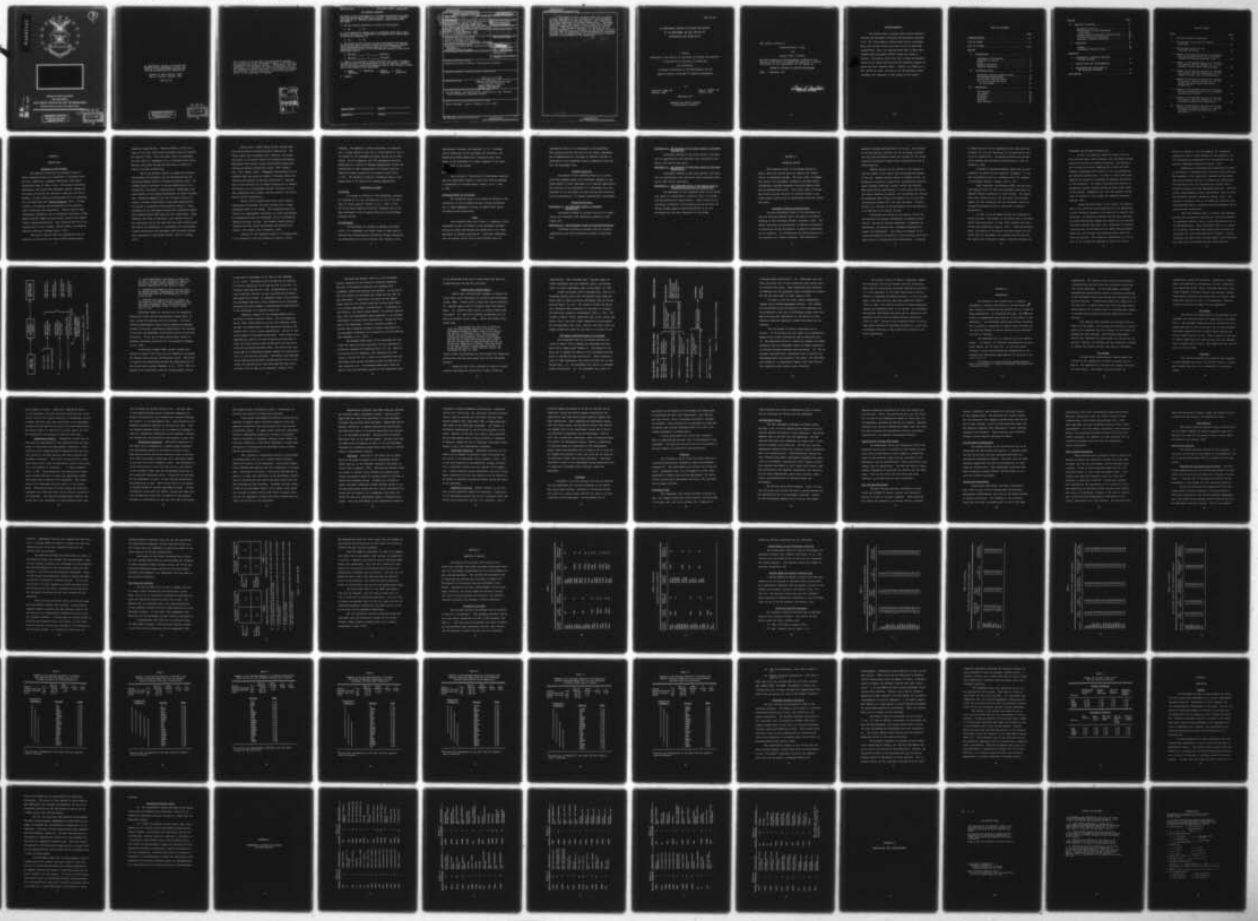
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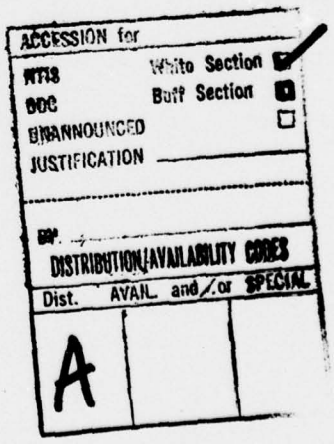
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The purpose of this research effort was to design a field experiment to test the effects of job enrichment and goal setting on worker satisfaction and productivity in a large Department of Defense organization. Individual demographic data and pretest survey results were obtained from the organization which is to participate in the experiment. This research includes: (1) the plan for the overall experiment; (2) a discussion of the threats to validity that must be considered in the experiment; (3) procedures, criteria, and recommendations for the selection of specific sections to participate in the experiment.

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AN EXPERIMENTAL DESIGN TO EVALUATE THE EFFECTS OF JOB ENRICHMENT AND GOAL SETTING ON SATISFACTION AND PRODUCTIVITY

A Thesis

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirements for the

Degree of Master of Science in Logistics Management

By

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TABLE OF CONTENTS

		Page
ACKNOWLEDGEMENTS		iii
LIST OF TABLES		vi
LIST OF FIGURES		viii
CHAPTER		
I	INTRODUCTION	1
	Statement of the Problem	1
	Definition of Terms	4
	Scope	5
	Research Objective	6
	Research Hypotheses	6
II	LITERATURE REVIEW	8
	Herzberg's Motivator-Hygiene Model	8
	The Hackman-Oldham Model	14
	Locke's Goal Setting Theory	19
	The Umstot Integrated Model of Job Design	20
III	METHODOLOGY	24
	The Setting	25
	The Sample	26
	Variables	26
	Treatment	34
	Measures	35
	Data Analysis	40

CHAPTER Page

IV ANALYSIS OF RESULTS 47

Grouping by Section 47
Establishment of the Preliminary Criterion 50
One-Way ANOVA and Duncan's Contrast Test. . . 50
Iterative Selection Procedure 50
Secondary Criteria Evaluation 64

V CONCLUSION. 68

Summary 68
Recommended Research Areas. 72

APPENDICES

A ALPHABETICAL LISTING OF SECTIONS BY TASK ACTIVITY. 73

B PRETEST-POST TEST QUESTIONNAIRE 79

C EXPLANATION AND FLOW CHART OF THE SELECTION PROCEDURE 97

BIBLIOGRAPHY 101

LIST OF TABLES

Table		Page
1	Sections Grouped for Analysis	48
2	Section Mean Scores for the Primary Variables	51
3	Section Mean Scores for the Secondary Variables	53
4	Summary of the One-Way Analysis of Variance and Section Mean Scores for the Primary Variable Motivating Potential Score	55
5	Summary of the One-Way Analysis of Variance and Duncan's Multiple Range Test for the Primary Variable Growth Need Strength	56
6	Summary of the One-Way Analysis of Variance and Duncan's Multiple Range Test for the Primary Variable JDS Job Satisfaction	57
7	Summary of the One-Way Analysis of Variance and Duncan's Multiple Range Test for the Primary Variable General Perceived Productivity.	58
8	Summary of the One-Way Analysis of Variance and Section Mean Scores for the Secondary Variable Goal Clarity	59
9	Summary of the One-Way Analysis of Variance and Duncan's Multiple Range Test for the Secondary Variable Goal Difficulty.	60
10	Summary of the One-Way Analysis of Variance and Duncan's Multiple Range Test for the Secondary Variable Satisfaction with Supervisor.	61

Table Page

11 Summary of the One-Way Analysis of Variance and Duncan's Multiple Range Test for the Secondary Variable Psychological Climate. . . . 62

12 Summary of the One-Way Analysis of Variance and Duncan's Multiple Range Test for the Secondary Variable Need for Achievement 63

13 Summary of Variable Mean Scores for the Selected Sections 67

LIST OF FIGURES

Figure		Page
1.	The Hackman-Oldham Model	15
2.	The Integrated Model of Job Design	21
3.	Factorial Design	45

CHAPTER I

INTRODUCTION

Statement of the Problem

The improved educational and economic status of today's American worker has contributed to discontent with the dull, repetitive, seemingly meaningless tasks which characterize many of today's jobs. The worker's attitudes, aspirations, and values have undergone dramatic changes but the nature of work has not evolved to keep pace with these changes. To many workers an interesting job is as important as a job which pays well (Work in America, 1973). Closely linked to job interest and satisfaction is the organization's efficiency and productivity. Factors such as high absenteeism, deliberate acts of vandalism, resistance to managerial induced change and poor product quality have significantly reduced productivity. This reduction has led to increased costs to the consumer, lowered output, and weakened American industrial strength (Percy, 1972).

The need to improve both the satisfaction and productivity of the worker is a major problem facing modern

industrial organizations. Research efforts to find solutions to this dual problem have proceeded along two separate but parallel lines. Since the early 1950s job enrichment has been used as a management tool to increase worker satisfaction, while goal setting has been used to achieve increases in worker productivity.

One of the earliest efforts to define the relationship between job enrichment and job satisfaction was the motivation-hygiene theory of Frederick Herzberg (1966). He proposed factors intrinsic to the work employees do (i.e., recognition, achievement, responsibility, advancement, personal growth) as the primary determinants of worker satisfaction. Herzberg suggested that the job should enable the worker to achieve satisfaction by providing opportunities for workers to experience these intrinsic factors. Early proponents of job enrichment believed that satisfied workers would perform better than those who were unsatisfied. These theorists felt that by enriching a job, workers would be more satisfied, and at the same time they would produce more. The failure of researchers to substantiate the relationship between satisfaction and performance has decreased the general acceptance of this belief (Porter, Lawler & Hackman, 1975).

Edwin Locke's (1968) theory of goal setting dealt with the problem of increasing worker productivity. The theory states that providing clear, specific, and acceptable goals to the worker results in increased performance. Researchers have found a strong relationship between goal setting and worker productivity (Locke, 1968; Latham & Yukl, 1975; Umstot, 1975). Management practitioners and researchers were now using one theory to increase worker satisfaction and another to increase productivity. The next step in the evolution of job design strategy was to combine the theories of job enrichment and goal setting to see if this combination would enhance both the worker's job satisfaction and his productivity.

Umstot (1975) conducted the first known research combining job enrichment with goal setting into a single integrated model of job design. The integrated model was tested as an experimental simulation in a field environment and demonstrated that job enrichment could be successfully combined with goal setting. The research showed positive increases for both worker satisfaction and productivity (Umstot, 1975; Umstot, Bell & Mitchell, 1976).

Research on the integrated model of job design needs to be continued to test the validity of Umstot's (1975)

findings. He suggested a similar experiment be conducted over a longer period of time (two to three months) to see if the effects of job enrichment and goal setting can be maintained. He also suggested that "the experiment should be replicated in a variety of ongoing organizations so that the complexities of real organizations can interact with the theoretical model proposed by the present study" (1975, p. 216). The validity of Umstot's integrated model of job design needs to be tested in an ongoing organization.

Definition of Terms

Job Design

Job design is defined as; "The deliberate, purposeful planning of the job, including any or all of its structural or social aspects" (Umstot, et al., 1976, p. 379). Two of the major separate structural components of job design considered in this research effort are job enrichment and goal setting.

Job Enrichment

Job enrichment, as defined by Hackman and Oldham (1976), is a management tool which "seeks to make jobs inherently more interesting and satisfying through adding such job characteristics as skill variety, task identity, task

significance, autonomy, and feedback" (p. 2). Although varied definitions of job enrichment are available, the Hackman and Oldham definition is presented since their theory of job enrichment is a major component of the integrated model of job design.

Goal Setting

Goal setting is "the process of developing, negotiating, and formalizing targets or objectives that an employee is responsible for accomplishing" (Umstot, et al., 1976, p. 381).

Integrated Model of Job Design

The integrated model of job design is defined as the combination of job enrichment and goal setting techniques into a single management strategy to enhance both worker satisfaction and productivity.

Scope

This research effort was limited to designing a field experiment to test the effects of job enrichment and goal setting on worker satisfaction and productivity in a large Department of Defense organization. Individual demographic data and pretest survey results were obtained from the

organization which is to participate in the experiment. This research includes the plan for the overall experiment and recommendations for selection of specific sections to participate in the experiment based on analysis of the pre-test and demographic data.

Research Objective

The purpose of this research effort was to accomplish the planning stages of an experiment designed to replicate Umstot's (1975) experiment in an ongoing organization. The objective of the experiment is to investigate the relationships of job enrichment and goal setting with productivity and satisfaction in a complex organizational environment.

Research Hypotheses

Hypothesis 1: Job Enrichment Leads to Increased Satisfaction

Individuals working in enriched jobs will be significantly more satisfied than individuals working in unenriched jobs.

Hypothesis 2: Job Enrichment Leads to Increased Production

Individuals working in enriched jobs will produce significantly more than individuals working in unenriched jobs.

Hypothesis 3: The Presence of Task Goals Leads to Increased Satisfaction

Individuals working in jobs with specific task goals will be significantly more satisfied than individuals working in jobs with no task goals.

Hypothesis 4: The Presence of Task Goals Leads to Increased Productivity

Individuals working in jobs with specific task goals will be significantly more productive than individuals working in jobs with no task goals.

Hypothesis 5: The Integrated Model of Job Design Leads to Increased Satisfaction and Productivity

The employment of the integrated model of job design will result in significantly increased levels of satisfaction and productivity among workers. These levels will be equivalent to measures of satisfaction and productivity obtained through separate operationalization of the job enrichment and task goal dimensions of job design.

CHAPTER II

LITERATURE REVIEW

The integrated model of job design proposed by Umstot (1975) has evolved from two separate but related schools of management thought. The first school of management theory, job enrichment, designed to increase worker satisfaction, includes Herzberg's motivator-hygiene model and the Hackman-Oldham model. The second school of management theory includes the work of Locke who sought to increase worker productivity by establishing individual worker task goals.

Herzberg's Motivator-Hygiene Model

The most influential theory of job enrichment has been the motivator-hygiene theory introduced by Frederick Herzberg in 1959 (Herzberg, Mausner, Snyderman, 1959). The theory classifies the determinants of employee satisfaction as motivators and the determinants of employee dissatisfaction as hygienes. Job satisfaction and dissatisfaction are not opposites on a single continuum. Each represents a

separate continuum characteristic of the job. The extremes of the satisfaction continuum are low or minimal satisfaction and high satisfaction while the extremes of the dissatisfaction continuum are high worker dissatisfaction and no dissatisfaction.

Hygiene factors are not related to the content of work but rather to the context and surrounding environment of the job. Hygiene factors consist of company policy, administrative practices, supervision, interpersonal relationships, working conditions, salary, status, and security. When these factors deteriorate to a level below that which the worker considers acceptable, job dissatisfaction results. By optimizing these factors the workers will not feel dissatisfied but neither will they feel satisfied. Dissatisfaction is a function of the environment while satisfaction is a function of the content of work.

Motivators are related to the content of work and are therefore the primary determinants of employee satisfaction. Motivators include achievement, recognition for achievement, interesting work, increased responsibility, growth, and advancement. Jobs should be designed to increase the quantity and quality of the motivators which will lead directly to increased worker satisfaction. Attention

to hygiene factors in the organization will make work more tolerable but will not contribute to increased worker motivation or productivity. Increasing motivation and productivity depends upon increasing the motivators in the job (Herzberg, 1966).

Although the motivator-hygiene theory has not been completely validated from an empirical standpoint, "it has been successfully used as a conceptual basis for numerous job enrichment efforts" (Umstot, 1975, p. 32).

Paul, Robertson, and Herzberg (1969) used the motivator-hygiene model in their job enrichment experiments at Imperial Chemical Industries in Great Britain. The experiments were conducted over a two year period and provided support for the contention that job enrichment results in increased satisfaction and, in some cases, increased productivity.

In 1970, a job enrichment project was initiated by United Airlines. The purpose of the project was to increase worker motivation which, in turn, would increase job satisfaction and productivity (Umstot, 1975). Using the Herzberg model, the results of the project provided support for the theory that job enrichment will increase job satisfaction. The results also indicated a weaker correlation between job

enrichment and increased productivity.

In 1974, the Ogden Air Logistics Center (ALC) at Hill Air Force Base, Utah initiated a job enrichment program under the direction of Frederick Herzberg. The objective was to enrich jobs where fragmentation of work and heavy workload requirements had resulted in low job satisfaction and decreased productivity. In order to enrich these jobs, emphasis was placed on increasing the quantity and quality of the motivators. The project succeeded and resulted in substantial monetary savings during the first eight months of the program. Management felt that even greater savings could be realized if the program was expanded (Herzberg & Rafalko, 1975).

During the first phase of the project, the measurement of job attitudes and satisfaction were not emphasized. In 1976, Herzberg returned to the Ogden ALC to measure these attitudes. He conducted interview sessions with employees and asked them whether changes had occurred in the satisfaction they received from their work. Herzberg's conclusions indicated that job satisfaction was higher among personnel whose jobs were enriched than among personnel whose jobs were not enriched. This change in satisfaction was the result of (1) allowing the employee to work on an entire

project as opposed to just one segment, (2) delegating supervisory tasks to lower echelons of the workforce, and (3) increasing the responsibility of the employee for the work he accomplished (Herzberg & Zautra, 1976).

Herzberg also interviewed the supervisors involved in the project to determine their attitudes toward the work. The responses of the supervisors supported the hypothesis that job enrichment results in increased job satisfaction. The supervisors felt job enrichment had allowed them to become more humane in their management practices. They had greater understanding of their subordinates' needs for fair and equitable treatment (Herzberg & Zautra, 1976). The results of Herzberg's work at the Ogden ALC indicated that job enrichment leads to increased worker performance and increased worker satisfaction.

While the Herzberg theory is popular with managers, and has been successfully employed as a basis for numerous job enrichment efforts, there is still some question as to its appropriateness. House and Wigdor (1967), in a review of 31 studies, found that those factors which satisfy one individual may cause dissatisfaction in another. Another conclusion was that within the same sample a given motivator may cause both job satisfaction and dissatisfaction.

Porter, Lawler, and Hackman (1975), after reviewing a number of research efforts using the Herzberg model, concluded that empirical support for the major tenets of the motivator-hygiene model was lacking. They found, "satisfaction and dissatisfaction can derive both from intrinsic job factors, and from extrinsic 'surround' factors" (p. 300). The Herzberg theory fails to consider the ways in which attitudes of the workers interact with the motivators affecting worker satisfaction. The motivator-hygiene theory also fails to specify how the presence or absence of motivators can be measured for existing jobs. This inability to measure the motivators makes a test of Herzberg's theory difficult to perform in an ongoing organization (Porter, et al., 1975).

> Because of the conceptual and empirical difficulties which have developed around the Herzberg theory, and especially considering the need to take explicit account of individual differences in needs and goals in designing work, an alternative conceptual approach may be called for [Porter, et al., 1975, p. 300].

The Herzberg model has been successfully implemented in organizational settings but has served its purpose. The motivator-hygiene model must now be superceded by a new model which will specify the predictor variables in a manner more applicable to rigorous research and which will consider

individual differences among workers (Umstot, 1975).

The Hackman-Oldham Model

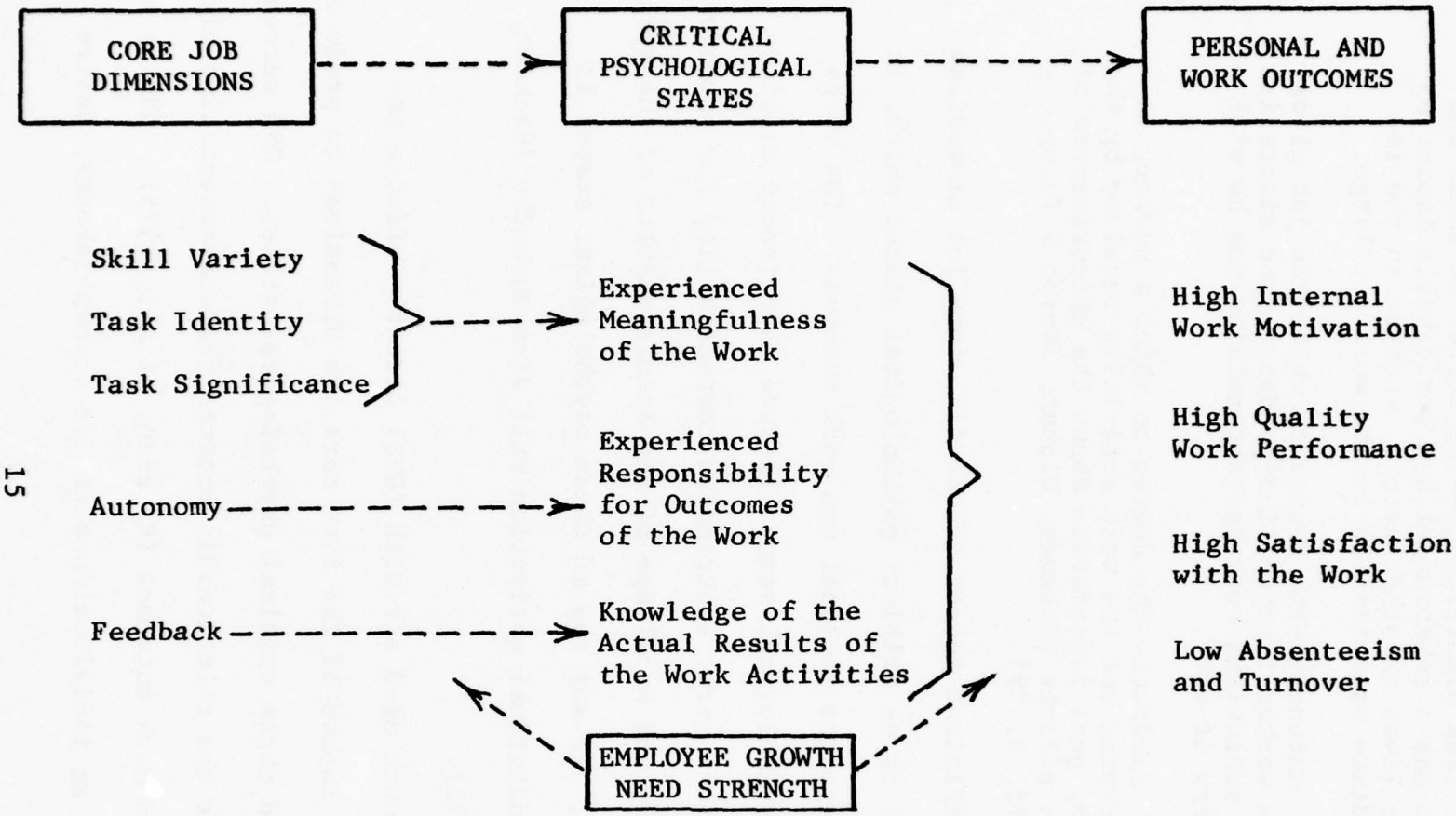
The work of Hackman and Oldham (1976) provided the tools necessary to accurately diagnose existing jobs by providing a blueprint for job design efforts (Figure 1). They present five measurable characteristics of a job called core job dimensions which when combined into a single equation, yield the motivating potential score (MPS). The complete equation is as follows (Hackman & Oldham, 1974):

$$\text{MPS} = \left[\frac{\text{Skill Variety} + \text{Task Identity} + \text{Task Significance}}{3}\right] \times (\text{Autonomy}) \times (\text{Feedback})$$

Those jobs with a low MPS are good candidates for job enrichment efforts while those jobs with a high MPS are considered to be enriched jobs already. Definitions of the five core job dimensions stated above follow:

1. Skill Variety--the degree to which a job requires the worker to perform activities that challenge his skills and abilities.

2. Task Identity--the degree to which the job requires completion of a "whole" and identifiable piece of work--doing a job from beginning to end with a visible outcome.



NOTE: Figure 1 is from Hackman and Oldham, 1974.

Figure 1. The Hackman-Oldham Model

3. Task Significance--the degree to which the job has a substantial and perceivable impact on the lives of other people, whether in the immediate organization or the world at large.

4. Autonomy--the degree to which the job gives the worker freedom, independence, and discretion in scheduling work and determining how he will carry it out.

5. Feedback--the degree to which a worker, in carrying out the work activities required by the job, gets information about the effectiveness of his efforts [Hackman, Oldham, Janson & Purdy, 1975, p. 59].

Sufficient inputs of the five core job dimensions produce the three critical psychological states which, in turn, produce the personal and work outcomes. The three critical psychological states include experienced meaningfulness of the work, experienced responsibility for outcomes of the work, and knowledge of the actual results of the work activities. If any one of these psychological states is missing, individual motivation will drop markedly (Hackman, et al., 1975).

Growth need strength (GNS) directly affects the ability of inputs of the five core job dimensions to produce the desired three critical psychological states. GNS serves to moderate the relationship between the characteristics of the job and work outcomes (Hackman, et al., 1975). GNS is a measure of an individual's need for accomplishment, desire

to grow and be challenged in all that he does (Hackman, et al., 1975). Individuals with low GNS will be difficult to motivate regardless of how high the MPS of the job. Individuals with high GNS will react enthusiastically to jobs with a high MPS, and will be more satisfied and productive than those with low GNS. An important advance over previous job enrichment theories is this consideration of individual attitudes and need strength in determining the applicability of job enrichment to a proposed target job.

Empirical support for the Hackman-Oldham model is provided by several research studies. The Job Diagnostic Survey (JDS), which measures the core job dimensions (MPS) and GNS, was administered to 1000 employees working at 100 diverse jobs in over a dozen organizations. Results of the survey support the Hackman-Oldham model. Those workers with high MPS were found to be more motivated and satisfied in their jobs while workers with low MPS were both less motivated and satisfied with their work. The results also supported GNS as a moderating variable between the characteristics of a job and work outcomes. Individuals with high GNS scores reacted more favorably showing greater levels of internal work motivation for jobs with high MPS than did individuals with low GNS scores (Hackman & Oldham, 1975).

The model was further tested in a job enrichment project conducted at the Traveler's Insurance Companies. The jobs of 98 keypunch operators and verifiers plus 7 assignment clerks were analyzed and enriched. At the end of the trial period, 60 personnel were doing the work that 98 had done before. Productivity increased for the experimental group by 39.6 percent while the control group showed a 8.1 percent improvement in productivity. In measures of satisfaction, the control group showed a 0.5 percent improvement, while the experimental group registered a 16.5 percent improvement in overall group satisfaction. During the first year of the experiment, Traveler's realized savings of $64,305 while potential savings by further application of job enrichment techniques were estimated at over $91,000 per year (Hackman, et al., 1975).

The Hackman-Oldham model of job enrichment has provided the theory and tools necessary for the researcher to accurately diagnose the characteristics of a job. Based on the results of this diagnosis, the researcher may then choose to enrich the job or reject the proposition that job enrichment would provide increased worker satisfaction for that particular job. The Hackman-Oldham model forms the basis of the job enrichment portion of the integrated model

of job design while the work of Locke forms the basis for integrating goal setting into the model.

Locke's Goal Setting Theory

Locke's goal setting theory attempts to explain the forces which cause individuals to increase work performance (Locke, 1968). Locke's work is based upon three assertions: (1) Specific goals result in greater output than general goals. (2) Difficult goals result in greater output than easy goals. (3) Goals will motivate performance only if they are accepted (Locke, 1968). Baldes and Latham (1975) stated that:

> . . . the setting of a goal that is both specific and challenging leads to an increase in performance because it makes clear to the individual what he is supposed to do. This in turn may provide the worker with a sense of achievement, recognition and commitment in that he can compare how well he is doing now versus how well he has done in the past and in some instances how well he is doing in comparison to others. Thus the worker is not only incited to expend greater effort, but he may devise better or more creative tactics for attaining the goal [p. 124].

Locke's theory could provide the link between job design and productivity that has been absent from the job enrichment theories.

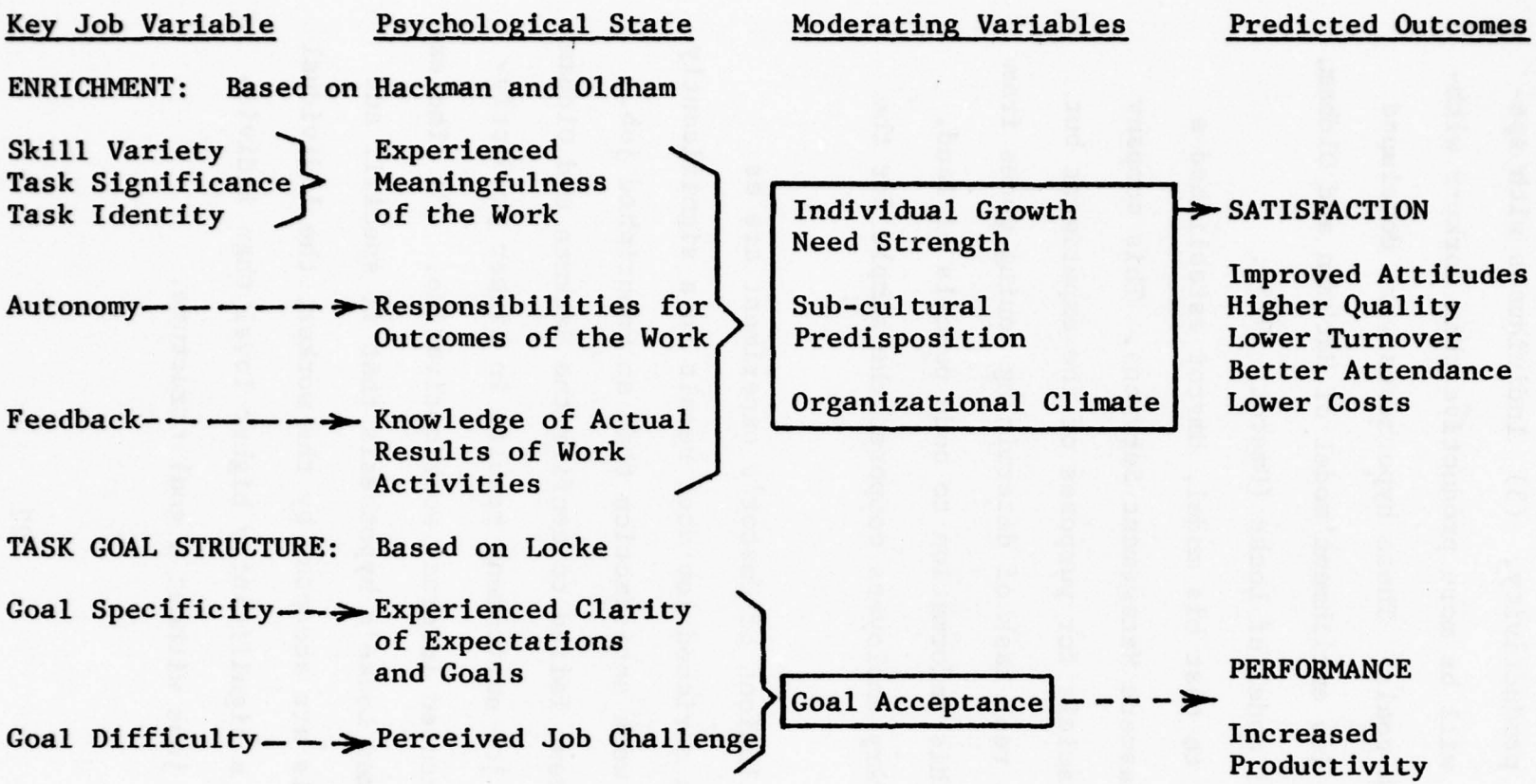
Latham and Yukl (1975) reviewed 27 reports of field research concerning the application of goal setting in

organizations. They concluded that, "specific goals increase performance and that difficult goals, if accepted, result in better performance than do easy goals" (p. 840).

Steers and Porter (1974) concluded that, "the act of providing subjects with clear and specific goals does generally tend to result in better performance than not providing such goals" (p. 437). The review by Steers and Porter also "indicates that acceptance of task goals is strongly and positively related to performance" (1974, p. 435). The reviews of Umstot (1975), Latham and Yukl (1975), Steers and Porter (1974), and Locke (1968) demonstrate strong support for the hypothesis that clear, specific task goals result in higher productivity than "do your best" or no goals at all.

The Umstot Integrated Model of Job Design

The integrated model of job design proposed and tested by Umstot (1975) combined job enrichment and task goals into a single model (Figure 2). The purpose of his study was to examine the effects of job enrichment and task goals on satisfaction and productivity. Umstot proposed a total of eight hypotheses, only three of which will be summarized here. (1) Job enrichment will result in increased worker satisfaction. (2) Job enrichment will result in



NOTE: Figure 2 is from Umstot, 1976.

Figure 2. The Integrated Model of Job Design

increased worker productivity. (3) Individuals with specific task goals will be more productive than workers without specific task goals. These hypotheses were developed by combining the job enrichment model of Hackman and Oldham, and the task goal model of Locke (Umstot, 1975).

In order to test his model, Umstot established a company called Cascade Management Services. This company was established solely for purposes of the experiment but did accomplish a real task of determining zoning codes from maps and using this information to code parcels of land. Forty-two temporary employees composed the sample for the research.

The conclusions of Umstot's experiment are as follows: (1) An enriched job does result in a significantly higher level of work satisfaction than an unenriched job. (2) The experiment failed to confirm the Hackman and Oldham hypothesis that job enrichment results in higher productivity through increased internal work motivation. (3) The experiment confirmed Locke's hypothesis that if specific and challenging goals are accepted by the worker, the individual will produce at a significantly higher level than individuals working in jobs without a goal structure.

The overall results of Umstot's experiment support the contention that job enrichment improves satisfaction while specific challenging task goals improves productivity. It is also important to note that "there were no adverse effects of combining enrichment and goals; in fact, in some cases, there may even have been some beneficial effects" (1975, p. 203). The results of Umstot's research generally support the integrated model of job design; "job enrichment and specific challenging task goals may be combined so that employees are both more satisfied and more productive" (1975, p. 203). Testing of the integrated model of job design should continue by operating the model in a true field environment involving a large established production oriented organization.

CHAPTER III

METHODOLOGY

The purpose of this research was to design an experiment to evaluate the effects of job enrichment and goal setting on satisfaction and productivity in a large on-going organization. To accomplish this goal, four sections within the organization were selected to participate in the experiment.[1] Job enrichment and/or goal setting treatments will be applied to personnel in three of these sections and the resulting changes in worker productivity and satisfaction will be measured.

The experiment will be conducted in three separate phases: (1) Pretest, (2) Treatment implementation and gestation period, and (3) Post test. In the first phase (Pretest) a survey questionnaire was administered to 656 personnel who represented approximately 120 sections in the

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[1]A section is a group of people working together, under the direction of a supervisor/manager performing similar specific tasks.

organization. The results of this survey were analyzed to determine which sections should be selected for participation in the experiment. In the second phase (Treatment implementation and gestation period) a treatment consisting of job enrichment and/or goal setting will be applied to the selected sections. A three month period will ensue prior to the post test. In phase three (Post test) the same survey questionnaire will be administered to determine what changes in satisfaction and productivity have taken place in the sections.

This chapter first describes the setting of the research and the sample. The criteria for selection to participate in the experiment and the variables in the overall experiment are then examined. The different measurement devices that comprised the pretest/post test durvey are summarized. Finally, the treatment and the techniques utilized to examine the pretest and post test data are discussed.

The Setting

A large Federal administrative support agency was selected as the organization in which to conduct the research. The organization is divided into support functions and directorates. The support functions within the

organization include the following: Information, Surgeon, Legal, and Comptroller; Directorates include: Administration, Personnel Records, Plans, Personnel Resources, Individual Programs, Personnel Actions, and Personnel Systems. These support functions and directorates are further subdivided into sections of from 1 to 33 personnel. Selected sections will form the samples for the experiment.

The Sample

The pretest was administered to 656 employees in 120 different work sections within the organization (see Appendix A). The personnel taking the survey included male and female employees as well as military and civilian personnel. Individuals ranged from GS-3 to GS-14 while military employees ranged from E-3 to O-6. Time in grade for the overall group ranged from less than one year with the organization to greater than 10 years. Age ranged from less than 21 years to over 60 years.

Variables

This section identifies and describes the independent and dependent variables, and possible threats to experiment validity that are to be considered in the research design.

Independent Variables

The two independent variables will be job enrichment and goal setting. Three of the four sections will be administered the job enrichment and/or goal setting treatment. The fourth section will serve as the control group. The sections will receive the following treatments:

Section	Treatment
1	Job Enrichment and Task Goals
2	Job Enrichment
3	Task Goals
4	Control Group

The treatments will be applied to test the effects of these independent variables upon the dependent variables job satisfaction and productivity.

Dependent Variables

The two dependent variables will be job satisfaction and productivity. These variables will be measured on the pretest and post test. The change scores from pretest to post test will then be analyzed to determine if satisfaction and productivity changed as a result of applying the job enrichment and/or goal treatments.

Controls to Counter Threats to Validity

The researchers will attempt to define ways to control the following threats to insure the experiment's

validity. These threats include: history, testing, compensatory rivalry, statistical regression, selection, experiment mortality, and the attitudes of supervisors of the sections. A brief discussion of each threat follows.

History. History is an observed effect due to an event which occurs between the pretest and the post test (Cook & Campbell, 1976). This event could influence the control and/or experimental groups. Possible events are a change in company policy or procedures, a change in office supervisors, or the introduction of more efficient production methods such as automation and computer technology. In order to avoid this problem an attempt was made to insure that those groups selected as either experimental or control groups were not scheduled for any major changes to their work environment during the course of the experiment.

Testing. Testing may adversely affect results because the same test is taken a number of times (Cook & Campbell, 1976). In this experiment the pretest and post test will be the same. There will not be an adverse effect due to taking the same test twice if the individuals (subjects) answer the questions honestly as it is believed they will. Pretesting may cause the experimental (treatment) groups to show greater gains in satisfaction and productivity than they

would without a pretest. Employees, knowing the nature of the experiment (sections and their supervisor are volunteers), may key off certain questions in the pretest in such a manner that they react more positively to job enrichment and goal setting than had the pretest not been administered. The pretest effect is expected to be quite small, but will be considered in the analysis of the post test data.

Compensatory Rivalry. Compensatory rivalry may result when all participants in the experiment know the exact nature of the control and experimental conditions. Conditions of social competition may be generated when the control section or sections perceive they have received less desirable treatments. "This result is particularly likely where intact units (such as departments, plants, work crews, etc.) are assigned to treatments . . ." (Cook & Campbell, 1976, p. 228). These groups may view themselves as underdogs striving purposely to reduce any significant differences which may be caused by the treatments. The control group in the experiment will not know it is the control group. This group and all the other groups not receiving treatments will know that they are not directly involved in the experiment. The nonparticipating groups, however, may assume that their performance is being measured since they

will be taking the pretest and post test. This may result in the nonparticipating groups displaying unexpected increases in productivity and satisfaction, thereby affecting the validity of the experimental data. This problem will be addressed during the analysis of the post test data. Various nonparticipating offices will be tested and compared to check for significant differences in the dependent variables job satisfaction and productivity from pretest to post test.

Statistical Regression. Statistical regression is the effect due to respondents or samples being classified into experimental groups on the basis of pretest scores. High pretest scorers may score relatively lower on the post test, while low pretest scorers may score relatively higher on the post test (Cook & Campbell, 1976). The difference in scores from pretest to post test may not be a true measure of the treatment effect upon the experimental group due to the statistical regression factor. Groups will be selected for the experiment, in part, on their initial satisfaction and productivity scores. These scores should be as similar as possible among the various experimental groups. If mean satisfaction scores were not similar, groups with lower pretest satisfaction scores will be expected to show greater increases in satisfaction on the post test than those groups

with higher pretest satisfaction scores. Statistical regression also applies to productivity measures.

Those groups with higher productivity scores will be expected to exhibit smaller positive changes in post test measured productivity than would groups with lower pretest productivity scores. To negate these statistical regression problems, experimental groups will initially be selected based on similarity of dependent variable scores within the practical limitations of the field experiment to insure that each group is starting with the same mean levels of satisfaction and productivity.

GNS, treated as a moderating variable in the Hackman and Oldham model, may act as a variable which adversely affects the results of the experiment. Groups with dramatically different GNS measures may react differently to enrichment. According to the model, a group with high GNS may be expected to react more positively to job enrichment, displaying more satisfaction with their work than a group with low GNS receiving the same treatment. Although the exact effect of GNS on job enrichment efforts is not known, every effort will be made to achieve similar GNS levels in groups selected for the experiment to insure that this variable does not affect the validity of the experiment.

Significantly different mean MPSs among the sections may adversely affect experiment validity. Sections with higher MPSs may react less positively to a job enrichment treatment than sections with lower MPSs. Higher MPSs may be equated, indirectly, to greater satisfaction with present work which may result in decreased sensitivity and reaction to a job enrichment treatment. Sections with low initial MPSs would react in the opposite manner. Sections with similar MPSs would be expected to react to the job enrichment treatment in a consistent manner which would have no adverse affect on experimental validity.

Selection. Selection is the effect due to differences in the types of people in the experimental groups rather than due to the different treatments each group receives (Cook & Campbell, 1976). Selection may become a serious threat to validity since sections are already established and subjects cannot be randomly placed in sections to balance the treatment groups. Attempts will be made to equate individual differences among treatment groups by selecting those groups having the most similar characteristics. Groups must be looked at as a homogeneous unit which can either be used as an experimental group or discarded altogether. The work environment of the organization cannot be

disturbed to insure randomness within groups. Comparison factors will include age, sex, education, military/civilian status, years in present job, and either military rank/ General Schedule (GS), Wage Board (WB), or Wage Supervisor (WS) grade of the individual respondent. The effects of differences among groups in any of these variables is not known. Analysis of the post test results, where possible, will be made against each of these variables to determine if measured changes are due to individual differences among groups or due to the experimental treatments.

Experiment Mortality. Experiment mortality is the effect due to changes in personnel within the groups over the course of the experiment (Cook & Campbell, 1976). Due to the short duration of the experiment, changes attributable to personnel turnover are not expected to be significant. Should turnovers become substantial, the size of each sample considered for post test analysis will be reduced by the number of personnel joining the sample during the course of the experiment.

Supervisor Attitude. Another variable is the attitude of each supervisor toward the experiment. Supervisors in the experimental groups will be all volunteers, while the control group supervisor need not be a volunteer. Due to

positive support and desire to do well on the part of the supervisor, groups may achieve greater satisfaction and productivity than they would without positive support from their supervisors. When comparing the experimental groups with the control group, the possibility exists that some of the changes noted in the experimental groups may be due to the supervisor's enthusiasm for the experiment. This effect, due to supervisor enthusiasm, cannot be measured among the control and experimental groups. However, comparisons of attitudes among the supervisors in the experimental groups toward the experiment will be made to try to rule out any changes from pretest to post test which may be caused by the supervisor rather than by group attitudes. Individual interviews of each of the experimental group supervisors will be conducted to determine their attitudes toward the experiment.

Treatment

Personnel in the four sections that will be selected for this experiment will receive treatments of job enrichment and/or goal setting. Personnel in the fourth section will serve as a control group, and will not know of its participation in the experiment. Job enrichment will be

introduced in accordance with the Hackman and Oldham model by increasing the job's task significance, task identity, and task variety, and by increasing the worker's autonomy and feedback. Goal setting will be introduced by using participative goal setting techniques which will lead to increased acceptance of planned goals.

A three month period will follow the treatments prior to administering the post test to participants in the experiment. The data from the post test will be analyzed to evaluate changes in productivity and satisfaction.

Measures

The instrument used to create and gather data was a structured questionnaire designed by Umstot and Rosenbach (Appendix B). The questionnaire was divided into seven sections: demographic data, the Job Diagnostic Survey (JDS), organization climate, goal setting measurement, job satisfaction, productivity measurement questions, and individual need strength questions.

Demographic Data

The demographic data section included questions on age, sex, highest educational level attained, civilian grade or military rank, and time in present job. Responses to

these questions were used as supplementary data in analyzing and selecting the sections for the experiment.

Job Diagnostic Survey

The JDS, developed by Hackman and Oldham (1974), provides a tool to aid in applying their theory of work design and employee motivation to work situations. The survey measures each of the five core job dimensions. The MPS computed from these five dimensions can range from 1 to 343 with an "average" score being 124. The JDS also includes supplemental measures which will provide a better understanding of job characteristics. These additional measures include feedback from agents (performance feedback from supervisors or co-workers), dealing with others (degree to which work requires individuals to work closely with others), general satisfaction, and specific satisfaction (job security, pay and other compensations, peers and co-workers, supervision, and opportunities for personal growth and development).

The JDS will serve three purposes. First, the pretest JDS scores will provide the data to analyze offices for the applicability of a job enrichment treatment. Second, the JDS satisfaction measure will be used as the primary

measure of employee satisfaction for both the pretest and the post test. Third, the pretest and post test JDS scores will be used in the manipulation checks to insure that the job enrichment treatment was applied as intended. Empirical testing of the survey by Hackman and Oldham (1974) has shown the JDS to possess both satisfactory internal consistency reliabilities, and adequate discriminant validity.

Organizational Climate Measurement

The measurement device was developed by Umstot and Rosenbach and was used to determine to what degree the sections could be described as either organic or mechanistic. Scores on the questions range from one (describes a very mechanistic type of organization) to seven (describes a very organic type of organization). The data was used as supplementary information in selecting the sections for the experiment. This was the first time this device was used, therefore its validity has not been established.

Goal Setting Measurement

The goal setting questions, developed by Steers (1976) and modified by Umstot, measure the individual's ability to relate to the goal treatment. These questions will enable the researchers to develop indices to measure

clarity, difficulty, and acceptance by individual workers of the assigned goals. The questions will provide support for the contention that changes in productivity were the result of goal setting. Scores on these questions range from one (question response--very inaccurate) to seven (question response--very accurate). These questions were validated through a factor analysis performed by Umstot.

Job Satisfaction Measurement

The primary measure of job satisfaction will be obtained from the JDS satisfaction measure. A secondary measure will be the four questions measuring individual job satisfaction developed by Hoppock. The scale used for these questions ranges from one (low job satisfaction) to seven (high job satisfaction). This measurement device has been used in numerous research efforts, and has proven to be a valid and reliable instrument.

Productivity Measurement

Productivity measurement questions, developed by Mott (1975) as part of his organizational effectiveness measurements questionnaire, were used as the primary measure of worker productivity. The responses to the questions range from one (very low productivity) to five (very high

productivity) with three representing average productivity. Empirical testing has proven the overall validity of the organizational effectiveness questionnaire (Mott, 1972). This experiment used only a specific portion of the overall questionnaire. For this reason, and because these questions measure the subjective perceived productivity of the individual respondent, the responses to these questions will be verified by personal interview with the experimental section supervisors.

Need Strength Measurement

These questions were developed by Umstot, Steers and Hackman to measure the individual's growth and social need strength, his need for achievement, and his existence need strength. Scores on these questions range from one (low individual needs) to seven (high individual needs). Individuals with high need strength scores will react more favorably to jobs with a high MPS. Growth need strength was considered by the researchers to be a variable of primary importance in determining which sections would benefit most from a job enrichment treatment. The need for achievement variable provided supplementary information on the overall characteristics of the sections. The questions have

been used and tested by Umstot, Steers and Hackman in their research and have proven to be reliable and valid.

Data Analysis

The pretest data was analyzed using a one-way analysis of variance (ANOVA) and Duncan's multiple range test. The post test data will be analyzed using a two-way ANOVA and Duncan's test (Senter, 1969).

Pretest Data Analysis

The pretest data was analyzed for two purposes: (1) To select the sections to participate in the experiment, and (2) to provide data against which to compare the post test scores.

Experimental Group Selection Procedure. For ease of data manipulation the 120 sections were grouped by similarity of work task into sections with a minimum of 10 personnel. A section with 10 personnel was selected by the researchers as the minimum size for statistical analysis.

Thirty-two variables were computed for each individual based on his/her responses to the questionnaire. From these variables and the section composite demographic data, were chosen those variables which formed the basis of the experiment selection criteria. Nine of the computed

variables were selected and divided into two categories. The first category included variables considered by the researchers to be of primary importance and the second category included variables considered to be of secondary importance in the section selection process. Variables of primary importance included MPS, GNS, JDS job satisfaction, and general perceived productivity. Variables of secondary importance included goal clarity, goal difficulty, satisfaction with supervisor, psychological climate and need for achievement. Additional data included in this second category were the demographic data variables age, rank, and time in job.

The sections met the following criteria established for the primary variables if they were to be considered in the selection process: (1) Low MPS, (2) Medium to high GNS, (3) Low JDS job satisfaction, and (4) Low perceived productivity. The researchers believed the sections possessing primary variable scores in these ranges would benefit most from a job enrichment and/or goal setting experiment. It was desirable that none of the sections selected under these criteria have primary variable scores significantly different from one another.

Secondary variable scores were considered as additional data to be used in selecting the sections for the experiment. The researchers felt it was desirable but not essential that the sections selected by the primary variable criteria also meet the following secondary variable criteria: (1) Low goal clarity, (2) Low goal difficulty, (3) Medium to high satisfaction with supervisor, (4) Medium to high values for the psychological climate variable, and (5) Medium to high need for achievement. Although it was desirable the sections show no significant differences from one another for these variables, this was not an essential requirement of the experiment.

The demographic variables were used as checks of consistency for the primary and other secondary variables. If extreme differences were noted in the composite demographic variables among sections the researchers expected that differences would be manifested in a similar manner among the other primary and secondary variables.

Section mean scores were computed for each of the selected nine variables. The researchers felt the most critical of the primary variables was MPS. All sections with a mean MPS of 124 or above (average job MPS for the American work force) were not considered for further

analysis. Demographic data was also compiled for each section. A one-way ANOVA and Duncan's contrast test were performed for each of the nine variables across all the sections thus far selected.

An iterative procedure was established to assist in selecting the final four sections for the experiment. Only the four primary variables were considered in this procedure. From the distribution of the section mean scores for each variable, a cut-off value was initially determined. These cut-off values were arbitrarily chosen to reduce the number of sections considered for further analysis. The cut-off values were in no way designed to dictate the final selection criteria but were used to determine a starting point for ultimately selecting the best four sections for the experiment.

Those sections which fell within the cut-off range for each primary variable were selected. The previously computed Duncan's contrast test was checked to see if the sections were not significantly different for each of the four primary variables. If fewer than the desired number of sections were obtained (four), the initial cut-off values would be relaxed to allow more sections to be considered in the selection process. If substantially more than the

required number of sections (over six) met the cut-off and not significantly different criteria then the initial cut-off criteria would be tightened to reduce the number of sections selected for further consideration.

The purpose of the overall procedure was to select the four sections which best met the following two criteria: (1) Most desirable primary variable scores, and (2) No significant differences among sections for the four primary variables (see Appendix C for explanation and flow chart of the selection procedure).

Post Test Data Analysis

The two-way ANOVA will be used to compare sections in terms of their satisfaction and productivity scores. These scores will be determined by taking the difference between the individual pretest and post test scores. The analysis will be performed twice, once using satisfaction as the dependent variable and once using productivity as the dependent variable. In both cases, the independent variables will be job enrichment and goal setting (see Figure 3).

A manipulation check will also be performed using the same ANOVA technique. This check will measure changes in the five core job dimensions and the respondent's MPS.

	Goal Setting Treatment	No Goal Setting Treatment
Job Enrichment Treatment	x_4	x_3
No Job Enrichment Treatment	x_2	x_1

ANOVA 1

(Dependent Variable--Satisfaction)

	Goal Setting Treatment	No Goal Setting Treatment
Job Enrichment Treatment	x_4	x_3
No Job Enrichment Treatment	x_2	x_1

ANOVA 2

(Dependent Variable--Productivity)

x_4 = Individual satisfaction or productivity scores for section that had treatment of job enrichment and task goal setting.

x_3 = Individual satisfaction or productivity scores for section that had treatment of job enrichment.

x_2 = Individual satisfaction or productivity scores for section that had treatment of task goal setting.

x_1 = Individual satisfaction or productivity scores for section that had no treatment (control section or group).

Figure 3. Factorial Design

The manipulation check will help insure that any changes in satisfaction and productivity are the result of the job enrichment and goal setting treatments.

After the ANOVA is performed, if there is a significant effect due to enrichment, goal setting, or interaction of the two, a Duncan's test will be used to determine which effects are significant. This test will compare the mean scores for the sections and determine which sections are significantly different from one another. The test will be performed three times, once using the mean satisfaction scores of the sections, once using the mean productivity scores of the sections, and once for the manipulation checks.

The exact alpha levels of the ANOVA and Duncan's test will be computed. Any test with an alpha level of 0.05 or less will be considered significant. Any test with an alpha level greater than 0.05 but less than 0.10 will be considered marginally significant and alpha levels of 0.10 or more will not be considered significant.

All the statistical analysis performed during this experiment used the Statistical Package for the Social Sciences (SPSS) computer programs (Nie, Hull, Jenkins, Steinbrenner & Bent, 1975).

CHAPTER IV

ANALYSIS OF RESULTS

The purpose of the pretest data analysis was to select four sections from within the agency which would best meet the requirements established for the job enrichment and goal setting experiment. The criteria and procedures used in selecting the sections were described in Chapter III. The analysis of the pretest data was performed in four phases: grouping of sections, establishment of the preliminary criterion, the one-way ANOVA and Duncan's contrast test for all selected groups and variables, the iterative selection procedure and secondary criteria evaluation.

Grouping of Sections

The 120 work sections were grouped into 29 sections of from 10 to 33 personnel. This grouping procedure reduced the total sample considered from 656 to 496 personnel (see Table 1). Some work sections contained less than 10 personnel and performed tasks dissimilar from any other section. The 160 personnel in these sections were not considered

TABLE 1

Sections Grouped for Analysis

Original Section	Coded Section	Number Personnel	Original Section	Coded Section	Number of Personnel
DAA	DA	11	DPD	DPD	14
DAAC			DPDO		
DAAO			DPDOD		
DAAS			DPDOI		
DAD	DAD	12	DPDOO	DPDOO	12
DADM			DPDOR		
DADP					
DADY			DPFDA	DPFDB	19
DAW	DAW	32	DPFDB		
DAWA			DPFDD	DPFDD	19
DAWB					
DAWC			DPFDF	DPFDF	13
DPAA	DPAA	22	DPFM	DPFM	12
DPAAD			DPFMA	DPFMB	20
DPAAR	DPAAR	22	DPFMB		
DPAB	DPAB	21	DPFRB	DPFRB	21
DPABP			DPFRC	DPFRC	18
DPACB	DPACB	19	DPFSB	DPFSB	22
DPACC	DPACC	24	DPRA	DPRA	13
			DPRAA		

TABLE 1 (continued)

Sections Grouped for Analysis

Original Section	Coded Section	Number of Personnel	Original Section	Coded Section	Number of Personnel
DPAC	DPAC	10	RTPU	RTPU	10
DPACA			RTPUA		
DPRO	DPRO	17	RTPUC		
DPROA			RTPUM		
DPROB			RTPUO		
DPROC			RTPX	RTPX	19
DPROD			RTPXA		
DPROP			RTPXP		
DPROS					
DPRP	DPRP	20	RTT	RTT	11
DPRPA			RTTI		
DPRPB			RTTS		
DPRPR			RTTT		
DPRS	DPRS	20	XPA	XPA	14
DPRSB			XPAP		
DPRSC			XPAQ		
DPRSD	DPRSD	14			
RTP	RTP	15			
RTPAR					

further as possible candidates for the experiment.

Establishment of the Preliminary Criterion

The section mean scores for each of the primary and secondary variables were computed (see Tables 2 & 3). Any section with a mean MPS of 124 or above was not considered for further analysis. This decision reduced the number of sections considered to 20.

One-Way ANOVA and Duncan's Contrast Test

A one-way ANOVA and Duncan's contrast test were performed on the 20 sections to determine which sections were not significantly different from one another in terms of the primary and secondary variables (see Tables 5 thru 7 & 9 thru 12). MPS and goal clarity were the only variables which displayed no significant differences at the 0.05 alpha level for any of the 20 sections (see Tables 4 & 8).

Iterative Selection Procedure

The iterative selection procedure was accomplished using the four primary variables. The initial cut-off values chosen for these variables were:

(1) MPS - Less than or equal to 90.0.

(2) GNS - Greater than or equal to 5.0.

TABLE 2

Section Mean Scores for the Primary Variables

Section	Motivating Potential Score	Growth Need Strength	Job Satisfaction	Perceived Productivity
DA	74.13	4.95	2.76	2.94
DAD	67.24	6.19	3.25	3.08
DAW	95.29	5.82	3.94	3.91
DPAA	134.58	6.03	4.74	3.70
DPAAR	150.32	5.67	4.53	4.35
DPAB	141.97	5.58	5.27	3.94
DPACB	163.48	5.43	4.23	3.33
DPACC	114.28	4.92	4.83	3.99
DPD	116.21	6.02	4.36	4.00
DPDOO	171.77	5.11	5.03	4.42
DPFDB	69.16	4.94	3.70	3.22
DPFDD	72.49	6.00	3.26	3.68
DPFDF	116.19	6.05	3.91	3.50
DPFM	85.20	5.64	3.36	3.10
DPFMB	69.88	5.58	3.53	3.35
DPFRB	82.95	5.90	4.11	3.89
DPFRC	72.89	5.46	3.63	3.02
DPFSB	148.72	5.71	5.15	3.83
DPRA	117.21	5.89	4.13	3.54
DPAC	141.15	5.20	4.87	3.73

TABLE 2 (continued)

Section Mean Scores for the Primary Variables

Section	Motivating Potential Score	Growth Need Strength	Job Satisfaction	Perceived Productivity
DPRO	111.32	6.44	4.22	3.63
DPRP	117.62	5.54	4.28	3.85
DPRS	124.11	6.02	4.97	3.94
DPRSD	111.23	5.33	4.57	3.78
RTP	76.45	5.83	2.78	3.62
RTPU	97.80	5.22	4.43	3.67
RTPX	134.21	5.46	3.98	3.40
RTT	105.20	5.67	3.64	3.55
XPA	94.25	5.98	4.55	3.55

TABLE 3

Section Mean Scores for the Secondary Variables

Section	Goal Clarity	Goal Difficulty	Satisfaction with Supervisor	Psychological Climate	Need for Achievement
DA	4.61	2.52	3.21	2.86	4.07
DAD	4.03	3.38	4.20	3.55	4.81
DAW	4.87	4.44	4.44	3.58	4.13
DPAA	5.06	4.03	4.96	3.68	4.67
DPAAR	5.41	4.17	5.18	3.56	4.48
DPAB	5.79	3.39	5.51	4.19	4.80
DPACB	5.84	4.82	4.00	3.24	4.00
DPACC	5.12	4.05	5.73	4.55	3.70
DPD	5.38	3.21	4.67	3.63	4.57
DPDOO	5.97	3.59	5.72	3.70	3.58
DPFDB	5.12	3.53	4.54	3.31	4.14
DPFDD	4.91	3.47	3.16	2.61	4.87
DPFDF	5.17	3.60	4.41	3.31	5.18
DPFM	4.92	3.56	3.89	2.76	4.39
DPFMB	4.97	4.08	3.47	3.03	4.19
DPFRB	5.50	2.68	5.13	4.12	4.55
DPFRC	5.22	3.36	4.59	3.40	3.84
DPFSB	5.86	2.98	4.94	3.97	4.49
DPRA	5.18	3.12	4.54	3.57	4.64
DPAC	5.63	3.50	5.23	3.85	4.00

TABLE 3 (continued)

Section Mean Scores for the Secondary Variables

Section	Goal Clarity	Goal Difficulty	Satisfaction with Supervisor	Psychological Climate	Need for Achievement
DPRO	5.00	2.93	5.29	4.24	5.10
DPRP	4.92	3.16	4.19	3.06	4.19
DPRS	5.77	3.33	5.98	4.86	4.38
DPRSD	4.98	4.30	4.21	3.81	4.08
RTP	4.96	2.93	3.87	3.49	3.91
RTPU	4.23	3.90	4.93	3.26	4.30
RTPX	5.35	4.20	4.91	3.48	3.82
RTT	4.39	3.89	4.55	2.95	4.24
XPA	5.45	2.77	4.33	3.88	4.88

TABLE 4

Summary of the One-Way Analysis of Variance and Section Mean Scores for the Primary Variable Motivating Potential Score

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Sections	19	108483.97	5709.68	1.17	0.28*
Within Sections	298	1454756.31	4881.73		
Total	317	1563240.28			

Section	Mean
DAD	67.24
DPFDB	69.16
DPFMB	69.88
DPFDD	72.49
DPFRC	72.89
DA	74.13
RTP	76.45
DPFRB	82.95
DPFM	85.20
XPA	94.25
DAW	95.29
RTPU	97.80
RTT	105.20
DPRSD	111.23
DPRO	111.32
DPACC	114.28
DPFDF	116.19
DPD	116.21
DPRA	117.21
DPRP	117.62

*No section was significantly different from any other section at the 0.05 level.

TABLE 5

Summary of the One-Way Analysis of Variance and Duncan's Multiple Range Test for the Primary Variable Growth Need Strength

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Sections	19	55.62	2.93	2.06	0.01
Within Sections	301	428.71	1.42		
Total	320	484.33			

Homogeneous Subsets*	Section	Mean
	DPACC	4.92
	DPFDB	4.94
	DA	4.95
	RTPU	5.22
	DPRSD	5.33
	DPFRC	5.46
	DPRP	5.54
	DPFMB	5.58
	DPFM	5.64
	RTT	5.67
	DAW	5.82
	RTP	5.83
	DPRA	5.88
	DPFRB	5.90
	XPA	5.98
	DPFDD	5.99
	DPD	6.02
	DPFDF	6.05
	DAD	6.19
	DPRO	6.44

*Sections not encompassed by the same line are significantly different.

TABLE 6

Summary of the One-Way Analysis of Variance and Duncan's Multiple Range Test for the Primary Variable JDS Job Satisfaction

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Sections	19	98.36	5.18	1.80	0.02
Within Sections	302	867.25	2.87		
Total	321	965.61			

Homogeneous Subsets*	Section	Mean
	DA	2.76
	RTP	2.78
	DAD	3.25
	DPFDD	3.26
	DPFM	3.36
	DPFMB	3.53
	DPFRC	3.63
	RTT	3.64
	DPFDB	3.70
	DPFDF	3.91
	DAW	3.94
	DPFRB	4.11
	DPRA	4.13
	DPRO	4.22
	DPRP	4.28
	DPD	4.36
	RTPU	4.43
	XPA	4.55
	DPRSD	4.57
	DPACC	4.83

*Sections not encompassed by the same line are significantly different.

TABLE 7

Summary of the One-Way Analysis of Variance and Duncan's Multiple Range Test for the Primary Variable General Perceived Productivity

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Sections	19	32.68	1.72	3.42	0.00
Within Sections	298	149.91	0.50		
Total	317	182.59			

Homogeneous Subsets*	Section	Mean
	DA	2.94
	DPFRC	3.02
	DAD	3.08
	DPFM	3.10
	DPFDB	3.22
	DPFMB	3.35
	DPFDF	3.50
	DPRA	3.54
	RTT	3.55
	XPA	3.55
	RTP	3.62
	DPRO	3.63
	RTPU	3.67
	DPFDD	3.68
	DPRSD	3.78
	DPRP	3.85
	DPFRB	3.89
	DAW	3.91
	DPACC	3.99
	DPD	4.00

*Sections not encompassed by the same line are significantly different.

Table 8

Summary of the One-Way Analysis of Variance and Section Mean Scores for the Secondary Variable *Goal Clarity*

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Sections	19	35.84	1.89	0.89	0.59*
Within Sections	300	630.74	2.10		
Total	319	666.58			

Section	Mean
DAD	4.03
RTPU	4.23
RTT	4.39
DA	4.60
DAW	4.87
DPFDD	4.91
DPFM	4.92
DPRP	4.92
RTP	4.96
DPFMB	4.97
DPRSD	4.98
DPRO	4.99
DPACC	5.12
DPFDB	5.12
DPFDF	5.17
DPRA	5.18
DPFRC	5.22
DPD	5.38
XPA	5.45
DPFRB	5.50

*No section was significantly different from any other section at the 0.05 level.

TABLE 9

Summary of the One-Way Analysis of Variance and Duncan's Multiple Range Test for the Secondary Variable Goal Difficulty

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Sections	19	98.86	5.20	2.71	0.00
Within Sections	299	573.71	1.92		
Total	318	672.57			

Homogeneous Subsets*	Section	Mean
	DA	2.52
	DPFRB	2.68
	XPA	2.77
	DPRO	2.93
	RTP	2.93
	DPRA	3.12
	DPRP	3.16
	DPD	3.21
	DPFRC	3.36
	DAD	3.38
	DPFDD	3.47
	DPFDB	3.53
	DPFM	3.56
	DPFDF	3.60
	RTT	3.89
	RTPU	3.90
	DPACC	4.05
	DPFMB	4.08
	DPRSD	4.30
	DAW	4.44

*Sections not encompassed by the same line are significantly different.

TABLE 10

Summary of the One-Way Analysis of Variance and Duncan's Multiple Range Test for the Secondary Variable Satisfaction with Supervisor

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Sections	19	141.14	7.43	2.75	0.00
Within Sections	305	824.76	2.70		
Total	324	965.90			

Homogeneous Subsets*	Section	Mean
	DPFDD	3.16
	DA	3.21
	DPFMB	3.47
	RTP	3.87
	DPFM	3.89
	DPRP	4.19
	DAD	4.19
	DPRSD	4.21
	XPA	4.33
	DPFDF	4.41
	DAW	4.44
	DPRA	4.54
	DPFDB	4.54
	RTT	4.55
	DPFRC	4.59
	DPD	4.67
	RTPU	4.93
	DPFRB	5.13
	DPRO	5.29
	DPACC	5.73

*Sections not encompassed by the same line are significantly different.

TABLE 11

Summary of the One-Way Analysis of Variance and Duncan's Multiple Range Test for the Secondary Variable Psychological Climate

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Sections	19	84.87	4.47	2.73	0.00
Within Sections	302	494.33	1.64		
Total	321	579.20			

Homogeneous Subsets*	Section	Mean
	DPFDD	2.61
	DPFM	2.76
	DA	2.86
	RTT	2.95
	DPFMB	3.03
	DPRP	3.06
	RTPU	3.26
	DPFDB	3.31
	DPFDF	3.31
	DPFRC	3.40
	RTP	3.49
	DAD	3.55
	DPRA	3.57
	DAW	3.58
	DPD	3.63
	DPRSD	3.81
	XPA	3.88
	DPFRB	4.12
	DPRO	4.24
	DPACC	4.55

*Sections not encompassed by the same line are significantly different.

TABLE 12

Summary of the One-Way Analysis of Variance and Duncan's Multiple Range Test for the Secondary Variable Need for Achievement

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Sections	19	53.08	2.79	1.92	0.01
Within Sections	294	428.83	1.46		
Total	313	481.91			

Homogeneous Subsets*	Section	Mean
	DPACC	3.70
	DPFRC	3.84
	RTP	3.90
	DA	4.07
	DPRSD	4.08
	DAW	4.13
	DPFDB	4.14
	DPFMB	4.19
	DPRP	4.19
	RTPU	4.30
	DPFM	4.39
	RTT	4.42
	DPFRB	4.55
	DPD	4.57
	DPRA	4.64
	DAD	4.81
	DPFDD	4.87
	XPA	4.88
	DPRO	5.10
	DPFDF	5.18

*Sections not encompassed by the same line are significantly different.

(3) JDS Job Satisfaction - Less than or equal to 4.5.

(4) General perceived productivity - Less than or equal to 3.5.

There were only four sections that met all these criteria: DAD, DPFMB, DPFRC, and DPFM. The Duncan's contrast test verified that none of these sections were significantly different from one another for each of the primary variables.

Secondary Criteria Evaluation

The four sections were analyzed in terms of the secondary variables. According to Locke there is a positive correlation between goal clarity, goal difficulty, and worker productivity. All sections exhibited low productivity scores and, with the exception of DPFRC, which had a slightly higher goal clarity score, all sections possessed low goal clarity and difficulty scores. These scores indicate that a goal setting program based on increasing the clarity and difficulty of acceptable goals should result in increased productivity (Locke, 1968).

The psychological climate of the sections was low. This indicates rapport between supervisors and subordinates is poor, the worker's innovative abilities are thwarted, with criticism and threats outweighing rewards and

encouragement. Satisfaction with supervisor is also low for each section. These scores are an indication of dissatisfaction among workers with the degree of respect, treatment, amount of support and guidance received from their supervisors. A job enrichment and goal setting experiment should improve this condition. However, the situation currently exhibited in these sections could also hamper the successful implementation of such an experiment. A successful experiment depends to a large extent on a good working environment and good worker-supervisor relationship. These two requirements are not present in this situation.

The worker's need for achievement in all sections is low. In order to achieve a successful job enrichment and goal setting experiment, the workers should have a desire for more challenging work assignments and more responsibility. The scores indicate these desires are not prevalent among the workers in the selected sections.

The secondary variables of satisfaction with supervisor, psychological climate, and need for achievement were not as high as was desired by the researchers. However, the researchers believe a job enrichment and goal setting experiment should be implemented in these sections. The increased validity of the experiment contributed by the above

diagnostic procedures outweighs the potential negative effects indicated by the low secondary variable scores. A Duncan's contrast test verified that none of these sections were significantly different from one another across the secondary variables.

The demographic data, age, grade and time in job, was analyzed for each section. There were no trends in these areas for any of the sections. For this reason the researchers felt the selected demographic characteristics of the four sections would not have any noticeable adverse effect on the job enrichment and goal setting experiment.

The purpose of the pretest data analysis was to select sections which best met the requirements of the experiment. During the analysis of the pretest data a number of sections were identified that might have benefited from a job enrichment and/or goal setting program. However, there were only four sections that met all of the criteria established within the framework of the experimental design (Table 13). The procedures used in this selection process are potentially applicable both to research and to organizational environments. When job enrichment and/or goal setting experiments or programs are planned, the use of this selection, or a similar selection process can contribute significantly to desired experiment or program results.

TABLE 13

Summary of Variable Mean Scores
for the Selected Sections

Primary Variables

Section	Motivating Potential Score	Growth Need Strength	JDS Job Satis-faction	General Perceived Produc-tivity
DAD	67.24	6.19	3.25	3.08
DPFM	85.20	5.64	3.36	3.10
DPFMB	69.88	5.58	3.53	3.35
DPFRC	72.89	5.46	3.63	3.02

Secondary Variables

Section	Goal Clarity	Goal Diffi-culty	Need for Achieve-ment	Satis-faction with Super-visor	Psycho-logical Climate
DAD	4.03	3.38	4.81	4.19	3.55
DPFM	4.92	3.56	4.39	3.89	2.76
DPFMB	4.97	4.08	4.19	3.47	3.03
DPFRC	5.22	3.36	3.84	4.59	3.40

CHAPTER V

CONCLUSION

Summary

Job enrichment and goal setting programs are becoming more popular with management as a cure for organization personnel problems. Researchers in social behavior are also conducting more experiments in this area. The U.S. Air Force has initiated programs to increase the satisfaction and productivity of its employees, both military and civilian. Whether a researcher desires to conduct a job enrichment and/or goal setting experiment or an organization desires to implement such a program, the questionnaire and selection procedures discussed in this paper can be of practical use.

A problem encountered by many researchers when conducting field experiments is how to insure the validity of experimental results. This problem often centers around the difficulty in insuring that statistical regression does not occur to any of the groups or sections selected for the experiment. In many cases the researcher has no choice as to

the groups to use in the experiment. In other cases, the researcher can choose among a number of candidates for the experiment. In either situation the procedures discussed in this paper can provide useful information in determining the validity of experimental results.

The questionnaire measures 32 variables which indicate the worker's attitude towards his job. The selection procedure as described in Chapter III enables the researcher to analyze these variables and systematically select groups based upon criteria of his own choosing. It also permits the researcher to insure the groups selected under these criteria are not significantly different from one another. This is important to a researcher when he wishes to compare the results of a treatment or experiment across a number of groups. If the researcher knows the groups are not significantly different prior to the conduct of the experiment, then any changes observed in the groups after a treatment has been applied can be attributed to the treatment. This is based on the assumption that all groups are equally exposed to any nontreatment external influences arising during the experiment.

When selecting groups for a job enrichment and/or goal setting experiment the research should consider the

demographic characteristics of the workers as well as their attitudes toward the job. The age, educational level, time in job, and pay grade of workers may affect experimental results. Although it is difficult for a researcher to find solutions for this potential problem, especially in a field experiment, he should be aware of any glaring demographic differences among the experimental groups.

The use of the selection procedure described in this paper allows the researcher to be more objective in the selection of personnel or groups for an experiment. By being more familiar with the attitudes and background of experimental groups, the researcher is able to insure a greater degree of validity in his experimental results.

The procedures described in this paper are also applicable to any organization which is contemplating implementation of a job enrichment and/or goal setting program. A program of this type requires a great deal of time and money, consequently, an organization expects positive results. To increase the probability of success, the organization should administer a pretest, analyze the data, then select those groups which would benefit most from the planned program. A job enrichment and/or goal setting program is sometimes implemented throughout the organization

with little regard for its applicability to individual work groups. The result of this approach is often failure. The organization can increase the potential for success by being more selective in the application of such a job enrichment and/or goal setting program.

The U.S. Air Force has used separate job enrichment and goal setting programs (Management By Objectives) in attempts to increase the satisfaction or productivity of its employees. Like many civilian organizations their approach has been primarily subjective. The data from pretests administered to organizations selected for such programs has been used for comparative purposes only. This data should be analyzed to determine which organizations or groups within the organization are most suitable for an enrichment and/or goal setting program.

Job enrichment and/or goal setting programs used in organizations have produced some good results in the past. The use of a selection procedure will enable organizations to channel resources and talent in directions where the expected benefits will be greatest. In order to achieve maximum results from a job enrichment and goal setting program, it is essential that researchers establish procedures and be more objective in selecting groups to participate in these

programs.

Recommended Research Areas

(1) The experimental design described in this paper should form the framework for conducting a field test to combine job enrichment and goal setting in a single work enhancement strategy.

(2) During the analysis of the pretest data, there appeared to be a fairly strong relationship between psychological climate, satisfaction with supervisor, and JDS job satisfaction. Research should be conducted to determine if a correlation exists between these three variables and to what extent the psychological climate and satisfaction with supervisor influence an individual's overall perception of his job satisfaction. Research should also be conducted to determine if low psychological climate and satisfaction with supervisor scores would adversely affect the implementation of a participative job enrichment and goal setting program.

APPENDIX A

ALPHABETICAL LISTING OF SECTIONS BY TASK ACTIVITY

Section	Number of Personnel	Task Activity	Section	Number of Personnel	Task Activity
ACB	5	Budget Division	DAL	3	Logistics Support Office
CA	1	Tech. Assist. to Commander	DAW	1	Word Processing Div.
CAG	1	Sen. ANG Advisor	DAWA	14	Word Processing Cen.
CC	2	Commander	DAWB	9	Word Processing Cen.
CCD	1	Commander's Staff	DAWC	8	Word Processing Cen.
DA	4	Dir. of Admin.	DFPMA	1	Unknown
DAA	1	Admin. Comm. Div.	DPA	1	Dir. of Personnel Actions
DAAC	5	Mailroom & Orders	DPAA	2	Separations Div.
DAAO	3	Mailroom & Orders	DPAAD	20	Discharge Branch
DAAS	1	Mailroom & Orders	DPAAR	22	Retirement Branch
DAD	2	Documentation Div.	DPAAS	6	Special Actions Branch
DADM	5	Documentation Div.			
DADP	3	Documentation Div.	DPAB	3	Promotion Div.
DADY	2	Documentation Div.	DPABO	4	Promotion Div.
DAEW	2	Admin. Systems	DPABP	14	Promotion Div.

Section	Number of Personnel	Task Activity
DPAC	2	Point Credit Accounting Div.
DPACA	8	Point Credit Branch
DPACB	19	Point Credit Branch
DPACC	24	Data Capture Branch
DPAI	1	Unknown
DPAMR	4	Admin. Branch
DPARI	1	Unknown
DPAS	4	Unknown
DPD	2	Dir. of Personnel Systems
DPDO	3	Data Management Div.
DPDOD	1	Data Management Div.
DPDOI	8	Data Management Div.
DPDOO	9	Operational Schedule Branch
DPDOR	3	Operational Schedule Branch
DPDS	1	System Management Div.
DPDSM	4	System Management Div.
DPDSQ	2	Requirements Analysis Div.
DPF	6	Dir. of Reserve Personnel Records
DPFBD	1	Unknown
DPFD	3	Records Disposition Div.
DPFDA	3	Receiving
DPFDB	16	Shipping
DPFDD	19	Receiving and Development
DPFDF	13	Receiving and Development

Section	Number of Personnel	Task Activity	Section	Number of Personnel	Task Activity
DPFM	12	Microfilm Division	DPRA	3	Airman Management Div.
DPFMA	11	Microfilm Operation Sec. #1-Update Line	DPRAA	10	Airman Management Div.
DPFMB	9	Microfilm Operation Sec. #2-Duplication	DPRAI	1	Admin. and Inquiry Div.
DPFP	3	Policy and Procedure Div.	DPRAP	5	Admin. and Inquiry Div.
DPFR	2	Records Maintenance Div.	DPRAS	2	Admin. and Inquiry Div.
DPFRB	21	File Bank #1	DPRO	4	Officer Management Div.
DPFRC	18	File Bank #2			
DPFS	1	Records Service Div.	DPROA	2	Officer Management Div.
DPFSA	9	Address Changes	DPROB	1	Officer Management Div.
DPFSB	22	Reference Div. (ID Cards)	DPROC	1	Officer Management Div.
DPMAR	1	Unknown	DPROD	2	Officer Management Div.
DPR	6	Dir. of Personnel	DPROP	4	Officer Management Div.

Section	Number of Personnel	Task Activity	Section	Number of Personnel	Task Activity
DPROS	3	Officer Management Div.	JAR	4	Reserve Program Div.
DPRP	3	Procurement Div.	OI	7	Office of Information
DPRPA	1	Procurement Div.	OIR	1	Office of Information
DPRPB	1	Procurement Div.			
DPRPR	15	Procurement Div.	PDRAA	1	Unknown
DPRS	3	Classification and Survey Div.	RT	4	Dir. of Individual Reserve Programs
DPRSB	4	Support Branch	RTAM	2	Program Support Div.
DPRSC	13	Classification Branch	RTAS	4	Program Support Div.
DPRSD	14	Classification Branch	RTP	4	Consolidated Reserve Personnel Office
HC	4	Command Chaplain			
JA	2	Staff Judge Advocate	RTPAR	11	Customer Assistance
JAM	1	Civil Law and Military Justice Div.	RTPQE	2	Quality Force
			RTPU	1	Personnel Utilization Branch

Section	Number of Personnel	Task Activity
RTPUA	1	Personnel Utilization Branch
RTPUC	3	Personnel Utilization Branch
RTPUM	3	Personnel Utilization Branch
RTPUO	2	Personnel Utilization Branch
RTPX	2	Participation (Points) Branch
RTPXA	11	Participation (Points) Branch
RTPXP	6	Participation (Points) Branch
RTT	1	Training Management Div.
RTTI	4	Training Management Div.
RTTS	3	Training Management Div.
RTTT	3	Training Management Div.
SG	10	Surgeon
SGA	2	Surgeon
XP	3	Dir. of Plans
XPA	1	Performance Analysis Div.
XPAP	5	Performance Analysis Div.
XPAQ	8	Performance Analysis Div.
XPM	5	Performance Analysis Div.
XPX	1	Plans and Programs Div.
XPXA	2	Plans and Programs Div.
XPXB	2	Plans and Programs Div.
ZZZZ*	9	Unknown

*Nine additional personnel did not state the section they worked for.

APPENDIX B

PRETEST-POST TEST QUESTIONNAIRE

SCN: 76 - 36

JOB ATTITUDE SURVEY

This questionnaire is designed to assist in the study of your job and show how it affects you. The survey data will be used to make your job better.

The questions are designed to measure your perceptions of your job and your reaction to it. Please answer each item as honestly and frankly as possible.

Thank you for your cooperation and participation.

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Instructor of Behavioral Science and Leadership
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PRIVACY ACT STATEMENT

In accordance with paragraph 30, AFR 12-35, Air Force Privacy Act Program, the following information is provided as required by the Privacy Act of 1974.

a. This survey information is authorized for solicitation by Federal Statute Title 10, United States Code, Section 8012, Executive Order 9397, 22 Nov 43, DODI 1100.13, 17 Apr 68, and AFR 178-9, 9 Oct 73.

b. The principal purpose for which this survey will be used is to measure specific motivational aspects of your work in an effort to allow for positive change where possible.

c. Routine use in addition to the above will include utilization of this data in the conduct of Air Force research in the area of organizational change.

f. The analysis of this questionnaire will be done at the Air Force Academy under the supervision of Lt Col Umstot and Major Rosenbach. Individual questionnaires will not be available to anyone in your organization. Summaries of the data will be reported to managers of your organization for the purpose of improving your job.

BIOGRAPHICAL DATA

All information in this section will be held in the strictest confidence; no one in your organization will have access to individual responses.

1. To be able to effectively measure changes in people's perceptions of their job, it is necessary to use some type of identification. The last four digits of the Social Security Number is a number that is easy to remember yet does not allow identification of an individual.

LAST FOUR DIGITS OF SSN | | | | |

2. SEX: Male_____ Female_____

3. EDUCATION (Check highest Level):

_____ Grade School
_____ Some High School
_____ High School Graduate
_____ Some business School or College
_____ College Graduate

4. AGE (Check one):

_____ Under 20
_____ 20-29
_____ 30-39
_____ 40-49
_____ 50-59
_____ 60 or over

5. MARITAL STATUS: Single _____ Married _____

6. RANK/GRADE: Military _____ Civilian _____

7. UNIT WHERE YOU WORK (Check one):

Vehicle Ops _____ Vehicle Maintenance_____ TMO _____
Sqd Admin/Tng_____ Reports & Analysis _____ Mobility Ops _____

8. JOB TITLE: _____

9. YEARS IN SERVICE (Check one):

_____ One year or less
_____ One to four years
_____ Four to eight years
_____ Eight to twelve years
_____ Twelve to sixteen years
_____ Over sixteen years

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SECTION ONE

This part of the questionnaire asks you to describe your job, as objectively as you can.

Please do not use this part of the questionnaire to show how much you like or dislike your job. Questions about that will come later. Instead, try to make your descriptions as accurate and as objective as you possibly can.

A sample question is given below.

A. To what extent does your job require you to work with mechanical equipment?

1	2	3	4	5	(6)	7
Very little; the job requires almost no contact with mechanical equipment of any kind.			Moderately			Very much; the job requires almost constant work with mechanical equipment.

You are to circle the number which is the most accurate description of your job.

If, for example, your job requires you to work with mechanical equipment a good deal of the time—but also requires some paperwork—you might circle the number six, as was done in the example above.

If you do not understand these instructions, please ask for assistance. If you do understand them, turn the page and begin.

1. To what extent does your job require you to work closely with other people (either "clients," or people in related jobs in your own organization)?

1---------2---------3---------4---------5---------6---------7

Very little; dealing with other people is not at all necessary in doing the job.	Moderately; some dealing with others is necessary.	Very much; dealing with other people is an absolutely essential and crucial part of doing the job.

2. How much autonomy is there in your job? That is, to what extent does your job permit you to decide on your own how to go about doing the work?

1---------2---------3---------4---------5---------6---------7

Very little; the job gives me almost no personal "say" about how and when the work is done.	Moderate autonomy; many things are standardized and not under my control, but I can make some decisions about the work.	Very much; the job gives me almost complete responsibility for deciding how and when the work is done.

3. To what extent does your job involve doing a "whole and identifiable piece of work? That is, is the job a complete piece of work that has an obvious beginning and end? Or is it only a small part of the overall piece of work, which is finished by other people or by automatic machines?

1---------2---------3---------4---------5---------6---------7

My job is only a tiny part of the overall piece of work; the results of my activities cannot be seen in the final product or service.	My job is a moderate-sized "chunk" of the overall piece of work; my own contribution can be seen in the final outcome.	My job involves doing the whole piece of work, from start to finish; the results of my activities are easily seen in the final product or service.

4. How much variety is there in your job? That is, to what extent does the job require you to do many different things at work, using a variety of your skills and talents?

1---------2---------3---------4---------5---------6---------7

Very little; the job requires me to do the same routine things over and over again.	Moderate variety	Very much; the job requires me to do many different things, using a number of different skills and talents.

5. In general, how <u>significant or important</u> is your job? That is, are the results of your work likely to significantly affect the lives or well-being of other people?

1---------2---------3---------4---------5---------6---------7

Not very significant; the outcomes of my work are <u>not</u> likely to have important effects on other people.	Moderately significant.	Highly significant; the outcomes of my work can affect other people in very important ways.

6. To what extent do <u>managers or co-workers</u> let you know how well you are doing on your job?

1---------2---------3---------4---------5---------6---------7

Very little; people almost never let me know how well I am doing.	Moderately; sometimes people may give me "feedback;" other times they may not.	Very much; managers or co-workers provide me with almost constant "feedback" about how well I am doing.

7. To what extent does <u>doing the job itself</u> provide you with information about *your work performance*? That is, *does* the actual <u>work itself</u> provide clues about how well you are doing--aside from any "feedback" co-workers or supervisors may provide?

1---------2---------3---------4---------5---------6---------7

Very little; the job itself is set up so I could work forever without finding out how well I am doing.	Moderately; sometimes doing the job provides "feedback" to me; sometimes it does not.	Very much; the job is set up so that I get almost constant "feedback" as I work about how well I am doing.

SECTION TWO

Listed below are a number of statements which could be used to describe a job.

You are to indicate whether each statement is an accurate or an inaccurate description of your job.

Once again, please try to be as objective as you can in deciding how accurately each statement describes your job--regardless of whether you like or dislike your job.

Write a number in the blank beside each statement, based on the following scale:

How accurate is the statement in describing your job?

1	2	3	4	5	6	7
Very Inaccurate	Mostly Inaccurate	Slightly Inaccurate	Uncertain	Slightly Accurate	Mostly Accurate	Very Accurate

____1. The job requires me to use a number of complex or high-level skills.

____2. The job requires a lot of cooperative work with other people.

____3. The job is arranged so that I do not have the chance to do an entire piece of work from beginning to end.

____4. Just doing the work required by the job provides many chances for me to figure out how well I am doing.

____5. The job is quite simple and repetitive.

____6. The job can be done adequately by a person working alone --without talking or checking with other people.

____7. The supervisors and co-workers on this job almost never give me any "feedback" about how well I am doing in my work.

____8. This job is one where a lot of other people can be affected by how well the work gets done.

____9. The job denies me any chance to use my personal initiative or judgment in carrying out the work.

___10. Supervisors often let me know how well they think I am performing the job.

Write a number in the blank beside each statement, based on the following scale:

How accurate is the statement in describing your job?

1	2	3	4	5	6	7
Very Inaccurate	Mostly Inaccurate	Slightly Inaccurate	Uncertain	Slightly Accurate	Mostly Accurate	Very Accurate

____11. The job provides me the chance to completely finish the pieces of work I begin.

____12. The job itself provides very few clues about whether or not I am performing well.

____13. The job gives me considerable opportunity for independence and freedom in how I do the work.

____14. The job itself is not very significant or important in the broader scheme of things.

____15. There is good rapport between superiors and the subordinates in this organization.

____16. When there is personal conflict in the organization, those involved openly discuss the problem.

____17. My immediate supervisor communicates often with me.

____18. For every situation there is an appropriate regulation.

____19. I am encouraged to be innovative in the performance of my tasks.

____20. My supervisor provides me with adequate information to perform my job in the best manner.

____21. Rewards and encouragement outweigh threats and criticism.

____22. The working environment is relaxed.

____23. The chain of command is strictly enforced.

____24. It is hard to get people higher up in this organization to listen to people at my level.

____25. I am encouraged to say what I really think.

____26. Strict obedience of orders is important here.

____27. Relations between different levels of organization are informal.

SECTION THREE

Every employee produces something in his or her work. It may be a "product" or it may be a "service". It is sometimes difficult, however, to identify that product or service. Listed below are some of the products or services produced at your unit.

Vehicles repaired	Records processed
Typed pages	On-time pickups
Vehicles dispatched	Reports prepared
Customers served	Records processed
Crates built	Procedures written

These are just a few of the products or services found at your unit. There are others, of course. We would like you to think carefully of the things <u>you</u> produce, and also of the things produced by those people who work with you in your work group (i.e., everyone who works for your boss).

There is a scale provided for each question. Select the response number (1 thru 5) that most accurately reflects the production in your work group.

1. Thinking now of the various things produced by the people you know <u>in your work group</u>, how <u>much</u> are they producing?

1	2	3	4	5
It is very low	It is fairly low	It is neither high nor low	It is fairly high	Their production is very high

2. How good would you say is the <u>quality</u> of the products or services produced by the people you know <u>in your work group?</u>

1	2	3	4	5
The quality is poor	The quality is not too good	The quality is fair	The quality is good	The quality is excellent

3. Do the people in your work group seem to get maximum output from the resources (money, people, equipment, etc.) they have available? That is, how efficiently do they work?

1	2	3	4	5
They do not work efficiently at all	Not too efficient	Fairly efficient	They are very efficient	They are extemely efficient

SECTION FOUR

Now please indicate how you personnally feel about your job.

Each of the statements below is something that a person might say about his or her job. You are to indicate your own, personal feelings about your job by marking how much you agree with each of the statements.

Once again, write a number in the blank for each statement, based on this scale:

How much do you agree with the statement?

1	2	3	4	5	6	7
Disagree Strongly	Disagree	Disagree Slightly	Neutral	Agree Slightly	Agree	Agree Strongly

_____1. In this organization people are rewarded in proportion to the excellence of their performance.

_____2. Generally speaking, I am very satisfied with this job.

_____3. There is a great deal of criticism in this organization.

_____4. I frequently think of quitting this job or asking for a transfer.

_____5. There are not enough rewards or recognition given in this organization for doing good work.

_____6. I am generally satisfied with the kind of work I do in this job.

SECTION FIVE

Now please indicate how satisfied you are with each aspect of your job listed below. Once again, write the appropriate number in the blank beside each statement.

How satisfied are you with this aspect of your job?

1	2	3	4	5	6	7
Extremely Dissatisfied	Dissatisfied	Slightly Dissatisfied	Neutral	Slightly Satisfied	Satisfied	Extremely Satisfied

_____1. The amount of job security I have.

_____2. The amount of pay and fringe benefits I receive.

_____3. The amount of personal growth and development I get in doing my job.

_____4. The people I talk to and work with on my job.

_____5. The degree of respect and fair treatment I receive from my boss.

_____6. The feeling of worthwhile accomplishment I get from doing my job.

_____7. The chance to get to know other people while on the job.

_____8. The amount of support and guidance I receive from my supervisor.

_____9. The degree to which I am fairly paid for what I contribute to this organization.

____10. The amount of independent thought and action I can exercise in my job.

____11. How secure things look for me in the future in this organization.

____12. The chance to help other people while at work.

How satisfied are you with this aspect of your job?

1	2	3	4	5	6	7
Extremely Dissatisfied	Dissatisfied	Slightly Dissatisfied	Neutral	Slightly Satisfied	Satisfied	Extremely Satisfied

_____13. The amount of challenge in my job.

_____14. The overall quality of the supervision I have received in my work.

SECTION SIX

Listed below are a number of characteristics which could be present on any job. People differ about how much they would like to have each one present in their own jobs. We are interested in learning <u>how much you personally would like</u> to have each one present in your job.

Using the scale below, please indicate the <u>degree</u> to which you would like to have each characteristic present in your job.

<u>NOTE:</u> The numbers on this scale are different from those used in previous scales.

4----------5---------6---------7----------8---------9----------10

Would like having this only a moderate amount (or less)

Would like having this very much

Would like having this <u>extremely</u> much

_____1. A high degree of job security.

_____2. Opportunities for personal growth and developemnt on the job.

_____3. Fairly difficult and challenging work assignments.

_____4. Working as a member of a group rather than by myself.

_____5. Very high pay.

_____6. Chances to exercise independent thought and action in my job.

_____7. A low-risk job where I do not have to stick my neck out to get a head.

_____8. Co-workers who pay a great deal of attention to the feelings of others at work.

_____9. Stimulating and challenging work.

____10. Working alone on the job instead of with a group of people.

____11. A great deal of responsiblity.

____12. Generous retirement benefits.

Using the scale below, please indicate the degree to which you would like to have each characteristic present in your job.

NOTE: The numbers on this scale are different from those used in previous scales.

4---------5---------6---------7---------8---------9---------10

Would like having this only a moderate amount (or less)	Would like having this very much	Would like having this extremely much

_____13. Opportunities to be creative and imaginative in my work.

_____14. Opportunity to talk about non-business related matters with those around me.

_____15. A sense of worthwile accomplishment in my work.

_____16. A dangerous job.

_____17. Opportunities to learn new things from my work.

_____18. Chances to work together with others in carrying out the job.

SECTION SEVEN

For the following questions choose the response that best reflects your feeling about your job. Circle the number that most accurately reflects your feelings.

---

1. Which one of the following shows how much of the time you feel satisfied with your job?

   1. All the time
   2. Most of the time
   3. A good deal of the time
   4 About half of the time
   5. Occasionally
   6. Seldom
   7. Never

2. Choose the one of the following statements which best tells how well you like your job.

   1. I hate it
   2. I dislike it
   3. I don't like it
   4. I am indifferent to it
   5. I like it
   6. I am enthusiasitc about it
   7. I love it

3. Which one of the following best tells how you feel about changing your job?

   1. I would quit this job at once if I could
   2. I would take almost any other job in which I could earn as much as I am earning now.
   3. I would like to chage both my job and my occupation.
   4. I would like to exchange my present job for another one.
   5. I am not eager to change my job, but I would do so if I could get better job.
   6. I cannot think of any jobs for which I would exchange.
   7. I would not exchange my job for any other.

4. Which one of the following shows how you think you compare with other people?

   1. No one likes his job better than I like mine.
   2. I like my job much better than most people like theirs
   3. I like my job better than most people like theirs.
   4. I like my job abiut as well as most people like theirs.
   5. I dislike my job more than most people dislike theirs.
   6. I dislike my job much more than most people dislike theirs.
   7. NO one dislikes his job more than I dislike mine.

SECTION EIGHT

Listed below are a number of statements which could be used to describe your job.

You are to indicate whether each statement is an accurate or an inaccurate description of your job.

Once again, please try to be as objective as you can in deciding how accurately each statement describes your job -- regardless of whether you like or dislike your job.

1	2	3	4	5	6	7
Very Inaccurate	Mostly Inaccurate	Slightly Inaccurate	Uncertain	Slightly Accurate	Mostly Accurate	Very Accurate

_____1. I am allowed a high degree of influence in the determination of my work objectives or standards.

_____2. I do not have too much difficulty in reaching my work standards; They are fairly easy.

_____3. I receive a considerable amount of feedback concerning the amount of work I do.

_____4. I accept the work standards or goals for my job.

_____5. My work standards are very clear and specific; I know exactly what is expected of me.

_____6. My work standards will require a great deal of effort from me to complete them.

_____7. I really have little voice in formulation of my work standards.

_____8. I am provided with a great deal of feedback and guidance on the quality of my work.

_____9. I accept the specific goals or standards set for my job.

____10. My work standards are unclear.

How accurate is the statement in describing your job?

Write a number in the blank beside each statement, based on the following scale:

How accurate is the statement in describing your job?

1	2	3	4	5	6	7
Very Inaccurate	Mostly Inaccurate	Slightly Inaccurate	Uncertain	Slightly Accurate	Mostly Accurate	Very Accurate

_____11. It will take a high degree of skill and know-how on my part to attain fully my work standards.

_____12. My boss seldom lets me know how well I am meeting my work objectives.

_____13. I do not try to meet the work standards or goals established for this job.

_____14. I understand fully which of my work standards or objectives are more important than others: I have a clear sense of priorities on these goals.

_____15. My work objectives are quite difficult to attain.

_____16. My supervisor usually asks for my opinions and thoughts when determining my work objectives or standards.

APPENDIX C

EXPLANATION AND FLOW CHART OF THE SELECTION PROCEDURE

STEP

1. Twenty-nine sections were initially selected for analysis.

2. The preliminary criterion decision was to select for further analysis only those sections with MPS of less than 124.

3. The remaining sections were then analyzed to determine:

   A. The primary variables

      1) Low MPS
      2) Medium to high GNS
      3) Low JDS job satisfaction
      4) Low perceived productivity.

   B. The secondary variables

      1) Low goal clarity
      2) Low goal difficulty
      3) Medium to high satisfaction with supervisor
      4) Medium to high values for psychological climate
      5) Medium to high need for achievement.

4. One-way ANOVAs and Duncan's contrast tests were performed for each of the primary and secondary variables.

5. Section mean scores were computed for each of the primary variables.

6. Initial cutoff values were established for each of the primary variables.

7. Those sections were determined which met each of the initial cutoff values established for the primary variables.

8. These sections were then compared to each other using the one-way ANOVA and Duncan's contrast test which were previously computed. These tests were performed to try to ensure that there were no significant differences among the sections thus far selected.

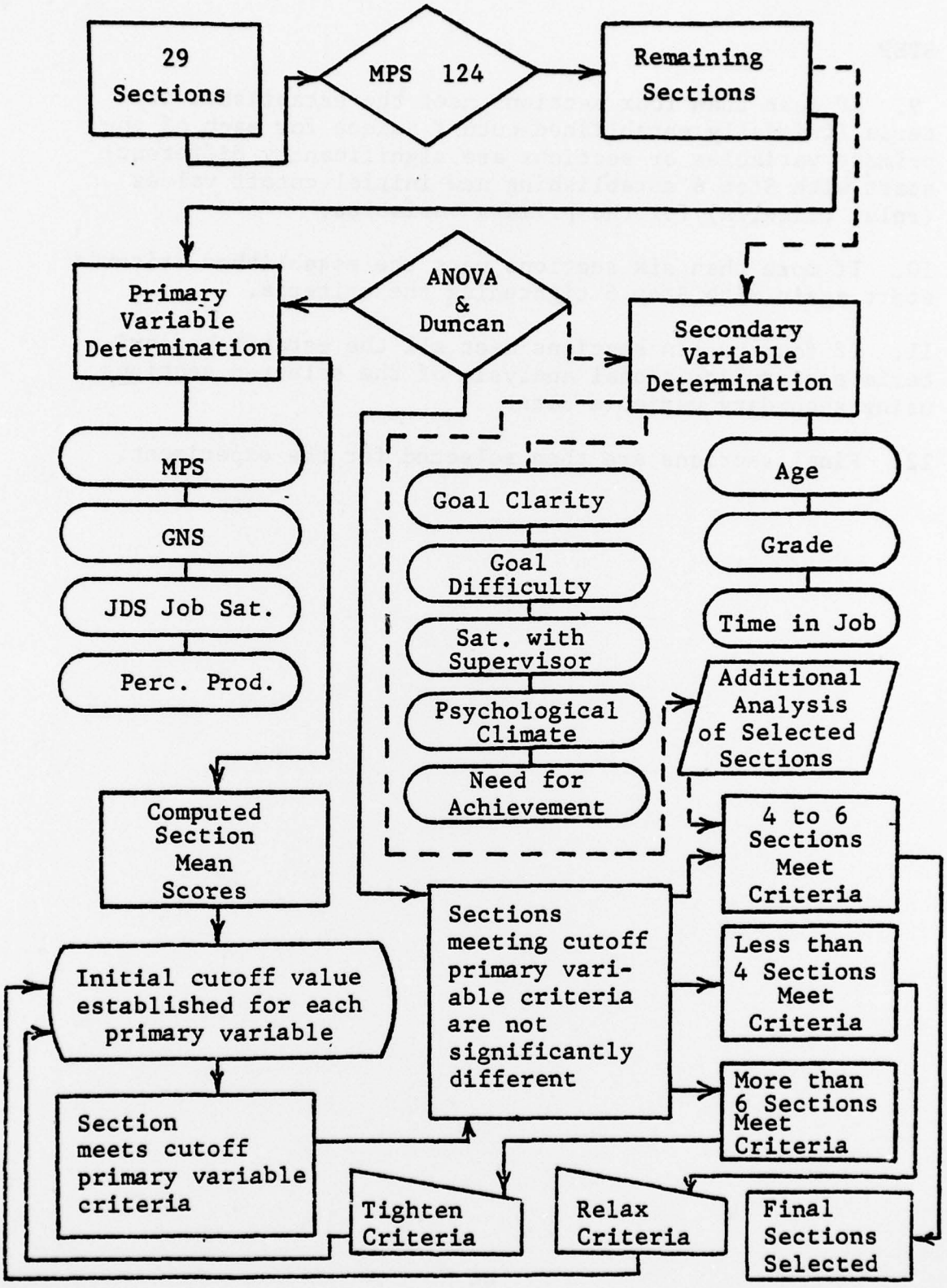
STEP

9. If less than four sections meet the established criteria (initially established cutoff values for each of the primary variables or sections are significantly different) start with Step 6 establishing new initial cutoff values (relax criteria) for the primary variables.

10. If more than six sections meet the established criteria start again with Step 6 tightening the criteria.

11. If four to six sections meet all the established criteria perform additional analysis of the selected sections using secondary variable data.

12. Final sections are then selected for the experiment.


29 Sections
MPS 124
Remaining Sections
Primary Variable Determination
ANOVA & Duncan
Secondary Variable Determination
MPS
GNS
JDS Job Sat.
Perc. Prod.
Goal Clarity
Goal Difficulty
Sat. with Supervisor
Psychological Climate
Need for Achievement
Age
Grade
Time in Job
Additional Analysis of Selected Sections
Computed Section Mean Scores
4 to 6 Sections Meet Criteria
Sections meeting cutoff primary variable criteria are not significantly different
Less than 4 Sections Meet Criteria
More than 6 Sections Meet Criteria
Initial cutoff value established for each primary variable
Section meets cutoff primary variable criteria
Tighten Criteria
Relax Criteria
Final Sections Selected

BIBLIOGRAPHY

Baldes, J. J., & Latham, G. P. The practical significance of Locke's theory of goal setting. Journal of Applied Psychology, 1975, 60, 122-124.

Cook, T. D., & Campbell, D. T. The design and conduct of quasi-experiments and true experiments in field settings. In M. D. Dunnett (Ed.), Handbook of industrial and organizational psychology. Chicago: Rand McNally College Publishing Company, 1976.

Hackman, J. R., & Oldham, G. R. The job diagnostic survey: An instrument for the diagnosis of jobs and the evaluation of job redesign projects. New Haven, Ct.: Yale University, 1974.

Hackman, J. R., & Oldham, G. R. Motivation through the design of work: Test of a theory. Organizational Behavior and Human Performance, 1976, 16, 250-279.

Hackman, J. R., Oldham, G. R., Janson, R., & Purdy, K. A new strategy for job enrichment. California Management Review, 1975, 17 (4), 57-71.

Herzberg, F. Work and the nature of man. New York: World Publishing Co., 1966.

Herzberg, F., & Rafalko, E. Efficiency in the military: Cutting costs with orthodox job enrichment. Personnel, 1975, 52 (6), 38-48.

Herzberg, F., & Zautra A. Orthodox job enrichment: Measuring true quality in job satisfaction. Personnel, 1976, 53 (5), 54-68.

House, R. J., & Wigdor, L. A. Herzberg's dual theory of job satisfaction and motivation: A review of the evidence and criticism. Personnel Psychology, 1967, 20, 369-389.

Latham, G. P., & Yukl, G. A. The review of research on the application of goal setting in organizations. Academy of Management Journal, 1975, 18, 824-845.

Locke, E. A. Toward a theory of task motivation. Organizational Behavior and Human Performance, 1968, 3, 157-189.

Mott, P. E. The characteristics of effective organizations. New York: Harper & Row, 1972.

Nie, N. H., Hull, C. H., Jenkins, J. G., Steinbrenner, K., & Bent, D. H. Statistical package for the social sciences. New York: McGraw-Hill Book Company, 1975.

Paul, W. J., Robertson, K. B., & Herzberg, F. Job enrichment pays off. Harvard Business Review, 1969, 52 (5), 70-80.

Percy, C. H. In the forward to Gooding, J. The job revolution. New York: Collier Books, 1972.

Porter, L. W., Lawler, E. F., & Hackman, J. R. Behavior in organizations. New York: McGraw-Hill Book Company, 1975.

Senter, R. J. Analysis of data: Introductory statistics for the behavioral sciences. Glenview, Ill.: Scott, Foresman and Company, 1969.

Smith, P. C., Kendall, L. M., & Hulin, C. L. The measurement of satisfaction in work and retirement: A strategy for the study of attitudes. Chicago: Rand McNally & Co., 1969.

Steers, R. M. Factors affecting job attitudes in goal setting environment. Academy of Management Journal, 1976, 19 (1), 6-16.

Steers, R. M., & Porter, L. W. The role of task goal attributes in employee performance. Psychological Bulletin, 1974, 81, 434-452.

Umstot, D. D. An experimental study of the effects of job enrichment and task goals on satisfaction and productivity. Unpublished doctoral dissertation, University of Washington, 1975.

Umstot, D. D., Bell, C. H. Jr., & Mitchell, T. R. Effects of job enrichment and task goals on satisfaction and productivity: Implications for job design. Journal of Applied Psychology, 1976, 61 (4), 379-394.

Work in America, Report of a special task force to the Secretary of Health, Education and Welfare. Cambridge, Mass.: The MIT Press, 1973.