Job Enlargement and Job Enrichment - A Meta-Analytic Study

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ACKNOWLEDGEMENTS

The investigator expresses his sincere thanks, appreciation and acknowledgement to Professor Dale M. Brethower who patiently, generously and expertly guided him in the design, execution and writing of this thesis. He is extremely grateful to him for his guidance and opportunity to study under him.

A word of thanks goes also to professors under whom he studied for the strong theoretical preparation which they provided during the course of his studies at Western Michigan University. Of course, any academic effort of this magnitude is impossible without the motivating variables within one’s private life that would make such effort worthwhile.

Thanks goes also to the Fulbright Foundation for a generous grant that made travel to, stay at and return from the United States possible.

Finally, he owes a debt to his late parents whose sacrifices before this thesis was conceived have made its completion possible and to his wife and children who had to make do all alone thousands of kilometers away.

Kenny Benedict Cemane
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CHAPTER I

STATEMENT OF PROBLEM

Ever since the factory system was developed to increase production, work activities have been an important focus of study. At different times in history different methods of study have been used. Since 1900, a closer and more scientific look was taken to work activities and processes and procedures used. Physical actions (elemental methods analysis, personal job demands (such as energy expenditure), machines and equipment used, tools and work aids used, job-related tangibles and intangibles (such as knowledge applied, materials processed, products made) have all been studied. Investigators have also considered work performance, and time taken for a task as well as the job context (involving work schedules, financial and nonfinancial incentives), organizational and social context, personnel requirements for the job (such as personal attributes, personality, and interests), training required, work experience, etc. Experts have in all instances not come up with the last word on these issues, and have always brought in unique improvements and models.

Job enlargement and job enrichment should be seen in this context. These are attempts at relating the worker to work better, so that he can be more productive, while at the
same time helping him adopt a more positive stance to the work. The current wave of interest is on humanizing jobs or redesigning and restructuring them. It is generally believed that many workers are becoming increasingly dissatisfied and frustrated by routine mechanically paced tasks and are reacting negatively, which reaction is evidenced by poor quality of work done, absenteeism, high turnover, and by pressing for high wages, expanded benefits, and greater participation in decisions that affect their jobs. Enlarging and enriching work is meant to increase performance on the part of the worker largely as a function of variables arising from the job itself. The following material describes the general nature of these variables and the behavioral science concepts related to them. Some major variables and concepts reported will be analyzed later in Chapters Two and Three.

Definition of Important Concepts

Job redesign is conceptualized as

specification of the contents, methods, and relationship of jobs in order to satisfy technological and organizational requirements as well as the social and personal requirements of the job holder. (Rush, 1971, p. 5).

Umstot explains job design as

a deliberate, purposeful planning of the job including all its structural and social aspects and their effect on the employee. Job design is a broad concept that can refer to any part or combination of parts of the job ... many factors affect job design, such as managerial style,
working conditions and technology (Umstot in Hellriegel and Slocum 1979, p. 431).

So, here we are concerned with any modifications in job content and job procedure that are technologically expedient, but also take into cognizance variables relevant to general characteristics and special requirements of the employee.

Job redesign is a general term that refers to a number of specific approaches.

**Job Rotation**

Under job rotation, the job held by the individual is considered to be unchangeable, even though it is recognized by management as being without challenge and opportunity for growth and is boring and monotonous. Thus the job holder rotates through a series of departments or positions centered about a core job in order to relieve problems arising from certain tasks, like extreme repetition or extreme accuracy required, and closeness of work. For example, in a cafeteria a server might swap a job for a week, ladling out potatoes and peas instead of preparing and serving big dish pizza, or a car mechanic may not only have to change engine oil, but also change transmission oil, grease the car, then vacuum clean and wash it.

By moving to another task, the worker develops other skills and, in many instances, acquires a perspective of
how his or her activity fits into the overall work flow. Upon close analysis, however, job rotation is not a true job design method, because neither the work nor the individual is altered in any way. Neither the job nor the individual has changed. Monotony may be relieved for a while, but the individual still returns to the same job. While the worker has been rotated, some critics charge, it has merely resulted in exposure to other boring and monotonous jobs. Thus intended effects of such a system (e.g. to augment worker motivation by eliciting intrinsic incentives derived from a job made more varied and, presumably, more interesting) are not realized.

Job Traction

This is another variety of job design often used with simple, repetitive work. Exponents of this design see the difficulty with many assembly line jobs as that the worker never finishes with them. At the core of specialization is continuous production with its highly precise synchronization of all contributing operations which are required to come together in uninterrupted final assembly. In an automotive industry conveyer belts keep on moving seemingly forever, cars with nuts to be tightened keep on coming at a prede-termined constant speed. In the post office the mail sorter never seems to run out of letters that need to be sorted. Job traction exponents aver that such work should come in
batches rather than as an unbroken flow. When an employee is through with a particular batch, there is then a reward, such as a coffee break or a five-minute rest period. Management can still control the situation by determining the amount in every batch.

Major benefit of this approach is that individuals tend to work faster as they approach the end of a batch. Thus rest breaks do not always result in loss of production. However, there are still serious questions regarding the optimum size of the work batch, as well as knowing in what type of work traction is most effective (Hodgetts and Altman, 1979).

Job Enlargement

This design recognizes that dissatisfaction and monotony may be traced to an extremely short-cycle time built into the nature of jobs because of overspecialization. Wickert (1951) found in a survey of female telephone operators that termination was significantly related to the degree to which workers felt involved in the day-to-day operations of the company. Ross and Zander (1957) found in a large industrial organization that those employees who left the company within a short period were dissatisfied with respect to certain psychological needs not met by the job. The most frequent reason given for the inability of many jobs to satisfy such presumed needs as autonomy, achievement and recognition is the way in which most of these jobs are constructed, that is,
there has been a continuing trend for jobs to become more simplified in terms of the functions required to perform them. Lefkowitz (1967) states that jobs are being constructed so that the greatest number of people are capable of performing them. In doing so engineers have constructed jobs inherently devoid of the need for individual initiative and ingenuity, jobs in which employees exercise little autonomous control over their work or responsibility for it, and jobs in which it is impossible to experience an increasing fulfillment of that which one is capable of.

Therefore, job enlargement should be conceived as a form of despecialization in that the number of tasks to be performed by the employee is increased. The increase in tasks theoretically makes the job more interesting and challenging and consequently work becomes more psychologically rewarding. Hulin and Blood (1968) define job enlargement as:

the process of allowing individual workers to determine their own working pace (within limits) to serve as their own inspectors by giving them responsibility for quality control, to repair their own mistakes, to be responsible for their own machine setup and repair, and to attain choice of method (Hulin and Blood, 1968: 41-42).

As a solution to the problem, the job is made larger with requirements for broader skill development and longer cycle time. The job is enlarged to include activities that were formally the domain of other specialized workers, thus increasing the number and variety of skills and activities
required of the individuals. The increase in the variety of tasks by an employee has as its purpose reduction of monotony and/or allowing the worker more freedom in the performance of the job. When speaking of job enlargement it is important to keep in mind that the major emphasis is upon enlarging the job by increasing the variety of tasks performed by the individual, not merely adding more repetitive tasks. (Kilbridge, 1960).

According to Reif and Luthans (1972) research by Reif and Schoderbeck (1966) brought out four issues:

(i) There was anxiety expressed by some workers who felt they would not be able to learn the new and modified skills required by the job enlargement design. This lack of confidence in one's ability to perform efficiently on the new job was justified, since most of the routine jobs did not require a great amount of skill and initiative. The very routine nature of a job reduced the possibility that an employee could develop necessary knowledge and skills required by the enlarged or enriched job design.

(ii) Fear of failure. Many workers spend years developing the skills that make them highly proficient at their present jobs. Over time they become highly competent in performing specialized, routine tasks. Despite the seemingly unchallenging nature
of a job, the worker develops a sense of pride in knowing he can execute his job better than anyone else. This feeling of accomplishment may give the employee cause to decline an offer, or react negatively to an enlarged job.

(iii) Employees' attitudes toward change can be influenced by their relationship with their superiors. As workers become highly proficient in their tasks, they require less direct supervision, and as a result, achieve a high degree of freedom and independence. The feeling can be quite satisfying to the worker. Initially, the move to an enlarged job would require closer and more frequent supervision, especially if the worker has new and often more difficult job skills. Going from a state of independence to even a temporary state of dependence may not be welcomed by the worker.

(iv) Psychological habit. In 1959 Herzberg and his associates published a book *The Motivation to Work*. They reported data from two samples of middle-level members of an organization (accountants and engineers). There was a broad agreement among the accountants and engineers on the kinds of satisfying things that were associated with their jobs, whereas a very different set of things were
associated with the job when they felt unsatisfied about them. Herzberg's dual-factor theory can be employed to interpret how task changes affect job satisfaction. In looking for motivators in the design of the enlarged job, we observe no essential inclusion of achievement, recognition, advancement or responsibility. Possibly, growth and duties of the work itself are the only two motivators that might be considered as being designed into an enlarged job. Possibility of growth is implicit in the requirements for increased skill development.

Prior to the mid 1950's interest in job enlargement was largely confined to its apparent ability to remedy many of the dissatisfactions associated with highly routine specialized jobs. Many firms were going through the same type of productivity analysis which had originally been popularized by the Hawthorne studies. The value of job enlargement was judged on the basis of its perceived improvement in employee attitude, morale and job satisfaction.

During the latter part of the 1950's several writers, and a number of practitioners, began to question the practicability of this human relations approach to job enlargement, and began to demand objectively determinable results (e.g. economic costs) from enlarged projects. As a direct consequence of this development, proponents of job
enlargement became divided into two schools: those, who viewed job enlargement as a weapon to combat poor attitudes and problems of motivation and morale and those who viewed this strategy as the road to lower costs, greater output and higher profits. The former was found in Schederbek's (1968) research in which firms were asked to rank in order of importance the four criteria which they used to determine the success of job enlargement. Thirteen ranked profit first in importance, four ranked improved attitude and morale first, three ranked quality first, and two ranked output first. This suggests that profit is the important concern in the vast majority of firms.

Job Enrichment

Behavioral science theorists concluded that job enlargement suffers from a lack of motivators. The job is not made more meaningful and capable of securing initiative, sense of accomplishment, individual responsibility, or an identification with the final product. To build in motivators in a concrete and systematic manner, the job needs to be enriched rather than enlarged. The design of the job itself is changed as in job enlargement, but it is changed in such a manner as to require the job holder to exercise initiative and accept evaluation and recognition for the quality of work done, and otherwise become involved in the nature of the job itself.
Dessler (1976) and Filey, House and Kerr (1976) use the concept of job scope which can be equated to job enlargement. Job scope is the number of lateral operations a person performs. If the scope is narrow, the person's job is purely repetitious. Where scope is wider a great number of different operations are performed and the job cycle is repeated less frequently. Herzberg, (1968) regards job enlargement as horizontal job loading. The activity merely enlarges a meaningless job. According to Herzberg, if you challenge the employee by increasing the amount of production expected of him by say, seeing if he can tighten 20 thousand bolts instead of his usual 10 thousand, you are multiplying zero by zero; if you add another meaningless task to the existing one, say, in some routine clerical activity, you are adding zero to zero; if you rotate assignments of a number of jobs that need to be enriched, say washing dishes for a while then washing silverware, you are substituting nothing for nothing; and if you remove the most difficult parts of the assignment in order to free the worker to accomplish more or less challenging assignments you are subtracting in the hope of accomplishing addition. Herzberg considers the whole concept of job enlargement inefficacious.

From this analysis and from a number of replications of his research reported in his 1959 book, Herzberg developed the concept of enrichment of a job. He linked job enrichment to his motivator-hygiene theory which posits that job attitudes
consist of positive feelings of job satisfaction stemming from factors intrinsic to the work itself, such as achievement and advancement, and negative feelings of job dissatisfaction stemming from factors extrinsic to the work itself, such as company policy and quality of supervision. As Herzberg describes it, job enrichment seeks to improve both task efficiency and human satisfaction by means of building into people's jobs, quite specifically, greater scope for personal achievement and recognition, more challenging and responsible work, and more opportunity for individual advancement and growth. It is concerned only incidentally with matters such as pay and working conditions, organizational structure, communications, and training, important and necessary though these may be in their own right.

Dessler's (1976) and Filey, House and Kerr's (1976) concept of job depth may be equated to job enrichment. Depth refers to the degree to which job incumbents are able to influence their work environment and can plan and execute their work without control or supervision of others. If the job is low in depth the worker has little or no autonomy over how he sets up his work, what tools he uses, etc.

Herzberg (1968) uses the concept of vertical loading for job enrichment. He gives the following principles for vertical job loading:

(i) Removing some controls while retaining accountability to enable the employee to experience responsibility
and personal achievement.

(ii) Increasing accountability of the individual for his own work to give him scope for responsibility and recognition.

(iii) Granting additional authority and job freedom to and employee in his activity to afford him responsibility, achievement and responsibility.

(iv) Making periodic reports and directly available to the worker himself rather than the supervisor and internal recognition to the worker.

(v) Introducing more difficult tasks which have not previously been handled allows for growth and learning.

(vi) Assigning individuals specific or specialized tasks, enabling them to become experts, add responsibility, growth and advancement to the worker.

Ford (1969) writes that to make a job more meaningful and satisfying for competent people with demonstrated ability

(i) give the employee a good module of work, pull responsibilities back down to his level if they have been assigned higher up only for safety's sake;

(ii) gather together responsibilities that are now handled by people whose work precedes or follows, including verifying and checking;

(iii) push routine matters down to lower-rated jobs;

(iv) automate the routine matters as completely as
possible;

(v) rearrange the parts and divide the total volume of work so that an employee has a feeling of "my customers", "my responsibility";

(vi) once an employee has earned the right, let him really run his job;

(vii) develop ways for giving each employee direct individual feedback on his own performance (not group indexes);

(viii) invent ways of letting the job expand so that an employee can grow psychologically.

Hackman, Oldham, Janson and Purdy (1975) give different but related principles of loading a job vertically so that responsibilities and controls formerly reserved for higher management are added to the job; viz.

(i) Return to the job holder greater discretion in setting schedules, deciding on work methods, checking on quality, and advising or helping to train less experienced workers.

(ii) Grant additional authority. The objective should be to advance workers from a position of no authority or highly structured authority to a position of reviewed, and eventually near-total authority for his own work;

(iii) Time management. The employee should have the
greatest possible freedom to decide when to start and stop work, when to break and how to assign priorities.

(iv) Troubleshooting and crisis decisions. Workers should be encouraged to seek problem solutions on their own, rather than calling immediately for the supervisor.

(v) Financial controls. Some degree of knowledge and control over budgets and other financial aspects of a job can often be highly motivating. However, access to this information tends to be restricted. Workers can benefit from knowing something about costs of their jobs, the potential effect upon profit, and various financial and budgetary alternatives.

These authorities contend that when a job is vertically loaded it will inevitably increase autonomy. This increases objective personal responsibility for the work, and ultimately leads to higher internal work motivation.

Specifically the model of job enlargement and job enrichment states that:

(i) Most people desire to contribute in a meaningful way to the attainment of significant objectives.

(ii) That majority of workers are capable of doing so to a much greater extent than their unenriched
Management's basic task is the creation of a work situation that allows subordinates to contribute as broad a range of their talents as possible toward attaining organizational goals.

As employees develop their skills, opportunities for control should be expanded.

Changes in the work situation that allow for greater utilization of employee capabilities will result in employees' exercising responsible self direction and concentrating their energies on the attainment of significant organization objectives. (Penzer, 1973; Yorks, 1976)

Aims of this review

Chapter Two reviews and analyzes recent research to clarify our knowledge relevant to the following items:

(a) What steps were taken in implementing the job enlargement/job enrichment design, and did implementation steps noted in different studies result in projected outcomes?

(b) What was the job procedure that existed before intervention and are these changes related to outcomes?

(c) How are the reported results from job redesign related to the nature of the redesign?
(d) Is there any single element that seems to account for the biggest increase in employee satisfaction and/or productivity in terms of quality and quantity?

Chapter Three presents a more detailed analysis of the research showing an affirmative answer to question (d) above. Thus, the present preview aims at ascertaining the ingredients of effective implementation and assessing positive results underlying that intervention.
CHAPTER II

DESCRIPTION OF MAJOR VARIABLES

Herzberg's approach of Orthodox Job Enrichment shall be followed to organize and to begin to analyze research that has been done. Representative studies shall be analyzed in terms of to what extent they reflect Herzberg's criteria of a good job. Herzberg's conceptualization of job enrichment is one approach, there are others, e.g. job participation, socio-technical systems, industrial democracy, quality of work life, organizational development and the Hackman-Oldham Model. Herzberg's criteria will then be analyzed in terms of feedback parameters and associated performance-incentive relationships. The reason for using the Herzberg model is that, since he was the first researcher to develop the concept of job enrichment, a number of studies have been undertaken to test the feasibility of his approach. Such research has continued to dominate the field and the other models are commonly presented as deviations from Herzberg's model.

Although historically Herzberg's model was developed out of his motivator-hygiene theory, the value of the model is not dependent upon that theory. The present analysis focuses on potential feedback to the employee that results from the manipulation of the job. Job features of the Herzberg model are seen as increasing the base for feedback.
emanating from the task itself. What shall be looked into is what changes were made on the job and what type of feedback was made possible by the facet of change. Results are presented in tabular form in the next chapter. Changes that are not immediately related to job redesign like promotions and transfers are not considered.

Orthodox Job Enrichment

This approach flows directly from the work of Herzberg and his associates. The basis of the idea is that motivators are factors meeting man's need for psychological growth, especially achievement, recognition, responsibility, advancement and opportunity. These factors are concerned with the job content.

Herzberg sees orthodox job enrichment as based on observed relationships between ability (both potential and opportunity) and on the results of performance reinforcement. The first relationship (ability to potential) determines what an individual can do, which relationship naturally leads to personnel selection and classification, that is getting people into jobs where their abilities can be manifested, and into training programs to develop the abilities they lack to do a job well.

The second relationship (ability to opportunity) determines how much of the individual's talent is permitted to show itself. A person can't be motivated to do a good
job unless there is a "good" job to do. Most people have more ability or potential ability than their fractionated jobs allow them to use or develop.

The third variable is the nature of reinforcement that results from job performance. Reinforcement has been classified as either intrinsic or extrinsic. The latter includes all those potential reinforcement operations controlled by the employer such as pay, fringe benefits and promotions. The former is considered extremely important because of the potential for both increasing performance and for improving the general level of personal satisfaction of workers. It occurs more naturally as a consequence of the tasks associated with the job. It sometimes refers to those thoughts or feelings that occur within the individual and that reinforce behavior, such as any feeling of satisfaction at one's own performance (Miller, 1978). Appraisal systems in most organizations emphasize extrinsic consequences of work performance like pay, bonuses, etc. (hygiene factors). Potentially more effective reinforcers for achievement include more immediately and readily manipulated items such as the opportunity for further achievement through new opportunities. These factors must be integrated into a systematic motivation program.

Herzberg (1974) describes eight ingredients of a good job:

1. Direct Feedback - it results from a person's performance and should be given directly to him
rather than through any supervisor, performance review, or administrative procedure that is bureaucratic. It should be nonevaluative and timely. Virtually every modern organization includes computerized data processing of information to provide quick, complete and reliable data. Often, however, these data are not delivered to individuals most responsible for achieving the result. Feedback can serve as a reinforcer if it is delivered to people who control the result. As Hackman et.al. (1975) point out it is generally better for a worker to learn about his performance directly as he does his job. Job related feedback usually is more immediate and private than supervisor-supplied feedback, and it increases the worker's personal control over his work in the process. Moreover, it avoids many of the potentially disruptive interpersonal problems that can develop when the only way a worker has to find out how he is doing is through direct messages or subtle cues from the boss.

(ii) **Client Relationship** - The employee has a customer or client to serve, whether external to the organization or inside it. Too often the customer is either a receiver of service or a supervisor. This can lead to the individual evaluating his
job in terms of how well "housebroken" he is.

(iii) New Learning - A good job should give the individual the opportunity to grow psychologically - always to provide an opportunity for the worker to learn something purposeful and meaningful.

(iv) Scheduling - Allowing the employee to schedule the day in the sequence that seems most appropriate will make the employee responsible for the work - not responsible to the schedule.

(v) Unique Expertise - When everyone is judged on sameness there exists a countervailing need for some personal uniqueness at work - for providing aspects of jobs that allow the worker to be innovative.

(vii) Control over Resources - Conceptually, the way this is done is to push cost and profit centers down as low as is organizationally feasible e.g. design engineers in a plant may be given authority to spend money allocated to a particular project. The cost becomes more realistic.

(viii) Direct Communication Authority - It enhances the growth potential of a job by providing the employee with new avenues of information. Giving a job holder the responsibility of work scheduling and cost control without providing the opportunity to communicate directly with the system.
is asking the employee to plan without knowing the facts.

(ix) **Personal Accountability** - It manifests itself in numerous ways, viz. increasing pride in workmanship, skill and service; a more positive, constructive, enriched job can result. (It is also possible that workers overdo things without consulting management.)

**Gains from Job Enlargement and Job Enrichment**

Job enlargement and job enrichment alter the basic relationship between a person and his or her job. When all the outer layers are stripped away, many organizational problems come to rest at the interface between people and the tasks they do (Hackman, 1975). Frederick Taylor realized this when he set out to design and manage organizations "scientifically", however the scientific methods and concepts were inadequate and/or their implementations were faulty. Financial incentive programs intended to make workers want to work hard toward organizational goals, and placing elaborate supervisory controls on workers proved inefficacious. The basic incongruence between a person and the work remained, and people-problems (such as high absenteeism, poor quality work, and high worker dissatisfaction) became increasingly evident in work organizations. Job enlargement and job enrichment are based on the assumption that the
work itself may be a very powerful influence on employee motivation, satisfaction and productivity. They provide a strategy for moving toward internal work motivation that induces the individual to do the work because it interests him, challenges him and rewards him for a job well done.

A main thrust for modern interest in job enlargement came from a reorganization of the parts manufacturing department in the Endicott plant of IBM in 1944. In an effort to improve job design and worker morale, four distinct jobs were combined: machine operator, setup man, tool sharpener and inspector. Following the reorganization machine operators not only worked the machine, but also sharpened their own tools, set up their own equipment and inspected their finished parts (Dunnington, Sirota and Klein, 1963)

Results attributed to this enlargement program were increased worker satisfaction, lower production costs, and better quality. One entire level of supervision was eliminated, giving workers greater responsibility and authority.

A field study of job enrichment was carried out by AT & T in a customer correspondence division of the company. Enrichment of an experimental group was attained through vertical loading techniques as reduction in supervisory review of output, specified increases in worker accountability for performance, and some allowance for workers' reorganization of the departmental assignments. After five months of the trial period, the company discovered sizeable
differences shown by the experimental over the control groups in terms of better performance on a customer service index, fewer absences, lower costs and turnover reduction (Ford, 1969).

Kraft and Williams (1975) report job enrichment by Roy Walters and Associates, New Jersey for Bankers Trust Co. New York. One of the objectives set by the job enrichment team was to set up an improved system for measuring quantity based on error rates. The year-long project in the stock transfer department focused on changes in the job of production typist. The end of month error rate dropped from 2.46 per cent in the first month of a three-month period to 1.40 per cent in the third. Total-cycle error rates dropped from 0.65 per cent to 0.53 per cent in a comparable period. Staff level before job enrichment was 63 and had dropped to 49 -- a 22 per cent savings -- by the end of 1973. The productivity index before job enrichment, 88.3 per cent, had risen to 106.6 by the end of 1973.

Improvements on productivity and quality have an impact on costs. In one unit of typists turnover dropped from 38 employees in the year July 1971 to June, 1972 to 14 in the following year. At an estimated cost of $1,600.00 to replace each person who left, the savings was 24 x $1,600.00 or $38,400.00.

The overall impact of increased productivity on costs was substantial in the unit. Total costs per standard hour
was $7.62 for 1972. As a result of increased efficiency through enrichment, the figure was reduced to $6.61. The resultant was a savings of $1.01 x 114,000 standard hours used as a basis for both years, which yields a total estimated savings of $115,140.00.

These studies show what gains are claimed by organizations that feel job redesigns have benefitted them.

Orpen (1979) points out that most of the evidence used to support job enrichment consists of either case studies or of correlational studies. Neither of these kinds of studies can be used to support the claim that changes in job content produce beneficial outcomes, such as greater satisfaction or better performance. In the first place, they lack appropriate controls, the changes observed cannot be attributed unequivocally to job enrichment. It is possible in such studies that the changes may have been caused by other factors besides alteration in job content. In the second place, the results of correlational studies cannot be used to infer causality, either from job enrichment to satisfaction or performance, or in the opposite direction.

Orpen conducted a longitudinal investigation in a real-life setting, in which measures were taken both before and after the introduction of a systematic program of job enrichment, which helped him make causal inferences about the effects of redesigned jobs on the people who perform them. His field experiment was designed to examine longitudinal
effects of job enrichment on three work outcomes (performance/productivity, absenteeism, turnover) and three personal outcomes (job involvement, job satisfaction, and internal work motivation).

Results indicate clearly that job enrichment can produce substantial benefits for the employee and the organization. They indicated a significant effect for enrichment on questionnaire items which were alleged to measure task variety, task identity, autonomy and the motivating potential of the jobs. However, results did not reveal significant effects for task significance and feedback. (The hypothesis tested was that employees whose jobs have been enriched perceived them to possess significantly more of skill variety, task identity, task significance, autonomy and feedback compared to employees whose jobs had not been enriched.)

A second hypothesis was that job enrichment results in significant increases in the job satisfaction, job involvement and work motivation scores of employees. Questionnaire analysis indicated significant effects for enrichment on each of the personal outcomes postulated.

However, results did not indicate significant effects for enrichment on the work outcomes of performance and productivity, as hypothesized. The mean performance rating (4.02) of employees in the enriched group did not differ significantly from that in the unenriched group (3.98). Similarly, the productivity index in the unenriched group (5.86) did
not differ significantly from that of the enriched group (6.02).

Job enrichment was postulated as resulting in significant decreases in the rates of absenteeism and turnover. This was found tenable. Absenteeism rate in the enriched group over the six-month period was significantly lower than in the unenriched group in the same period. The same kind of analysis also revealed that the turnover rate in the enriched group was significantly lower than in the unenriched group over the same period.

**Feedback as an Important Factor in Job Design**

Inherent in job enlargement and job enrichment studies is an attempt at giving a worker a job that allows greater discretion in deciding on work methods, working schedules and scope for identifying personally with the operation. The overall model supports responsible autonomous job behavior as a major aspect of individual-organizational-technological relationship in a work setting. Responsible behavior is understood as

(i) acceptance of responsibility by the individual or group for the cycle of activities required to complete the product or service,

(ii) acceptance of responsibility for rate, quantity, and quality of output and

(iii) recognition of interdependence of the individual
or group on others for effective progress of a cycle of activities.

Autonomous behavior further connotes

1. self-regulation of work content and structure within a job, where the job is an assignment having inputs, facilities and outputs,

2. self-evaluation of performance, and

3. self-adjustment to changes required by technological variability, and

4. participation in setting up of goals or objectives for job outputs (Davis, 1966).

This aspect of autonomy emphasized in literature involves accountability on the part of the job holder. Parke and Tausky (1975) maintain that by introducing arbitrary assumptions about the intrinsic higher-order needs of people, enrichment theoreticians pay little attention to the necessity for managerially designed control structures based on accountability and rewards. They suggest that to understand behavior in enriched settings, attention should be redirected from the presumed inherent need for self-actualization to the consequences people face for the behavior manifested within the work situation.

One dimension flowing from this thought is adding onto a worker's sphere of activity greater decision-making on the job. This, according to Karasek (1979) enhances the individual's ability to cope with the environment. Constraints
on decision-making are a major problem, which problem affects not only executives but also workers in low status jobs. The individual working in a job with few opportunities for decision-making in the face of output pressure (e.g. assembly worker, garment stitcher, freight-and-material handler, nurse's aid and orderly and telephone operator) is subject to job strain. Job strain occurs when job demands are high and job decision latitude is low. Employees within organizations must be able to attend to and deal with work-related uncertainty. They must be able to gather, process and export information, as well as receive feedback.

Job redesign increases the task-based feedback in a job. This is evident, for example, in the Wing Slat Project conducted by Herzberg and Fafalko (1975). Work in this project involved modification of the F-4 aircraft to improve its maneuverability. Before enrichment, work was scheduled by the foreman and checked by him or a quality control officer. When a quality error was found, the foreman assigned the job to another mechanic. This shows the situation the mechanic was in. He did a job, but was not responsible or accountable for it. He was not afforded data on what progress he was making and how many quality errors were his fault. He could not be expected to improve his performance. Even the practice of waiting on the foreman or quality controller is itself bad. The time they take to make their observations known to the operator may
be long such that the mechanic cannot relate what he did particularly to the poor quality output as he would had feedback been given immediately after the fault was committed. Giving the poor quality product to the other mechanic cuts off a potential source of feedback and assures the worker that errors are acceptable, since there is another worker whose job is to correct them (and whose job depends upon there being errors to correct.)

Job enrichment brought task-based feedback to mechanics themselves. They began working directly with quality inspectors. This allowed for development of expertise and learning function on the part of the mechanics and feedback was direct. Foremen began checking only some of the aircraft, and any defects in workmanship were the responsibility of the mechanic who made the error. Task-based feedback was increased and the consequences of making errors were greatly altered. Working together with the quality inspector changes the relationship from possibly competitive to cooperative and increases possible positive feedback and/or social reinforcement. In addition, the total job on an aircraft was assigned to crews with overlapping shifts, and the crews began scheduling their own work, providing another opportunity for goal setting and a resulting potential for increased positive feedback and social reinforcement.

Compared to the best of four production crews assigned to slat work, the test group, after learning their new tasks
well, surpassed the control group. The company estimated savings of more than $89,000 from the experimental group's work.

**Feedback Parameters or Ingredients**

Feedback is generally defined as information about performance presented to the individual who has performed (Miller, 1978). However, it must be understood that feedback is functionally defined in terms of affects on performance. This concept has been found useful for describing the information that results from the operator's own activity. In this way a worker resembles the kind of self-regulating device often known as servo-mechanism.

Miller (1953) cited by Holding (1965) differentiates between action feedback and learning feedback. The former is "within cycle" knowledge of the changing state of a person's attempts to produce results. The latter leaves behind it a changed ability to deal with similar circumstances. Miller breaks down the process into stages, viz.

(i) The feedback signal must be discriminated.

(ii) There must be a connection between what the operator did (the original response) and the resulting feedback.

(iii) It must be possible to relate the response with what led up to it (the relevant antecedent stimuli).
(iv) It must be possible to produce a modified response which could reduce the degree of error.

Payne and Hauty (1955) distinguish between directive and incitive feedback. In their research 144 subjects received preliminary training on a complicated compensatory pursuit task involving simulated aircraft instruments and controls, then continued for four hours after having been distributed among 36 combinations of three directive feedback treatments, three incitive feedback treatments and four pharmacological treatments.

Directive feedback consisted of three methods of apprising the subject whenever any of the instrument pointers drifted from its null area. Incitive feedback provided subjects with varying amounts of information concerning their progress at the conclusion of each cycle. The first level ($M_1$) consisted of no prescribed information at all other than a very hazy notion of progress which subjects might form spontaneously. The second level ($M_2$) provided a subject with knowledge of his standing relative to a performance level represented to him as a group norm. It pertained only to the single cycle then completed. The third level ($M_3$) included the second, but it also allowed subject's standing on previous cycles to remain in view.

Directive feedback signals induced an immediate increment in task proficiency. This increment was a positive
function of the specificity of the information supplied.

An appraisal of treatment differences for each cycle of incitive feedback showed that $M_3$ means were significantly superior to $M_1$ means from the second cycle onward. $M_2$ means were significantly superior to the $M_1$ means for cycles two to fourteen (the first 60 minutes) but thereafter the differences were generally not significant.

Incitive returns, thus, could be said to have postponed work decrement for no longer than an hour, either singly or in combination with other experimental variables.

Several investigators have distinguished between the information or cuing function of feedback and the motivational function. The former refers to information given to subjects regarding the nature and locus of errors and the nature of the correct response. Given a constant motivational state, the more information given the subject about the task or about how to correct errors, the better his performance level.

Motivational feedback has been called knowledge of results by researchers, and has been noted as playing a major role in worker performance.

Ammons (1956) discusses the following generalizations emerging from research studies on knowledge of results.

(a) The performer usually has hypotheses about what he is to do and how he should do that. These hypotheses may be about relevance of cues, appropriateness of responses, or both. They
will interact in some way with knowledge of performance.

(b) For all practical purposes, there is always some knowledge of a person's performance available to the human being. Arps (1917 and 1920) found that performers set up subjective sources of information which they used when objectively (physically) stopped telling them how they were doing in the ergograph situation. His subjects reported imagining pen markings and the physical characteristics of individual lifts and that this kept up their performance.

(c) Knowledge of performance affects rate of learning and level reached in learning. The advantage given the knowledge-of-performance group is a directional one. The performer can correct his performance on the basis of information about direction and the amount of error. Knowledge makes possible a better orientation to the task. Pressey (1950), cited by Ammons (1956), reported that students who repeated quizzes with an immediate self-scoring arrangement showed much greater learning than did those to whom the test was given again without any knowledge of results. He worked with difficult English vocabulary items, Russian vocabulary, and facts in the field of psychology.
(d) Knowledge of performance affects motivation. In Arp's (1920) study, subjects seemed much more highly motivated when they were given details about their "lifts". Pressey found that students who had used a "punchboard" as a device for the immediate self-scoring of the quiz results, preferred this way of taking multiple-choice tests, and did not like giving it up as an instructional device.

(e) The more specific the knowledge of performance, the more rapid the improvement and the higher the level of performance. However, there is an optimum specificity of knowledge and additional knowledge does not improve performance or may even lead to its deterioration.

(f) The larger the delay in giving knowledge of performance, the less effect the given information has. If the delay is too long the individual uses what is immediately available in the way of information and this may be irrelevant or even misleading. Knowledge of performance can serve as a reward and what is rewarded is the ongoing behavior at the time of reward. When knowledge is delayed, the possibility that the behavior to be rewarded is actually rewarded is decreased, and this increases the possibility that some relatively irrelevant response is rewarded.
(g) In the case of discontinuous tasks where knowledge of performance is given, small intervals between trials are generally better than are longer ones.

(h) When knowledge of performance is decreased, performance drops. However, whether the drop would bring performance back to the baseline level as if knowledge of performance had obtained all along is an open question.

(i) Where subjects are not being given supplementary knowledge of performance by the experimenter any longer, the ones who maintain their performance level probably developed some substitute knowledge of performance. After knowledge of performance is removed, some clue, such as the kinesthetic sensations from the wrists at the end of each movement, is necessary as a check on that movement and as a guide to the nature of the correction required in the next movement.

(j) When direct knowledge of performance is removed, systematic "undershooting" or "overshooting" may appear in performance and this may be related to the time intervals between trials.

Types of Feedback and How they Related to Performance

Holdings (1965) classifies feedback types according to the nature of delivery.
Intrinsic or Artificial

Performance feedback in the work setting is central to employee performance, motivation and satisfaction. Greller and Harold (1975), cited by Harold and Greller (1977), indicated that job performance feedback, or information about the extent to which one has met job requirements can be meaningfully thought of as emanating from different sources. These sources are identified as intrinsic or extrinsic. Intrinsic sources are psychologically closer to the individual and are seen as providing more meaningful feedback than those identified as external or psychologically distant. Intrinsically provided feedback comes from the task immediately before the worker. These investigators noted a correlation between feedback and measures of autonomy, use of sophisticated skills, involvement, work enjoyment, as well as a negative correlation for repetitiveness. These findings seem to indicate that jobs that are enlarged or enriched are also jobs in which there is an enhancement of intrinsic feedback, making external feedback relatively less salient. Intrinsic feedback is present in the usual form of a task and artificial feedback is the extra information added on - what is sometimes called "augmented" knowledge of results. In the laboratory augmented feedback has been provided by sensing system error (the difference between input and output) and comparing this to a criterion such as an on-target criterion. If the operator is on
target, he receives an auditory or visual signal confirming that fact; if he gets off target, the signal ceases until he gets back on target. Such augmented feedback clearly is supplementary because the operator can see directly his tracking proficiency on the system display.

Uniformly superior tracking proficiency has been found when augmented feedback is present. In a work setting posting of the number of articles finished or number of rejects an operator is responsible for would come under augmented feedback.

Enlarged and enriched tasks should be understood as providing intrinsic feedback. For example providing an employee with opportunities to detect and correct errors and to see the completed task adds intrinsic feedback. Feedback received directly during an activity is a powerful factor in getting people engrossed in what they do. The idea of this feedback is well captured by M. Scott Myers' (1970) description of feedback-filled experience in bowling. Every time a bowler bowls a ball he knows right away whether he has crossed the foul line, lofted the ball, or aimed correctly. He finds out immediately how many pins were downed. After each game he knows exactly how well he did on his own. Bowling is a constant series of personal tests and challenges to one's competence. Constant feedback is available. Equivalent forms of feedback should be derivable from an enriched job.
This intrinsic feedback is important in a work setting, for objective augmented feedback may not be forthcoming from some jobs, because of, among other things:

(a) Some jobs often do not have incontestable standards of good performance;
(b) Performance records are kept at higher levels;
(c) Supervisors may discuss performance of unacceptable work only;
(d) Checking of errors and effecting corrections may be done by some other units;
(e) Quality inspection may be a domain of other employees; and
(f) Records may be kept by section of department, but not by the individual performer. (Walters & Associates, 1975)

(ii) Concurrent or Terminal

In Annet's (1959) experiment (cited by Holding) subjects with concurrent feedback were able to reproduce the correct pressure with each response. Concurrent feedback occurs at the same time the stimulus is perceived. The terminal procedure (information arising as a result of a completed response) gave fairly large errors at the outset, which gradually reduced toward the end of the learning period. Next, subjects were tested with no feedback. The subjects who were treated to terminal feedback initially did get
worse, but only gradually. Conversely, removing concurrent feedback led to immediate and drastic loss of accuracy. Some job enrichment projects do allow for concurrent feedback. In the Xerox Corporation (Jacobs in Davis and Cherns, 1975), technical representatives were given full responsibility for ordering parts and tools to maintain their own inventory individually and were allowed to make calls (usually long distance) to branch, region, or headquarters specialists.

(iii) Immediate or Delayed

Lag in concurrent feedback from continuous operations disrupts performance. In the Valley National Bank (Rush, 1971) encoders (working as proof operators, ensuring that each debit is balanced by credit) were allowed to do much of their own checking of their work, whereas previously another person did the checking. Delay in feedback may offer an opportunity for interference from other sources.

(iv) Verbal or Non-Verbal

One advantage of verbal feedback is that it provides a convenient and flexible means of conveying a wide range of information to the operator. The supervisor may communicate a detailed analysis of responses and their effects, hints on form and stance, on what to look for in the task stimuli, and information about standards of performance. If there is reason to doubt the accuracy of understanding, the supervisor can clarify the issue by repeating the message
in different forms until the worker indicates understanding.

Verbal feedback readily lends itself easily to using the three styles of positive feedback, viz.
Supportive - when an employee comes with a disconcerting problem, the supervisor can reassure him or her that all is not lost. Pointing out alternatives he or she may not have considered would be supportive and calming.
Probing - asking why a particular worker feels so frustrated, what as far as he can make out led to the difficulty, how he sees the situation can be made better.
Understanding - paraphrasing a person's remarks to show that the supervisor cares about correctly understanding the situation, and maybe reinforcing remarks with nonverbal gestures - eye contact, facial expression of sincerity and touching.

Nonverbal feedback also may be elaborate. Graphic methods, for instance, are often more efficient than verbal coaching when tricky movement sequences are involved. In the Herzberg and Rafalko (1975) Avionics project both these methods were involved where mechanics were supposed to follow their planes out of the hangar to flight test. Over and above client relationship with the pilot the
mechanic would discuss the performance of the plane he had been repairing with the pilot himself and plane displays at the same time afforded him graphic feedback on its performance.

(v) Separate or Accumulated

Effects of accumulated knowledge of results may be lasting and appear to have incentive value. If accumulated over too long a period the effect on performance is so slight that its permanence serves no purpose. Combination of separate, response-by-response information is sometimes necessary. Knowledge of performance consists of relating the accumulated knowledge of results of many individual actions to some kind of composite goal.

In P P G Industries (Rush, 1971) a point system was devised for each segment of an operation: doffing, cleaning, start-up and running machines. Operators kept their own records, and their efficiency was measured on the basis of how many bobbins they filled each day. Points were assigned for each of the steps in filling a bobbin. The operator's rating and productivity (which were reflected in compensation and promotional opportunities) made him or her more of a "manager" of his or her full job.

(vi) Social Feedback

The worker experiences social feedback in a social setting from his/her peers, client contacts or other significant people in his or her work environment. This type of feedback
should be distinguished from individual feedback which is information given to an individual about his/her performance with no intervening social factors. It is moderated by whether the individual's behavior occurs in a group setting. Group feedback, where information reflects the functioning of the group as a unit, can also be expected to influence social feedback. Unfortunately, social feedback has been neglected in job enrichment, job enlargement and job satisfaction research.

Review of Selected Studies

In this paper it was found necessary to work from a model in trying to analyze studies. For that reason a) the Herzberg job enrichment model and b) feedback effectiveness were used providing the framework to answer the questions set out in Chapter I. Both the Herzberg model and feedback effectiveness are found relevant and have been shown effective in previous job-related research.

Using this theoretical framework, it is possible to identify performance-related behavioral events. From the standpoint of performance, behavioral events may be classified as desirable, undesirable or irrelevant. Intervention is required when desirable behavioral events occur too infrequently or undesirable behavioral events occur too frequently. Once identified, desirable behaviors must be strengthened and undesirable behaviors must be weakened.
and extinguished (Luthans and Kreitner, 1975).

Ensuring that the behavior is performance related is as important as identifying observable, countable and definable behavioral events. For example, Walters and Associates (1975) noted that to create effective task feedback requires that the desired results of job performance be identified and that a procedure be set up for giving the data on results regularly. The desired results of job performance might be any or all of the following:

(i) Customer satisfaction
(ii) Product quality
(iii) Product completeness
(iv) Worker accuracy
(v) Worker productivity
(vi) Worker efficiency—producing better quality goods
(vii) Worker effectiveness, in terms of involvement

The second basic step involves measuring the strength of the performance-related behavioral events identified in the first step. A baseline measure of response frequency indicates how often the behavior is occurring prior to attempts to change it.

Then follows functional analysis, which answers two questions:

(i) where in terms of the above areas does the responding take place and
(ii) what are its consequences.
The basis of this analysis is that the identified behavior is being maintained by the task environment.

Only then may a job enrichment specialist decide on intervention strategies. He should decide on the most appropriate strategies, to change the frequency of response of the identified behavior. This intervention should be so arranged that employees receive feedback information about their performance while they are working. Without feedback there is no opportunity for the self-recognition of achievement that is the cornerstone of internal motivation. (Walters and Associates, 1975) The feedback may come directly from the task, from a supervisor, or from a client. Self-feedback is sometimes used where the worker keeps his own record of output or errors and measures that against the standard set. That helps him develop effective work goals.

The final step is evaluation. Job enrichment is geared directly to performance improvement and bottomline results. If the evaluation determines that the intervention strategies are not positively affecting performance of the individual or group whose behavior has been identified, measured, analyzed and intervened, then corrective action must be taken.

To expand the model, reinforcements should be considered. Positive reinforcement, contingently applied can effectively control human behavior, by the presentation of
a desirable consequence. Positive reinforcers strengthen the behavior upon which they are contingent and make the reoccurrence of the behavior more probable (Luthans and Kreitner, 1975).

In the selection of studies for review the researcher has been guided by the following considerations:

(i) availability of studies,

(ii) the frequency of them being mentioned in literature as studies demonstrating pertinent aspects of design,

(iii) type and level of personnel used as subjects - an attempt has been made to include representative studies using blue-collar workers, professionals, and women, (Incidentally, no studies were found that stipulated specifically whether subjects were ethnic minorities or not, whether subjects were aged or not- There is one study that used handicapped workers in sheltered employment for a job enlargement experiment.)

(iv) results reported - what types of changes resulted in which outcomes, and

(v) the number of variables covered in the manipulation.
CHAPTER III
PRESENTATION OF STUDIES AND ANALYSIS

Analysis of Studies Using Herzberg's Eight Ingredients of a Good Job.

A positive answer to each of the questions below for each element or parameter led to the decision as to where a particular change falls.

1. Direct Feedback - considered were the following aspects:
   Does the employee get feedback from management?
   Is there an arrangement for self-feedback built in the job changes?

2. Client Relationship - Is there an arrangement for a relationship to be established when a worker
   (i) contacts and is contacted by clients directly?
   (ii) personally deals with clients to solve problems?
   (iii) feels that the client belongs to him or her?

3. New Learning - Are additions into the employees' job task those were done by people above the worker (e.g. quality control)? Or do the job changes introduced lead to workers learning new skills?

4. Scheduling - is an employee allowed to schedule his day in the sequence that he feels most appropriate, to decide when to work and when to break and to assign priorities to items of work as he fancies?
5. Unique Expertise - does the changed job involve the employee in situations that call for innovation and creativity, allowing him/her to develop a solution, obtaining advice where necessary and implementing change?

6. Control over Resources - Are the employees given responsibilities involving expenditures, budgets, and profit concerns?

7. Direct Communication - Does information flow freely and unrestricted upward, downward and across? Does the job environment provide for lateral interaction among peers, vertical interaction between workers and management, 1) to assess worker needs and 2) to make possible participatory decision making and across hierarchical levels?

8. Personal Accountability - Is the employee able to pinpoint his own behaviors which contribute to his productivity? Is poor performance corrected by the employee himself?

Analysis of Studies Using Feedback Parameters

1. Intrinsic - Does the employee meet his own goals? Does he find better ways of doing the job? Is the job such that he can know how much he proceeds without making a mistake? Is the work such that he can finish all the work?
2. Augmented - Does the worker receive a formal report of performance variables? Does the employee receive data-based feedback on each of the major data variables? Is data graphed and posted?

3. Concurrent - Is the job so arranged that information of job progress comes as a person operates on his/her job? Is the employee given latitude to call for technical assistance as he/she is operating?

4. Terminal - Does feedback come at the end of cycle or at the end of the day or week?

5. Immediate - Is there no lag between an operation and knowledge of performance?

6. Delayed - What is the interval between doing an operation and receiving knowledge of results of that operation?

7. Verbal - Is feedback verbally communicated to the employee by management or peers?

8. Nonverbal - Are graphic methods used to convey feedback data? Are there displays or counters from which the operator gets his/her feedback.

9. Separate - Is there feedback conveyed for each datum or each cycle of operation?

10. Accumulated - Is feedback a reflection of performance on a batch over a given time period?

11. Social - Is the feedback arrangement so that you verbally receive it from your clients or peers at work?
Is feedback given to an individual employee or does it involve the whole group of which the individual is a member?

12. Is performance feedback related to incentive systems?

13. Is performance feedback related to social reinforcement possibilities?
### TABLE 1
ANALYSIS OF STUDIES REVIEWED

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Quasi-Federal Agency Orpen 1979.</td>
<td>Receiving and classifying incoming mail</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Employees could decide for themselves which kind of operation they wanted.</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>86, 72% women.</td>
<td>They were allowed to choose and alter strategies they fancied.</td>
<td>1 ; 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Receiving outgoing mail and classifying it and dispatching it</td>
<td></td>
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<tr>
<td></td>
<td>Employees formed themselves into separate groups of 10, each of which did the entire job.</td>
<td>8</td>
<td>11</td>
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<tr>
<td></td>
<td>Employees briefed about the importance of their jobs and told exactly how they fitted into the organization as a whole.</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Group allowed to choose length and timing of their own breaks.</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Group performed their own inspection at intervals and made personal decisions.</td>
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</table>

**Results.**

Levels of job satisfaction, job involvement and work motivation increased.

Absenteeism and turnover decreased.

Effect on productivity—not much. N.B. Employees had been told explicitly beforehand that no benefits (pay, promotion etc.) would be forthcoming after this experiment.
TABLE 1 (continued)

<table>
<thead>
<tr>
<th>The Job.</th>
<th>Changes</th>
<th>Herzberg Elements</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Insurance</strong></td>
<td><strong>Janson (1974)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work coming into the department went from the supervisor to one of seven assign-clerks.</td>
<td>Operators were given continuing responsibility for certain &quot;accounts&quot; - either for particular departments or particular recurring jobs.</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>After checking it for errors, illegibility problems etc. it was parcelled out in batches of about one hour's work to operators.</td>
<td>Some planning and controlling were added to the central task of keypunching.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>If a clerk found other problems, work returned to the supervisor for resolution.</td>
<td>Operators were given several channels of contact with their clients.</td>
<td>2</td>
<td></td>
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<tr>
<td></td>
<td>Operators now inspected documents for correctness, and could take up problems with the client.</td>
<td>2 5; 7;11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Each operator kept her own file of her errors and could review it for error frequency. A weekly print out was sent directly to the operator.</td>
<td>1 2; 4; 6;10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Operators could set their own schedules and plan their daily work.</td>
<td>4 3</td>
<td></td>
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</table>

**Results.**

Quantity of work processed rose 39.6%. Error rate was reduced from 1.53% to 0.99% by the end of the study the number of operators whose error rate was considered poor had dropped from 11.1% to 5.5%. 
TABLE 1 (continued)

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<tbody>
<tr>
<td>Douglas and Johnson, 1975</td>
<td>Task of the section selected was processing of correspondent bank accounting transactions. Section consisted of 1 clerk and 4 key-punch operators.</td>
<td>Control clerk job was eliminated.</td>
<td>3 ; 5 ; 8</td>
<td>1 ; 5</td>
</tr>
<tr>
<td>Enrichment of Key-punch operating.</td>
<td>Control clerk opened and distributed work, balanced and corrected errors, and routed completed work.</td>
<td>Each operator was made responsible for all aspects of the job.</td>
<td>Operators could initiate any necessary contact with the correspondent bank's or computer personnel.</td>
<td>2 ; 7</td>
</tr>
</tbody>
</table>

Operators simply punched work assigned to them.

<table>
<thead>
<tr>
<th>Reported Results.</th>
<th>Item</th>
<th>Prior to Changes</th>
<th>Two months after Change</th>
<th>Seven Months After.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absenteeism</td>
<td>5.4%</td>
<td>3.1%</td>
<td>1.7%</td>
<td></td>
</tr>
<tr>
<td>Error rates</td>
<td>1.3%</td>
<td>.8%</td>
<td>.7%</td>
<td></td>
</tr>
<tr>
<td>Unit/Time Productivity</td>
<td>21.1%</td>
<td>17.7 sec.</td>
<td>16.8 sec.</td>
<td></td>
</tr>
<tr>
<td>Group Completion Time</td>
<td>181.9 mins.</td>
<td>151.0 mins.</td>
<td>148.2 mins.</td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---------------------</td>
<td>----------</td>
<td>----------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Started 14 months.</td>
<td>Employees divided into 4 six-person teams: 3 teams worked on sorting, 1 on the miscellaneous mailroom jobs in a rotating basis.</td>
<td>1</td>
<td>11</td>
<td>Turnover rate of combined experimental groups during the seven months, pre-enrichment period was 17% as compared with 11% during the seven months, post enrichment period. It dropped 6% in experimental units and increased 20% in control units.</td>
</tr>
<tr>
<td>Locke, Sirota and Wolfson (1976)</td>
<td>Teams could decide for themselves how to divide operations.</td>
<td>4</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Each team kept track of and posted its own daily productivity.</td>
<td>1</td>
<td>2; 8; 10</td>
<td>Productivity benefited from enrichment. For groups A and B differences were greater in the last 3 months.</td>
</tr>
<tr>
<td></td>
<td>Later on members were also trained to classify the mail.</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Unit B.</td>
<td>Clerks were allowed to decide for themselves what needs to be done with certain types of files.</td>
<td>5</td>
<td>1</td>
<td>In interviews experimental groups complained that enrichment had not gone far enough, and they had not received any extrinsic rewards for the new skills they had learned.</td>
</tr>
<tr>
<td></td>
<td>Decided for themselves when to send completed work.</td>
<td>5</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 1 (continued)

<table>
<thead>
<tr>
<th>Changes in 3 units.</th>
<th>Herzberg Elements.</th>
<th>Feedback.</th>
<th>Reported Results.</th>
</tr>
</thead>
<tbody>
<tr>
<td>If material searched could not be located, decided for themselves what to do.</td>
<td>5</td>
<td>1 and 5</td>
<td>Incidentally, they were told explicitly at the beginning that benefits which were extra to their wages could not be promised.</td>
</tr>
<tr>
<td>Allotted time to various tasks based on what needed to be done.</td>
<td>4</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>On a rotational basis, one member was assigned the job of unit captain with the job of screening incoming work, etc. He could also make calls directly to other units regarding problems files. Eventually, all employees could make such calls themselves any time.</td>
<td>2; 4; 6</td>
<td>2 and 7</td>
<td></td>
</tr>
<tr>
<td>Unit had meetings with other units to go over common problems related to filing.</td>
<td>6; 11; 7</td>
<td>2 and 7</td>
<td></td>
</tr>
</tbody>
</table>

Unit C.

Unit production standards were eliminated.
TABLE 1 (continued): Herzberg Elements. Feedback

<table>
<thead>
<tr>
<th>Changes in 3 units.</th>
<th>Herzberg Elements.</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees could switch back and forth between tasks, at will. Interrelated tasks could be done as desired by one person.</td>
<td>4</td>
<td>1; 4</td>
</tr>
<tr>
<td>All clerks were trained to do some advanced tasks.</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Employees kept track of their own production. Individual and unit production was posted each day. Accuracy of the self-kept production figures could be checked by both supervisors and other units to whom the work was passed.</td>
<td>1</td>
<td>10; 11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 and 8</td>
</tr>
</tbody>
</table>
TABLE 1 (continued)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Avionics personnel on the production lines checked and repaired the 19 navigational systems on their assigned aircraft before flight test and then began work on another aircraft. Any defects subsequently found were analyzed and repaired by the avionics flight test personnel. Only flight line group communicated with pilots.</td>
<td>Consolidation of flight line and one-third of production line technicians. Each avionic technician handled his own defects. Each avionics technician followed his plane out of hangar, worked with pilot testing his aircraft.</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Ogden Air Logistics Center. Avionics Project. Herzberg and Rafalko, 1975. Testing and repair of all navigational equipment of F-4 aircraft scheduled for maintenance.</td>
<td></td>
<td>8</td>
<td>6; 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1; 2</td>
<td>2; 7</td>
</tr>
</tbody>
</table>

Results:

Test flights were reduced by an average of one-half flight per aircraft - an estimated savings of $85,648 during the test phase alone in which 47 planes were involved.
### TABLE 1 (continued)

<table>
<thead>
<tr>
<th>The Job.</th>
<th>Enrichment.</th>
<th>Herzberg Elements</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ogden Air Logistics.</td>
<td>Tapes had to be pulled out and delivered to meet delivery.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnetic Tape Librarians</td>
<td>Had to be scratched and cleaned in period end batches.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herzberg and Kafalko, (1975)</td>
<td>Had to meet customer demand for scratching and cleaning.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Everyone had to correct his own mistakes.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Results.

Average number of tapes lost decreased from none to one per month.

Savings on researching and reconstructing tapes was estimated at $4,216.

Time was saved in computer usage efficiency.
TABLE 1 (continued)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Springs Insurance Company</td>
<td>Coding services was composed of 3 basic units, special multi-peril (SMP), loss coding (LC) and auto and liability coding (ALC) each of which was responsible for coding premium loss evidence on all kinds of casualty insurance.</td>
<td>All work from branch offices was assigned to specific individuals, requiring them to perform all tasks and functions necessary to process that work.</td>
<td>3 1; 3; 5</td>
</tr>
<tr>
<td>Champagne and Tausky, 1978. Coding Services. Experiment ran for one year.</td>
<td>After being coded information was forwarded to the key punch department and ultimately stored in computer system. Work was distributed at random to operators.</td>
<td>Base pay was not increased. Coders were expected to correct errors themselves. Coder could contact the branch office by phone, teletype or memo if they detected errors.</td>
<td>8 6 7 or 8 2; 7 5 or 6</td>
</tr>
</tbody>
</table>

Reported Results.

1. In the experimental group average absenteeism decreased by 2.2 days per year; In the control group it increased by 2.9 days.

2. Experimental group turnover decreased by more than 50% from previous year; It was 10% less than the control, but there was a general improvement for the whole staff, which was 3% less than experimental group.

3. Productivity results - inconclusive.

4. Workers' evaluation - more satisfaction, and liked having responsibility for particular client.

Complained about pay. Felt bonus should have accompanied job redesign.
TABLE 1 (continued)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Walters and Associates (1975)</td>
<td>Supervisor received all the work, sorted, scheduled, and assigned it according to due dates and skills of various workers.</td>
<td>3 teams were formed: commercial, industrial and weddings and portraits.</td>
<td>11</td>
<td>1; 7; 5</td>
</tr>
<tr>
<td></td>
<td>When over-load was heavy she did some of the work herself.</td>
<td>Each team was headed by a leader, responsible for sorting, assigning work and training new leaders.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Art Department consisted of 12 women employees and supervisor.</td>
<td>She checked completed work and sent it to Print section for final inspection. If unacceptable it went to repair file.</td>
<td>In case of a problem with another department the worker would discuss it directly with that department.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Set their own schedules to meet due dates, and ordered their own supplies.</td>
<td>Department repair file was abolished and each worker had to handle her own repairs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supervisor handled all contacts with Print Department and other departments.</td>
<td>Workers were expected to call directly to customer with questions about work in progress.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2; 5; 7</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 1 (continued)

Results:

Monthly output increased about 35% with no increase in number of employees. Quality also improved.

Hourly increases were inaugurated, and they reflected increased productivity. One result was much greater cooperation when workloads were heavy in some specialities, and light in others.

Greater customer contact was also a source of satisfaction. Employees were frequently asked to escort visiting customers or photographers on tour - a responsibility which had previously fallen to the sales manager.
TABLE 1 (continued)

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maher and Overbagh (1971)</td>
<td>When the operator completed his particular manufacturing operation the in-plant inspector would determine the quality of the parts generated and accept them on this basis.</td>
<td>An in-plant Quality assurance department was organized, to inspect all finished part orders.</td>
<td>Their responsibilities included:</td>
<td>Resolution of all quality problems not immediately controllable by machining.</td>
</tr>
<tr>
<td>Experiment ran for 9 months.</td>
<td>Inspectors had little opportunity to offer assistance in improving quality. Their morale was low.</td>
<td>Decision-making on nonconforming material from machining.</td>
<td>7 and 2 7 and 4, 11</td>
<td>5 1 and 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reviewing all routing documents for accuracy, clarity and completeness.</td>
<td>8 1, 3, 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conducting process machine capability studies.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Establishing programs for the prevention of poor quality machining.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results:
Attitudes toward company and job itself had become favorable.
Acceptance rate of purchased production parts rose from 92.9% to 97.5%.
Inspection time was reduced by approximately 50%. Defective quality was reduced by more than 50%. Reduction in the time required to inspect purchased parts came down from 1.5 hours per job to .7hrs. per job.
TABLE I (continued)

<table>
<thead>
<tr>
<th>Changes</th>
<th>Herzberg Elements</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 British Companies dealing with different products and markets, both wholesale and retail.</td>
<td>Representatives were no longer obliged to write reports on every customer they called. They were only to pass information when they thought appropriate or request action as they thought required.</td>
<td>8</td>
</tr>
<tr>
<td>Paul, Robertson and Herzberg (1969)</td>
<td>Calling frequencies were wholly their responsibility.</td>
<td>4 1</td>
</tr>
<tr>
<td>Sales Representatives.</td>
<td>They could call on demand for technical service department.</td>
<td>7 5</td>
</tr>
<tr>
<td></td>
<td>Communication was by direct contact, paperwork being cleared after the event.</td>
<td>1 5, 7, 9</td>
</tr>
<tr>
<td></td>
<td>Representatives were to settle customer complaints up to $250 if they were satisfied that consequent liability would not be prejudicial.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Representatives were given a discretionary range of about 10% on the prices of most company products.</td>
<td>8 1</td>
</tr>
</tbody>
</table>

Results.

Sales increased by almost 19%. A higher rate of improvement was noted. Group mean score in job reaction survey rose by 11%.
TABLE 1 (continued)

| Imperial Chemical Industries, Ltd. | Design department faced an increasing work load as more design work for the division plants was being done internally. The situation was exacerbated by difficulties in recruiting qualified design engineers. | Engineers were given a completely independent role in running their projects. The engineer had to judge for himself when and to what extent he should seek advice. When authority to allocate work to outside consultants was given, engineers were to have the responsibility for making the choice of consultants. Limits on spending money were removed. No financial ceiling limited their authority to place orders. The manned selection panels, and a recruit would only be allocated to a particular engineer if the latter agreed to accept him. Engineers were allowed to authorize overtime, cash advances and traveling expenses for staff. | Herzberg Elements. | Feedback. |

Results.

Supervisors' routine involvement in projects was much reduced, and they were able to give more emphasis in their work to technical development.

Whereas before the design engineers had to seek approval from as many as 3 higher levels of management for any expenditure over $5,000 - a time consuming process for all concerned - now they could and did, place orders easily.
40 Technicians were involved. 2 sections were experimental group (N=15) and 2 as control group (N=29).

<table>
<thead>
<tr>
<th>Imperial Chemical Industries</th>
<th>The Job</th>
<th>Changes</th>
<th>Harzberg Elements</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paul, Robertson and Herzberg</td>
<td>Laboratory technicians had to implement experimental programs devised by scientists.</td>
<td>Technicians were encouraged to write the final report, or &quot;minute&quot; on any project for which they had been responsible. Such reports carried the author's name.</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>They set up the apparatus, recorded data, and supervised laboratory assistants, who carried out simple operations.</td>
<td>It was up to the technician to decide whether he wanted his report checked by the supervisor or not. He was fully responsible for answering questions arising from it.</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>They authorized requisition of materials and equipment, requested analysis and ordered services such as maintenance.</td>
<td>Technicians were involved in planning projects and experiments and they set targets. They could follow up their own ideas, even if these went beyond the planned framework of research.</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>They interviewed candidates for laboratory assistant jobs, and acted as first assessor in any staff assessment of their laboratory assistants.</td>
<td>They interviewed candidates for laboratory assistant jobs, and acted as first assessor in any staff assessment of their laboratory assistants.</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

Results:
Reports of control groups were far outpaced by those of the experimental group over time. Morale of the technicians improved considerably.
### TABLE 1 (continued)

<table>
<thead>
<tr>
<th>Imperial Chemical Industries:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Paul, Robertson and Herzberg. (1969)</strong></td>
<td><strong>Factory Supervisors</strong></td>
<td></td>
</tr>
<tr>
<td>Production foremen were authorized to modify schedules for loading and sequencing. Engineering foremen were given more responsibility for preventative maintenance, and encouraged to comment on design.</td>
<td>Foremen were given more &quot;on the spot&quot; responsibility of official deputizing for engineers, the writings of monthly reports, and more recognition of foremen's achievements.</td>
<td>4</td>
</tr>
<tr>
<td>All were assigned projects in specific problems such as quality control and could draw on the necessary resources for their implementation.</td>
<td>Engineering foremen were given complete control of certain &quot;on cost&quot; budgets. Production foremen were encouraged to make all decisions on non standard payments.</td>
<td>3; 6</td>
</tr>
<tr>
<td>Foremen could interview and hire labor, based on their decision.</td>
<td>They decided on disciplinary action consulted with personnel department if they found it necessary.</td>
<td>3</td>
</tr>
<tr>
<td>They decided on disciplinary action consulted with personnel department if they found it necessary.</td>
<td>Assessment, training and development of subordinates became their sphere of influence.</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

**Results:**

The number of assistants who were unable to do the work of the man they assisted fell by 37%. The number of repeat offenses among employees with poor disciplinary record was reduced. Harmonious industrial relations were in evidence.
TABLE 1 (continued)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rush (1971) Chemists.</td>
<td>Chemist is assigned to the project after review by sales department.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chemist is responsible for selecting and ordering needed raw materials.</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>He prepares estimates of time and man-hours it shall take to develop processes.</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Estimates of costs of producing compound.</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Estimates submitted to planning committee.</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chemist is responsible for project till it is over pilot testing</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>He works closely with process engineers.</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Results.

Prompter deadlines on customer orders. Increased productivity.

Improved morale among chemists and salesmen who are primary customer contacts.

Less voluntary turnover.
TABLE 1 (continued)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lockbox Department of Chemical Walters and Associates, 1975.</td>
<td>Each clerk was given a batch of envelopes to inspect contents and separate bills from checks.</td>
<td>Each clerk was given full responsibility for a number of accounts, and processed them start to finish.</td>
<td>3; 8 1</td>
</tr>
<tr>
<td>Electronic Customer Services section.</td>
<td>Checks arranged by account were given to other clerks for final inspection of payee signature and date.</td>
<td>In some cases the clerk was given the authority to make simple changes and adjustments and to contact customers directly.</td>
<td>2 5; 7</td>
</tr>
<tr>
<td>Checks and bills went out for encoding, listing and balancing.</td>
<td>When balanced checks and bills were returned, each clerk received a batch of accounts, randomly assigned, for writing up the tape listing, creating a customer advice and credit, forwarding checks to the microfilm area, and mailing out detail work and information.</td>
<td>Supervisor handled all customer contact.</td>
<td></td>
</tr>
</tbody>
</table>

Results.

Turnover dropped to 24% from 59% of the previous four years.

Absenteeism dropped from 11.2 days to 9.3 days.

Each worker performed one of nine operations spaced at stations along the conveyor line. Job rotation from hard to easy stations and vice versa took place every two hours. Changes. Conveyor and pacing were eliminated and workers rotated among 9 individual stations using a batch method of assembly.

<table>
<thead>
<tr>
<th>Elements</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>11</td>
</tr>
</tbody>
</table>

Results.

In group job design (no pacing by conveyor) quality improved. Defects fell from an average of 0.72% to 0.49%.

On individual job design (all 9 operations done by one man) average productivity index rose slightly.

Quality improved - defects per lot falling 0.18.

After experience with individual job design workers disliked line job.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmaceutical Appliance.</td>
<td>Each operating department had its own maintenance crew that looked after 60 to 75% of its needs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Davis, 1966.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance Craftsmen.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remainder was supplied by central crafts shops.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

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TABLE 1 (continued)

<table>
<thead>
<tr>
<th>The Job.</th>
<th>Changes.</th>
<th>Herzberg Elements</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump Assembly.</td>
<td>The job was changed to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kilbridge, 1960</td>
<td>a one-man operation, requiring 1.49 mins.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enlargement.</td>
<td>The job was changed to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The product is a centrifugal water pump composed of 27 parts.</td>
<td>a one-man operation, requiring 1.49 mins.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Its assembly requires an arbortype press, powered by hand tools,</td>
<td>In the enlarged job</td>
<td></td>
<td></td>
</tr>
<tr>
<td>holding fixtures, and water-testing equipment. When this experiment</td>
<td>some freedom of pace was achieved by converting to the batch system.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>began, the assembly was being done by 6 operators on a conveyer line.</td>
<td>The operator now checked each pump and stamped it with his mark.</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Time required to assemble pump was 1.77 mins.</td>
<td></td>
<td>1, 3, 5</td>
<td></td>
</tr>
</tbody>
</table>

Results.

Direct labor costs was $19,912 per annum based on $1.80 per hr. rate, for the six-man line and only $16,762 for the one-man operation.

There was a savings in the wage rate. Both the 6-man operation (specialized) and the 1-man operation (enlarged) fall in the same job-evaluation labor grade.

Quality improved. The number of pumps reworked or rejected in final assembly declined, probably because the assembler's identifying mark places the blame squarely on him.
TABLE 1 (continued)

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Job.</strong></td>
<td><strong>Changes.</strong></td>
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<td>Assembly of water pump for an automatic washer.</td>
<td>Analysis indicated that all work could be done by one person.</td>
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<td>Pump was assembled by 5 to 7 workers, including one man for repair or relief or stock up.</td>
<td>Sequence of prior machining operations on the pump body was changed.</td>
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<td>Cycle time for various levels ranged from 0.33 mins. to 0.44 mins per unit.</td>
<td>Work content for each operator was increased to about 1.5 mins. per unit (3.0 mins. for each cycle of two parts.).</td>
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<tr>
<td>Pump was assembled on a conveyer belt.</td>
<td>Operator was now in control of his pace; could stop and correct a mistake.</td>
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**Results.**

**For Management.**

1. Quality improved. Rejects went from approximately 5% to less than 0.5%.
2. Costs were reduced. Direct labor was reduced by approximately 50%.
3. Operator turnover was reduced, hence lower training costs.
4. Housekeeping improved. Each operator became responsible for his work area.

**For Workers.**

Change was welcomed as resulting in a more meaningful job and readily accepted new responsibilities.

**Remarks.**

Questionnaire showed that enlarged jobs were preferred, but no preferences were associated with personal characteristics. Disliked was limited chances for social interaction and short learning time.
Each group worked a total of 5 days on the experimental task, which consisted of sorting either nuts or bolts. Each subject, independently sorted a different size nut or bolt. No subject had I.Q. below 75, 8 had physical impairments, but none were considered serious enough to influence their performance on the assigned tasks. 26 were illiterate.

Midway through the third workday, either a job change or job enlargement was introduced to 3 members of the group selected according to their relative status in the group.

Job enlargement involved additional assignment of sorting specified nut or bolt, assembling that and placing it in a packing box. The admonition was "Be sure to get these right because they will be shipped out at the end of the day."

Job change involved merely assigning a particular size nut to subjects who had been sorting bolts or nuts.

Results.

Job enlargement was found generally to be of no greater influence than job change so far as worker's satisfaction and tension were concerned.

Workers whose jobs were manipulated accounted for significantly more errors than their co-workers who did not undergo either job enlargement or job change.

Workers whose jobs were enlarged suffered a decrement in quality of performance, while those jobs that were merely changed without enlargement.

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<td>Bishop and Hill, (1971)</td>
<td>Each group worked a total of 5 days on the experimental task, which consisted of sorting either nuts or bolts. Each subject, independently sorted a different size nut or bolt.</td>
<td>Midway through the third workday, either a job change or job enlargement was introduced to 3 members of the group selected according to their relative status in the group.</td>
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Monsanto Company, Missouri. Rush, 1971. Chemical plant, for conversion of chemical raw materials to nylon salt and eventually to nylon.

**TABLE 1 (continued)**

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<td>Chemical operators prepared batches of raw materials, did sampling of nylon intermediaries, and monitored the operation. It was monitored pneumatically by manipulation of dials and graph equipment on a large and elaborate control panel. Chemical operators who manned the control panels had to follow the operation carefully, adjust mix controls, monitor reactions, and record voluminous data on each batch processed. He worked from process specifications drawn up by engineers.</td>
<td>Operators were given an overview of the entire operation and the relationship of each step to every other. The following responsibilities were added. Control limits and danger levels were spelled out for each type of process. They were taught simple calculations to tell when a change in the automated process is necessary. They were given freedom to change the process or to compensate for an irregularity when instruments indicated it. They designed their own log sheets for recording exceptional data. They were accountable for keeping the process under control. They sorted out problems from shifts just finished and tried</td>
<td>Feedback.</td>
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He did not always know why he did any particular step of the operation.

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<th>The Job.</th>
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<th>Herzberg Elements.</th>
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<td>to identify the central problem and contributing factors.</td>
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<td>Met with foremen, engineers and maintenance men for planning corrective actions.</td>
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<td>If the problem was due to the operators lack of skill he was given the information he needed.</td>
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<td>If the problem was inherent in the process appropriate person or persons were assigned to take action.</td>
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**Results:**

Charting of quality changed from erratic extremes to a constant and improved level within one month.

Loss and waste of raw materials which previously could not be accounted for dropped almost to zero.

Turnover and absenteeism were both low; after enrichment there was neither and increase nor decrease.

Because of more efficient use of his time and because he now managed the job, each operator was now able to monitor and control up to 50% more instrument panels, making possible the manning of expanded process facilities without additional personnel.

Operators were enthusiastic about taking on the additional job responsibilities, they welcomed the added challenge and wanted more control over their own jobs. And they presented no demands for additional pay.
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**Quasi Federal Agency. Orpen.**

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**Insurance Co. Janson, '74**

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**Trust Co. Keypunch. Douglas & Johnson**

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**Federal Agency. Clerical Locke et.al.**

| 9 | 3 | 2 | 2 | 2 | 1 | 2 | 3 | 4 |

**Avionics Project. Herzberg and Rafalko.**

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**Magnetic Tape Librarians Herzberg and Rafalko**

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<td>Deep Springs Co. Coding.</td>
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<td>3 British Companies.</td>
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<td>Sales. Paul et al. '69</td>
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<td>Imperial Chemicals. Design</td>
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<td>Engineers. Paul et.al.</td>
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<td>Arapahoe Chemicals.</td>
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<td>Chemists. Rush 1971</td>
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<td>Lockbox. Customer services.</td>
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CHAPTER IV

DISCUSSION

This study aimed at finding out what working procedures were present before job enlargement and job enrichment were instituted and what changes were made on the job. Results of the changes are then related to the job changes effected.

These studies are discussed in terms of reported results and the importance of feedback. The relevance of reinforcement is highlighted. The Herzberg model concentrates on giving workers a greater decision-making role in their work and feedback which is direct, frequent and data based to increase performance; to maintain desired behavior reinforcement is necessary. Reinforcement may be said to have occurred any time the frequency of a response has increased as a result of the contingency between a behavior and its consequences.

These studies show that job design can provide for personal accountability of workers. An employee can be given the latitude of deciding for himself or herself the operational strategy that suits him or her best, of being responsible on a continuing basis for certain accounts or particular departments, for handling his or her errors, in some cases for even stamping the finished product with his or her signature. This arrangement allows a worker to
see his or her contribution in terms of the whole organizational output. This personal accountability has built within it an occasion for experiencing intrinsic feedback. He or she derives psychological benefit as he or she appreciates the fruit of the labor.

Coupled with accountability is unique expertise and scheduling. Elements like these can encourage workers to conceive and propose innovative ways of dealing with their jobs. For example in the Monsanto Company study (Rush, 1971) workers were given freedom to change the process or to compensate for an irregularity when the instruments indicated it. The added challenge was welcomed and they wanted more control over their own jobs.

Elements like these can encourage workers to conceive and propose innovative ways of dealing with their jobs. Together with direct communication channels employees are enabled to be involved in interorganizational relationships which introduce them to new ideas, new perspectives, new techniques of solving work problems and new sources of information.

In most studies client relationships were considered. Employees were encouraged to take up problems directly with clients, mechanics followed their planes to pilot-testing etc. This arrangement allows direct feedback on a one-to-one communication basis. The employee is offered an opportunity with his or her client to concentrate on each
other's primary concerns of the moment. Each person has an opportunity to provide feedback to the other in order to ensure clarity, and each may influence the other without interference of the organization.

Research indicates that oral communication outside the organization is of vital importance for gathering information on markets, technologies and customers (Allen and Cohen, 1969; Czepeil, 1975) and to stimulate ideas and solution approaches to technical problems (e.g. Baker et al., 1969; Utterback, 1971).

Another aspect of importance is consideration of feedback the individual currently receives during or following performance. Numerous research studies (e.g. Parsons, 1974; Panyon, Boozer and Morris, 1970; Brethower, 1973) have demonstrated the effect of feedback on performance. Research studies on establishing performance improvement projects in the organizational setting have consistently demonstrated if the individual is not receiving any measured feedback, a procedure should be established to provide this feedback. Panyon et al. (1970) point out that the feedback system is one economical method whereby the performance of employees can be maintained in the absence of daily supervision.

The value of feedback is directly related to the attention paid to it. Miller (1978) cites a case of a data processing center of a major textile firm that provided
its sales organization with a monthly analysis of all sales. Sales were broken down by customer, by salesperson and by fabric sold. A voluminous computer printout with all the pertinent data on a salesperson's performance was available to each salesperson every month. None of the salespersons were, however, aware of how they were performing relative to their objectives, their previous performance, or the performance of other salespersons. The reports were glanced at, at best. This data was wasted because the managers did not attend to it in a manner that would establish it as functionally important. Management must make the information feedback relevant by visible concern about the data, social approval when the data indicates improved performance and/or by other incentives or reinforcers.

The importance of feedback for goal setting completely eluded Herzberg. Feedback enables the person to perform tasks better and to evaluate progress toward a task goal. This augmented feedback allows for a review of type and frequency of errors, visually. Quantity of goods produced can also be targeted.

A study by Locke and Bryan (1966) compared the effects of knowledge of results and no knowledge of results on a computation task. This study reported that there was no significant difference between the knowledge of results and no knowledge of results in the two groups studied. However, when subjects were reclassified according to
their postexperimental goal descriptions, a significant relationship of goals to performance was found among them. Two subsequent studies (Locke, 1967; Locke and Bryan, 1969) were carried out in an attempt to separate the motivational effects of knowledge of results from cue effects using a 2 x 2 factorial design. In the first study, half of the subjects were given specific hard goals to aim for on each trial, while the other half were told to "do their best". In the second study, half of the subjects were given easy goals to aim for and half were given hard goals. In both studies, the subjects with hard goals performed significantly better than those with easy "do best" goals. These studies seem to indicate that knowledge of results does not automatically improve performance unless it helps the individual to set specific goals.

Brethower (1973) emphasizes that feedback systems may be used effectively if

(i) the organization wishes to influence important, not trivial performance:

(ii) employees have control over their performance or the organization is willing to make changes that give them control over their performance; and

(iii) groups can be constituted such that there can be consistent administration of performance indicators and perceived accountability by group members.
In the studies reviewed in this thesis, all these conditions existed, but the amount of control an individual had on his performance varied according to the manipulation effected by the experimenter. But in all instances there was room for feedback of one sort or another.

Extrinsic reinforcements are a component of the employment relationship that need to be taken account of. In his model Herzberg completely rejects them, but in the experiments conducted their effects are not controlled except for money. Often jobs are interdependent and workers are socially interdependent. Since rewards and punishments from the informal group are apt to be administered immediately and frequently they are apt to be very powerful in controlling behavior (Nord 1969). In Rice's (1953) study job enlargement increased efficiency and reduced damages. He explained his finding on the basis of small group development made possible by changes. He emphasized the importance of textile weavers' satisfying psychological and growth needs of the job. A group serves a vital function in giving the learner or neophyte information on what he or she is doing right or wrong in the job. Equally important, the group can provide reinforcement by rewarding correct behaviors and punishing incorrect ones. Both functions help a worker improve skills.

Hackman, Brousseau and Weiss (1976) showed that explicit group discussion of strategy did improve group
productivity -- but only when the task required co-ordination and sharing among members for effective performance. Groups showed higher flexibility in how they approached task procedures, they were more likely to change procedures when things obviously were not going well on the task and members communicated with one another slightly more clearly and understandably. The overall climate of the group reflected the affective atmosphere of the group as experienced by members, the amount of interaction which took place while the group worked and the degree to which members were comfortable in the total experimental setting. Groups provide an outlet for affiliation needs, and are a source of emotional support and reassurance.

Equity theory developed by Adams (1963, 1965) suggests that an individual evaluates a situation by consciously comparing his or her output/outcome ratio that of a Comparison Other (CO). Inputs might include education, age, skill level, sex and effort. Outcomes might include pay, status, fringe benefits and the challenge and complexity of the job. Equity occurs when the focal employee's ratio of inputs to outcome is equal to the Other's input/outcome ratio. The consequences of inequity is a state of tension in the focal person which results in dissatisfaction and the motivation to reduce the tension by altering one or more components of the ratio, such as productivity.

In job studies this possibility of an employee comparing
himself or herself with a significant Other who may be doing
the same type of work with different payoffs in another
organization was not controlled.

In the job enrichment experiment by Locke et.al. (1976)
subjects complained that they had not received any extrinsic
rewards for the new skills they had learned, although they
were told explicitly at the beginning that benefits which
were extra to their wages could not be promised. In Orpen's
(1979) experiment the same warning was given, and he found
that productivity did not improve much. Incentives should
be made contingent on higher productivity and better quality.
Bergum and Lehr (1964) reported that the subjects in the
experimental group who received individual incentives per­
formed better than those in the control group who were never
rewarded. When the incentives were removed from the experi­
mental group the group's performance was poorer than of the
control group. Also, data reported by Hammer and Foster (1975)
tend to support the assumption that the effect on intrinsic
and extrinsic reinforcements are additive in nature. (The
performance level of subjects increased in an interesting
task setting with the introduction of the contingent pay
condition.) They point out that their finding gives
strong support to a reinforcement-based prediction that the
task characteristics and money payments, when appropriately
scheduled, increase task performance and/or self reports of
attractiveness and interest.
They cite Skinner (1969 p. 13) who recommended that a task that is automatically reinforcing to the worker, when combined with a contingency-pay plan will result in an increase in performance. Skinner, therefore, recommended that the organization should design a work setting where the dual objective of getting things done and making work enjoyable are met. Judging from these studies and others, Lawler suggests that incentive reinforcement system which ties financial rewards to individual performance can be expected to result in increased performance by 10 to 20%.

It is very possible that over time the novel effects of job enrichment will wear off. Client contact will be taken as matter of course, all the new learning that there is in the enriched job will no more be exciting and direct communication is seen as a necessary part of the work and will be taken for granted. Productivity will go down and be slipshod, absenteeism will start to increase and most of the conditions that existed before the job was enriched will return, though they may not come down to the original baseline. This will be because reinforcement is not controlled. Positive reinforcement of desired behavior is one aspect that should be tied in with job enlargement and job enrichment for lasting results.

Positive reinforcers strengthen the behavior upon which they are contingent and make reoccurrence of the behavior more probable. Personnel policies concerning
incentive pay, transfers, time off, breaks etc. can be used as positive reinforcers. So, after redesigning the job, the job enrichment expert should identify, beyond any shadow of doubt, additional reinforcers, not currently delivered, that can be added contingent on the desired performance. There should be positive consequences that follow as a function of performing the behavior itself.

Johnson (1975) performed a study in which he simulated a zero defects program common in industrial settings. He tried to identify which elements of a zero defects program might be expected to exert influence over performance. He preconditioned workers to perform under contingencies that reinforced high levels of production. He then attempted to influence performance by

(i) persuasive influence - instructions to perform quality work;

(ii) announcement of a pay contingency for quality work; and

(iii) an actual pay contingency in which workers were paid according to the quality of their performance.

Johnson found that the first condition was not efficacious, the same held for condition two, but the third condition brought marked differences in performance depending on the pay contingency. The experimenter got what
he paid for. When subjects were paid for quality they worked more accurately than when they were paid for quantity. Antecedent stimuli and instructions need contingent reinforcement to influence performance.

Indications for Future Research

This study provides some aspects that should be considered in job redesign - viz. the importance of feedback and reinforcement systems to prop up desirable work behavior of employees.

However, some issues still remain open:

(a) Having demonstrated that job enrichment changes positively affect job behavior, is this performance maintained over time? Published studies are all one-time studies and it is important that there should be tracking over time to note what effect they have on productivity, absenteeism, satisfaction and morale.

(b) In some reported studies workers appreciated increased autonomy and responsibility, elements of control, planning and decision-making that were incorporated into the target job, but felt management had not gone far enough. There is scope for a comparative study in which one set of workers are guided by management in redesigning their work and another case where identical
changes are made but these are imposed on the work force by management. Does participation in change decision-making affect the results of the job enrichment exercise?

(c) Future studies will have to look into positive reinforcement patterns that blend well with job enrichment. This shall entail a number of observational studies in which reinforcement patterns shall be manipulated.

(d) In some experiments, a group is singled out for the experiment and there is a control group. The patent artificiality of the experimental setting and the workers' knowledge that they are participating in an experiment should have a bearing on results. The pretesting itself and post-testing questioning and in some cases presence of consultants produce this reactive arrangement. The genuineness of reported results and responses to questionnaires in such experimental settings can be studied in the context of long term effects.

(e) Feedback effects may be short-term or long term. If performance indicators are removed in job enrichment studies does performance deteriorate? Logically removing the performance indicator causes control to cease. But the individual
may have generated his own feedback system.

Conclusion

This study has looked at published studies of enlargement and job enrichment focussing on the amount of change involved and results reported. The Herzberg (1974) job enrichment model and a feedback model have been used as framework to analyze studies, because the elements of an enriched job postulated by Herzberg were found to be closely connected with feedback. A relationship was found. Herzberg's model aims at incorporating into the target job increased autonomy and responsibility, and the worker is given greater scope for control, planning and decision-making as he operated on his job. For all this to be appreciable, feedback from the task itself is necessary, it aligns the worker with what he or she is doing. However, the model should also emphasize reinforcement contingent on positive, desirable job behavior. This would support the changes made by ensuring that there is a greater possibility of intended outcomes being continued.
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