive reinforcement is to be preferred over punishment as a means of shaping desired behavior in the work setting.

In any case, the individual will exercise self-direction and self-control toward the achievement of some task outcome to the extent that outcome has reinforcing properties for the individual, either in itself, or instrumentally. Thus, recognition from superiors may be a valued consequence of meeting or surpassing work standards. In a positive sense, such recognition may satisfy the individual's "esteem needs," or perhaps act as a generalized conditioned reinforcer in the same way we think of affection and approval as "means to many different ends." In a negative sense, recognition may be perceived by the worker as signifying the removal of the threat of punishment--e.g., dismissal.

Recognition may also be perceived by the individual as conferring status upon him, and the assignment of additional responsibility in his job may be a confirmation and stabilization of this status to the individual. This is, of course, only true if these increases in responsibility are paired with commensurate increases in authority. If the individual is granted additional authority, it is important that the exercise of such has, or is expected to have, reinforcing consequences for the individual. For example, a worker may be given the responsibility to decide when a particular piece of complex and expensive machinery should be serviced and the authority to have the machinery

shut down and maintenance personnel called out to service it. Unless he has been trained to recognize the need for such servicing, this authority may be the source of great anxiety for him, i.e., an aversive consequence, which he will avoid any way he can.

Recognition can come from sources other than the organization--e.g., from one's self and from one's peer group. An individual may derive satisfaction from achieving a given outcome because he recognizes the achievement as confirmation of his own self-worth; it is reinforcing because it is a source of self-esteem. Such a concept may be related to the extent to which reinforcement is viewed as a consequence of one's own behavior, or as a consequence of such forces as "fate," "luck," or the "power of others," i.e., internal-external locus of control (Rotter, 1954). The potency of the peer group in influencing behavior is well established and will be covered in some detail in the following section.

Psychological growth refers to the individual's perception of gaining knowledge or understanding about himself and his activities, his place in the "scheme of things," and the relationship of his activities to the activity of others; to his feeling of being used to his full potential, and of the prospects for advancement--to go on to "bigger and better things." In this sense, it is akin to Maslow's (1970) concept of "self-actualization." To the degree, then, that the work environment, or, elements of it, provides for psychological growth, it will be perceived as reinforcing by the individual. This means that the individual's job must stimulate his interest, challenge his capabilities, and offer him a continuous opportunity to learn. His work

place itself must not isolate him either socially or conceptually (prevent him from gaining an insight into other work processes). At the same time, these measures must be appropriate to the individuals involved. Growth implies a point of departure. The point of departure will be different from one individual to the next. Havighurst's (1970) concept of the evolutionary nature of an individual's reward-punishment system is relevant in this regard.

The taxonomy. Let us attempt now to construct a "behavioral taxonomy" for enrichment which will compare the essential components of the strategy with the various principles of human behavior we have discussed (i.e., stipulate their "behavioral correlates") and explicate the assumptions that necessarily underlie these components. Such a taxonomy is presented in table 1. The rows list the components of job enrichment, the first column its behavioral correlates, and the second the assumptions implicit in the combination of these items. It should be understood that we have purposely avoided reading anything into the enrichment strategy and it will be noted, consequently, that few of the principles of behavior we discussed have been fully utilized in the strategy. Also, the assumptions given in the table are, by necessity, stated rather briefly, without providing many examples as to why certain outcomes may be reinforcing to the individual. Such examples have been provided in the immediately preceding discussion.

TABLE 1

A BEHAVIORAL TAXONOMY FOR JOB ENRICHMENT

| Behavioral Correlates | Assumptions |
|---|---|
| COMPONENT 1. Remove controls while retaining accountability | |
| Behavior which is followed by positively reinforcing events has a higher probability of occurring under similar conditions in the future. | The individual's past experiences with self-initiated/self-controlled performance behaviors have had reinforcing consequences. |
| The objectives toward which the individual is assigned to work will have increasing valence for the individual as the instrumentality of the objectives for the attainment of personal goals increases, and vice versa. | The individual perceives assigned work objectives as instrumental to the attainment of personal goals. |
| Psychological Force = Valence x Expectancy. | The individual expects effective task performance to lead to work objectives, to which he attaches positive valence and this constitutes a psychological force on the individual to undertake effective task performance. |
| COMPONENT 2. Increase accountability for individual's own work. | |
| The effectiveness of arranged consequences in the work environment increases as the correlation perceived by the individual between required task behaviors and those consequences increases. | The individual perceives, or will learn, the connection between (contingency) task congruent/task incongruent behavior and reinforcing and/or aversive consequences in the work environment. |
| COMPONENT 3. Give individual a complete, natural unit of work. | |
| Behavior which is followed by positively reinforcing events has a higher probability of occurring under similar conditions in the future. | A complete, natural unit of work involves greater stimulus diversity to a degree perceived as reinforcing by the individual. |

TABLE 1--Continued

| Behavioral Correlates | Assumptions |
|---|---|
| The opportunity for meaningful achievement in a work task is directly related to the degree of closure (the property of having a definite beginning and end) provided for in the task. | The individual perceives the opportunity for achievement as a potentially reinforcing outcome (corresponds to the assumption of high "need-achievement" motivation). |
| COMPONENT 4. Introduce new and more difficult tasks. | |
| Behavior which is followed by positively reinforcing events has a higher probability of occurring under similar conditions in the future. | New and more difficult tasks provide greater stimulus diversity to a degree perceived as reinforcing by the individual. |
| The magnitude of achievement as a generalized conditioned reinforcer is positively correlated with the degree of challenge involved in the work task, relative to the individual's capabilities. | The degree of challenge offered in the work task is appropriate to the individual's capabilities and "need-achievement" motivation. |
| Learning, broader understanding, and self-fulfillment (working up to one's capacity) act for some individuals as generalized conditioned reinforcers. | The individual finds the degree of learning, understanding, and self-fulfillment accompanying new and more difficult tasks reinforcing. |
| COMPONENT 5. Assign the individuals specific or specialized tasks enabling them to become "experts." | |
| The "expert role" as an outcome will have increasing valence for the individual as the instrumentality of the role for the attainment of personal goals increases, and vice versa. | The individual perceives the "expert role" as instrumental to the attainment of personal goals, e.g., recognition, status, etc. |

TABLE 1--Continued

| Behavioral Correlates | Assumptions |
|---|---|
| COMPONENT 6. Grant the individual additional authority in his work. | |
| The magnitude of achievement as a generalized conditioned reinforcer is positively correlated with the degree to which the individual directs and controls his own actions, as well as others. | The degree of authority granted the individual is appropriate to his competence and "need-achievement" motivation. |
| Behavior which is followed by positively reinforcing consequences has a higher probability of occurring under similar conditions in the future. | The exercise of authority by the individual will have positively reinforcing consequences for him. |
| COMPONENT 7. Make periodic reports directly available to the individual. | |
| Where the individual perceives a valued outcome as contingent upon his completion of a given number of task behaviors, progress toward completion can act as a conditioned reinforcer in maintaining task behavior until the outcome is achieved. | The progress reported to the individual is toward outcomes he values. |
| Behavior adaptation to environmental stimuli is made possible through feedback (KOR). | Feedback provided the individual has the attributes of: specificity, relevance, accuracy, objectivity, timeliness, completeness, and conciseness, to a large degree |

Involvement

There are two "essential components" of the basic involvement concept/participative decision-making (PDM) strategy, viz:

1. Give individuals the opportunity to participate in making decisions that affect their particular work activity (generally, by involving them in group decision making with members of their natural work unit--e.g., section or branch)

2. Give individuals the opportunity to be represented in decision making concerning matters of broader impact--e.g., affecting the work activities of individuals in other work groups as well as their own (generally, by allowing them to elect an individual from within their ranks to participate as their representative in inter-group decision making)

The advocates of PDM contend that such a strategy will lead to commitment on the part of the individual to meet company goals, while deriving greater satisfaction in doing so. The PDM strategy involves certain concomitants and assumptions which require explication and evaluation if the likelihood of successful employment of PDM is to be properly assessed. Let us now undertake this explication of the PDM strategy.

PDM model. Our purpose is to discover what mechanisms may be operating in a participative state of affairs and what assumptions need be met to cause the kind of outcomes desired by instigators of PDM. As before, our unit of analysis will be the individual. Our scheme for analyzing PDM is illustrated in figure 4. First, starting at the top-left of the figure, participation is a response by the individual which,

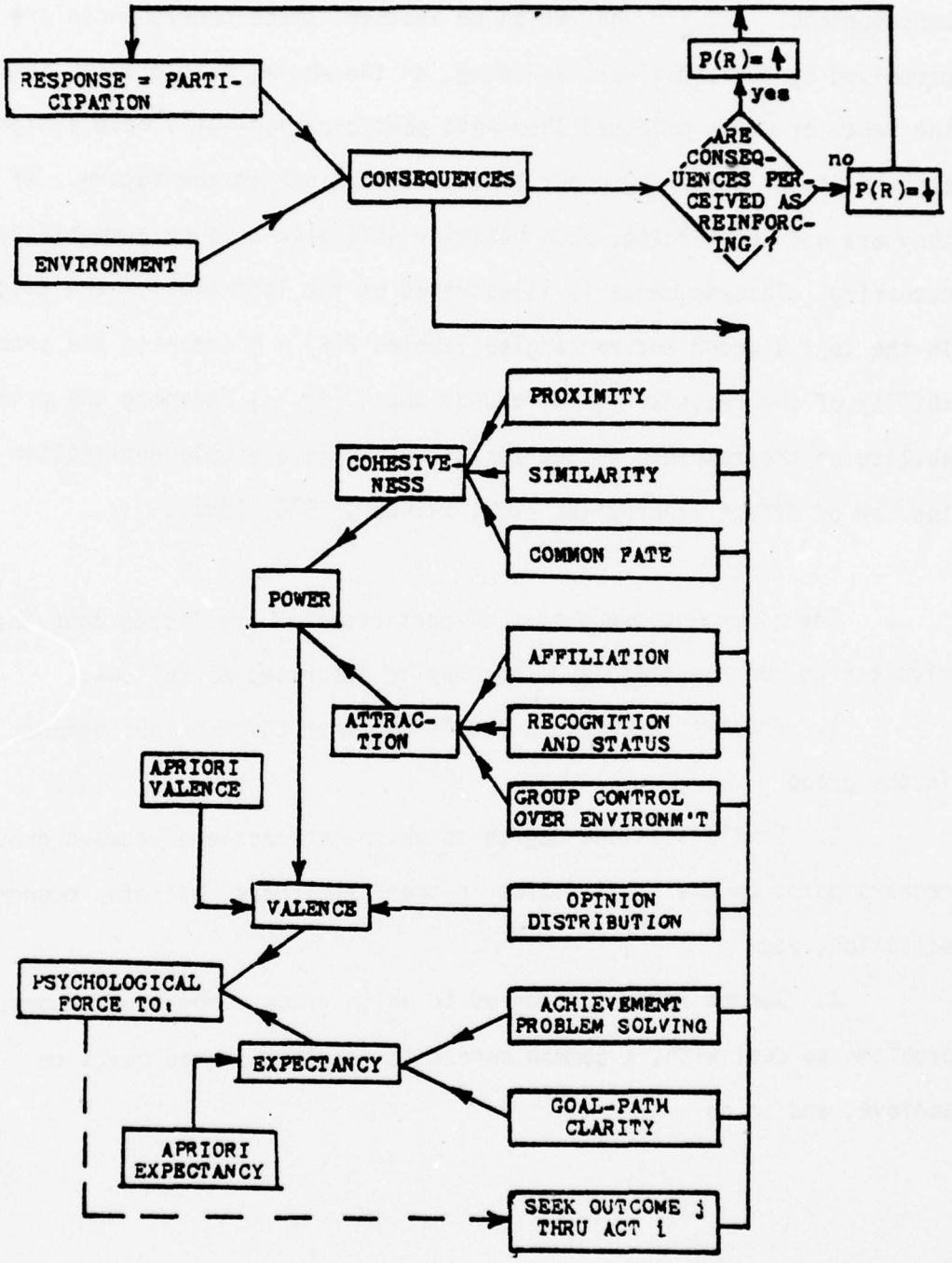



Fig. 4 PDM Model

through interaction with the participative environment, produces certain consequences. If, for one reason or another, these consequences are perceived by the individual as being, on the whole, reinforcing, then the behavior which produced them--his participation--will have a higher probability of occurring under similar conditions in the future. If they are not reinforcing, such behavior will have a lower probability of occurring. This sequence is illustrated on the left side of the diagram in the test diamond and rectangles labeled P[R] = ↑ (meaning the probability of the response is increased) and P [R] = ↓ (meaning the probability of the response is decreased). This is a simple application of the Law of Effect (Thorndike, 1932; Skinner, 1938, 1953).

The general consequences of participation are listed down the middle-right of the diagram. They may be described as follows:

1. Proximity--bringing people together through involvement in the group

2. Similarity--the degree to which interactions between group members point up the similarities in their attitudes, beliefs, economic situation, etc.

3. Common Fate--the degree to which group members have common problems to deal with, a common threat to repulse, shared goals to achieve, and so on

4. Affiliation--being in the company of others

5. Recognition and Status--the degree to which an individual's participative behavior receives the attention and approval of other group members and his subsequent role is deferentially highly valued

6. Group Control Over Environment--the degree of control exercised by the group over relevant environmental stimuli (potentially reinforcing or aversive objects or circumstances)

7. Opinion Distribution--the distribution of member opinions on alternatives regarding a particular decision question

8. Achievement (Problem Solving)--the process and product of decision making

9. Goal-Path Clarity--the degree to which the goal and the path to the goal are clarified for the individual, and the degree to which personal, group, and organization goal instrumentalities are clarified

10. Seek Outcome j Through Act i--the group decision or goal

The first three consequences--proximity, similarity, and common fate--are determinants of group cohesiveness. The next three consequences--affiliation, recognition and status, and group control over environment--are determinants of the degree of attraction which group membership holds for the individual. Together, cohesiveness and attraction determine perceived group power. In other words, an individual will ascribe power to the group in relation to its cohesiveness and his desire to continue as a (favored) member.

The perceived power of the group will be a factor in determining the valence of the group's decision for the individual. Other factors

are opinion distribution on the decision and the valence (and its determinants) of decision factors held by the individual prior to his participation in decision making (shown in the diagram as "a priori valence").

The other factor in a cognitive model is, of course, expectancy. Both achievement (problem solving) and goal-path clarity contribute to this factor. Thus, the individual's expectancy that act i will be followed by outcome j will be influenced by his immersing himself in the problem-solving aspects of participation and, perhaps, working out for himself the relationship between act i and outcome j. This achievement can itself be a reinforcing consequence of participation, mediated perhaps by the individual's "achievement motivation" (McClelland, et al, 1953). It may also be the case that the probability that i will be followed by j is communicated to him by group members in whom he has a high degree of trust and/or respect for their judgment. Their efforts may result in a clarification of the goal-path relationship, as well as the degree to which personal, group, and organizational goals are interdependent. As before, the individual's "a priori expectancy" also contributes to his final expectancy regarding the group decision.

These two factors then, valence and expectancy, determine the psychological force on the individual to "seek outcome j through act i," which comes about as a result of the participative process. With this model in mind, let us examine more closely the PDM strategy and its concomitants. This strategy is illustrated diagrammatically in figure 5.

Desire to participate. First, to foster the individuals' continued participatory behavior, the consequences of participation must, on the whole, be perceived by the individual as reinforcing. In the participatory state of affairs itself, affiliation with others may be reinforcing because, for example, it acts as a generalized conditioned reinforcer, instrumental in leading to other reinforcing social stimuli. There is empirical evidence to suggest a "need for affiliation" which renders group membership rewarding (e.g., Gewirtz and Baer, 1958a, 1958b; McClelland et al., 1953; Schachter, 1959; Singer and Shockley, 1965). Additionally, the individual may be reinforced by being offered the opportunity to participate because he perceives it as recognition of his skills and abilities and as conferring upon him a certain favored status. Then, too, the participatory process may result in his "contributions" receiving recognition, for example, in the form of verbal reinforcement, and his role in facilitating decision making may be more highly valued (i.e., he gains status from his participatory role). It may also be the case that member characteristics are such that the individual finds members personally attractive and is reinforced by the opportunity to interact with, and be considered a part of, their group. Such inter-personal attraction has been found to be a positive function of physical attractiveness, attitude similarity, personality similarity, economic similarity, perceived ability of the other person,

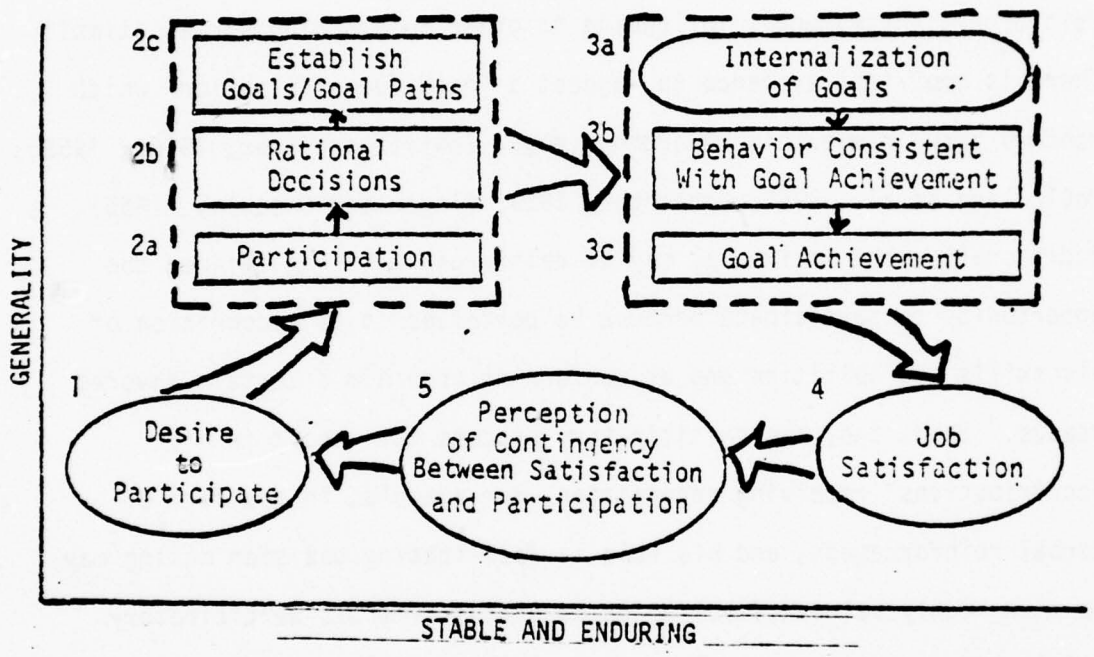



Fig. 5. The PDM strategy and its concomitants

and need compatibility (Shaw, 1971). In fact, the relationship between interpersonal attraction and attitude or opinion similarity is so consistent and predictable that it has been termed the "Law of Attraction" (Byrne and Nelson, 1965).

Rational decisions. The next issue to arise with reference to the diagram concerns the block titled "rational decisions," which we may define briefly as decisions which accrue to the benefit of the organization and its members. Let us elaborate on this definition somewhat. By a rational decision, we mean a decision which, at least a priori, and in the judgment of a qualified person, is compatible with overall organizational objectives (e.g., survival and growth, profit making, good customer and community relations, etc.). Thus, the prerequisites for a rational decision are the motivation of the individual to make such decisions and his capability of making them. At this point, we are interested in the former requirement: circumstances which contribute to the individual's motivation to make rational decisions. There are a number of possibilities here. For example, if the individual attaches positive valence to the participative state of affairs, he will attempt to behave in such a way that his opportunity to participate is enhanced, or at least not degraded. He learns that making rational decisions is a contingency for continued participative opportunities; thus, he seeks rational decisions. More precisely, the positive valence attributed to the participative outcome, and the individual's expectancy that the act of rational decision making will lead to that outcome, constitute a psychological force on the individual to carry out the act of rational decision making.

Couched in Exchange Theory terms (Thibaut and Kelly, 1959), we might say that the individual hypothesizes that his behavior in making a rational decision has reinforcing or reward value for those controlling the opportunity for him to participate--which has reward value for him--and he is willing to "exchange" the reinforcer under his control for the one under their control.

It may also be the case that the individual perceives the achievement of organizational goals as instrumental to the achievement of his personal goals and, thus, is motivated to seek alternatives (i.e., make decisions) that enhance the probability of organizational goal achievement. For example, he may equate the magnitude of his remuneration and/or his degree of job security directly to the success of the organization and, thus, contribute to the effort of its enterprise by making rational decisions when given the opportunity to do so, in the same way we might expect him to engage in other work behavior (e.g., arrive on time, do quality work, be productive) which accrued to the benefit of the organization and, in turn, himself.

In addition to these instrumental orientations to rational decision making, the individual may find the problem-solving state of affairs and the opportunity to exercise his "mental prowess" in seeking rational decisions intrinsically reinforcing. This would constitute a consummatory orientation, related perhaps to the concept of "self-esteem."

In any case, the various factors which act on individuals to produce their decision-making behavior will ultimately be mediated by the same group variables discussed in relation to the individual's

participatory behavior. For example, high group cohesiveness both reflects and produces a widespread sharing of values. Since these values influence the selection of goals, there is also likely to be found in such groups a relatively widespread consensus based on acceptance (Thibaut and Kelly, 1959). Goal-path clarity as a function of group processes may influence the individual's decision-making behavior (Raven and Rietsema, 1957). Thus, the manner in which the other group members approach the decision process will influence the individual's own decision-making behavior. In this regard, it is important to remember that group variables may act to foster "non-rational," as well as rational decision-making behavior. A highly cohesive work group, for example, may reach a consensus to restrict output and be very effective in obtaining member decision behavior which contributes to the "best" means of doing so (Schachter et al., 1951; Berkowitz, 1954). Seashore (1954) has found that when group members perceive the organization as providing a "supportive setting" for the group, the goal that is set is toward higher productivity, whereas a nonsupportive setting results in the goal tendency toward restriction of output.

Goal establishment and internalization. Let us move on to the establishment of specified goals/goal-paths and the internalization of these goals. From the individual's standpoint, the group decision-making process has led to block 10 in figure 4: to seek outcome j through act i. The primary premise in the PDM strategy is that the individual's participation in the decision-making process will lead to a "greater commitment" to the decisions made and their incorporated

outcomes and acts. We might rephrase this and say that participation is expected to lead to a greater psychological force on the individual to seek outcome j through act i. We have, in fact, already covered the mechanisms which determine psychological force--valence and expectancy-- and discussed their participatory antecedents in relation to the model illustrated in figure 4. It may be useful to point out here that internalization of organizational goals in the sense used by Katz and Kahn (1966), among others, as the "incorporation" of these goals as part of the individual's "value system" need not (and, indeed, probably will not) take place in order that the individual be impelled (by the psychological force) to accept and act to achieve them. For example, it is difficult to conceive of a General Motors auto worker "internalizing" GM's goal of making a profit. The participative process may, however, point up the relationship between this global GM goal, the consensus outcome of the group, and the individual's own goals.

Briefly recapitulating, the individual may be impelled to "seek outcome j through act i" because the participative process clarifies the instrumentality of outcome j for his own personal goals, because he values group membership and is willing to act in ways that secure and maintain it, or because he values certain rewards, or fears certain sanctions over which the group has control.

It is, of course, possible that the individual's a priori valence and expectancy relative to the outcome and act already impelled him toward the group goal. A chemist, for example, working for a pharmaceutical firm may spend many grueling hours at his research

because he seeks to develop a drug which will have very beneficial effects for mankind. The firm also wishes the drug produced (for a combination of reasons, including profit) and desires the kind of effort being exerted by the individual. Not only is this kind of goal congruence rare in most profit-seeking organizations; it is also not directly attributed to the participative process. Generally speaking, then, PDM may result in a greater psychological force for the individual to seek outcome j through act i, but the primary mechanism is instrumentality and the process generally does nothing to engender "intrinsic" reinforcement in either the outcome, or, perhaps more importantly, the act itself. Herein lies the justification for job enrichment as well as PDM.

Behavior consistent with goal achievement. This brings us to the block in the diagram of the PDM strategy titled "behavior consistent with goal achievement." There are, of course, many factors which influence work behavior. We are, however, interested here only in those factors which derive from the PDM strategy. In this regard, we have already seen in the model of PDM how the psychological force on the individual to seek outcome j through act i comes about. Once the group goal and/or goal path has been established, behavior consistency among group members may be achieved through group norms. These norms exist when there is (1) consensus about the behaviors group members should or should not enact, and (2) social processes to produce adherence to these behaviors (Thibaut and Kelly, 1959). The PDM process may act to clarify group norms to the individual and to facilitate feedback to both the individual and the group concerning

compliance with normative behavior. The importance of norms is greatest when the behaviors required of the individual in his particular task are intrinsically unrewarding.

Thibaut and Kelly (Ibid.) have classified three types of social influence that in varying degrees may operate to induce conformity to norms. They are (1) the application of sanctions based on nonconformity to norms, in which case active surveillance is necessary; (2) the presentation of rewards for conforming behavior, in which case surveillance is not necessary; and (3) the case in which rewards and costs derive from the task, in which case social influence takes the form of advice and training. These three classifications correspond closely to Kelman's (1961) three processes of social influence: compliance, identification, and internalization. As Thibaut and Kelly pointed out, ". . . in any actual instance in which a group exerts social influence to gain conformity to a norm all three processes are very likely to be involved at least to some degree" (p. 245). The effectiveness of group norms will depend in large part on the ease and efficiency of communications--another area in which PDM may play a positive role.

Goal Achievement. If, indeed, participation leads to the "internalization" of goals, then a reasonable degree of goal achievement is absolutely essential to the continued success of any PDM effort. Here it is important to realize that a high "psychological force to seek outcome j through act i" will generally not be sufficient in itself to assure goal attainment. The PDM effort must do more than simply "motivate" participants to support group and, in turn,

organizational objectives. It must also enhance its ability to do so. The concept of cooperation--which PDM is intended to both reflect and produce--has two aspects, the motivational and the coordinative (George, 1970). The PDM process may enhance the latter aspect in a number of ways. For example, it may facilitate interaction, improve intra-group communication, enhance group cohesiveness, point up member and task interdependencies, enhance problem solving, provide feedback, and facilitate the differentiation and integration of roles and functions. It is beyond the scope of this paper to discuss these aspects of group dynamics in any detail (extensive treatments may be found in Shaw, 1971; and Thibaut and Kelly, 1959). However, it should be pointed out that such salutory effects depend upon the right combination of a number of factors, including--but not limited to--task structure, group member characteristics, interpersonal competence and attraction, communication networks, and the physical environment.

Some tentative guidelines might be suggested concerning the attributes to seek in constructing an effective group (Shaw, 1971). First the larger the group, the more difficult it is to coordinate its efforts and the less satisfaction members derive from group membership (Thibaut and Kelly, 1959; Slater, 1958; Hare, 1952). Although the selection of any one size would perforce be arbitrary, the literature on T-group/sensitivity training would suggest a group consist of not more than twelve members. Next, the group should be composed of individuals who are reasonably intelligent, socially sensitive, approach-oriented, ascendant, dependable, and emotionally stable (Shaw, op. cit.).[2] Group members should be selected to compose a group

which is cohesive, compatible with respect to interpersonal needs, and heterogeneous with respect to abilities (Shaw, 1971; Laughlin et al., 1969). Of particular importance is the group leader. He should be task-competent, socially sensitive, and flexible. His power base should be as wide as possible, but emphasize reward, referent, and expert power. The particular style of leadership exercised will need to vary according to group and task variables. However, a non-authoritarian style would appear to have wider application when both job enrichment and PDM are operating. With the exception of the leadership role, status differentiation with respect to functional roles should be deemphasized. Final decision authority and responsibility should be centralized with the leader, but other aspects of structure and function should be decentralized, especially the communication network. Finally, it should be emphasized that (1) our orientation here is toward the business/industry environment and, hence, formal groups; and (2) these guidelines are tentative at best and will vary with respect to the task environment (e.g., task complexity, intrinsic reward or aversion, coordinative requirements, etc.).

Satisfaction. We need to look at behavior and its consequences rather than the global measure of satisfaction. Thus, we can expect the individual's attainment of, or contribution to the attainment of, group goals to reinforce his task behavior if, indeed, the expected instrumentalities materialize (or consummatory reinforcement takes place). Further, if the consequences of participation are reinforcing to the individual, then his participatory behavior is likely to be repeated (under similar conditions). Behavior is the best measure

of satisfaction so long as it is the criterion behavior (e.g., participation, attendance/absenteeism, productivity).

When we employ the concept of satisfaction, we imply the concept of deprivation and/or drive. Suppose that within the context of a given individual there are deprivations with respect to achievement and affiliation (need-achievement and need-affiliation) and the PDM process provides the opportunity for affiliation, while his task assignment precludes any meaningful achievements. What outcome can we expect on a self-report measure of "job satisfaction"? The point is that PDM has certain consequences which a given individual may find reinforcing, but these consequences are generally limited in scope and cannot be expected to correlate closely with global measures of job satisfaction. Thus, it may be more appropriate to label this step in the PDM strategy "group satisfaction." The individual's perception of the contingency between participation and satisfaction will then complete the PDM loop by increasing the probability of future participatory behavior.

The taxonomy. We are now ready to construct a behavioral taxonomy for participation, which will serve to summarize the various factors we have discussed. The taxonomy (table 2) consists of: (1) the components of participative decision-making (PDM), (2) behavioral correlates of these components, and (3) the assumptions implicit in the combination of these two items, arranged as before, with the components in rows and the correlates and assumptions in columns. The first component in the taxonomy has been broken out along the lines indicated in figure 5, illustrating the PDM strategy, i.e., according to (1) what

TABLE 2

BEHAVIORAL TAXONOMY FOR PARTICIPATIVE DECISION MAKING

| Behavioral Correlates | Assumptions |
|---|---|
| COMPONENT 1. Give individuals the opportunity to participate in making decisions that affect their particular work activity. | |
| Behavior which is followed by a positively reinforcing event has a higher probability of occurring under similar conditions in the future. | The employee's past experiences with participation have had positively reinforcing consequences. |
| Participation as a state of affairs will have increasing valence for the individual as the instrumentality of participation for the attainment of his individual goals increases. | The individual perceives participation as instrumental to the attainment of his individual goals--e.g., to affiliate with others, to receive recognition, to gain status, to exercise some control over his work environment (gain in autonomy), etc. |
| Psychological Force = Valence x Expectancy. | The individual expects the act of rational decision-making on his part to lead to the participatory state of affairs to which he attaches positive valence. This constitutes a psychological force on the individual to attempt rational decision-making. |
| The achievement of organizational objectives as an outcome will have increasing valence for the individual as the instrumentality of organizational objectives for the attainment of the individual's goals increases. | The individual perceives the achievement of organizational objectives as instrumental to the attainment of his personal goals--e.g., job security, remuneration, the continuation of social relationships, etc. |

TABLE 2--Continued

| Behavioral Correlates | Assumptions |
|---|---|
| Psychological Force = Valence x Expectancy | The individual expects the act of rational decision-making to lead toward the achievement of organizational objectives to which he attaches positive valence. This constitutes a psychological force on the individual to attempt rational decision making. |
| Behavior which is followed by a positively reinforcing event has a higher probability of occurring under similar conditions in the future. | The individual's past experiences with problem solving have had positively reinforcing consequences--e.g., enhanced self-esteem, achievement, etc. |
| Groups usually require more time to solve a problem than do individuals working alone, but produce more and better solutions. | The quality of solutions is of primary concern and time is not a (critical) constraint. |
| A decentralized communication network is most efficient when the group must solve complex problems, is less vulnerable to saturation, and results in higher group morale. | Two-way communication channels are open between peers, and between superiors and subordinates (the individual expresses himself openly and candidly). |
| Individuals who are approach oriented with respect to other people enhance social interaction, cohesiveness, and morale in groups. Socially sensitive individuals behave in ways which enhance their acceptance in the group and group effectiveness. The moderately ascendant individual generally facilitates group functioning. | Personality characteristics of group members are, on the whole, favorable in so far as they have a positive effect on group processes. |

TABLE 2 --Continued

| Behavioral Correlates | Assumptions |
|---|---|
| Group cohesiveness is enhanced to the degree group members interact frequently, are similar in attitudes, opinions, status, etc., and have common problems to deal with, goals to achieve, and so on. | There is an opportunity for frequent interaction among group members, they are similar in attitudes, etc., and share common experiences. |
| The group decision as an outcome will have increasing valence for the individual as the individual's perception of group cohesiveness increases, his attraction to the group increases, and the number of members supporting the decision increases. | The individual perceives the group as cohesive and is attracted to it. |
| Group goals will tend toward congruence with organizational goals as group members tend to view the organization as providing a supportive setting. | Group members tend to perceive the organization as providing a supportive setting--e.g., to be trustworthy, to be sincerely concerned with their welfare, etc. |
| The probability that the individual will accept the group decision will be increased to the extent the decision outcomes (goals) have positive valence for the individual and his actions required under the decision (goal-paths) are expected to lead to the outcomes. | Decision outcomes are positively valent for the individual and he expects specified actions to lead to those outcomes. |
| Goal and goal-path clarity are positively correlated with group efficiency. | Goals and the paths thereto are clearly understood by group members. |
| A cooperative situation is superior to a competitive one where group functioning is a determinant of goal achievement. | Group functioning is a determinant of goal achievement. |

TABLE 2--Continued

| Behavioral Correlates | Assumptions |
|---|---|
| The probability that a cooperative situation will evolve and be maintained is enhanced to the extent that: (1) personal and group goals are congruent, and (2) goal regions for each of the group members are defined so that they can be entered, to some degree, by any given individual only if all individuals in the group can enter their respective goal regions, to some degree (goals are mutually supportive. | There is reasonable congruence between personal and group goals, and goals are mutually supportive. |
| The likelihood that the individual will comply with group norms is increased to the degree the individual perceives the group as cohesive and attractive (powerful), and to the degree there is consensus about the behaviors group members should and should not enact. | There is consensus about the behaviors group members should and should not enact, and the individual's perception of group power is such that group norms are effective mechanisms for regulating his behavior. |
| The likelihood that the individual will comply with group norms relative to job behavior is increased to the extent that the consequences of job behavior are perceived by the individual as non-aversive, and vice versa. | The consequences of job behavior are perceived by the individual as non-aversive. |
| The probability that an individual will emerge as group leader is increased to the degree the individual possesses special skills, abilities, and information relative to the group task, is sensitive to the skills and abilities, and emotional characteristics of group members, and is flexible. | Management, supervisors, foremen, and appointed group leaders in general are task-competent, sensitive, and flexible. |

TABLE 2--Continued

| Behavioral Correlates | Assumptions |
|---|---|
| A nonauthoritarian leadership style is more effective when group members are task-competent and perceive the task as non-aversive. | Group members are task-competent and perceive the task as non-aversive. |
| Behavior adaptation to environmental stimuli is made possible through feedback (KOR). | There is an objective system to measure deviations from normative behavior and to transmit corrective information to group members. |
| COMPONENT 2. Give individuals the opportunity to be represented in decision making concerning matters of broader impact. | |
| The probability that a cooperative situation will evolve is increased to the extent that: (1) group and organizational goals are congruent, and (2) goals are mutually supportive. | The group members perception of goal congruence and the mutually supportive nature of goals will be enhanced through frequent intergroup interaction, based on representation. |
| The cohesiveness of the organization will be positively correlated with its success in achieving organizational objectives. | Participation in decision making through representation will enhance intergroup and, in turn, organizational cohesiveness. |

may generate participatory behavior in the first place, (2) what causes the individual to attempt "rational" decisions, (3) group processes in reaching a decision and the effect of these processes on the individual, and (4) group processes and individual behavior in actual task performance. This breakout is indicated by the dotted lines. The second component has received limited space, because further elaboration leads directly back through the correlates and assumptions contained under the first component.

Incentive

Generally speaking, most wage incentive schemes derive from the classical school of management and have, until recently, received little attention from the behavioral school. The exceptions are the Scanlon Plan and the Lincoln Electric Plan. Perhaps because of their success, these plans have received considerable attention in the behavioral literature.

One of the first things to surface on careful examination of these plans is that they are far more than just wage incentive systems. In fact, it is hard to miss the elements of participation which invest both plans and their stress on open and forthright communications, good interpersonal relations, and cooperation and trust, among other things. Our evaluation will address only the wage incentive features of the plans.

TABLE 3

A COMPARISON OF SCANLON AND LINCOLN ELECTRIC PLANS

| Features | Scanlon Plan | Lincoln Plan |
|---|---|---|
| Type of Incentive | Group | Group |
| Paid | Monthly | Yearly |
| Distribution | As a percentage of basic wage | Weighted according to sum of three ratings per year |
| Determination of Bonus | According to success of firm:<br>1. Ratio = payroll to sales value of product<br>2. Bonus = Ratio x Sales Value of Product minus actual payroll | According to success of firm:<br>Profit after dividend and "seed money" |
| Extent of Plan | Organization | Organization |
| Development and Implementation Approach | Participative | Participative |
| Structure of Suggestion System | Formal, through production and screening committees | No formal structure |
| Stock Options | None | Stock owned only by owner/employees; dividends paid quarterly |
| Approach to Union-Management Relations | Participative | No explicit policy |

As evidenced by table 3, the Scanlon Plan and the Lincoln Electric Plan are quite similar and, in fact, we can present one set of "essential components" that will cover both. These are: (1) pay employees at a rate that is comparable to the "market value" of labor for the industry, profession, or craft in question; (2) devise a group wage incentive system which is independent of--not a substitute for--the basic wage system; (3) develop and implement the system on a participative basis; (4) make provision in the plan for adjusting the incentive system when changing conditions dictate, and work out any such changes on a participative basis; (5) apply the incentive system to the entire organization, including management if possible; (6) tie incentive earnings first to the success of the organization, and then as directly as possible to the individual efforts of employees; (7) in implementing the incentive system, guarantee that the new plan will not accrue to the earnings disadvantage of any employee--e.g., guarantee their basic wage plus previous average incentive earnings; and (8) distribute incentive earnings in as close a temporal pattern as possible to the time period in which they were earned.

Group incentive strategy. Figure 6, illustrates the general group incentive strategy used in the Scanlon and Lincoln incentive plans. As shown here, the plans apply to an entire "productive unit," or group.

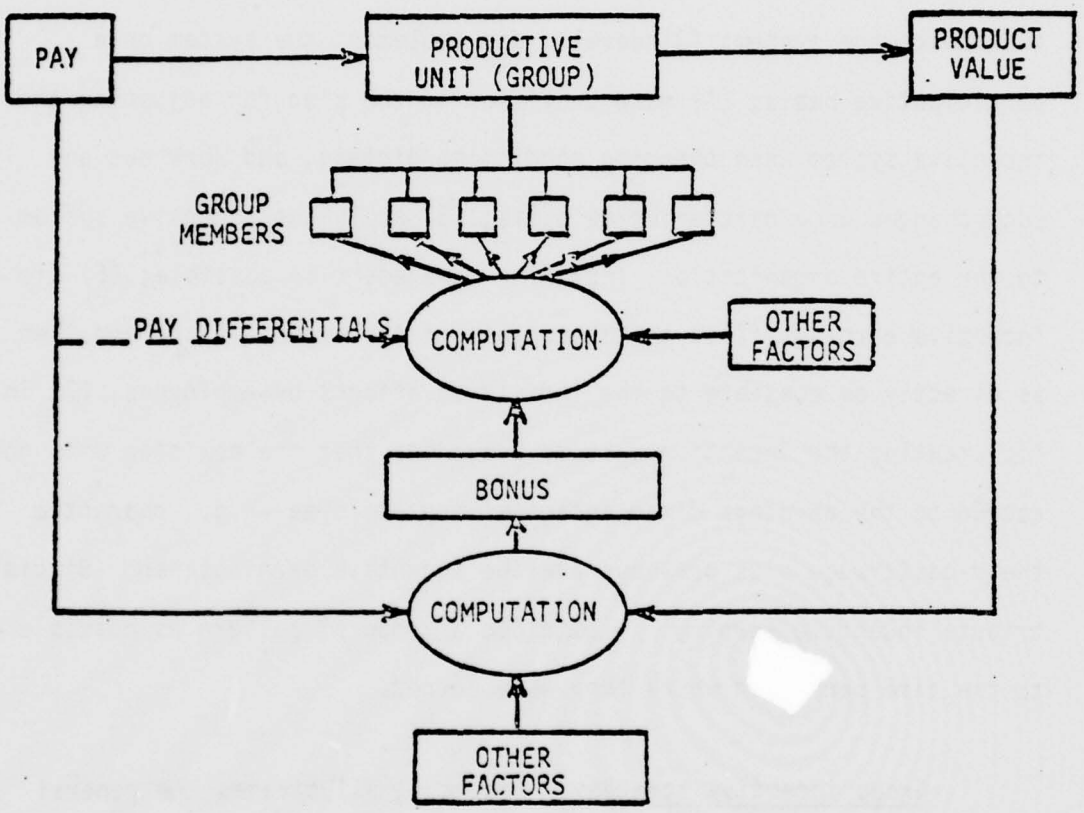



Fig. 6. General group incentive strategy used in Scanlon and Lincoln incentive plans.

Input to the group is their basic pay and output is the value of the product(s) they have produced. Second, the group is rewarded with a bonus, which is derived from an input-output comparison, with consideration of other factors. Finally, the bonus is distributed among group members in some manner ostensibly commensurate with their contribution.

The role of money. Money is, perhaps, the best known and one of the most commonly employed generalized conditioned reinforcers. It is also one of the most effective og the generalized reinforcers. There are several reasons for its effectiveness. First, because it can be exchanged for primary reinforcers of wide variety, behavior reinforced with money is relatively independent of the momentary deprivation of the individual. Second, because it is distinguished by its physical specifications, the use of money permits a sharper contingency between behavior and consequence. As B. F. Skinner (1953) put it: "When we are paid in money, we know what our behavior has accomplished and what behavior has accomplished it" (p. 79). Third, the exchange value of money is more obvious (different amounts may be compared on a standard scale) than such other generalized reinforcers as attention, recognition or praise, respect, or affection. Finally, money is easily employed in a number of reinforcement schedules--e.g., fixed interval, fixed ratio, etc.

Money and performance. March and Simon (1958) have pointed out that "the available evidence on the motivation of workers casts serious question on the automatic efficacy of wage incentives as a motivating device" (p. 19). They suggested a number of reasons for this, among them: (1) wage payments represent only one of a number of rewards in the system; (2) the "utilities associated with wage payments may be discontinuous," reflecting some idea of "satisfactory" wages, and thus not be linearly/monotonically related to wage payments; and (3) the impact of wage incentives is not stable due to the change of "utilities" of wages through time with shifting aspirations. There are also complications with time-study techniques,[3] and collective bargaining (March and Simon, Ibid., p. 19).

The behavioral school has tended until recently to emphasize the social/organizational consequences of employee behavior and has relegated explicit reward schemes of management to the background. However, as March and Simon (op. cit.) stated, "a model of man that does not give a prominent place to economic incentives is, for most humans, a poor model" (p. 61).

The effectiveness of wage incentives in shaping desired performance behavior will be a function of: (1) the reinforcing value of money for the individual; (2) the individual's "subjective trade-off" between the incentive consequence and other consequences operating at "cross-purposes"; and (4) the schedule on which the incentive is administered.

Items (1) and (2) may be put in the context of Vroom's (1964) VIE model, viz, the individual's performance behavior will be a function of the valence of money for the individual and his expectancy that his

performance will lead to the money. Effective performance as an outcome will have increasing valence for the individual as the instrumentality of effective performance for the attainment of money increases. The concepts here are similar to the Path-Goal Approach theory of Georgopoulos et al. (1957). The effectiveness of incentive plans in general depends upon the worker's knowledge and understanding of the relationships between performance and earnings (Opsahl and Dunnette, 1966).

Item (3) reflects the fact that a monetary reward is only one of many possible consequences of the individual's work behavior. Some of these consequences are reinforcing, some may be aversive, some mutually supporting, and others mutually exclusive. Skinner (1953), for example, has said,

> That part of the behavior of the worker which is under economic control generates aversive stimuli--from the nature of the work itself or from the fact that it prevents the worker from engaging in activities that would be reinforcing in other ways (p. 391).

The worker is offered economic reinforcement as a means of inducing him to accept the job and its consequences. When the worker accepts or rejects the job offer, he may be said to be making a trade-off between positive and negative reinforcers. It has recently been hypothesized that this trade-off and, more fundamentally, the valence of the monetary reward itself will be effected by a person's subjective judgment regarding the "equity" of the reward relative to (1) the "cost" to him (an input/output ratio) compared to an internal standard, or (2) a social comparison process--his cost/reward versus another's cost/reward. The theory, which according to Miner and Dachler (1973) is still relatively

vague and unsophisticated, derives from the work of Adams (1963),[4] and has been expanded upon and clarified by-Goodman and Friedman (1971), Leventhal et al. (1969), and Pritchard (1969), among others. Our earlier discussion concerning the operant paradigm and task-related behavior is relevant here as well. Such behavior generates many consequences, both reinforcing and aversive; and in order to deal effectively with work design, we need to be able to specify and evaluate these consequences. As stated by Skinner (op. cit.), "In the design of optimal working conditions, considered with respect not only to productivity, but to absenteeism and labor turnover, we need an explicit analysis of actual reinforcing and aversive events" (p. 391).

"Piecework pay" is perhaps the best example of a reinforcement schedule in the economic control of work behavior. Paying a man for a set number of items produced constitutes a "fixed ratio" reinforcement schedule. By far the more common form of payment is "fixed interval"--i.e., pay by the hour, day, week, month, etc. There are, then, the "combined schedules" which occur when incentive systems are used to supplement basic wage systems. These are generally fixed interval--fixed ratio combinations. The schedule on which incentives are administered, item (4), is an extremely important, but often neglected, aspect of incentive systems.

The considerable literature on schedules of reinforcement allows us to make the following predictions about work performance under various pay schedules (with the usual "other things being equal" qualification).

(1) If the amount of work required per unit of pay is not too

great and the unit of pay is of significant magnitude, the individual on a fixed ratio schedule will characteristically work at a high rate

(2) Because of the contingent nature of a ratio schedule, progress toward the completion of a given number of responses (work units) acts as a conditioned reinforcer, and the schedule will be more effective if feedback regarding this progress is provided

(3) Fixed ratio and fixed interval schedules of pay will be characterized by a period of inactivity on the part of the worker just after each reinforcement, increasing with an increasing ratio or interval and/or decreasing reinforcement magnitude

(4) Fixed interval schedules of pay must be supplemented by intervening discriminative stimuli and task-correlated control techniques (reinforcing and/or aversive consequences); otherwise they may generate only a small amount of work just before pay-time (the most effective of such supplemental "techniques" is a task which is intrinsically reinforcing)

(5) If wage payment systems could be adapted to them, variable ratio and variable interval schedules of pay would have the advantages of higher sustained responding and greater resistance to extinction over their counterpart fixed schedules.[5]

Analysis of the Scanlon and Lincoln Electric incentive plan components. The first component of the combined plans is the payment of what we might term a "fair wage"--i.e., one that is comparable to what the employee might receive elsewhere doing the same basic job. This is, of course, not really a part of the incentive plan, but it is also true that the two forms of compensation cannot be considered

wholly independent. The basic wage is a consequence of the worker's accepting a job with the firm in question. If he can realize a greater financial reward by accepting a job at a rival firm, then the difference in basic wages must be considered an aversive consequence of job acceptance with the first firm. If the worker accepts the job with the first firm because he is attracted by the incentive system, then it is likely that some portion of the incentive system loses its "effort-reward" effect to be "allocated" instead the "employment-reward" area. In general, the basic wage may be thought of as controlling job-acceptance behavior and the type of activities performed, but not the rate at which such activities are performed (March and Simon, 1958).

The second component of the combined Scanlon/Lincoln plans is to devise a group incentive system, keeping it independent of the basic wage system. Proponents of the Scanlon Plan, for example, emphasize that it must not be treated as a substitute for collective bargaining and/or normal wage increases. By keeping the systems independent, it is hoped that incentive payments will maintain their full effort-reward impact.

Generally, the rationale for employing a group incentive system rather than an individual incentive system has three aspects. First, it is not always feasible to apply individual incentives because of pervasive task interdependencies.[6] Second, the difficulty of developing objective measures of work performance, especially in the white-collar area, precludes the employment of defensible individual incentives. Finally, the employment of individual incentives sometimes produces unanticipated behaviors which are detrimental, rather than helpful, in achieving overall organizational objectives. These aspects of the group

incentive rationale might be termed the "technological," the "methodological," and the "motivational." We are interested in the motivational aspect here.

Douglas McGregor (1960), discussing the benefits of the wage incentive feature of the Scanlon Plan, stated that,

> It is a means for promoting collaboration . . ., Competition is minimized within the organization and maximized with respect to other firms in the industry . . . and it is directly related to the success of the organization (p. 112).

What McGregor was stressing is that group incentives are conducive to the evolvement of a cooperative situation, while individual incentives are not. This is an important advantage under conditions where group functioning is a determinant of goal achievement.

The conditions under which a cooperative effort evolves most successfully include: personal and group/organizational goal congruence, goal regions defined so that they can be entered by all group members (goal attainment by some does not impede goal attainment by others), free and open communication, favorable interpersonal perception (e.g., mutual trust and respect), and a continuing opportunity for interaction. The group aspect of the wage incentive featured in the Scanlon/Lincoln plans is designed to create both goal congruence and mutual goal attainability (other aspects of the plans are involved with the remaining conditions for cooperation).

As pointed out by Opsahl and Dunnette (1966), the chief disadvantage with group incentives is the likelihood of a decreased correlation between the worker's individual efforts and his incentive earnings. This effect becomes more pronounced with increasing group

size. Since the individual's perception of the contingency between his performance behavior and his incentive earnings is a principal factor in the effectiveness of a wage incentive, this disadvantage with group plans can be a major problem.

Group incentive systems also share some of the problems associated with individual incentive plans. These include a less than satisfactory effort on the part of workers because: (1) they fear they may work themselves out of a job; (2) they are concerned that management may up the standard if they begin to earn too much through high production; and (3) they are concerned about the consequences of new social relationships that might evolve (Hickson, 1961). The possibility of union opposition is, of course, a consideration common to any wage incentive plan, as well as other factors in the labor contract.

Finally, group incentive systems may suffer because of perceived inequities from one group to another under different formulations of the basic group plan. This problem corresponds to the problem of inequities dealing with tight and loose rates under individual incentive plans.

The problem areas discussed above in connection with group incentive systems are the prime considerations in the follow-on components composing the combined Scanlon/Lincoln plans. Let us turn now to these remaining components.

The third component on our list specifies that development and implementation of the group incentive plan must be on a participative basis, including management, the workers, and the union. The reasons for advocating participation have already been discussed in a general context, and the rationale here is no different. Participation is

expected to enhance goal congruence and lead to goal-path clarity. Thus, in some measure, the disadvantage associated with the effort-reward contingency under group incentive systems is expected to be offset. Further, participation is expected to enhance the favorability of interperson perception--especially trust--and thus, to a large degree, ameliorate worker fears regarding the continuance of employment, management's good faith relative to the effort-reward bargain, and the maintenance of rewarding social relationships. Including the union in these participative undertakings is designed to solicit their input and cooperation early-on and preclude future haggling, which may undermine the overall cooperative effort.

We may refer to our taxonomy on participative decision making (table 2) to determine the assumptions which underlie the salutary effects expected of participation. First, the individual must accept the opportunity to participate and will do so if he perceives the participatory state of affairs as potentially reinforcing. The probability that he will have this perception is higher when he and other group members are relatively homogeneous with respect to attitudes and opinions. More importantly, the probability will be higher if the consequences of past participatory experiences of the individual have been reinforcing. Second, group members should be positively disposed toward the organization, intellectually capable of treating the degree of difficulty inherent in formulating the incentive plan, and privy to information relevant to its formulation. The individual's attitude toward the organization will be more positive as it becomes more apparent that his own personal financial goals can best

be met when organizational goals are achieved. Third, the group should be cohesive (similar in attitudes, beliefs, interpersonal orientation, etc.), the operating communication network should be decentralized, and group goals and the paths thereto should be specified in terms of the individual behaviors required in their achievement (i.e., they should be operationalized). Finally, participation must be on a continuing basis, not a "one-shot" affair. In this way, the participative sessions can serve as an effective means of feedback for both the group and the individual.[7]

Component four is directly related to three. One of the principal causes of rate restrictions under incentive plans mentioned by Hickson (1961) was the individual's uncertainty about continuation of the "effort-reward-bargain" between management and labor. Even when there are legitimate reasons for changing some element of the incentive plan (e.g., technological improvements, different product mix), such changes may be construed as a disguised attempt on the part of management to renege on their part of the bargain. By making a provision in the plan for adjusting the incentive system, the combined Scanlon/Lincoln plan provides a formal mechanism for labor and management to participate in working out such changes, again under the assumptions implicit in the PDM approach. Studies by Lawler and Hackmen (1969) and Scheflen, Lawler and Hackman (1971) appear to bear out the efficacy of participation in the development and operation of incentive plans. In addition, a study by Lawler (1965) dealing with secret pay policies, suggests that money is more effective both as an incentive device and as a knowledge-of-results (KOR) device when employees are informed relative

to pay differentials and derivations.

The fifth component in the combjned plans states that, if possible, the incentive system should be applied to the entire organization, including management. The trade-off here is fairly straightforward: applying the same incentive system "across-the-board" increases the likelihood of perceived equity, but decreases the likelihood of perceived correlation between individual effort and reward. The feasibility of such a policy depends, of course, on the characteristics of the organization in question. Many of today's massive conglomerates are characterized by large-scale diversification, numerous divisions involving few interdivisional transactions, or little integration in general, a small central staff, and a minimum of centralized policies and procedures. This type of organization simply does not lend itself to an organization-wide incentive plan. In such cases, the plan may be applied "in principle," but specific formulations must be tailor made to the division or plant in question. On the other end of the spectrum lies the smaller, dominant-product company, characterized by a high degree of integration among activities or plants, a large central staff, and centralized policy and procedure. Here, the climate for a company-wide incentive plan is considerably more favorable.

Component six states that incentive earnings should be tied to the success of the company, then as directly as possible to the individual efforts of employees. This policy is designed (1) to create personal and group/company goal congruence, (2) to structure goal regions so that they can be entered by any given individual, only if all members of the group can enter them, and (3) to enhance the effectiveness of

incentive earnings by arranging a reasonably direct contingency between individual performance behavior and monetary reward. In other words, this component specifies in general terms the actions that are required to realize both the cooperative benefits of a group incentive system, and the individual performance benefits. Let us consider how the Scanlon/Lincoln plans go about this task and the assumptions that must be met if its goals are to be achieved.

Referring to the diagram illustrating the group incentive strategy (fig. 6), we can see that the total monetary reward, or bonus, available for distribution to individual employees, is a "bounded sum." The derivation of this sum involves (1) the cost of labor, (2) the value of goods produced, and (3) "other factors." Thus, the employee can be shown that his productivity has a direct bearing on the amount of money available to be distributed as incentive earnings. However, as "other factors" become more numerous and/or have greater impact on the derivation, this relationship becomes less direct. In the terms of Vroom's (op. cit.) VIE theory, organizational success as an outcome will have increasing valence for the individual as the instrumentality of organizational success for the attainment of individual monetary rewards increases, and vice versa. This is why final profit is considered one of the least acceptable measures to base this type of bonus on. It is a measure which depends on a number of factors besides worker productivity (e.g., the state of the market, technological developments, materials costs, investments, etc.), over which the majority of workers have little or no control.

Still, the Lincoln Electric Plan does base its bonus on profits. In order to increase the valence of profits for the individual worker,

Lincoln Electric, in essence, draws them into partnership. This is accomplished through the stock option plan, which is all the more effective because it limits stock ownership to Lincoln employees. In this way, the value of the stock is a direct function of the efforts of employees, and not a function of Wall Street manipulations. As the net worth of the company increases, the value of the stock held by employees increases. Thus, company success is positively valent for the individual because of its instrumentality for his own success. The combination of profit sharing and employee stock ownership provides the proper structure for goal regions, as well as goal congruence, for the success of the company depends on the cooperative efforts of all its employees. No one individual can profit at the expense of others.

Under the Scanlon Plan, the number and impact of "other factors" is purposely limited by deriving the bonus directly from labor savings, rather than profit margins. Examples of factors used in the computation include the sales value of the products, value added by manufacture, total amount produced (ounces of silver, pounds of castings, tons warehoused), and so on. Thus, the Scanlon plan provides directly for goal congruence and proper goal structure.

Both the Scanlon Plan and the Lincoln Electric Plan have provisions for setting aside a certain portion of the savings/profit for various reasons. These provisions could detract from goal congruence if they are perceived by workers as being inequitable. As with component four, the probability of this happening can be minimized by keeping employees well informed about the reasons for the split and how it is derived (assuming, or course, that it is equitable).

It must be recognized that nothing in the foregoing provisions for tying incentive earnings to the success of the company specifically deals with possible worker concern about job security. For example, under the Scanlon Plan it is suggested that the major labor savings are realized as a result of suggestions, rather than increased effort. What happens if an employee conceives of a labor savings plan that would result in he and/or a number of his fellow workers no longer being needed? The same question applies under the Lincoln Plan, where the employee may see greater productivity leading to fewer jobs. There is, therefore, a major assumption underlying the expectation that the provisions of component six will promote a cooperative effort directed toward company success. This assumption is that employees perceive management as providing a "supportive" job setting--i.e., being sincerely concerned with employee welfare, including doing whatever might be necessary to guarantee steady employment.

The other aspect of component six involves linking individual efforts as directly as possible to the individual's share of the total bonus. Referring again to figure 6, we see that this is accomplished in a computation involving (1) pay differentials, and (2) "other factors." More specifically, under the Scanlon Plan, distribution of the total bonus is made as a proportion of the individual's basic pay. Under the Lincoln Electric Plan, distribution of the bonus is made in proportion to the individual's basic pay weighted by the average of three performance ratings per year (these ratings constitute the "other factors" in the diagram). The principal assumption here is that a relationship exists between the individual's basic pay and his contribution to the overall

productive effort. The use of ratings under the Lincoln Plan is designed to test this assumption to some degree. A corollary assumption then, is that these ratings are made on an objective basis and are reasonably accurate.

Component seven applies when there is some other incentive scheme in operation when management is considering a changeover to a Scanlon/Lincoln-type plan. In this case, there is the chance that some employees may suffer decreased incentive earnings under the new plan. Ostensibly, management's consideration of the new plan stems from a desire to enhance achievement of organizational objectives by providing greater incentive earnings for employees; earnings which are a more direct result of their productive efforts. It is unreasonable to expect employees to enthusiastically endorse an alternate incentive system which could result in decreased earnings for them. Even if there is only the bare chance that such a decrease could occur, employees are likely to be suspicious, especially where management-labor relations are not the best and the new plan is part of the effort to correct them. This is where component seven comes into the picture. If management is sincere in its belief that the new system will improve the lot of the worker as well as the company, it is not unreasonable to expect them to guarantee a minimum level of earnings under the new plan equal to average earnings under the old plan. For example, in the case of the Lapointe Machine Tool Company, where the Scanlon Plan was first introduced in 1947, the many workers who had been on piecework were guaranteed their regular hourly rate plus their average incentive earnings prior to the time the new plan went into effect (Whyte, 1955).

There is a risk for management in making the above guarantee. Since a piecework-type incentive system is based on the premise that employees will work harder under incentive conditions to earn additional income, it is possible that once guaranteed the additional income, the employees will fail to respond to the revised incentive conditions under the new plan and perhaps even revert to productivity levels below that achieved under the old plan. This may occur, for example, if, as March and Simon (op. cit.) hypothesized, the "utilities" associated with wage payments are discontinuous and some "satisfactory" level of wages has been reached relative to worker aspirations. Of course, the "utilities" associated with wages will be different for different workers, but where group incentive systems are concerned, the manifestation of such a phenomonon in even a small minority of workers can be disruptive. It should also be remembered that incentive payments represent only one of a large number of consequences of work behavior. By changing this particular consequence, the employee's "subjective trade-off" involving other consequences is liable to be altered. If, for example, the individual perceives his task to be aversive, it may be that the positive valence associated with additional income under the new incentive plan fails to outweigh the negative valence associated with the task itself. In these circumstances, the individual may perceive the guarantee of earnings as a means of reducing the aversive stimuli associated with task avoidance behavior and, thus, be "motivated" to increase such behavior--an outcome exactly opposite that intended by management. In this regard, Opsahl and Dunnette (1966) reviewed a number of studies concerning "personality-task interactions" and the

effectiveness of incentive payments. They stated their findings as follows: "The net conclusion from these studies is that repetitive tasks, destructive tasks, boring tasks, and disliked tasks are apparently much less susceptible to monetary incentives" (p. 105). It follows that the assumption management makes here is that employees do not perceive their tasks as reflecting these aversive characteristics.

The final component in our list, number eight, is relatively straightforward--by paying out incentive earnings on a close temporal schedule to the period during which the behavior occurred that produced them, the contingency between behavior and reward is clarified. As Jablonsky and DeVries (1972) pointed out,

> Immediacy of reinforcement is considered by many to be an essential concept of learning theory. Experiments suggest that if reinforcement does not occur immediately after the response occurs, it is much less effective in changing behavior. The reduced effectiveness is due to the fact that the delayed reinforcement may be reinforcing behaviors which have occurred after the desired behaviors (p. 344).

Fortunately, in dealing with human subjects, somewhat more latitude is possible in the temporal pattern of reinforcement--i.e., the reinforcing effects are not as sensitive to delay in reinforcement. This is so because other discriminative stimuli--most importantly verbal--serve to maintain the connection between response and consequence.

Under the Scanlon Plan, the requirement for close-following reinforcement is met by distributing bonus payments in the month following the month in which they were earned. Under the Lincoln Plan, as in most profit-sharing plans, the bonus is distributed yearly; a fact which mediates against its effectiveness in shaping desired performance behavior. However, under the Lincoln stock option plan,

a dividend is paid quarterly to stockholder-employees, and this feature serves to provide some of the immediacy of reward missing in the bonus aspect of the plan. Another feature of the Lincoln Plan which, to some degree, offsets the weakness of its delayed bonus is the three performance ratings per year accomplished on employees. Because these ratings have a direct impact on the employee's share of the bonus, they may serve as conditioned reinforcers (the same way that progress toward a given number of responses on a ratio schedule does) and, thus, provide some additional degree of continuity.

The taxonomy. The taxonomy for the combined Scanlon-Lincoln Electric incentive plans is contained in table 4. It is structured exactly as before: components in the rows, correlates and assumptions in the columns.

Incorporating Social Psychological Factors in Work Design: Some Propositions.

It is time we incorporated our expanding knowledge of social psychology more adequately in the broad problem of work design. We have illustrated one way of applying social psychological knowledge to work design--i.e., by constructing a "behavioral taxonomy" for specified work design strategies. Certain properties of these strategies should now be apparent, viz: (1) there is a good deal of overlap among them; (2) no one strategy, by itself, is sufficient in the scope of its work

TABLE 4

A BEHAVIORAL TAXONOMY FOR A COMBINED SCANLON-LINCOLN ELECTRIC INCENTIVE PLAN

| Behavioral Correlates | Assumptions |
|---|---|
| COMPONENT 1. Pay employees at a rate that is comparable to the "market value" of labor for the industry, profession, or craft in question. | |
| The consequences of behavior effect the probability that the behavior will be emitted again under similar conditions in the future. | The basic pay rate, as perceived by the employee, is of sufficient magnitude to constitute an effective employment-reward contingency. |
| COMPONENT 2. Devise a group wage incentive system which is independent of the basic wage system. | |
| A cooperative situation is superior to a competitive one where group functioning is a determinant of goal achievement. | Group functioning is a determinant of goal achievement. |
| The probability that a cooperative situation will evolve is increased to the extent that: (1) personal and group goals are congruent, and (2) goal regions for each of the group members are defined so that they can be entered, to some degree, by any given individual only if all individuals in the group can enter their respective goal regions, to some degree (goals are mutually supportive). | Characteristics of the group incentive system are such that personal and group goals are, to a large degree, congruent and mutually supportive. |
| The perceived correlation between individual effort and incentive earnings under a group incentive system tends to decrease as group size increases. | Characteristics of the group incentive system act to counter the tendency of decreasing correlation between individual incentive earnings and individual effort as group size increases. |

TABLE 4--Continued

| Behavioral Correlates | Assumptions |
|---|---|
| Workers may react unfavorably to a group incentive system because of: (1) concern for job security, (2) concern about the continuation of the effort-reward bargain, and/or (3) concern over changed social relationships. | Characteristics of the group incentive system will allay worker concern regarding job security, continuation of the effort-reward bargain, and changed social relationships. |
| Group incentives may result in intergroup conflict because of perceived inequities between groups under different formulations of the basic plan. | Characteristics of the group incentive plan will ameliorate intergroup conflict. |
| COMPONENT 3. Develop and implement the group incentive system on a participative basis. | |
| Behavior which is followed by a positively reinforcing event has a higher probability of occurring under similar conditions in the future. | The employee's past experiences with participation have had positively reinforcing consequences. |
| The probability that personal, group, and organizational goals will tend toward congruence, and consensus will be reached concerning goals/goal-paths, will be increased to the extent that the group is cohesive and the organization is perceived as providing a supportive setting for employees. | Participation will contribute to group cohesiveness and enhance the individual's perception of the organization as providing a supportive setting for employees. |
| Psychological Force = Valence x Expectancy | Participation in developing and implementing the incentive system will have a positive effect on the individual's perception of the reinforcing value (valence) of the incentive system outcomes and increase the individual's expectancy that effective work performance will lead to those outcomes. |

TABLE 4 --Continued

| Behavioral Correlates | Assumptions |
|---|---|
| COMPONENT 4. Make provision in the plan for adjusting the incentive system when changing conditions dictate, and work out any such changes on a participative basis. | |
| Uncertainty regarding the continuation of a favorable effort-reward bargain will result in anxiety which will, in turn, inhibit effective group functioning. The resolution of this uncertainty will thus enhance group functioning. | Participation in working out changes to the incentive system will resolve uncertainty regarding the continuation of a favorable effort-reward bargain. |
| Behavior which is followed by a positively reinforcing event has a higher probability of occurring under similar conditions in the future. | The group member/employee perceives the consequences of the changes as potentially reinforcing. |
| Psychological Force = Valence x Expectancy. | Participation in initiating and implementing changes will have a positive effect on the reinforcing value (valence) of the new incentive system outcomes and increases expectancy that effective work performance will lead to those outcomes. |
| COMPONENT 5. Apply the incentive system to the entire organization, including management if possible. | |
| The likelihood of perceived equity tends to increase as the scope of the incentive system increases. | The character of the organization is such that an organization-wide incentive system is feasible--i.e., the organization consists of a dominant-product company, involving a high degree of integration among activities, a large central staff, and centralized policy and procedure. |

TABLE 4 --Continued

| Behavioral Correlates | Assumptions |
|---|---|
| The likelihood of perceived correlation between individual effort and individual incentive earnings tends to decrease as the scope of the incentive system increases. | Characteristics of the incentive system act to counter the tendency for perceived correlation between effort and reward to decrease with increasing scope. |
| COMPONENT 6. Tie incentive earnings first to the success of the organization, and then as directly as possible to the individual efforts of employees. | |
| Organizational success as an outcome will have increasing valence for the individual as the instrumentality of organizational success for the attainment of his individual monetary rewards increases, and vice versa. | The individual perceives organizational profit as instrumental to the attainment of his individual monetary reward. The perceived instrumentality is enhanced by exclusive employee ownership of organization stock (Lincoln Electric-type profit sharing and stock option).<br><br>The individual perceives a total bonus based directly on labor savings as instrumental to the attainment of his individual monetary reward (Scanlon-type bonus plan). |
| The congruence of personal and group goals and the extent to which goals are mutually supportive, contribute to the evolution and maintenance of a cooperative effort. | The fact that the total bonus available for distribution to employees is a "bounded sum," reflecting company success (either through profit or labor savings), creates both goal congruence and mutually supportive goals. |
| The effectiveness of incentive earnings in promoting desired performance behavior increases as the individual's perception of correlation between his effort and his individual incentive earnings increases. | Distribution of the total bonus in proportion to the individual's basic salary, or the basic salary weighted by a performance rating, increases the individual's perception of correlation between individual effort and reward. |

TABLE 4 --Continued

| Behavioral Correlates | Assumptions |
|---|---|
| | The individual's basic salary is correlated in a positive way to his contribution to the overall productive effort.<br><br>Performance ratings are positively correlated with actual performance. |
| COMPONENT 7. Guarantee that the new incentive system will not accrue to the earnings disadvantage of any employee. | |
| The probability that personal, group, and organizational goals will tend toward congruence will be increased to the extent the organization is perceived as providing a supportive setting for employees. | A guarantee of no disadvantage in earnings under the new system will be perceived by employees as evidence of a supportive setting. |
| The anxious group member inhibits effective group functioning. | A guarantee of no disadvantage in earnings under the new system will reduce anxiety, thereby enhancing group functioning. |
| The effectiveness of a behavior-reward contingency will decrease as the satiation of the individual for the reward increases. | The individual's guaranteed level of earnings does not constitute a satiating level. |
| Job avoidance behavior as an outcome will have increasing valence for the individual as the instrumentality of job avoidance for the withdrawal of aversive job consequences increases, and the instrumentality of job attendance for the presentation of reinforcing consequences decreases. | The trade-off involving the individual's perception of reinforcing and aversive job consequences, and the contingency between these consequences and performance behavior is favorable to a continuation of effective job performance. |

TABLE 4--Continued

| Behavioral Correlates | Assumptions |
|---|---|
| COMPONENT 8. Distribute incentive earnings in as close a temporal time pattern as possible to the time period in which they were earned. | |
| The effectiveness of reinforcement in shaping desired behavior increases as the immediacy of the reinforcement relative to that behavior increases. | Distribution of incentive earnings in the month following the month in which they were earned constitutes a sufficiently close temporal pattern between behavior and reward.<br><br>Dividends under a stock option plan constitute a sufficiently close temporal reward.<br><br>Performance ratings serve as conditioned reinforcers on a sufficiently close temporal basis. |

design objectives/remedies; (3) the strategies or, more precisely, the components that make them up, are based on a whole host of critical assumptions concerning both individual experential factors and group variables; and (4) the components that make up the strategies represent only one point on a continuum of alternatives dealing with the content and context of work.

Considering the three behavioral taxonomies presented in this paper in conjunction with one another, one can derive a number of properties of the work system that bear examination in the work design effort. These properties are listed and defined in table 5. It must be emphasized that these properties are recommended for consideration expressly because of their possible impact on social psychological aspects of worker behavior. There are, of course, many other properties that must be considered from a traditional human factors standpoint alone.

The properties listed in table 5 must be considered in relation to the characteristics of the population from which the work force is to be drawn. It is unlikely that these properties can be ranged along extreme positions on their respective continuums and apply equally well to all workers. This is true whether they are ranged along the current extreme of highly rationalized, dull, repetitive, paced tasks, or along

TABLE 5

PROPERTIES OF THE WORK SYSTEM THAT SHOULD BE CONSIDERED IN THE DESIGN EFFORT

CONTENT:

Closure: the degree to which the work task has the property of a definite beginning and end.

Variety: the degree of stimulus diversity in the work task.

Complexity: the number of different stimuli encountered in the task, their interdependencies, and the variety and pattern of responses required of the operator.

Novelty: the degree to which stimuli encountered in the work task are encountered for the first time.

Discretion: the degree to which the temporal pattern and pace of task activities, and the tools to be employed in the activities, are determined by the worker, rather than the machine/process.

End-Product Relation: the degree to which the task outcome relates to the final end-product of the production unit, or firm.

Character of Stimuli: the physical characteristics of intrinsic task stimuli--e.g., clean - dirty, odor free - malodorous, pure - foul, etc.

Worker Product Relation: the degree to which the product, or outcome, of the task can be directly related to the efforts of the individual worker.

Feedback: the degree to which the task provides cues to the worker regarding both progress toward task completion, and task completion itself.

CONTEXT:

Autonomy: the degree to which the worker exercises self-direction and self-control in his task activities, rather than being directed and controlled by others.

Participation: the degree to which organizational procedures permit or encourage the individual to take part in making decisions that affect his work activities, and the functions of the organization at large.

Interaction Opportunity: the degree to which technological, plant, and/or organizational arrangements/procedures provide an opportunity for employees to interact with one another.

Supportiveness: the degree to which the organization, by its actions, displays a sincere concern for the well-being of its employees.

Cohesion (work group & organization): the degree to which members of the work group/organization interact, are similar in attitudes, opinions, etc., and share common experiences.

TABLE 5--Continued

Basis for Leadership Attempts: the options provided by systems design for leadership attempts--e.g., are options provided to exercise reward, expert, and referent power, as well as legitimate and coercive power?

Information Distribution: the degree to which organization members are privy to information relevant to their work activities, the work activities of other organization members, the interrelationship therein, and the functions and goals of the organization at large.

Basic Wages: the degree to which the basic wage offered by the organization compares favorably with the basic wage offered by other organizations for similar work.

Salary-Contribution Relation: the degree to which the individual's salary correlates with his potential contribution to the overall productive effort.

Effort-Reward Bargain: the degree to which incentive earnings are correlated with individual productive effort.

Individual Incentive-Organization Success Relation: the degree to which individual incentive earnings are correlated with organization success.

Incentive Schedule: the temporal pattern of incentive payments in relation to work effort--e.g., how closely are incentive earnings to be distributed to the time period in which they were earned?

Scope of the Incentive System: the degree of organizational coverage.

Effort-Reward Guarantees: (1) the degree to which the worker is guaranteed a continuation of the basic effort-reward bargain, (2) the degree to which the worker is guaranteed at least his prior level of basic and incentive earnings when a new incentive plan is installed, and (3) the degree to which the worker is guaranteed higher productivity will not lead to layoffs.

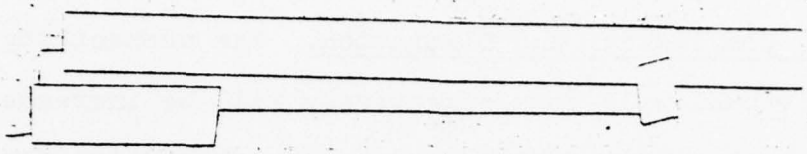
Incentive System Adaptability: the degree of flexibility built into the incentive plan.

Suggestion Subsystem: the degree to which the work design includes a structured subsystem for soliciting and evaluating employee suggestions for methods and improvements.

Hierarchial Mobility: the degree to which the work system provides for the advancement on merit of employees to higher levels in the organization, providing for greater responsibility, authority, and compensation.

the other extreme reflecting "enriched" tasks. However, this is not meant to imply that the characteristics of workers are fixed quantities which we must "work around." If this were so, there would be little utility in the elaborate and expensive training programs incorporated in our large industries.

The properties listed in table 5 have been incorporated in the following list of propositions. These propositions are presented as a guide to action. They are not to be construed in any sense as laws. Many of the propositions leave a lot up to the judgement of the user. Considering the current state of the art and the complexity of the problem, there is simply no way around this.. Further research is required before social psychological propositions for work design can be made more definitive.



Propositions Dealing with Work Content

Variety and Novelty. The probability that an individual will arrive at his workplace punctually, and do so on a regular basis, will be increased to the extent the work task is perceived by the individual as interesting, and not monotonous.

1. The perception of a work task as to some degree interesting or monotonous will be a function of individual characteristics and the task properties of variety and novelty. These properties should be incorporated in the work task to a degree suitable to the task incumbent/operator. Since objective cognitive measures are difficult to derive in this instance, a gradual introduction of stimulus diversity (variety) and new stimuli (novelty) should be undertaken, meanwhile measuring the relevant performance variables -- i.e., tardiness and absenteeism.

Physical Characteristics of Stimuli. The probability that an individual will arrive at his workplace punctually, and do so on a regular basis, will be increased to the extent the characteristics of task stimuli are perceived by the individual as physically agreeable, rather than disagreeable.

2. Every effort should be made to remove potentially disagreeable task stimuli from the work task, or from direct contact with the task operator.

Closure, Complexity, and Discretion. The probability that an individual will work effectively will be increased to the extent the individual perceives an opportunity for meaningful achievement in the task structure and to the extent the individual is "motivated by a need to achieve."

3. The opportunity for achievement is related in part to a task's property of having a definite beginning and end (closure). Short time-cycle, repetitive tasks are likely to be perceived as one continuous job with no discernible beginning or ending, except as provided by the time clock. Such tasks should be restructured, either by combining operations or by a logical rotation of the operator through the various phases of a complete, natural unit of work.

4. The opportunity for achievement is related in part to the number of different stimuli encountered in the task, their interdependencies, and the variety and pattern of responses required of the operator (task complexity). These properties should be incorporated in the work task to a degree suitable to the task incumbent/operator. Since individual characteristics will mediate the individual's response to this task property, a gradual introduction of complexity should be undertaken, meanwhile measuring the relevant performance variables -- i.e., output per manhour, deviation from tolerances, error rate, rejects, etc.

5. The opportunity for achievement is related in part to the degree to which the temporal pattern and pace of task activities, and the tools to be employed in the activities, are determined by the worker, rather than the machine/process (degree of discretion

allowed). This property of the work task is related to task complexity and should be treated in conjunction with it, and according to the same general approach.

6. Characteristics of the individual to be employed on the task in question should be considered in conjunction with task properties of variety, novelty, complexity, and discretion. General intelligence, task-related skills and abilities, and need-achievement motivation should be among the characteristics evaluated. Task individuation is the preferred approach where practical from an objective cost-benefit standpoint.

Subdivision of Labor. Given that the individual perceives an instrumental relationship between the attainment of reinforcing consequences, the production of acceptable task outcomes, and the achievement of group/organizational objectives, the probability that an individual will produce acceptable task outcomes will be increased to the extent the outcome is perceived by the individual as making up a significant part, or contributing significantly to, the final group/organizational end-product or objective.

7. The likelihood that a task outcome will be perceived by the individual as making up a significant part, or contributing significantly to, the final group/organizational end-product or objective will be inversely related to the degree of subdivision of labor. The task properties of closure, variety, complexity, novelty, discretion, and worker-product relation

are also inversely related to subdivision. Thus, this approach to work design must be considered very carefully from the standpoint of technological benefits versus social psychological costs.

Propositions Dealing with Work Context

Autonomy -- The Individual's Past Experience. The probability that an individual will work effectively under conditions of increased autonomy will be greater to the extent the individual has worked under these conditions previously with generally rewarding consequences.

8. In the case of an individual who has not worked under conditions of increased autonomy, who has worked under such conditions but with aversive consequences, or where there is no information regarding the individual's past work experience in this regard, a transitional program of gradually increasing autonomy should be implemented, with provisions included for performance evaluation, feedback, and reinforcement.

Autonomy -- Perceived Instrumentalities. The probability that an individual will work effectively under conditions of increased autonomy will be increased to the extent the individual perceives effective work performance as instrumental to the attainment of reinforcing consequences.

9. In all cases, the individual should be throughly briefed on: (1) the exact task outcomes he is expected to produce; (2) the

criteria used to measure the successful completion of these outcomes; (3) any limitations which may exist on the latitude he may exercise in the activities undertaken to achieve these outcomes (prescribed methods and procedures), including constraints regarding time; and (4) the connection between the degree of success achieved in his task functions and the magnitude of rewards dispensed.

The probability that an individual will produce an acceptable task outcome under conditions of increased autonomy will be increased to the extent the individual perceives achievement of acceptable task outcomes as instrumental to the attainment of reinforcing consequences.

10. Work system design: go to propositions 27 through 30.

Autonomy -- Worker-Product Relation. The probability that an individual will produce an acceptable task outcome under conditions of increased autonomy will be increased to the extent the outcome can be traced directly to the efforts of the individual (worker-product relation).

11. Work task design should incorporate a means of identifying an individual's task output. Where appropriate, the individual himself should sign, or otherwise identify his work. Where task functions are so interdependent that individual identification is inappropriate, the achieving group should be identified.

Feedback. Given that the individual perceives effective work performance as instrumental to the attainment of

reinforcing consequences, the probability that the individual will work effectively will be increased to the extent the individual receives feedback regarding his performance. Given that the individual perceives achievement of task outcomes as instrumental to the attainment of reinforcing consequences, the probability that the individual will produce an acceptable task outcome will be increased to the extent the individual receives feedback regarding these outcomes.

12. Work design should incorporate an objective means for measuring effective work performance and acceptable task outcomes, and transmitting the results directly to the worker. Such feedback should be accurate, objective, timely, relevant, complete, specific, and concise.

Participation -- Individual's Past Experience. The probability that an individual will accept an opportunity to participate in group decision making regarding task activities will be increased to the extent the individual has participated in similar decision-making situations previously, with generally rewarding consequences.

13. In the case of an individual who has not participated in decision making previously, who has participated, but with aversive consequences, or where there is no information regarding the individual's past work experience in this regard, a transitional program of participative decision making (PDM) should be implemented beginning with a session describing the purpose, scope, and general format of the program.

Participation -- Group Attraction. The probability that an individual will accept the opportunity to participate in a group decision-making situation will be increased to the extent the individual perceives the decision-making group as attractive.

14. To the extent possible, the decision-making group should be formed of individuals who are approach-oriented with respect to others, socially sensitive, similar in attitudes, opinions, and status in the organization.

Participation -- Meaningful Issues. The probability that an individual will accept the opportunity to participate in decision-making will be increased to the extent the individual perceives an instrumental relationship between participation and the attainment of personal goals.

15. The likelihood that the individual will perceive an instrumental relationship between participation and the attainment of personal goals is positively related to the degree meaningful issues pertaining to his work activities, and to organizational policies and programs that affect him, are to be decided upon in the participation situation. Therefore, the goal of such an effort should be to incorporate the "real" issues in PDM, rather than treating the effort as a "human relations gimmick."

Participation -- Perceived Instrumentalities. The probability that an individual will attempt to make

rational decisions in the PDM situation will be increased to the extent the individual perceives the achievement of group/organizational objectives as instrumental to the attainment of his personal goals -- e.g., remuneration, job security, meaningful work, etc.

16. There should be a major effort made in the design of the work system to achieve, in so far as possible, a direct relationship between the success of the organization and the achievement of personal goals by the individual. The common area for study is wage incentives, which we will deal with in other propositions. But other areas should be explored as well (e.g., additional leisure). This effort should be undertaken in a participative manner in itself. This will enhance the individual's understanding of the relationships achieved.

Participation -- Information. The probability that an individual will make rational decisions in a PDM situation will be increased to the extent the individual is privy to relevant decision-making information.

17. The work system should be designed to include a management information system (MIS), with appropriate outputs available to individuals to serve as source information in PDM.

Participation -- Communication. The probability that the individual will be capable of participating successfully in group decision making will be increased to the extent the individual feels free to express his views openly and candidly.

18. The likelihood that the individual will feel free to express his views openly and candidly in the group is greater when group members have a continuing opportunity to interact. Thus, the design of the work process, operator method, plant layout, etc., should consider social interaction opportunity as one of the relevant variables. Interaction (and, perhaps, interpersonal competence) may also be increased by holding periodic group sessions in the T-group/sensitivity training 8/ format.

Goal/Goal-Path Clarity. The probability that the productive unit, or work group, will function efficiently will be increased to the extent unit/group goals and the paths thereto are clearly understood by group members. This understanding will be facilitated to the extent goals and goal-paths are operationalized.

19. Design of the work system should incorporate a formal subsystem for the development of operational work group goals and goal-paths (task objectives, methods, and procedures). This subsystem will be more effective if it incorporates a decentralized communication network. 9/

Cooperation -- The Work Group. The probability that the productive unit, or work group, will function efficiently will be increased to the extent a cooperative situation evolves and is maintained.

20. The work system should be designed so that there is reasonable congruence between personal and group goals; and goal regions for each of the group members are defined so that they can be entered, to some degree, by any given individual only if all individuals

in the group can enter their respective goal regions, to some degree (goals should be mutually supportive). See proposition 28.

Valence [10] of Group-Decision Outcomes. The probability that individual work group members will work effectively toward the decision outcomes formed by the group will be increased to the extent the individuals perceive their assigned work tasks as non-aversive.

21. Work system design: go to propositions 1 through 7.

Leadership -- Individual Characteristics. Other things being equal, the probability that an individual will emerge as work group leader is increased to the extent the individual possesses special skills, abilities, and information relative to the group task, is sensitive to the individual characteristics of group members (both cognitive/psycho-motor and personality/emotional), and can adapt readily to novel situations (is flexible).

22. Design of the work system should insure that appointed group leaders (titular leaders) are task-competent, possess a high level of interpersonal skills, and can adapt readily to novel situations. This design consideration will involve three subsystems: (1) the selection subsystem, (2) the training subsystem, and (3) the performance evaluation subsystem.

Leadership Style. The probability that a nonauthoritarian

leadership style will be a positive factor in group functioning and goal achievement will be increased to the extent individual group members: (1) clearly understand group goals and the paths thereto, (2) are task-competent, and (3) perceive task assignments as non-aversive.

23. Work system design: (1) go to propositions 9, 17, and 19; (2) insure task competence through operation of selection, training, and performance evaluation subsystems; and (3) go to propositions 1 through 7.

Cooperation -- The Organization. The probability that productive units, or work groups, within the organization will function efficiently with respect to overall organizational objectives will be increased to the extent a cooperative situation evolves and is maintained.

24. The work system should be designed so that: (1) there is reasonable congruence between group and organizational goals, and goal regions for each group are defined so that they are mutually supportive (go to proposition 29); and (2) there is an opportunity for interaction among the various interdependent groups (go to proposition 30).

Propositions Dealing with Monetary Rewards for Work

Basic Wage. The probability that a wage incentive system will have its maximum effect with respect to an individual's effort-response in the work task will be increased to the extent the basic wage paid the individual

is comparable to what he would receive in other employment situations for similar work.

25. The basic wage paid the individual should be comparable to what he would receive in other employment situations for similar work. The incentive system should not be a substitute for an equitable basic wage, or normal increases thereto.

Salary -- Contribution Relation. The probability that an individual will perceive his basic salary as equitable relative to other group members will be increased to the extent his basic salary is correlated with his potential contribution to the overall group productive effort.

26. Design of the basic salary [sub]-system should incorporate an objective means for establishing the potential contribution of a given salaried position to the overall group productive effort. The basic salary paid the incumbent of this position should then reflect this potential contribution, as well as the degree to which the incumbent fulfills required position qualifications. Upgrading should take place as these qualifications are met.

Incentive System. The probability that an individual will work effectively toward the achievement of task objectives will be increased to the extent the individual perceives an instrumental relationship between the achievement of task objectives and the attainment of reinforcing consequences.

27. Design of the work system should include a wage incentive [sub]-system, which ties individual incentive earnings as directly as possible to individual productive output.

Instrumentalities -- Individual and Group. The probability that an individual will attempt to coordinate his task activities with other work group members to achieve work group objectives will be increased to the extent the individual perceives an instrumental relationship between achievement of work group objectives and attainment of personal reinforcement.

28. The incentive system should be designed so that the total incentive bonus available for distribution to work group members is derived as directly as possible from the overall achievements of the work group.

Instrumentalities -- Group and Organization. The probability that the work group will attempt to coordinate its task activities with other organizational work groups to achieve overall organizational objectives will be increased to the extent work group members perceive an instrumental relationship between achievement or organizational objectives and attainment of group and, in turn, personal reinforcement.

29. The incentive system should be designed so that the total incentive bonus available for distribution to the various organizational

work groups and, in turn, their members, is derived as directly as possible from the overall financial achievements of the organization.

Perceived Equitability and Instrumentality -- Participation.

The probability that an individual will perceive incentive system outcomes as equitable (given that they are equitable) and will perceive the instrumentalities between individual task performance, work group performance, and organizational performance (given the existence of these instrumentalities) will be increased to the extent the individual has the opportunity to participate in the development and operation of the incentive system.

30. The incentive system should be developed and operated on a participative basis. Changes to the basic incentive plan, which may be deemed necessary due to changing conditions, should also be worked out on a participative basis. All individuals who will be covered by the system should be included (see propositions 13 through 18).

Perceived Equitability and Instrumentality -- Scope.

The probability that incentive earnings will be perceived as equitable by members of the various organizational groups will be increased to the extent the same incentive system covers each group in the organization. However, the probability that the individual perceives a direct

relationship between his productive effort and his incentive earnings tends to decrease as the scope of the incentive system increases.

31. The wage incentive system should be designed to cover the entire organization to the extent feasible (considering the characteristics of the organization -- i.e., large, diversified versus small, dominant product); and to the extent this can be accomplished while incorporating the means to enhance the correlation between individual productive output and individual incentive earnings.

Immediacy of Reward. The effectiveness of reinforcement in shaping desired behavior increases as the immediacy of the reinforcement relative to that behavior increases.

32. Distribution of incentive earnings should take place in as close a temporal pattern as practicable to the time period in which they were earned.

Magnitude of Reward vs. Nature of Task. The probability that a given level of average incentive earnings will be an effective motivator of desired task behavior will be increased to the extent the individual perceives the task as nonaversive.

33. Work system design: go to propositions 1 through 7.

Guarantees. The probability that an individual will be favorably disposed toward the implementation of a new wage incentive system will be increased to the extent

the individual is guaranteed there will be no earnings disadvantage to him under the new system.

34. Planning for the development and implementation of a new incentive system should include consideration of a provision guaranteeing there will be no earnings disadvantage to individuals under the new plan. Among the factors to include in such a consideration are: (1) the individual perception of the reinforcing and/or aversive nature of assigned work tasks, (2) the degree to which individuals generally view the organization as providing a supportive setting for individuals, (3) the individual's perception of the magnitude of his current earnings relative to his expression of a "preferred life style," and (4) the individual's expression of the value he attaches to potential increased earnings under the new incentive system.

Distribution -- In Proportion to Basic Salary. Where total group incentive earnings are distributed to group members in proportion to their basic salary, the probability that the individual group member will perceive a correlation between his incentive earnings and his productive effort will be increased to the extent there is a correlation between the individual's potential contribution to the overall group productive effort and his basic salary.

35. Work system design: go to proposition 26.

Distribution -- In Proposition to Weighted Basic Salary. Where total group incentive earnings are distributed to

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group members in proportion to their basic salary as weighted by a performance rating, the probability that the individual group member will perceive a correlation between his incentive earnings and his productive effort will be increased to the extent there is a correlation between the individual's actual contribution to the overall group productive effort and his weighted basic salary.

36. Work system design: (1) go to proposition 12, (2) go to proposition 26.

## Concluding Comments

The foregoing list of propositions is only a first step in the attempt to incorporate social psychological factors in the design of work systems. Further research is required in order to flesh out and definitize these propositions. The problems of work design are complex and multivariate. They include consideration of individual experential factors and group variables; organization objectives; constraints under which the organization must operate, such as federal regulations, and union contracts; technological requirements, e.g., production scheduling, maintainability, quality control; and others. Consequently, the propositions presented here are not intended as universal prescriptions for work design. It is hoped, however, that the propositions presented will provide an insight into the processes or relationships between human behavior and work design and as a general tool, enhance the

likelihood that an optimum work/organization design will be developed. We are at a stage in the evolution of our work systems in which the need for such a tool is critical. Advancing technology and the burgeoning cost of resources, especially personnel, have cut drastically into a manager's error tolerance. In today's environment -- and more so in tomorrow's -- mistakes that in the past were costly but reversible, could be disastrous and irreversible. "Seat-of-the-pants" management just won't do. The process of modern management requires a staggering array of talents and information. It involves the problems of controlling both inanimate and living systems. Over the course of the years we have made giant strides in solving the former problem. We have accomplished this by employing a systematic approach to the application of knowledge from other disciplines, such as mathematics, physics, engineering, physiology and, more recently, computer science. It is time to take the same approach to the much more complex problem of controlling living systems. It is time to put into the practice of management what we know about the determinants of human behavior. We need to do this not through generalizations, cliches, or moralistic palliatives, but objectively and systematically, according to the rigorous rules of science. And it must be accomplished not as a separate or singular imperative, but as an integral part of the whole -- no more or less important, a priori, than other elements in the system. When we do this, we will find that the result is not one solution, but a series of alternatives, each with its advantages and disadvantages. The manager must select the optimum solution. He will

do this by evaluating the tradeoffs. The information he possesses to apply to this evaluation is one of the critical factors in the process of decision making. There is a critical shortage of such information regarding social psychological factors of work design. It is essential to the continued effectiveness of our business, government and social systems that this shortcoming be rectified.

## FOOTNOTES

1 - Page 10. It is, of course, necessary to consider individual differences in the so-called "need for achievement" before generalizing its reinforcing properties. Although there is evidence to suggest people do find achievement reinforcing, the evidence also suggests definite differences in the "need for achievement" between different cultures (McClelland, 1962).

2 - Page 25. These characteristics can be operationalized and tested using a number of attitude assessment and projective techniques (e.g., see O. K. Buros, ed., 1972, Mental Measurements Yearbook; G. Lindzey, ed., 1954, Handbook of Social Psychology; B. I. Murstein, ed., 1965, Handbook of Projective Techniques.

3 - Page 31. William F. Whyte (1955) predicted the following problems when "the traditional approach to piece rates is carried out": (1) workers will restrict output to a point well below their capacity; (2) workers will develop many inventions which they will keep secret from management; (3) when they are observed for rate-setting purposes, they will use all their ingenuity in working slowly and yet giving the impression of working fast; (4) in spite of all efforts to compensate for worker deception, time-study men will set some rates that are unfairly tight and others that are unnecessarily loose; (5) the coexistence of incentive jobs and nonincentive jobs and of tight and loose rates will create endless disturbances in inter-group relations (pp. 261-62).

4 - Page 33. Homans (1961) advanced a similar theory of "distributive justice" as an element of his wider theory of elementary social behavior, which is one of several social-reinforcement exchange theories. According to Homans,

> "A man in an exchange relation with another will expect that the rewards of each man be proportional to his costs--the greater the rewards, the greater the costs--and that the net rewards or profits of each man be proportional to his investments--the greater the investments, the greater the profit" (p. 75).

5 - Page 34. See the article by Owen Aldis (in Ulrich et al., 1966) for an interesting suggestion on how a variable ratio schedule might be employed for an incentive scheme in industry.

6 - Page 35. Katz and Kahn (1966) have pointed out that modern, large-scale organizations, employing advanced technology, consists of people engaged in many interdependent tasks. This, and the fact that performance is often controlled by the tempo of intercoordinated machines, rules against the logic of individual incentives. The Bureau of Labor Statistics (September 1971) has commented to the same effect:

"With the trend away from man paced toward machine tending and service jobs, the applicability of individual output incentives is being questioned. Accordingly, interest is growing in incentive plans that are based on total plant performance" (p. 19).

7 - Page 39. Although we have not included it as a direct feature of the incentive plan, the Scanlon suggestion system serves as the mechanism for continuing participation, as well as a means of enhancing the individual's perception of the effort-reward contingency.

8 - Page 58. T-group/sensitivity training is a therapeutic (in the broadest sense of the word) endeavor which emphasizes direct, face-to-face emotive confrontations, usually involving a group of from 6-12 persons (see Argyris, Interpersonal competence and organizational effectiveness. Homewood, Ill: Dorsey, 1962).

9 - Page 58. A decentralized communication network is one in which there is a stable arrangement of channels of communication among members of a group, and each member has the same number of channels available.

10 - Page 59. Valence refers to an individual's affective orientation toward a particular outcome. Preferred outcomes are "positively valent," while outcomes not preferred are "negatively valent." (see Vroom, V.H. *Work and motivation. New York: John Wiley*, 1964).

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