A Comparison of the Effects of Participation, Expected Payment, and No Expected Payment on Clerical Performance

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A COMPARISON OF THE EFFECTS OF PARTICIPATION,
EXPECTED PAYMENT, AND NO EXPECTED PAYMENT
ON CLERICAL PERFORMANCE

by

James Theodore Austin

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Arts
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Western Michigan University
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Seventeen psychology students participated in a group comparison of the effects of participative decision making, defined as subject decision making in three areas of the experiment, expected payment, and no expected payment on performance of a repetitive scanning task. Measures of performance quantity and quality were assessed directly, while satisfaction and manipulation checks were evaluated via self-report. Clerical pretest scores were used as covariates in an analysis of covariance, which revealed no significant differences on the quantity dimension but highly significant differences (p = .03) for quality (error) performance. The findings, which may have been biased by an experimenter "instruction" effect, point to the effectiveness of participation in facilitating quality control.
ACKNOWLEDGEMENTS

The author wishes to gratefully acknowledge the assistance and guidance provided by my advisor, Dr. Jack Asher, and the other members of the committee, Drs. John Nangle and Dale Brethower. During the course of this project, advice was given by all freely and in a truly educational sense. Also, gratitude is expressed to the persons who served as observers during the experiment itself. The preparation of the manuscript was made possible, in large part, by my parents and to them I owe a great debt.

James Theodore Austin
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CHAPTER I
REVIEW OF THE LITERATURE

Introduction

Ever since Hugo Munsterberg wrote *Economic Psychology* (1917) the subject or worker motivation has been paramount. Recently it has become even more important. Within the framework of the major organizational outcome variables—productivity and satisfaction—there have been numerous attempts, correlational and experimental, to relate behavioral operations such as goal setting, incentives, and participation to these outcomes. Prior to the Hawthorne studies, progressing through Lewin's investigations, and right up to the manipulations at Harwood, one variable that has been manipulated by organizational psychologists is participation in decision making.

Briefly defined as shared influence in decision making where the joint decisions may be executed by the decision makers, this concept has attracted attention from managers and researchers. Motorola recently ran several full page advertisements in *Newsweek* (1982) about their participative management program. The journal *Industrial Relations* has sponsored two print symposia (1970, 1979) on worldwide implications of worker participation. Several books have been written on the subject (Dachler & Wilpert, 1978; Marrow, Bowers & Seashore, 1967) and there are numerous articles published every year. One question that arises is the reason for this intense interest. Is the rationale pragmatic or is it social?
There has been a documented decline in worldwide and especially in American worker individual productivity since World War II; surveys reveal substantial reports of dissatisfaction with many aspects of work. Thus participation seems to make intuitive sense for dealing with productivity and satisfaction simultaneously. However, it makes no sense to utilize participation merely because it seems logical or intuitive. Therefore a major objective of research has been to determine the effects of participation on organizationally valued outcomes. So far the inconclusive and equivocal results of experimentation point to several problems with current concepts of participative decision making. More than one reviewer has noted the inconsistencies in the primary literature (Henson & Camp, 1977; Locke & Schweiger, 1979; Vroom, 1969). Commonly noted problems include imprecise definitions, multiple variable confounds, and possible intervening variables. In a summary table of the evidence (laboratory, correlational, and field studies), Locke and Schweiger showed that regarding productivity, 56% of the studies they reviewed found no or only contextual increases while for satisfaction 30% found no differences.

The division of this paper will be as follows: first, a review of selected literature in three parts, to examine concepts, laboratory studies, and relevant field experiments; second, a description of the procedures; third, presentation of the results; and finally, a discussion of the findings and recommendations for future investigation.
Conceptual Issues.

As noted in the introduction, participation has been widely applied. In one or another variation it has been used worldwide in attempts to increased valued outcomes while decreasing undesirable ones, which is of substantial interest to organizations. Henson and Camp (1977) found 44 articles on PDM between Lowin's (1968) review article and 1975; Locke and Schweiger, in their rigorous review of the paradigm, cited 221 references and examined some 150 studies. There is an obvious glut of research and theory on the subject, however, there are still flaws which should be studied and corrected through experimentation and application.

This review of literature will be subdivided into three parts. First, an examination of conceptual disarray regarding participation as well as some key issues in the area will be conducted and a definition of PDM presented. Second, relevant field experiments will be briefly summarized as they provide much of the impetus for the PDM movement. Even though this is a laboratory investigation it is presumed that field investigations provide hypotheses and identify potential moderating variables. Last, laboratory studies will be examined in greater detail as they are directly relevant.

The first problem which crops up when reading the literature is the variability associated with defining, conceptualizing, and measuring participation. Is it a process? A technique? Is it something done to or with workers? Is it done with salaried or hourly workers or both?
The Influence Power Continuum (IPC) used by the Decisions in Organizations research group in Europe operationalizes participation as the "extent of participativeness or control" perceived in hierarchies. Radical views of participation have led to laws designed to make it a part of the organization in many countries of Europe (i.e. Germany, Sweden, and Yugoslavia). In the United States it seems to be regarded as a management technique to be used along with goal setting or job enrichment. Leadership styles are often classified as falling along a continuum ranging from participative to autocratic. Organization development (OD) specialists also often use participative techniques to unfreeze change related resistance. Participation has been used in conjunction with goal setting in laboratory and field studies (Dossett, 1978; Ivancevich, 1976; Latham & Yukl, 1976) as well as in job enrichment research (Locke, Sirota, & Wolfson, 1978). In an "industrial democracy" approach (Blumberg, 1969) as practiced in Europe, participation involves the formation of worker's councils to participate in decisions that affect them and the organization.

As can be seen from the range of reported applications, many organizational researchers have hypothesized that PDM is a valuable adjunct to management. Exactly what is it that they are talking about? French, Israel, and As (1960) give a definition as follows: Participation is a process whereby "parties influence each other in making certain plans, policies, and decisions." This seems to include the concept of power sharing used by other researchers (Mulder, 1959; Mulder & Wilke, 1970; Wood, 1972). Lowin (1968) provides a more inclusive definition of PDM.
as "organizational operations in which decisions as to activities are arrived at by the very persons who are to execute them." He contrasts this mode to more traditional hierarchical (HIER) structure in which power and influence are concentrated in authority networks and usually applied downward. Locke and Schweiger (1979) carefully distinguish between participation and delegation based on the hierarchical and non-interactive nature of delegated duties. Other definitions have been advanced by Alutto and Belasco (1972), Henson and Camp (1977), McGregor (1960), Sashkin (1975), and Vroom (1960, 1969) to mention only a few.

In addition to definitional confusion there are additional dimensions on which participation may vary; from typology to formality, directness, degree, or scope. (Locke and Schweiger, 1979). It seems logical that PDM could be used to determine goals, methods for goal achievement, evaluation standards, and goal achievement rewards. Sashkin has presented a model which included types, methods, targets, mechanisms, and outcomes of participation. By types he referred to content areas of goal setting, decision making, problem solving, and/or organizational. Methods are individual, dyadic, or group. Locke and Schweiger classify four types of decisions that could be addressed with PDM as routine personnel functions, the work, working conditions, or policies of the organization.

Another variable in the definition is the perceived validity of the participation, that is, is participation being used as a "bone"
by management to quiet workers through ersatz participation in
decisions that are a) already made, or b) of trivial importance.
Or are the problems relevant and important. Do the workers know how
to participate? Another issue revolves around the actual versus
perceived extent of participation; what is the effect, if any, of a
discrepancy between objective and subjective estimates of participation.
Discrepancy theory (Locke, 1969; Porter, 1961) might propose decreases
in satisfaction as the distance between actual and desired participation
increases. Alutto and Belasco (1972) have proposed a three level
typology of PDM perceptions that implies the potential of providing
too much participation. Their levels are decisional deprivation,
equilibrum, and saturation. It is thus seen as possible to change
toward participation faster than performers can adapt.

To summarize this definitional confusion, it is apparent that
various researchers have proposed different concepts and operational
definitions of participation. Several continua have been proposed in
the literature (Blumberg, 1969; Likert, 1961; Tannenbaum & Schmidt,
1958), typologies developed (Alutto & Belasco, 1972; Sashkin, 1975),
and models formulated (Locke & Schweiger, 1979; Lowin, 1969; Spencer,
1975). Multitudes of self report scales have been devised to measure
participation (Alutto & Belasco, 1972; Cooper & Wood, 1974; Neider,
1980; Ruh, Raymond & Scontrino, 1973; Tosi, 1970; Vroom, 1960) so
that scales are at least as common as definitions.

Most researchers are thus working with a different set of tools
and techniques that creates at best a general, loose framework; at most
a few independent studies use common definitions. The net result of these differing definitions is waste of investigative power through examination of closely related but distinct phenomena. Also, transition between studies is hampered by the necessity to shift gears with each subsequent study reviewed. The overall effect of this is unparsimonious and scientific rigor is reduced.

Another related issue is how participation achieves its alleged effects on outcome variables. If withdrawal can be subsumed under satisfaction due to a strong correlation between turnover and satisfaction, in addition to a weaker but still practical correlation between absenteeism and satisfaction, then there are two major outcome categories, satisfaction and production, on which PDM is alleged to effect increases. There is still some question as to whether the effects are immediate or delayed (Spencer, 1975; Vroom, 1969) so the question becomes one of what psychological mechanisms contribute to outcome increases.

Henson and Camp (1977) state that research is needed to clarify "the various mechanisms by which participation affects organizational outcomes."

The definition of participation proposed here will borrow from previous ones and conceptualizes PDM as a special case of group problem solving or decision making where the decisions made will (or may) be executed by or have an effect on the group. The interactive nature of this process is important.
Psychological mechanisms that exert their influence because of previous participation are subdivided into two major classes, motivational and cognitive, by Locke and Schweiger. Henson and Camp used a broader category that included both of the above categories but it seems more useful to subdivide the general category in order to more fully classify this phenomenon. Motivational mechanisms would appear to exert their influence on satisfaction and production outcomes while cognitive factors might affect production more.

Satisfaction, while important, is and should be subsidiary to productivity increases. The goal of satisfaction is mainly an individual pursuit, as noted by Locke and Schweiger, but should not be forgotten when designing organizational systems and contingencies as satisfied workers, through reductions in withdrawal, can impact both organizational effectiveness and efficiency.

Motivational factors developed by Locke and Schweiger include less resistance to change, changed perceptions of control, acceptance of organizational policies, and higher goal setting. Reduced resistance to change, the focal point of the Coch and French (1948) study, is probably the most widely mentioned byproduct of PDM. Following that investigation, many others were conducted to verify and replicate the finding (French, Israel, & As, 1960; Kahn, 1974; Lawrence, 1971). Given the integral and increasing nature of change in our society, it follows that methods for reducing resistance and smoothing the path of change would be extremely useful.
Control, as perceived by individual performers, is more of a speculative mechanism at this time but one which has logical appeal. If PDM is seen as legitimate by employees; this gives them an additional input channel into the organization; if their participation actually bears fruit then those behaviors might be self perceived as shifting the locus of control from external management to one's own behavior. To date there has not been any research conducted on this topic but it might be profitably investigated in the future.

Concomitant with reduced resistance is hypothesized greater acceptance of decisions made in a PDM mode. Scheflen, Lawler, and Hackman (1971) studied a natural reversal and maintenance of a participatively developed incentive system designed to reward good attendance. Management dropped two of three participative plans and the investigators discovered that attendance dropped quickly and noticeably from that point in time at which the plans were dropped. Obviously the commitment to the plans suffered considerably. Conversely, it was found through interviews with managers that they felt no involvement with the plans. The experimenters speculated that since the managers themselves had not participated in the development of the plans they felt no ownership or commitment to them. This suggests that more complete participation that had involved the management cadre might have resulted in long term support by all parties for the plans. It seems that acceptance of a decision can be assessed quite easily during implementation by observing behavior or monitoring performance levels.
Salancik (1977) proposed that participation affects commitment because behaviors and goals are specified publicly, agreed upon, and presumably relevant to both parties, member and organization. Group social processes such as feedback and reinforcement can then maintain behaviors necessary for goal achievement.

Human relations theorists like Likert (1961, 1967) along with goal setting researchers (Latham & Saari, 1979; Locke et al., 1981) have urged that goals be set participatively as higher goals are thus set. This line of reasoning is also relatively new and requires more investigation before firm conclusions can be reached.

Also postulated in the area of job satisfaction, which appears to be related to interactions between availability of valent/contingent reinforcers, work and working conditions, and the quality of social interactions at the workplace, are: need fulfillment; ego involvement (Allport, 1945); value attainment (Locke, 1976); ego motivation, financial incentives, and "closure and the sense of participation" (Lowin, 1968); expression of one's viewpoint (Argyris, 1955); and/or respect and dignity (Davis, 1957). Many writers seem to agree complete participation is seldom achieved and undesirable so that if a worker has that motive it will likely never be satisfied. Even at the forefront of the industrial democracy movement there are still decisions being made by upper management. Possible results of increased job satisfaction or involvement through participative decision making include reduced grievance rates, lower absenteeism/turnover, or expressions of hostility such as stealing or aggression.
Cognitive factors might affect production through improvements in information processing/usage, understanding, or by facilitating communication between workgroups, although productivity is a variable that may be contaminated by factors beyond a worker's control. One of the major factors mentioned in the literature is increased information as a result of interaction as well as improved skills for using that information. Participation, as a group interactive process, entails more communication between members if conducted properly and thus suggestions have been made that it increases vertical communication in the organization (Sashkin, 1975; Strauss, 1963). Leavitt (1965) found that feedback and information exchange increase the accuracy of transmittals within a network. Neider (1980) observed that newer and less experienced employees could easily learn "tricks of the trade" by interacting with other employees; since group discussions are an integral part of PDM and are presumably task oriented, it seems obvious that information can be gathered and used by performers. Of course, the information available must be relevant and there must be the skills to use it or PDM is an irrelevant mechanism. Much of the literature on group problem solving, especially that by Maier (1950, 1953, 1957, 1973) and Vroom and Yetton (1973), suggests that the quality of a group decision is higher than that of individuals but there is other contradictory evidence (Campbell, 1968; Dunnette, Campbell & Jastaad, 1963; Taylor, Berry & Block, 1958) which finds the quality higher using individuals. There are undoubtedly other parameters that impinge on the effectiveness of the problem solving unit, either
individual or group. Factors such as time, process leadership, and available skills all appear to be important. One fact that seems to be definitely borne out by the literature is that acceptance is higher when decisions are made participatively.

Mitchell (1973) has proposed an expectancy theory model of participation that posits four ways participation might impact behavior. First, it might lead to path-goal clarity so that workers would know how to achieve desired outcomes; second, it might enable performers to select performance goals that are most congruent with individual goals; third, it could conceivably increase perception of control over outcomes; and fourth, it might lead to more effective group social pressure through ego involvement. This last postulate, group social pressure, might work to increase some members perceived responsibility for a decision so that they then might reinforce or give feedback to others.

A second cognitive factor mentioned by Locke and Schweiger is greater understanding by performers who have participated in decision making. They should gain greater understanding of goals, methods, and reasons for a certain decision. This is what Lawler and Hackman (1969) reported in an experimental field study on participative incentive system design. Employees who participated in bonus plan development interacted for several hours and were able to clarify points through questions whereas a control group received information about the plan in a short one hour session. Thus the authors inferred that the participative group had more knowledge about the plan.
Clearly there are many hypothetical mechanisms by which PDM may lead to increased positive outcomes for an organization and its members. What is needed is research to separate and evaluate the motivational from the cognitive factors as well as separate other behavioral phenomena from participation.

Field Studies

In this section some experimental field studies will be briefly summarized. Most relevant research on participation is conducted in the field; the majority of reported investigations are either experimental or correlational field studies. The concepts of internal and external validity, which bear directly on the advantages and disadvantages of each type of setting (laboratory or field) have been thoroughly reviewed elsewhere (Campbell & Stanley, 1963; Cook & Campbell, 1976, 1979) but briefly each category has good and bad points. External validity, or the goodness of inferences to the population of interest or other populations and settings, is greatest in the natural field setting; internal validity, or the inference of causation from the design and analysis elements of the experiment, is minimized in the field due to lack of control. The converse holds for laboratory studies.

Field studies can be divided into experimental or correlational depending on whether the independent variable is manipulated or observed. Only experimental investigations will be scrutinized here as they support causal inference much better than correlational studies.
The starting point for many reviewers is the series of studies at Hawthorne's Western Electric Plant, however, an earlier investigation by Mayo (1924) labelled itself as participatory in retrospection because workers were allowed to schedule themselves for rest pauses. Unfortunately, since the rest breaks were confounded with the participation, no speculation is supportable. After the Hawthorne studies, which manipulated a semiparticipative leadership style in one of the five studies, and the Scanlon Plan, developed during the Depression, the next pertinent research was performed by Kurt Lewin, who investigated various leadership styles (1939). These studies manipulated three styles of task leadership, autocratic, laissez-faire, and democratic, in a social club setting with children as the subjects. Autocratic groups worked harder when the leader was present but democratically led groups were superior in the absence of the leader. Several methodological problems with this study prevent the reader from being confident of the findings.

Following the classic experiment by Coch and French (1948) at Harwood there was much interest manifested at the University of Michigan's Institute for Social Research (ISR) in studying large scale and long term participation interventions. There were a number of studies between 1949 and 1956 (Katz, Maccoby, & Morse, 1950; Katz, Maccoby, Gurin, & Floor, 1951; Morse & Reimer, 1956). The study performed by Morse and Reimer is of particular interest because they attempted to shift the locus of decision making downward in a normally hierarchical organization. In two autonomy groups decisions
were made at the worker level whereas in hierarchical groups decisions were moved even higher up the authority chain. Satisfaction was evaluated with a questionnaire while productivity was measured with a composite processing time criterion. A good feature of the design was the inclusion of training for the autonomy groups in group decision making.

Results showed that while the autonomy groups reported more satisfaction (as hypothesized) the hierarchical groups increased their production even more (10% for autonomy, 14% for hierarchical). Exactly what was the nature of the participation? It appears that genuine participation did in fact occur in this study, as can be seen in this excerpt from the report:

The range of decisions was great, including work methods and processes, and personnel matters, such as recess periods, the handling of tardiness, etc. (p. 122)

However, these findings did not confirm prevailing beliefs that participation was globally good in and of itself so the experiment did not receive much attention despite the sound design.

French, Israel, and As (1960) performed a crosscultural replication of Coch and French's original study in a Norwegian shoe factory but could not confirm the earlier findings.

Two studies (Jenkins & Lawler, 1980; Lawler & Hackman, 1969) dealt with the effects of employee designed contingencies or performance-outcome linkages. The original study by Lawler and Hackman used four groups. Participation/incentive groups designed a plan that rewarded perfect attendance with a $2.50 bonus per week; the plan was also implemented. The imposed group did not participate in design but
were told that they would be under the plan. A participative only group developed a plan but it was not used. Absenteeism was measured as the percentage of scheduled hours actually worked for 28 weeks (12 before and 16 after). The participation/incentive group was the only one to increase its average attendance, which rose from 88% to 94% \( p = .05 \). Two major reasons for the increase were advanced by the experimenters; one was an increased understanding of the plans that derived from the participation in development, the other was higher commitment. Since there was no attitudinal data to support these claims, it is hard to be sure of them.

Jenkins and Lawler (1980) extended that line of research to include the development of entire pay plans for a tool and die manufacturing organization. Bass and Shackleton (1979) had argued that PDM is an inappropriate tool in the area of pay because of self interest and equity issues. However, Jenkins and Lawler argued that since pay is important and highly visible, successful participation there will generalize widely. After gaining entry to the organization, they administered a baseline attitude survey, then formed a management-labor committee, worked with its wage/salary subcommittee to develop the new pay plan, then administered a second survey to assess hypothesized change.

The analysis of attitude change, although controversial, was used inferentially to compare increase in pay, perceived influence in pay, satisfaction with the pay program, and reaction to the pay program. It was found that satisfaction with the program, followed by perceived
influence over pay, explained the most variability and had the highest intercorrelations with the 14 dependent measures from the survey.

Participation was defined in these two studies as joint development of either an absenteeism reduction plan or a base pay plan for an entire workforce. The participation was carried out as the bonuses were paid and the base plan implemented. This series of studies was important as it extended the range of participation and scope of investigation into a sensitive, new area narrowing the focus considerably from a global conception. These studies are also exceptions to the rule in that the plans were continued rather than dropped after the experiment. Most PDM interventions seem to be dropped after the study is completed, which leads one to believe that maybe they had no practical significance.

Neider (1980) utilized an expectancy interpretation of participation, as presented by Mitchell (1973), as a framework for a well designed experiment that used participation in conjunction with valent reinforcers (identified by a preintervention survey). Mitchell's main thesis was that participation, as a clarifier of the effort-performance linkage, as well as reinforcers, to clarify the performance-outcome linkage, are necessary to show the true effects of participation. This starting point implied that participation might not stand alone but must be linked to incentives.

Four department stores were exposed to treatments as follows: Participation only stores engaged in small discussion groups, conducted by the experimenter, that discussed and developed new methods of customer approach behavior, which had been identified as a major
issue by the preintervention survey. The new techniques were then implemented by management for four weeks but there were no rewards linked to higher performance. Another store served as the incentive only condition and valent reinforcers were used in a cafeteria type system with three target levels of performance. The experimental store was exposed to both of these conditions while a fourth store served as a control and received no treatment although dependent variables were assessed. The dependent variables were sales levels and manager ratings of performance, which were measured for a total of 20 weeks. Multivariate analysis of covariance (MANCOVA), followed by univariate analyses to pinpoint differences between stores, revealed that the combined store was superior to all others, however, immediately after the experiment all stores returned to levels that reflected no significant difference. An internal replication run on the previous control store found results that were similar to the first phase.

Neider discussed her findings with the implication that participation must be linked to valent reinforcers to achieve full effect. She felt that this might be the explanation for failures to replicate reported by French, Israel, and As (1960) and Lischeron and Wall (1975). Those studies did not use reinforcers but manipulated participation alone. Overall, this study was extremely valuable as the participation was specifically defined as decision making in a relevant area, customer approach behavior, and was actually carried out in those groups that participated. Such a narrower conception of participation is needed if we are to truly understand contingency factors that appear to influence participatory effectiveness.
What can we learn from the field studies reviewed here? One obvious point is the increasing focus of the investigations; they narrow and traverse from a molar, inclusive definition to one that relates to a specific area for participative decisions. Sophistication in theory and design is also apparent from the experiments of Jenkins and Lawler (1980) and Neider (1980) and theoretical papers by Mitchell (1973) and Bass and Shackleton (1979). One problem that is also clear is the disturbing lack of permanence displayed by so many of these studies. Only the Lawler and Hackman and Jenkins and Lawler studies represent experiments where the decisions made approached permanence. It seems that one goal of experimental design should be to incorporate plans for permanent operation, given practical AND statistical significance and including cost effectiveness. By that criterion, most studies reviewed herein as well as many others would fail.

As far as results, these studies show generally positive results in the areas of satisfaction and production but there are exceptions such as that reported by Morse and Reimer which point to ongoing problems with participation.

Other studies that bear on the general area of participation include Coch and French (1948); French, Israel, and As (1960); French, Kay and Mayer (1966); Fleishman (1965); Lippitt and White (1960); Lischeron and Wall (1975); and Spencer (1975). Correlational studies have been performed by Foa (1957); Heller and Yukl (1969); Ivancevich (1976, 1977); Runyon (1973); Vroom (1960); and Vroom and Mann (1960). Prominent review articles that have appeared within the
last 20 years were written by Lowin (1968), Locke and Schweiger (1979), and Vroom (1969).

Laboratory Studies

Laboratory studies of participation are not as common as might be expected given the evident popularity of the topic. The reason for this is summarized by Lowin (1968), who found six reasons that make it hard to "justify the continued use of laboratory experimentation in exploring organizational PDM." He favored long term, "action research" methodology that would include collection of attitudinal data, genuine power sharing, and long lead time for experimental effects. Notwithstanding this criticism and similar charges by other writers, there have been many laboratory investigations on participative decision making. Filley, House, and Kerr (1976) pointed out that Maier and his associates alone have performed nearly 30 experiments on group decision making.

Reasons for the popularity of this type of investigation are probably threefold: greater control over variables, inability to penetrate actual organizations, and ease of subject recruitment. Locke and Schweiger wrote that laboratory investigation allows more control, which improves internal validity, however, the nonnatural setting may hinder generalization to real organizations. Common problems that they cited included the short length of most laboratory studies, the different population sampled, the fact that less may be
at stake, and possible confounding due to demand characteristics (1979). Lathan and Yukl indicated that certain well designed laboratory experiments display good generalization when transferred to work settings although they were referring to goal setting.

Participatory laboratory studies generally seen to fall into two classes; one emphasizes the acceptance and quality criteria developed by Maier while the other includes applications of PDM to other phenomena such as goal setting (Latham & Saari, 1979; Dossett, 1978), intrinsic/extrinsic motivation controversies (Turnage & Muchinsky, 1976), or general satisfaction (Cooper & Wood, 1974).

Relative contributions of personal and role attributes were studied by Kidd and Christie (1961) using a simulated air traffic controller task with three man teams, two controllers and a supervisor. A greco-latin square design varied supervisor roles, task loads, and supervisors themselves across all conditions. Supervisory roles were designated as laissez-faire, active monitor, or direct participant, the latter of which was the participative role. Task loads were high or low and three confederates of the experimenter were rotated as the supervisors. Dependent variables were mean percentage delay time, error correction lag time, positioning errors, and separation errors.

An overall analysis of variance, which was significant, revealed that four times as much influence was accounted for by individuals as by roles. Interaction terms were not significant. Nonparametric comparisons, used to probe the effects of roles on the criterion variables, did not show any one role to be superior to all others on all dependent measures. Laissez-faire was superior in terms of delay
percentage, active monitoring was best for reducing detection lag
time and positioning errors, and direct participant roles reduced
separation errors more. The task load factor was significant at the
.03 level with performance better under a lower load.

Despite the small sample size, some interesting points are raised
by these results. A relevant point is that the task was realistic
enough to simulate organizational tasks and workloads, which enhanced
generalization. One major finding was the individual characteristics
accounted for more variability than role characteristics but that in
turn raises another question. What were the individual characteristics
that determined this? When examining the roles, it becomes apparent
that there is a tradeoff effect, that is, certain roles are better for
certain criteria. Speed, defined as delay, was greatest under the
laissez-faire leadership, however, there were fewer errors with close
supervision. The active monitor role was also judged superior on two
of four dependent variables.

In this investigation the participative variable was defined as
being in direct contact with pilots and controllers instead of close,
direct supervision by the task leader. Since the task was both
realistic and real time, it is apparent that the manipulation was
effective. Results did not confirm any superiority for the participative
groups; although they worked at higher speed they made more errors.
These errors, in real life situations, might have been more serious
than slowness as they might result in loss of life.
Turnage and Muchinsky (1976), basing their work on that of Deci (1971, 1972a, 1972b, 1975), designed a three factor study to examine the effects of reward contingency, participation, and intrinsic/extrinsic motivation on task performance. Two tasks were used; one was intended to be boring and repetitive while the other was creative, varied, and thus assumed to be intrinsically motivating. PDM was manipulated so that subjects either had a choice of reinforcement or no choice. Since Deci had also spoken against contingent payment due to attenuation of intrinsic motivation, the third factor was contingent or noncontingent payment. Eighty subjects, in ten person groups, were subjects with two additional groups serving as controls for payment. Three response variables, intrinsic motivation (measured as amount of free time spent on the task), experimenter monitored performance time during the task period, and task interest/difficulty ratings obtained after the session, were assessed.

Preliminary analysis showed significant differences between control and experimental subjects. A three-way ANOVA revealed significant differences between groups on all dependent variables except task effort ratings. There was clear discrimination between tasks on all measures. Main effects of reward contingency were significant—the contingently rewarded subjects performed faster; participation was also significant but the participative (choice) subjects worked slower than no choice ones. A significant interaction between choice and contingency was found on the intrinsically motivating task, which was cited as support for Deci's hypothesis that effects of the two types of motivation are not additive (also supported by Calder & Staw, 1975).
Suggesting that the effects of extrinsic reinforcement and participation interact with type of task, Turnage and Muchinsky prescribed participation and noncontingent rewards for intrinsically motivating work but not for boring repetitive tasks. Although Deci's major hypotheses were supported, a design element that would have improved the inferences is improved performance measures. Participation, defined as choice or no choice, was rather weak and unidimensional—the experimenters observed that subjects did not seem to expect it. However, the participation was carried out as the choices made were honored.

None too many of the studies reviewed here have shown convincingly that PDM should even be extended to field settings for further testing. Problems with manipulations, time span, and task interactions seem to have been the most prominent sources of mixed results. The manipulations were mainly performed by confederates playing roles assigned by the experimenter. This can lead to considerable variability in leader performance and thus in subject performance. Perhaps training, as used by Morse and Reimer (1956); Wexley, Singh, and Yukl (1973); and Spencer (1975), could be utilized to counteract this. Another possibility would be to employ experimenter confederates over a longer period of time; they could be trained and gain experience as they work. Of course, this problem is mitigated in the field where real supervisors and leaders can be found.

Length of the studies is another factor that dampens enthusiasm for laboratory studies. As Spencer (1975) and Lowin (1968) have
suggested, time may be an important intervening variable in participatory studies, no matter where they are performed. However, field studies are usually budgeted for a longer time period anyway, so this is not as much of a problem there. In laboratory studies the median length appeared to be about one to one and a half hours. Such a short time span, when performance time is also considered, can leave very little time for participation or its effects to be assimilated, especially when the fact that participation is not expected is added. Another problem is the subject's potential inability to participate as Turnage and Muchinsky (1976) noted. If a laboratory study could be extended in time so as to more closely simulate organizational reality, training in group decision making (Maier, 1967) might enable more complete participation. Also, structural techniques used by the leader might also enhance the quality of participation.

Interactions between tasks and participation have been suggested by Sales (1966) and others (Filley, House, & Kerr, 1976). Sales, in a review of six participative laboratory studies, concluded that most did not represent a test of participation. Also, many correlational field studies have pointed to personality variables that may affect participation receptivity, based on constructs such as higher order need strength, need for independence, and authoritarianism. The reader is referred to a recent study by Steers (1977) for up to date work in the area. These variables, however, have not yet been supported consistently so there may be other unidentified variables directly or indirectly affecting participation.
In the studies reviewed in this section, there has been greater evidence supporting the effects of participation on satisfaction than on productivity. Where productivity has been supported, as in the Kidd and Christie study, it has been supported for a subset of performance variables. There has not been across the board support by any study in both satisfaction and productivity.

The Problem

Given the mixed results, further experimentation that might clear up these problems should be carried out. This research should be carried out in the tradition of an empirical science that strives to manipulate the phenomena of behavior rather than with restrictive and preconceived ideological emphases. Conditions and processes that might facilitate the effective use of PDM, if that use is even possible, should be delineated so that if participation is prescribed by a psychologist it can be done confident that research has laid out parameters for effective use. Implied in this is the notion that participation may not always be the best course of action. It is more time consuming than traditional hierarchical decision making. But as Vroom (1969) notes in his closing remarks:

The critics and proponents of participative management would do well to direct their efforts toward identifying the properties of situations in which different decision making approaches are effective rather than toward wholesale condemnation or deification of one approach. (p. 232)
Based on this prescription this laboratory study was designed to investigate questions about the relative effectiveness of participation and payment, payment only, and no expectation of payment as these variables might be related to clerical task performance. A clerical task which was designed to be repetitive and simple as well as yield unambiguous quantity and quality performance measures was developed. In addition to direct measures, self reports of satisfaction and manipulation effectiveness will be gathered. Participation will be operationalized as subject participation in several important decisional areas of the experiment. The participative subjects will also be paid in accordance with their decision of rates of compensation. Reward only subjects will be working for money only. The controls will not be expecting money but will be paid after the experiment. All subjects recruited from the introductory psychology class will receive credit for their participation. This experiment is intended to generalize to the population of part time clerical workers of college age, although external validity will be hard to achieve.

Other researchers have noted the social process by which participation works (London, 1975; Spencer, 1975). They and others point to the development of social networks and concomitant increased interactions as preliminary mechanisms by which PDM exerts its power. Therefore, there will be observation of the groups during initial decision phases to attempt to determine if there are observable differences in social process, defined here as idea generation, evaluation, and reinforcement, that might differentiate the groups.
Research Hypotheses

There are two major hypotheses which will be tested here, both related to the performance variables that are to be assessed. It is hypothesized that participative group subjects will perform better in terms of quantity and quality, where quantity is defined as the gross number of task sheets completed during the experiment and quality is defined as the number of errors, of omission or commission, made during the experiment. Testing of the results will use analysis of covariance (ANCOVA) with clerical pretest scores as the covariate and multiple comparisons derived from terms of that analysis (Huitema, 1980). The Type I error rate will be present at alpha equal to .05.

On the observational and questionnaire data, no statistical tests will be performed as these are subject to biases in recording. However, visual inspection of these results should reveal that participative subjects emitted more positive statements and generated more ideas and less negative statements than other group subjects. Questionnaire responses, it is believed, will reveal that participative subjects report more satisfaction with the task and the payment. Interest ratings of the task should reveal low scores, since the task is designed to be simple and repetitive.
CHAPTER II

METHODS

Subjects

Since one major aim of a scientific investigation is to discover phenomena that are generalizable to a larger, predefined population and that can be replicated by other independent researchers, an important part of the report is a description of the sample. In this way others can judge for themselves the inferences made. This study had originally been conceived as a field experiment but after three attempts to secure a setting had failed it was determined to perform a laboratory investigation.

Contact was first made with the professor teaching introductory psychology, who was willing to present the idea to her class. After this initial contact, other professors in various departments were contacted and small presentations were made to their classes but only one student expressed interest. Initial contact was made with the psychology students using a short presentation that concealed the true hypotheses of the experiment and stressed the voluntary nature of participation in the study. Eighteen students expressed interest and filled out sheets giving their names and availability during the week. They were then divided into two groups to roughly equate the numbers of each sex in the groups. It was not possible to randomly assign students to groups due to recruitment difficulties. It was
necessary to run the participative group first, followed by the others, since the participative group would be determining contingency elements that would be imposed on the other groups.

The third, or control group, eventually was formed of subjects who did not show up for their initial session (from one of the first two groups) and subjects recruited in the experimenter's dormitory (3). There were six subjects in the control and payment only groups and give in the participative group, giving a total sample size of 17.

Information gathered by demographic questionnaire revealed that 11 subjects were female and 6 were male. The only group that was unbalanced was the participative group, which had four females and only one male. Age distributions were as expected for a college population; six subjects were between 18 and 20, eight were between 20 and 22, and three were older than 22. As for educational level, two subjects were freshmen, four sophomores, four juniors, five seniors, and two were graduate students. All in all, that seems to be an adequate cross section of a college population.

Clerical experience and length were also assessed as this might have been a factor when performing the experimental task. However, the majority of subjects, 11, reported no clerical experience, five reported up to one year, and only one subject reported two years. Fifteen of seventeen subjects were U.S. citizens while two were not (one Chinese male and one Iranian female).

It should be reemphasized here that subjects from the psychology class were promised five points credit for their participation. It
is not known whether this could be a source of bias but it might also act as a reinforcer for persistence.

It is intended that this study generalize to a population of college students who are also part time clerical workers. This is because of the nature of the sample and the short nature of the intervention, which might represent only one-half of a day's work. Nonetheless, this segment of the workforce is growing at the present time and is a sizable portion of the total worker population, especially in college areas.

Experimental Task

A task which involved scanning arrays of numbers, letters, and spaces to mark the letters was developed and then generated by computer. The program that created the task and a sample task sheet are presented in the appendix. The intent in devising the task was to present the subjects with a simple, repetitive task that would yield unequivocal measures of quantity and quality. Quantity would be the number of sheets completed and quality would be reflected by the number of errors. This would yield measures of performance on two dimensions rather than one.

Three hundred task sheets, in sets of 30, were generated so that all subjects would be performing the task in the same order. Each subject's task sheets were separated from the others and stapled together to ensure minimal interruptions. Every half-hour the experimenter would signal the subjects in the room to mark the sheet
that they were then working on so that performance measures would be available by the half-hour.

The task sheets themselves were in arrays of 80 X 40, where one field could contain either a letter, a number, or a blank. None of the sheets had no letters; the minimum was three letters and the maximum was seventeen. Performance instructions were given to the subjects to scan the sheets however they wished and to mark with a hi-liter the string that contained the letter or the letter itself. It was emphasized that they could use any strategy and go over a page as many times as they wanted. They were asked to "do their best" so as not to confound the manipulation with goal setting. No feedback was given as this might prove to be another confound. Subjects were scheduled for two two-hour sessions, which all except three were able to attend, and these were further divided into half-hour segments so that there were eight total segments and a total of four hours task performance.

As a design element to partially preclude the possibility of learning alone explaining task performance, the task included repetitive pages. Seventy-five of the three hundred sheets were repetitive, as 60 instead of 30 copies had been generated by computer. These were inserted in no special order throughout the sequence of task sheets. Subjects were not informed of this.

Procedure

The participative group, hereafter referred to as Group One, was run first as they determined the shape of the contingency for the
other groups. When they arrived at the first experimental session, they were given the demographic questionnaire and a sheet of instructions for the clerical pretest. They were also assigned a number that would identify them throughout the experiment. Five of nine subjects showed up at the first session but since some mortality had been expected the experiment proceeded as planned.

Minnesota Clerical Test (MCT; Andrew, Patterson, & Longstaff, 1961) "numbers" scores were used as the covariate. It was close to the task and was selected over the General Clerical Test (GCT) and the Short Employment Tests (SET) for that reason. It was administered according to the guidelines provided; instructions were read from the administrators manual in addition to the sheet of instructions provided to each subject and the test was timed (8 minutes).

After the pretest was administered and collected, the manipulation was started with two observers present, who had been asked to record three categories of behavior: positive statements (social reinforcement), alternatives/solutions (ideas), and negative or evaluative statements. These were taken from the 12 categories of the Interaction Process Analysis (Bales, 1951). It had not been possible to train the observers but immediately before the experiment questions were answered and procedures covered by the experimenter. Subjects were seated in order of their numbers so that the observers could track their remarks more easily. The task was explained and demonstrated to the subjects and the "do your best" goal was set.
The experimenter asked the subjects if they would decide on some of the elements of the experiment, since he was interested primarily in task performance. He stated that they could, for example, decide as a group such things as rest breaks, scheduling, and payment, since the experiment basically consisted of working for four hours on the clerical task. At this point questions were solicited. One subject asked, "What do you mean, we decide as a group?". The reply was that since the experimenter had less interest in those areas it would be better for the group, whose members would be doing the work, to decide on the conditions under which they would work. Then there was a question about the money aspect. Subjects were told that a grant had been received (even though all money was the experimenter's) and a certain amount was to be allocated for each group.

Attempting to treat the manipulation as a problem to be solved, inputs were solicited as to what parameters of the experimental contingency were to be decided. Alternatives suggested were essentially those that had been mentioned before—money and rest breaks. Attempts to stimulate other alternatives were unsuccessful and it appeared to the experimenter, and was later corroborated by the observers, that subjects were not expecting participation as evidenced by some unease nor were they skilled at participating, which in this stage could be compared to Wood's (1973) phase of generation.

As the subjects appeared to know little about various ways that the rest breaks could be scheduled, the experimenter, as leader, took the initiative and suggested two alternatives. Either ten or fifteen
minutes could be allocated per hour. The pauses could be scheduled as one 10 minute break, one 15 minute break, or others. Then the subjects were asked what other alternatives might be considered, to which one replied that there might also be two or three five minute breaks. The subject was reinforced for this participative behavior and other potential alternatives were asked for from the subjects. Since no more were received the subjects were asked to decide on which they favored; four of five preferred one ten minute break. One of the subjects, an Iranian female, did not participate at all during the session and only spoke when spoken to by the experimenter. No one disagreed with the rest break decision and it was adopted.

Next the group moved on to the question of compensation. The experimenter explained that the grant had totalled $200.00 and that with two other groups this roughly broke down to $65.00 per group to divide. This was done because there are usually limits and constraints on what any participative group does, even in industry there are usually higher levels of review. It was hoped that one or two of the subjects would know and mention something about different schedules of reinforcement, since that was a primary topic in their curriculum, but none did. Therefore, the researcher was again forced to generate alternatives for the group. These were various contingent schedules related to either quantity or quality. Based on a preexperimental estimate of around two minutes per page (one pass over the sheet) and taking into account the rest break, which meant there would be 50 minutes of work per hour, it was hypothesized that each subject might
be able to complete between 90 and 100 sheets in the entire experiment. Therefore, the quantity contingent schedules that were suggested were ones which would pay 6.5 or 6 cents per page completed, with amounts calculated during the experiment and paid afterward. For quality performance no estimates were made but it was suggested that 6, 7, or 8 cents could be paid for a sheet with no errors. At this point one subject asked if anything could be paid for a page with one error. This matter was put to the group but no one liked the idea so it was eliminated from consideration. None of the contingent schedules were approved by the group with the quality schedules being especially disliked. Finally one subject suggested that a lump sum be paid for the entire experiment and this sum determined by dividing the number of subjects expected to be in the group, or ten. This would result in a schedule called Fixed Time (FT) by some reinforcement investigations (Pritchard, Hollenbeck, & DeLeo, 1981). This involves payment of a sum for a specified time, not for the first response after an interval as in a Fixed Interval schedule. A defect of this schedule is that it is only contingent upon a subject being present for the study and not on any performance. However, since this was a subject generated input and was unanimously approved, it was adopted.

For scheduling individuals for their sessions, which was more of an individual concern, in keeping with the concept of shared power or influence the researcher had prepared sheets that showed the times that he was available. During those times the subjects were asked to sign up for two two-hour blocks so that all groups would be working for the same amount of time.
As a final element, subjects were asked if there were any other elements they wished to discuss. None were presented so the manipulation was ended and the scheduling sheets filled out. Total time spent in making decisions was 25 minutes, which was the time that would be equalized across the other groups.

Areas that the first group discussed and decided were threefold: rest break scheduling, payment, and individual scheduling of work sessions. Under Locke and Schweiger's four categories these would come under two of the four; rest breaks and individual scheduling would be considered covering working conditions while payment would be a policy area. Work had been predetermined by the experimenter and no routine personnel functions were covered. Even though the subjects did not engage in a complete decision making sequence they did engage in two of three elements, generation and choice. Choice has been found to be the more important (Cooper & Wood, 1974; Wood, 1973). Other areas that could have been decided include feedback, goal setting, or choice of work but the first two might have set up rival hypotheses that have been found to affect performance so they were not mentioned by the experimenter. Choice of tasks is also not that realistic in modern organizational settings, at least not for part time clerical workers, so it was not presented to the subjects.

The second group, payment only, was run exactly as the first except that after the pretest they did not engage in PDM on the elements of the experiment but performed a group problem solving exercise taken from Kolb, Rubin, and MacIntyre (1977). The exercise consisted of
ranking a list of ten characteristics of an "ideal man" so that they corresponded to the rankings obtained from a sample survey of women who read *Psychology Today*. It was thought that this participative decision making, although genuine, was irrelevant to the experiment and thus would not impact performance. Also, the elements that had been decided by Group One were arbitrarily imposed on this group by the researcher in a traditional experimental manner whereby the experimenter controls the study and dictates what the subjects will do. They were informed what amount they would be paid, what rest breaks they would take, and they were scheduled by the experimenter based on their reported availability.

Another element of the manipulation lay in the manner in which the researcher interacted with the subject. The groups were treated differently depending on whether there was shared influence or not. With Group One an effort was made to behave in a smiling and friendly manner. Tone of voice was friendly and open, subjects were called by their first names, and informal attire was worn by the experimenter which consisted of bluejeans and a tee shirt. With the other two groups more formal attire consisting of sport shirt and slacks was worn, subjects were addressed as Mr. or Ms. plus their last name, and an effort was made not to smile. The researcher attempted to act formal in one situation and relaxed in the other.

The control group, which was composed of three subjects who had not appeared for their initial session and three others recruited by
word of mouth, was run the same as the expected payment group and also during the same week since finals were scheduled for two weeks after that week. They engaged in the irrelevant problem solving exercise also. The third or control group was informed as the outset that there was no money to pay them but that they would be informed of the results.

After performing the experimental task for four hours the subjects filled out a short questionnaire designed to assess the effectiveness of the manipulations as well as satisfaction with the pay and the task. Two questions were inserted to check for possible demand characteristics. Since the control group was not expecting money, two forms of this questionnaire were used, both of which are presented in the appendices. Control subjects were paid after they completed the forms.

Debriefing occurred by means of a one page summary of the manipulations and the true hypotheses that was copied and given to the graduate assistant for transmittal to the subjects who had participated. A phone number (of the researcher) was included for any lingering questions but none were forthcoming; other subjects were debriefed personally in the dormitory.
CHAPTER III

RESULTS

Results will be presented, wherever possible, in tabular as well as graphic format to assist in interpretation. The order of presentation will be clerical pretest, preliminary tests for the analysis of covariance, analysis of the response variables, quantity and quality, and finally results of the observations and questionnaire.

Table 1 displays the basic descriptive statistics for the pretest scores by group. It can be seen that there is some disparity between Group One and the other two in terms of means.

<table>
<thead>
<tr>
<th>Group</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>106.40</td>
<td>136.83</td>
<td>118.00</td>
</tr>
<tr>
<td>S. D.</td>
<td>22.42</td>
<td>26.94</td>
<td>19.90</td>
</tr>
<tr>
<td>Variance</td>
<td>502.80</td>
<td>726.16</td>
<td>396.40</td>
</tr>
<tr>
<td>Range</td>
<td>76.0–130.0</td>
<td>89.0–172.0</td>
<td>96.0–142.0</td>
</tr>
<tr>
<td>Median</td>
<td>110.00</td>
<td>140.50</td>
<td>115.50</td>
</tr>
<tr>
<td>S.E. or Mean</td>
<td>10.02</td>
<td>11.00</td>
<td>8.12</td>
</tr>
</tbody>
</table>

Moreover, on closer inspection it can be seen that the second group's mean is heavily influenced by one score of 172, which was the highest score.
A preliminary test suggested by Huitema (1980) is to perform an analysis of variance on the covariate scores using a liberal alpha of .20. The results of this test are shown in Table 2 below. Judging from the small obtained F value and its associated probability, there were no significant differences between groups despite the disparity of the means.

Table 2
Clerical Pretest ANOVA

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>dF</th>
<th>Mean Square</th>
<th>F value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>2623.02</td>
<td>2</td>
<td>1312.00</td>
<td>2.40</td>
<td>.12</td>
</tr>
<tr>
<td>Within</td>
<td>7624.03</td>
<td>14</td>
<td>544.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>10247.05</td>
<td>16</td>
<td></td>
<td>Eta squared = .26</td>
<td></td>
</tr>
</tbody>
</table>

Despite the lack of statistical significance there does seem to be a practical difference between the groups. Furthermore, Groups One and Three, the participative and control groups, appear to be similar to each other rather than to Group Two. Group Two has an extremely high mean compared to the others, around the 80th percentile compared to norms developed for the MCT. With the exception of one low score all scores in Group Two are above 130, which is the highest score obtained in Group One and near the highest score in Group Two (142). Since some differences such as these had been expected, the analysis of covariance was employed to remove differences predictable from the clerical pretest.
One additional statistical test that is recommended prior to use of the analysis of covariance is that of homogeneity of within-group regression slopes (Huitema, 1980; Kirk, 1969). This ensures that the adjusted means are adequate descriptive measures at various points along the regression slopes. It is analogous to testing for interactions in a factorial experiment. Tables 3 and 4 present the summary tables for this test for each of the dependent variables. From the results it was concluded the analysis of covariance is an appropriate procedure to utilize since the F values are both nonsignificant at the predetermined alpha level ($p = .05$). This means that the pooled within-group regression coefficient, $b_w$, is an appropriate estimator.

Table 3
Homogeneity of Slopes Test (Quantity)

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>dF</th>
<th>Mean Square</th>
<th>F value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heterogeneity of slopes</td>
<td>2374.03</td>
<td>2</td>
<td>1187.01</td>
<td>1.61</td>
<td>.20</td>
</tr>
<tr>
<td>Individual residual</td>
<td>8099.54</td>
<td>11</td>
<td>736.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within residual</td>
<td>10473.57</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Two dependent variables, quantity and quality, were measured in this study. Quantity was conceptualized as number of task sheets completed while quality was the number of errors, both during the entire four hours of task performance. Table 5 shows the descriptive statistics for both variables. Following that, Figures 1 and 2 present the grouped data, by session and group, for the dependent variables. Individual curves are not displayed, since it was thought that they were confusing due to the number of data points. There were eight segments divided into two sessions of two hours each.

Table 4
Homogeneity of Slopes Test (Quality)

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>dF</th>
<th>Mean Square</th>
<th>F value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heterogeneity of slopes</td>
<td>4468.50</td>
<td>2</td>
<td>2234.25</td>
<td>2.55</td>
<td>.15</td>
</tr>
<tr>
<td>Individual residual</td>
<td>9649.99</td>
<td>11</td>
<td>876.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within residual</td>
<td>14118.49</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5
Quantity and Quality Summary Statistics

<table>
<thead>
<tr>
<th>Group</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>65.6</td>
<td>100.83</td>
<td>99.50</td>
</tr>
<tr>
<td>S.D.</td>
<td>14.08</td>
<td>28.65</td>
<td>35.61</td>
</tr>
<tr>
<td>Variance</td>
<td>198.30</td>
<td>821.36</td>
<td>1268.70</td>
</tr>
<tr>
<td>Range</td>
<td>47.0-80.0</td>
<td>78.0-155.0</td>
<td>38.0-146.0</td>
</tr>
<tr>
<td>Median</td>
<td>70.00</td>
<td>90.00</td>
<td>100.50</td>
</tr>
<tr>
<td>S.E. of Mean</td>
<td>6.29</td>
<td>11.70</td>
<td>14.54</td>
</tr>
<tr>
<td></td>
<td>Quality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>32.60</td>
<td>84.16</td>
<td>66.00</td>
</tr>
<tr>
<td>S.D.</td>
<td>5.59</td>
<td>38.25</td>
<td>41.54</td>
</tr>
<tr>
<td>Variance</td>
<td>31.30</td>
<td>1463.36</td>
<td>1726.00</td>
</tr>
<tr>
<td>Range</td>
<td>25.0-39.0</td>
<td>44.0-147.0</td>
<td>22.0-126.0</td>
</tr>
<tr>
<td>Median</td>
<td>34.00</td>
<td>81.00</td>
<td>53.50</td>
</tr>
<tr>
<td>S.E. of Mean</td>
<td>2.50</td>
<td>15.62</td>
<td>16.96</td>
</tr>
</tbody>
</table>

Tables 6 and 7 are the summary tables for the analyses of covariance. As can be seen, the quantity analysis resulted in a nonsignificant F ratio (p = .25) while the quality analysis was highly significant (p = .03). Despite the lack of statistical significance, there are large differences between the groups on the quantity measure.

In order to form a composite score which would represent performance on both the quantity and quality segments of the task, errors per page
Table 6
Analysis of Covariance—Quantity

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Square</th>
<th>dF</th>
<th>Mean Square</th>
<th>F value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between adj. treatments</td>
<td>2491.6</td>
<td>2</td>
<td>1246.0</td>
<td>1.55</td>
<td>.25</td>
</tr>
<tr>
<td>Error</td>
<td>10473.7</td>
<td>13</td>
<td>805.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total residual</td>
<td>12965.4</td>
<td>15</td>
<td></td>
<td>Eta squared = .19</td>
<td></td>
</tr>
</tbody>
</table>

Adjusted Means

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>59.43</td>
</tr>
<tr>
<td>2</td>
<td>110.12</td>
</tr>
<tr>
<td>3</td>
<td>96.05</td>
</tr>
</tbody>
</table>

Table 7
Analysis of Covariance—Quality

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Square</th>
<th>dF</th>
<th>Mean Square</th>
<th>F value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between adj. treatments</td>
<td>9307.8</td>
<td>2</td>
<td>4654.0</td>
<td>4.29</td>
<td>.03</td>
</tr>
<tr>
<td>Error</td>
<td>14114.7</td>
<td>13</td>
<td>1086.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total residual</td>
<td>23422.5</td>
<td>15</td>
<td></td>
<td>Eta squared = .39</td>
<td></td>
</tr>
</tbody>
</table>

Adjusted Means

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25.1</td>
</tr>
<tr>
<td>2</td>
<td>92.1</td>
</tr>
<tr>
<td>3</td>
<td>64.4</td>
</tr>
</tbody>
</table>
were calculated by dividing the total number of errors by the number of task sheets completed. This can be thought of as an efficiency index. Table 8 displays the basic statistics by group on this dimension.

Table 8

<table>
<thead>
<tr>
<th>Group</th>
<th>Experimental</th>
<th>Control 1</th>
<th>Control 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>.51</td>
<td>.86</td>
<td>.65</td>
</tr>
<tr>
<td>S.D.</td>
<td>.14</td>
<td>.47</td>
<td>.35</td>
</tr>
<tr>
<td>Variance</td>
<td>.019</td>
<td>.22</td>
<td>.13</td>
</tr>
<tr>
<td>Median</td>
<td>.485</td>
<td>.725</td>
<td>.555</td>
</tr>
<tr>
<td>Range</td>
<td>.38-.76</td>
<td>.51-1.77</td>
<td>.36-1.34</td>
</tr>
<tr>
<td>S.E. of Mean</td>
<td>.06</td>
<td>.19</td>
<td>.14</td>
</tr>
</tbody>
</table>

Inspection of these figures reveals that although differences have been attenuated there are still practical differences between groups. The participative group is superior, followed by the no expectation of payment and expected payment control groups. This index may be the most revealing of all since it combines performance on both dimensions. It shows that the participative group surpasses the other two most clearly on the quality performance dimension.

Since the participative group completed far fewer task sheets, on the average, than the other two groups, this raises the question of the correlation between quantity and quality performance. The obtained Pearson product-moment coefficient, r, was found to be .55, which is
FIGURE 1 Quantity performance by half-hour segments

FIGURE 2 Quality performance by half-hour segments
significant at the .05 level. The associated coefficient of determination, $r^2$, was calculated as .30, which is interpretable as the proportion of variability on one variable explained by knowledge of scores on the other.

Recall that the F ratio for quality performance was highly significant. When the overall test yields a significant result like this it is customary to perform multiple comparisons when there are more than two groups in order to pinpoint differences between conditions. In Table 9 are the results of the multiple comparisons performed on the quality scores. Fisher's protected least significant difference (LSD) procedure was used because it provides the greatest uniform power when the preliminary analysis is significant. This precluded testing the groups on quantity scores. The obtained values reveal that the participative

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Obtained t value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1--2</td>
<td>2.90</td>
<td>.05</td>
</tr>
<tr>
<td>1--3</td>
<td>1.92</td>
<td>.10</td>
</tr>
<tr>
<td>2--3</td>
<td>1.37</td>
<td>.20</td>
</tr>
</tbody>
</table>

group made significantly fewer errors than the second, payment group. But compared to the third, control group the participative group was only marginally better ($p = .10$). The second and third groups were obviously not different.

Since the task was one that required repetitive scanning, the possibility of vigilance decrements biasing true effects was possible. Therefore, correlated sample $t$-tests were run between first half-hour
scores and those from the second and fourth half-hours on the quality criterion. Table 10 below presents the results of these tests, which were performed within group so that treatment and vigilance shifts would not be confounded. Negative values imply that there were fewer errors as the experiment progressed; since there were no positive values it can be assumed that there were no vigilance decrements.

To evaluate the effectiveness of the manipulations as the subjects perceived them, the observational and questionnaire results are shown here. Two observers had rated each group's participation exercise on three categories: idea generation, positive statements, and evaluative or negative statements. Results by group are shown next in Table 11. The right hand column for each observed category represents the rating of the first observer while the left hand column is that of the second.

Interobserver reliability, calculated as the percentage of agreements over agreements plus disagreements, was calculated to be .87, which although somewhat low is acceptable. The fact that it is below the commonly desired figure of .90 may have been due to the lack of
Table 11
Observational Results

<table>
<thead>
<tr>
<th>Group</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea Generation</td>
<td>3/4</td>
<td>6/6</td>
<td>7/7</td>
</tr>
<tr>
<td>Positive</td>
<td>7/6</td>
<td>2/3</td>
<td>3/3</td>
</tr>
<tr>
<td>Negative</td>
<td>2/4</td>
<td>3/3</td>
<td>4/4</td>
</tr>
</tbody>
</table>

training. Evidence for this is provided by the fact that the most disagreements occurred for the participative group, also the first group, and there was only one disagreement after that. There were no disagreements during the session when the control group was run.

No statistical test were run on either the observational or the questionnaire data as they were intended more as a manipulation check. But as can be seen from the observational results, there are discriminable differences between groups. In the idea generation phase, the participative group scored lowest, confirming the researcher's own observation that there were fewer ideas mentioned. Also, it should be remembered that one subject did not contribute anything to the discussion. In gross terms, the controls generated more raw alternative ideas in their task. It was in the category of positive statements, which might be related to the formation of a social system, that the participative group was superior to the others. For evaluative/negative statements, all groups were essentially the same, plus or minus one.
The general form of the postexperimental questionnaire was explained previously. It was designed to do several things. One, subjects were asked to describe their own behavior, what they had done during the experiment. This was done to set up no response biases where the nature of the hypothesis is revealed inadvertently, also, it would enable a check of whether the subjects perceived the manipulation enough to mention it in the short paragraph. Another question, the fifth, was inserted to check whether the initial procedures, participatively determined in one case the imposed in the other two, were carried out during the course of the study. This would not definitely discriminate between groups but since the manipulations had been different would assess the extent to which subjects felt that the contingency was maintained.

Second, questions two and three asked for ratings, on five point scales, of the boringness/interestingness of the task and satisfaction with the pay. These complementary questions were intended to tap the satisfaction with two important elements of the experimental "job." Of course, since control group subjects were not supposed to expect pay, question three had to be modified to read, "What rate of pay would be adequate for this four hour job?" Another question, also inserted for the control group, asked if they were expecting pay.

A third purpose of the questionnaire was to assess any demand characteristics that may have arisen. The fourth, sixth, and seventh questions were designed to do this. The fourth question asked what strategy subjects had used to perform the task, thus continuing the
the concealment of the true hypotheses. It was irrelevant to the study and can be dropped from any analysis. The sixth asked what the purpose of the experiment was and the seventh queried subjects as to whether they had talked to anyone outside of the experiment as this was one way that different treatments might have been discovered by subjects.

The first and sixth questions had to be content-analyzed since they were open ended. To aid in interpretation, the answers are presented in Table 12 which utilized broad categories. The answers were examined to determine whether comments in any of the categories were found. For Question One, the two categories were: one, whether subjects mentioned the participative discussion and two, whether there was mention of the topic of discussion and decision, which affected the

<table>
<thead>
<tr>
<th>Group</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>1</td>
<td>5/5</td>
<td>4/6</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4/5</td>
<td>3/6</td>
</tr>
<tr>
<td>Question 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>1</td>
<td>3/5</td>
<td>4/6</td>
</tr>
</tbody>
</table>

Note. Each entry represents the number responding on that category over the total number in that respective group.
experiment in one case but not in the others. Question Six was analyzed using one category, whether there was mention of the ostenible, false purpose of the experiment that had been given at the initial briefing.

Other items on the questionnaire were either scales or yes-no dichotomies. Table 13 shows the results of Questions 2, 3, and 5, which dealt with satisfaction constructs. The scores for Questions 2 and 3 have been summed to yield a composite measure of satisfaction, since they appeared to tap different and independent dimensions of the experiment. This could not be done for the control group because of substituted questions on their questionnaires, so there is no composite or Question 3 answer presented in the table. The higher the composite score, the greater the reported satisfaction.

Table 13
Satisfaction Indices

<table>
<thead>
<tr>
<th>Group</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 2</td>
<td>4.0</td>
<td>3.0</td>
<td>2.33</td>
</tr>
<tr>
<td>Question 3</td>
<td>4.2</td>
<td>3.7</td>
<td>----</td>
</tr>
<tr>
<td>Question 5</td>
<td>4.8</td>
<td>4.2</td>
<td>4.0</td>
</tr>
<tr>
<td>Composite</td>
<td>8.6</td>
<td>6.7</td>
<td>----</td>
</tr>
</tbody>
</table>

Answers for the two different questions that were utilized with the control group revealed that none reported an expectation of receiving payment; the other question, substituted for the third, asked the subjects to state how much pay would be appropriate for the entire experiment. This might be considered an indirect measure of satisfaction, that is,
if a subject reported that a very high rate of pay was appropriate then it might be concluded that he or she was dissatisfied whereas if a rate near the minimum wage was reported that might be evidence that there was more satisfaction with the task. Five of the six subjects in this group reported that minimum wage or lower would be appropriate, with the estimates ranging from $8.00 to $14.00. One subject answered that $40.00 would be an appropriate figure. It is not known how much dissatisfaction this might represent but the figure does appear to be rather inflated.

To summarize the analysis of the results, there were nonsignificant but practical differences on the clerical pretest distributions; the analysis of covariance for quantity performance was nonsignificant but there were the same practical differences; results for quality performance were highly significant with the participative group committing fewer errors than the second group (by multiple comparison) but not the third. Correlated sample t-tests between the first half-hour and the second and fourth half-hours did not reveal any performance decrement such as might be expected for a vigilance task. Results from the observational procedures revealed that the participative group emitted more positive statements but generated fewer ideas than the others. Postexperimental questionnaire results were taken to mean that most of the participants perceived that the manipulations took place and that participative subjects tended to rate the experimental task as more interesting (4.0--3.0--2.33) than the other two groups. Participative subjects also rated the pay higher than the other two groups and on a
composite score composed of pay and interest ratings tended to report higher satisfaction.

The next section will relate the results of this study to the literature which was reviewed earlier, discuss possible threats to validity, and suggest further avenues of investigation for researchers.
CHAPTER IV

DISCUSSION

Analysis of the data supported one of two major research hypotheses. Quality scores were significantly different between groups, however, multiple comparisons revealed that the participative group performed better than the expected payment group only. There were no significant differences on the quantity dimensions although there were large practical differences in mean performance levels. On the self report and observational data, it appeared that groups did differ. The participative group generated fewer alternatives, made fewer evaluative comments, and more positive or reinforcing statements. The participative group also reported more satisfaction with the task and the compensation.

In order to connect these findings to the body of previous research, it should be noted at the outset that trend of mixed results is continued, in that there was not a clear superiority demonstrated for the participative group on all dimensions. The participative group was only superior to one other group on the quality dimension while on quantity both other groups surpassed the performance of the participative group by large margins. It might be argued that the reason for the lack of statistical significant on the quantity dimension is an inflated error variance, which stems from large variability within groups. However, the manipulation appears to have reduced the variability in the participative group on the quality dimension resulting in superior performance. Perhaps
quality performance is affected by participation as suggested by proponents of "Japanese management."

Also, the psychological mechanism which the manipulation attempted to tap was not a cognitive one as proposed by Locke and Schweiger, since the task was simple and repetitive, but a motivational one. This implies that since the task was easy to perform, it was postulated that subjects would respond better on dependent variable dimensions if they had participated in the design of the experimental contingency. This was why no other behavioral operations except money were introduced and were actively avoided in order to allow any effects to show up in an undiluted form.

Field studies which were reviewed earlier are not directly pertinent but did establish a number of conceptual boundaries which were utilized in planning and conducting the experiment. First and foremost, as suggested by Morse and Reimer (1956), it was determined to place as much of the decision making power for the experiment as possible in the hands of the subjects. Reasoning that matters which would affect them during the experiment would, if decided by the subjects themselves, enhance their sense of control or ownership, the manipulation consisted of generation and choice of alternatives by the subjects. This is diametrically opposed to traditional models of experimentation in which the experimenter, having derived explicitly hypotheses and a design to confirm or disconfirm them, recruits his subjects and controls them to put them "through their paces." They come into the experimental setting and are told what to do from the start.

Second, following Neider (1980) both participation and rewards were linked. Even though her design stressed cognitive over motivational
aspects, it was believed that motivational aspects must have played a large role in determination of levels of effort expenditure in that experiment. Much the same situation, albeit on a smaller scale, might occur in a laboratory setting. Subjects, when confronted with an experimental task, decide how much effort to expend on performance. This could occur at one time for all dimensions or separately. This interturn leads obliquely to the question of what self generated processes might have impacted performance based on the fact that subjects were in an "experiment" which may have been their first such experience. Much has been written about demand characteristics and it must be assumed that this is another influence on behavior in a experiment which is additional to obvious sources such as participation, money, or credit. What subjects "expect" when they enter an experimental setting should be further investigated. For example, one subject noted on the questionnaire that he believed that the experimenter was observing him through a two way mirror.

Third, this study incorporated elements of the Jenkins and Lawler (1980) experiment in that subjects determined their rates of pay, within limits. Conceivably they might have determined other elements such as pay delivery, since there are other elements of pay than just amount. Consistent with the findings of Kidd and Christie (1961), this study found that participation/incentive subjects were not better in all phases of performance but rather on a subset, in this case the quality dimension but not the quantity. Due to the fact that there
was only one experimenter it was not possible to control for characteristics of the experimenter.

Turnage and Muchinsky (1976) used two tasks, one high and one low in intrinsic motivation, whereas the present investigation used only one that would be classified by those researchers as low in intrinsic motivation. While the participation in this study seems to have been more realistic and inclusive (as compared to choice or no choice of reward in the previous experiment), the results obtained were the opposite of that study—choice subjects (participative) made fewer errors in this investigation. However, the apparently greater amount of participation makes comparison between the studies inevitable.

Comparisons between this study and that of Skuja and Sheehan are hindered by the exploratory nature of their design. Persistence, the dependent variable in that study, was not assessed here but all subjects did persist in this study, despite notification that they could leave at any time without penalty. Possibly this was due to the fact that class credit was received. However, the three subjects who were recruited outside of classroom settings continued throughout.

A summary of the relationship between these findings and those of other researchers reveals that inconclusive results continue to predominate. Results here suggested that participation might improve simple clerical task performance.

Another step that should be taken during research is the presentation and evaluation of rival hypotheses that might also explain the observed results. If these can be rejected then one can have more
confidence in the supported hypotheses. A preliminary question relates to the effectiveness of the manipulation, that is, did the subjects reported that they participated. This is borne out by the observational data and the first question on the postexperimental questionnaire. A majority (4 of 5) of participative group subject subjects indicated that they had discussed various elements of the experiment and decided on them at the outset. There was no suggestion, via wording, as to the hypotheses. Generally it has been noted that demand characteristics manifest themselves when subjects know the hypotheses or discover them in the setting of the experiment. This did not happen here as a diversionary hypothesis was presented.

One rival hypothesis that could account for the smaller number of errors by the participative group is the quantity of task sheets they completed. In other words, they may have committed fewer errors because they did less. One way to evaluate this is through the product moment correlation between quantity and quality scores, which was .55 (Significant at the .05 level). This implies that quantity and quality were related, although the $r^2$ of .30 does not account for a great deal of the variability. Still, the fact that the correlation was significant, when linked to the large observed differences, makes this a tenable hypothesis.

A related possibility is that learning alone accounted for increases in quantity and decreases in errors. Recall that the t-tests for quality resulted in negative values for all groups but that only the tests on the participative group scores were significant. Since all values were
not significant, this would seem to indicate that any learning which took place was either insignificant or indetectable statistically. Also, the task's simplicity and the repetitive insertion decrease this possibility. Examining the data points, it is apparent that the curves are very gradual but that there is much variability in the two non-participative groups. The curves for the participative group are clustered tightly together. Since the task was not a group one there may be no plausible explanation for the reduced variability there. Even the formation of a social system or network, nascent as it must have been, could not readily account for performance of disparate individuals performing an individual task. Also, the experimenter was present in the room for most of the performance time and observed no interactions which might account for reduced output.

It also seems that there were not other events which occurred simultaneously in the lives of all subjects that might account for the results. Intervening events between sessions would also have had to exert an effect on all subjects to produce artifacts; this did not occur.

Another important element is suggestion of areas that might have been improved, in order that other researchers not make the same error or improve on their own designs. For the manipulation part of the study, there are other areas of potential participation which might have been utilized to increase subject perception of participation. One might be the work itself, which might be facilitated by having several tasks to select from. Decision elements that were used in this
study might be expanded on to include greater numbers of alternatives or new areas for participation. Behavioral operations that were not included such as feedback, goal setting, or performance standards might be used if there were design elements to separate their own effects from those of participation.

Also, since many researchers have suggested that subjects were not ready for participation or were unsure, a training component on group decision making should enhance participation. This has been done in several field studies but not yet in a laboratory study. One way to do this might be to present a classroom unit on group decision procedures and then select subjects from that class. Also, the time element in this study might have been extended longer than five hours to more closely simulate organizational reality. This experiment, though shorter than most field studies, was longer than the majority of laboratory studies reviewed.

Finally, the adequacy of laboratory investigations for the study of seemingly long term phenomena is doubtful. In addition to problems with time span and realism, there is a major problem with the meaning of a job to a worker (who depends on the earnings) versus an experimental task to a subject. Importance here is what an experiment means to a college student. Effects exerted here would be supplemental to those exerted by other reinforcers. This was essentially the situation that the control group subjects were in and their performance, on errors, was not significantly different from that of the participative group while their quantity performance was almost as good as that of the
incentive only subjects. So it appears that the controls turned in as
good a performance as the other two groups when both quantity and
quality scores are considered and combined.

It also seems that the experimental comparison would have been
improved if the schedule of payment had been contingent on quantity
and quality. That this was not done was due to the inability of the
experimenter to persuade or lead the group to decide on those schedules.
Subjects took the easiest option available to them, which has been
suggested and names the "limits of rationality" by systems pioneers
March and Simon (1958). Undoubtedly with more persuasion they could have
been induced to adopt a contingent schedule, which would have facilitated
a direct comparison between participation and contingent reinforcement.

Overall, this experimental experience has illustrated the
laboratory "fallacy" that was pointed out by Lowin (1968). It now
appears follish, in retrospect, to have selected an artificial setting
with concomitant lack of external validity to investigate what appears
to be (and has been called) a relatively long term phenomenon like
participative decision making. Added to this must be the evident
artificiality of the task, since nothing in the future of the subjects
depended on their performance on the experimental task. Even if the
task simulated a real life work situation, the plain fact is that this
laboratory experiment was a one time shot for the subjects. They would
not continue performing this task day in and day out as everyday
organizational performers would. Therefore, it must be concluded that
the external validity was very low or nonexistent so as to make generali-
izations unsupportable.
Given the short nature of the manipulation, despite the self reports it could be argued that performance was due to an "instruction effect" which was set up by the different manner and clothing used by the experimenter to differentiate the participative group from the other two groups. This was an element which differed from group to group so it cannot be ruled out experimentally. It could have been controlled easily, however, simply by adopting the same clothing and mannerisms across groups.

Finally, the observational results cannot be accepted confidently due to the lack of training of the observers. It is advisable in the future to ensure that all observers are trained and able to practice before the actual experiment is conducted.

Although performance on the quantity aspect of the task was not significantly different between groups, quality differences were highly significant. This suggests that the primary effects of participation on performance might be in the area of quality or quality control. There is already some suggestion of this in the writings of so called advocates of "Japanese management," which can be redefined as reapplication of American management principles in a different cultural context. From the "OK" program at Mitsubishi Industries to the "Tool Management Culture" promoted by Motorola, there appears to be support in nonscientific circles for the effects of participation on quality.

What is needed then, is research to clearly discriminate participatory effects on quality performance as well as the mechanisms by which beneficial effects are exerted. Perhaps it results in higher goals.
being set or perhaps the sense of involvement or "ownership" acts
to strengthen or motivate high quality performance. Another question
to be resolved is whether PDM strengthens existent quality performance
motivation or whether it builds a new structure.
APPENDIX A

QUESTIONNAIRES
DEMOGRAPHIC QUESTIONNAIRE

SO THAT I MAY PROPERLY DESCRIBE THE SAMPLE USED IN THIS EXPERIMENT, PLEASE FILL OUT THIS QUESTIONNAIRE:

AGE______  EDUCATIONAL LEVEL_____
SEX______  CLERICAL EXPERIENCE____
U.S. CITIZEN______  IF ANY, HOW LONG?____
POSTEXPERIMENTAL QUESTIONNAIRE #1

1. BRIEFLY DESCRIBE EVERYTHING YOU DID IN THIS EXPERIMENT STARTING WITH THE PRETEST.

2. PLEASE RATE THE EXPERIMENTAL TASK ON A SCALE FROM 1 TO 5 WITH 1 MEANING DISLIKE/BORING AND 5 MEANING LIKE/INTERESTING.

   .1.   .2.   .3.   .4.   .5.

3. WAS THE PAY ADEQUATE FOR THE TASK?

   .1.   .2.   .3.   .4.   .5.

   NO    ?    YES

4. WHAT STRATEGY DID YOU USE TO PERFORM THE TASK?

5. WERE AN INITIAL PROCEDURES CARRIED OUT AS SPECIFIED?

   .1.   .2.   .3.   .4.   .5.

   NONE  SOME  ALL

6. WHAT DO YOU THINK WAS THE PURPOSE OF THIS EXPERIMENT?

7. DID YOU TALK TO ANYONE OUTSIDE OF THE EXPERIMENT ABOUT IT?
POSTEXPERIMENTAL QUESTIONNAIRE #2

1. BRIEFLY DESCRIBE EVERYTHING YOU DID IN THIS EXPERIMENT STARTING WITH THE PRETEST.

2. PLEASE RATE THE EXPERIMENTAL TASK ON A SCALE FROM 1 TO 5 WITH 1 MEANING DISLIKE/BORING AND 5 MEANING LIKE/INTERESTING.
   .1.   .2.   .3.   .4.   .5.

3. WHAT WOULD BE A FAIR RATE OF PAY FOR THIS TOTAL (FOUR HOUR) JOB?

4. WHAT STRATEGY DID YOU USE TO PERFORM THE TASK?

5. WERE ANY INITIAL PROCEDURES CARRIED OUT AS SPECIFIED?
   .1.   .2.   .3.   .4.   .5.
   NONE   SOME   ALL

6. WHAT DO YOU THINK WAS THE PURPOSE OF THIS EXPERIMENT?

7. DID YOU TALK TO ANYONE OUTSIDE OF THE EXPERIMENT ABOUT IT?

8. DO YOU EXPECT TO GET PAID?
APPENDIX B

EXPERIMENTAL TASK INFORMATION
**TASK PROGRAM**

*** FUNCTION: CREATE A RANDOM PATTERN FILE

INTEGER PAGE (3240), LOOKUP (26), DIGIT (10), INDEX, RDM, 1

REAL SEED


DATA DIGIT /'0', '1', '2', '3', '4', '5', '6', '7', '8', '9'/

OPEN (UNIT=1, DEVICE=DSK, FILE='JIM'DAT', ACCESS='APPEND')

WRITE (5,1)

1 FORMAT ('ENTER A POSITIVE INTEGER UP TO 5 DIGITS: ')

READ (5,2) RDM

2 FORMAT (I)

DO 25 I=1, RDM
    INDEX=IFIX(RAN(SEED))
25 CONTINUE

INDEX=1

50 RDM=IFIX (RAN(SEED)*10.8) + 1
   IF (RDM .NE. 5) GO TO 200
   RDM = IFIX(RAN(SEED)*5.8) +3
   DO 100 I=1, RDM
       PAGE (INDEX) = ' '
       INDEX = INDEX + 1
100 CONTINUE
   GO TO 400

200 CONTINUE
   RDM = IFIX(RAN(SEED)*25.8) + 1
   IF (RDM .NE. 163) GO TO 300
   RDM = IFIX(RAN(SEED)*25.8) + 1
   PAGE (INDEX) = LOOKUP (RDM)
   INDEX = INDEX + 1
   GO TO 400

300 CONTINUE
   RDM = IFIX(RAN(SEED)*9.8) + 1
   PAGE (INDEX) = LOOKUP (RDM)
   INDEX = INDEX + 1

400 CONTINUE
   IF (INDEX .LT. 3200) GO TO 50

WRITE (1,3)

3 FORMAT ('!', '///', '#', '///', '///')

WRITE (1,4)(PAGE(I), I=1,3200)

4 FORMAT (X, 80AI)

STOP

END
## SAMPLE TASK SHEET

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