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THE TRAINING NEEDS
OF
INDUSTRIAL FOREMEN

A thesis presented in partial fulfilment

of the requirements for the degree of

Master of Science

in Psychology

at Massey University

Kenneth Francis Hyde

1985

ABSTRACT

This thesis reports the results of three interrelated studies relevant to the work and training of foremen. Training programmes for foremen which are based on traditional leadership research have not resulted in changes to objective performance outcomes. A review of the literature on observation studies of foreman's work suggested a Model of effective foreman behaviour. This model was tested in Study I, using data obtained from a continuous observation record of the work behaviours of nine foremen in one New Zealand plant. Correlations between work behaviours and four measures of performance outcome - productivity, turnover, absenteeism and accident rate - failed to provide support for the model. Two multidimensional scaling solutions were constructed to discover the underlying dimensions of behaviour. These also failed to correlate significantly with any of the performance criteria. It was concluded that no one model of effective behaviour could be prescribed for all foremen as the foremen's behaviour was largely under the control of the production system. It was also concluded that levels of performance outcomes were under the control of the production system, rather than under the control of the foremen's behaviour. However the study did identify one critical aspect of all foremen's jobs, the Pacing Factor, which was simulated with an in-basket exercise in Study II. The simulation and a training exercise were pilot tested with thirty five trainees from supervisory courses. A three-group experimental design failed to indicate significant improvements to performance following a short training session, but post-hoc validity for the simulation was provided by one

group of experienced trainees scoring significantly higher than the other groups. In a third study, five of the foremen from Study I completed the in-basket exercise. These foremen rated it as a realistic simulation of their jobs and their mean score was higher than that for the less experienced supervisory trainees. Ideas for the future development of the in-basket exercise and its use in training are outlined.

In memory of

my father

Herbert Francis Hyde

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PREFACE

The first study reported in this thesis arose from an investigation into the training needs of foremen in an industrial firm. This investigation was carried out over a six week period in May and June 1984. It was hoped that the identified training needs could be addressed in a training programme, and that the success of this programme could itself be evaluated for the thesis, in terms of any real changes made to productivity. However, in a report to the firm's management, it was suggested that training of foremen was not the correct solution to the difficulties faced by the firm. The report was well received and a number of organisation changes were made as a result. These and other changes did take time, and it was not possible to continue research on foremen in the firm during the reorganisation. During this period the opportunity was taken to pilot test an in-basket simulation of critical aspects of the foremen's jobs in a laboratory study. Finally, in January 1985, it was possible to return to the firm and collect further data on critical aspects of the work of the foremen.

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INTRODUCTION

Training is a planned effort by an organisation to improve the job knowledge and skills of its employees, in ways which improve employees' performance of the job (Goldstein, 1980; Landy, 1985; Wexley, 1984). Training may include lectures, movies, simulations of the job such as role plays, case studies and business games, or group sensitivity exercises, on-job coaching or systematic job rotation. There are two potential targets of training programmes: new applicants to a job who lack in knowledge or skills for the position, or existing incumbents who are performing below expectation (Miner, 1966 in Campbell et al, 1970). In a survey of studies from the period 1971-1981, using psychological approaches to improving productivity, Katzell & Guzzo (1983) found that training interventions were the most commonly reported form of intervention.

But there is an unfavourable side to training too. Many activities in the guise of training programmes simply result in a short-lived feeling of goodwill or zeal, or the behaviour change they promote is merely temporary. Hinrichs (1976) was outspoken in his condemnation of the showy side of training interventions: "The good program is attention-getting, dramatic, contemporary or fun. Whether or not it changes behavior becomes secondary." In the extreme case a programme of training may simply be a means of rewarding an experienced employee with a break from his or her job.

Identifying a Need for Training

Training is usually considered appropriate when work performance is below that desired, and when this deficit can be attributed to a lack of skill, knowledge or attitude among staff (Baynes, 1975). Traditionally personnel psychology has taken a three-step process to define a training need. These steps are: organisation analysis, task analysis and person analysis (Goldstein, 1980).

The aim of organisation analysis is to identify where in the organisation training should be targeted. Manpower inventories may be examined to indicate where in the organisation extra skilled and trained staff will be required in the future. Indices of accident rates, turnover, absenteeism or productivity may be collected, to identify organisation units which are performing below expectation (Goldstein, 1980; Wexley, 1984). The organisation analysis identifies a gap between a desired performance level and the present level of performance of a work unit. The work of Thomas Gilbert (1978) is one such systematic approach: the organisation is represented as a hierarchy of goals and missions; individual units are assessed in terms of the ratio of their average performance to their best performance on these goals. Training is only one possible solution to the performance deficits thus identified.

The aim of a task analysis is to specify what the content of training should be. Many of the traditional job analysis approaches are appropriate here including interviews, questionnaires and job

observation (see McCormick, 1976). Firstly the tasks performed by the employee are listed. Next, behaviours critical to the performance of these tasks are specified. Finally, the training required for the worker to acquire those critical behaviours is established (Goldstein, 1980). The employee may not require training in all tasks in which he or she is deficient. It is more appropriate that the employee is trained in those behaviours most related to a deficit in job performance (Campbell et al, 1970). It is the role of the training analyst to show that the selected content of his/her training programme is in fact related to on-job performance.

The final level of analysis, person analysis, seeks to identify who in the organisation requires training. The analyst's job is to pinpoint individual employees with substandard performance.

Criteria for Judging the Effectiveness of Training

Given that an organisation unit or individual has been identified which is performing below expectation, the goal of any training effort must be some improvement in the identified job performance measure or organisational output measure. Hamblin (1974) has defined several levels of criteria for evaluating the success of a training effort: a) trainee reaction, b) trainee knowledge, c) trainee behaviours, and d) results. Any one training effort may evoke a favourable reaction from trainees, improve their knowledge or alter their behaviour, but unless these changes result in some objective change in a valued outcome, the

training effort can hardly be considered successful. The training of an industry's foremen has traditionally been suggested as a means to resolve production or personnel difficulties.

Appropriate "results" criteria for evaluating the effectiveness of training may include an increase in productivity, or a favourable change in some personnel measure (such as turnover, absenteeism, or accident rate). The measurement of such criteria is not without problems of accuracy. Researchers are dependent on the information systems used in firms, unless special recording procedures are instituted by the psychologist, personnel officer or production engineer.

Distinguishing Foremen from other Supervisors

The focus of this thesis is on the training needs of one occupational group, industrial foremen. The psychological literature generally makes no distinction between this role and the more general term of "Supervisors": a lower level management position in charge of directing staff. The assumption is often that because all such postions involve the directing of staff, there is an interpersonal skill requirement common to all these positions. (In the psychological literature this common skill requirement is termed "Leadership" skills).

But there is value in defining the more concise term of "Foreman". The Dictionary of Occupational Titles (1965) devotes 15 pages and some 28,000 words to Foreman positions. There is a distinct industrial or manufacturing component in these jobs. The foreman is one who supervises and coordinates the activities of workers, studies production schedules and estimates man-hour requirements, etc. Table 1.1 provides a list of the general duties of a Foreman.

On the other hand the D.O.T. devotes a further three pages to Supervisor positions. Here there is a distinct clerical or office component to the jobs.

To avoid confusion, the term Foreman will be used throughout this thesis to imply one who works in industry. We will see that in fact the skill requirements for such positions may be considerably different

Table 1.1 The Jobs of Foremen

(Dictionary of Occupational Titles)

supervises and coordinates activities of workers

studies production schedules and estimates man-hour requirements

enforces safety regulations

interprets job orders

adjusts work procedures

recommends measures to improve production methods

resolves work problems

recommends personnel actions (e.g. promotion)

trains new workers

maintains time and production records

requisitions materials

confers with other foremen

confers with workers' representatives

is adept or knowledgable at the activities of workers

from those for supervisor positions in office settings.

The traditional approaches to management and supervisory training have come in part from the study of leadership. The psychological literature on leadership and on managerial and supervisory training will now be examined.

Psychology and the Supervisor : The Study of Leadership

For more than 60 years psychology's approach to the study of the work of managers and supervisors had been through the study of Leadership. The approach has three implicit assumptions:

1. The most important component of a supervisor's job is the interpersonal skill involved in handling subordinates;

2. The best action for handling subordinates can be prescribed in simple terms based on a knowledge of a few aspects of the work situation; and

3. Adopting a prescribed approach to leadership behaviour will lead to productive outcomes either in terms of productivity levels, or the relief of personnel problems, or both.

As Landy (1985) puts it - "Historically, this has been the goal of many leadership theories - to identify those behaviours, styles, or characteristics of leaders that are associated with increased subordinate satisfaction, motivation, and performance on the one hand and decreased absenteeism, turnover, and accidents on the other" (p. 426).

The first approach to this problem was to identify the characteristics of a good leader. Was the good leader more ambitious? more authoritarian? Did he/she have greater intelligence, or perhaps

greater self-confidence? As early as the 1940's it was becoming apparent that this "trait" approach was fruitless. In a very lengthy review of such studies, Stogdill (1948) demonstrated that there was no relationship between personality factors and leadership effectiveness.

Psychology turned its attention to the behaviours of effective leaders. What do successful leaders do? Generally the approach has been to undertake extensive surveys in which managers, supervisors and their workers describe the actions of the manager. The most quoted of these approaches, conducted by researchers at Ohio State University, concluded that there were two dimensions of behaviour related to leader effectiveness: consideration and initiating structure (Fleishman & Harris, 1962). Consideration implies a positive regard for employees, a desire to be supportive and have rapport with workers. Initiating structure implies that the leader concentrates on the task at hand, organises and defines the activities of the group, and pushes for production (Fleishman & Harris, 1962). Many hundreds of studies have been conducted to attempt to establish the relationship between these dimensions in managers' and supervisors' behaviour, and such criteria as productivity, absenteeism and turnover. At first the "Human Relations" school of thought contended that supervisors should emphasise considerate styles. Other researchers argued that effective supervisors must display both high consideration and high structuring behaviours. An exhaustive review by Kerr et al. (1974) concluded that any number or combination of 18 separate moderator variables may affect the relationship between the Ohio State dimensions and performance criteria. Whether or not `consideration' was the appropriate way of

handling staff, and thus achieving productive outcomes, could depend on the supervisor's experience, or the complexity of the job at hand, or workers expectations about the supervisor, etc. The situation becomes very complex. In the end to train a supervisor to take on one or other of the leadership "styles" is questionable.

Newer models of supervisor action take the view that the effectiveness of foreman's actions is dependent on some characteristic of the work situation. The most popular of these approaches has been the work of Fred Fiedler (1967). Fiedler suggested there was an enduring property of managers and supervisors called L.P.C. (`Least Preferred Coworker'). High LPC supervisors describe their least preferred coworker in positive terms; they seek esteem through interpersonal relations, and can distinguish between qualities of the worker and qualities of his/her work. Low LPC supervisors describe their least preferred coworker in more negative terms; they seek esteem through succeeding at the task, and link the performance of the worker with his/her personality. (As an example, the low LPC supervisor might blame poor work performance on the worker being an habitually `lazy' person). Fiedler contended that the supervisor's effectiveness depended on certain properties of the work situation: how much the workers like their supervisor, the complexity of the work task, and the amount of authority in the supervisor's position. Despite a considerable volume of research on these concepts, the accumulated evidence is contradictory (see Saskin et al, 1974; Stinson & Tracy, 1974; Vecchio, 1977). The complex theoretical nature of LPC and its unsubstantiated relationship with productivity outcomes greatly

reduce its value as a guide to supervisor actions.

After 60 years of continued research the literature on leadership has not resulted in any clear relationship between leadership variables and results criteria. The literature is voluminous and poorly defined, and the results contradictory (McCall, 1976). Miner (1978) quips - "I propose that the concept of leadership has outlived its usefulness" (p. 5). The errors in a Leadership approach to supervisor behaviour can be enumerated:

1. The research has relied on a single method of study, namely questionnaire surveying, and failed to actively observe the behaviours of supervisors;

2. The instruments used in such surveys have been of questionable psychometric value (Kerr & Schriesheim, 1974) and construct validity (Korman, 1966);

3. The research has sought to explain the behaviour of many hundreds of subjects throught the use of a few simple categories;

4. The research has narrowly focussed on the interpersonal relations of the supervisor and his/her immediate work group;

5. The research has ignored the nature of the foreman's total job, including the many other activities involved.

Luthans & Davis (1982) in a paper on organisational behaviour research call for a reinstatement of the `idiographic' approach to research. They note that the group-centred research approach, in which validity of results is assured through collapsing data from as many subjects as possible, has not added greatly to our understanding of organisational behaviour. The writers contend that quality of information will result from intensive single subject studies of observed behaviour, or from smaller case studies. The present author concurs with this opinion; direct observation of the work of industrial foremen should provide valuable insight into the effective work actions of foremen, those actions leading to productive outcomes.

Similarly there is little of this form of intensive research conducted in New Zealand industry. Because the research which is reported describes the work of foremen in the United States or United Kingdom, it is valuable to ask in what ways the work of New Zealand foremen may differ. Given that New Zealand's industries are much smaller than their American or British counterparts, it is not unreasonable to assume that the work of foremen will be different.

Management and Supervisory Training

Research into leadership, and other organisational behaviour topics, has profoundly influenced approaches to the training of managers and supervisors.

In New Zealand alone, literally thousands of supervisors and managers participate in training and development programmes each year. The most popular programmes are run by the Institute of Management, the Vocational Training Council and the Industrial Training Service (of the Department of Labour). The former two courses are largely run by staff of technical institutes. There are also, of course, numerous programmes run by management and training consultants, and those run in-company. In the majority of these courses the audience is made up of trainees from a great variety of backgrounds, from clerical and service industries, government and professional bodies and a variety of industries. It is assumed that all these supervisors have a common training need. Yet a training needs analysis is seldom undertaken prior to sending staff on these courses, and very few courses are evaluated in terms of their effect on productive outcomes.

The courses run by the Vocational Training Council have a substantial theoretical content. Topic areas covered by lectures and written exercise include leadership, motivation, communication, discipline, delegation, problem-solving and decision-making. The courses run by the Industrial Training Service are the traditional "Training Within Industry" modules first used in Britain in the 1940's. The four modules cover job instruction skills, human relations, improving job methods, and on-job safety.

Many of these programmes attempt to alter behaviour by imparting knowledge about particular theories, be they McGregor's Theory X - Theory Y (McGregor, 1960), McClelland's need achievement (McClelland,

1951) or on the Ohio State variables of consideration and initiating structure. The exceedingly popular work of trainer-psychologist teams Hersey & Blanchard (1969) and Blake & Moulton (1978), in the United States, comes directly from the assumption that a good manager has both a high considerate style and a high concern for production. Whether such newfound knowledge motivates the foreman or manager to change their work behaviour is an empirical question.

Research literature has attempted to evaluate the success of such approaches to training. The fullest review of management training up to 1970 was the work of Campbell et al. (1970). From a review of 84 published studies several conclusions were drawn, including:

1. Seventy percent of studies were evaluated in terms of changes to `internal' criteria, chiefly changes in such attitudes as "employee mindedness", ""human relations" or "consideration". Often these measures were taken within the training session itself (hence the term `internal' criteria). Frequently no control group was included.

2. There was no demonstrated transfer of training effects to the workplace. There were no demonstrated changes in "results" criteria such as productivity, staff turnover or absenteesism.

Though leadership research sought to prescribe those behaviours of leaders which would lead to productive outcomes, interventions based on changing the behaviour of supervisors (i.e. through their training)

have seldom taken productive outcomes as the criteria for evaluating their success. Instead, psychologists have most often substituted their own instruments - such as behavioural or performance rating scales - as criteria of training success. Campbell (1971) concluded, "one cannot come away from this literature without feeling disheartened" and "by and large, the training and development literature is voluminous, nonempirical, nontheoretical, poorly written, and dull... it is fadish to an extreme" (p. 565).

Subsequent reviewers have not seen any reduction to the onslaught of poorly grounded, untested training techniques (Goldstein, 1980; Wexley, 1984).

The reason for this state of affairs is only too apparent to these authors (Campbell, 1971; Campbell et al., 1970; Goldstein, 1980). Where the training of manual, clerical or any number of non-supervisory, non-management positions is concerned, training programme content is firmly based on a thorough analysis of the job at hand: what tasks are performed, and what behaviours are essential for the successful performance of those tasks. Management and supervisory training suffers from being out of touch with any knowledge of the critical requirements of managerial/supervisory jobs. There is a need to observe and systematically record the work activites of managers and supervisors, and to correlate these activities with effective performance of the job (Campbell, 1971; Campbell et al., 1970; Goldstein, 1980).

Behavioural Modeling : The Newest Approach in Supervisory Training

Since the mid 1970's a great deal of interest has been generated in a new technique of supervisory training, behavioural modeling. In the majority of cases industry has adopted, without substantial variation, the programme modules and learning points of psychologists Goldstein & Sorcher (1974). Table 1.2 and Table 1.3 list typical modules and learning points from a Goldstein/Sorcher programme.

These psychologists insisted that the aim in training supervisors is not a change in `attitude' but a change in on-the-job behaviour. The approach attempts to systematically apply the principles of behavioural and social learning theories to the training of supervisors. There are four steps to the behavioural modeling process :

1. an effective job incumbent is portraited resolving an employee-related problem on a video film. The actions of this model supervisor follow closely a set procedure for handling the situation. This set procedure forms the set of `learning points' for the session;

2. the trainee role-plays a similar work situation, usually taken from a case study, to practise the learning points;

Table 1.2 Training Modules

(Goldstein & Sorcher, 1974)

orienting a new employee

giving recognition

motivating a poor performer

correcting poor work habits

disciplinary action

reducing absenteeism among disadvantaged workers

reducing turnover amongst disadvantaged workers

handling the racial discrimination complaint

handling the reverse discrimination complaint

reducing resentment of the female supervisor

overcoming resistance to change

correcting inadequate work quality

correcting inadequate work quantity

discussing personal work habits with an employee

reducing evaluation resistance

delegating responsibility

conducting a performance review

Table 1.3 Typical Learning Points from Training Modules
(Goldstein & Sorcher, 1974)

HANDLING A COMPLAINT:
avoid responding with hostility or defensiveness
ask for and listen openly to the employee's complaint
restate the complaint for thorough understanding
recognise and acknowledge his or her point of view
if necessary, state your position nondefensively
set a specific date for a follow-up meeting

IMPROVING EMPLOYEE PERFORMANCE:
describe the problem in a friendly manner
ask for the employee's help in solving the problem
discuss and write down each appropriate idea
decide on specific action to be taken by both of you
agree on a specific follow-up date

DISCIPLINARY ACTION:
describe the situation and review previous discussions
ask for reasons for the situation
listen and respond with empathy
indicate what action you must take and why
agree on specific action and follow-up date
indicate your confidence in the employee

DELEGATING RESPONSIBILITY:
indicate what new responsibility you would like the employee to handle and why
describe the new responsibility in detail, outlining tasks and performance standards
ask for questions and suggestions
listen to the employees comments and respond empathetically
ask the employee for a committment and offer your help
express your condience in the employees ability

MOTIVATING THE AVERAGE PERFORMER:
describe specifically what the employee is being recognised for
indicate why this is important to the work group
indicate the form the recognition will take
express confidence in the employee's ability in this area
thank the employee again

HANDLING EMOTIONAL SITUATIONS:
remain calm and make the discussion private
listen openly to the employee's comments and respond empathetically
encourage the employee to give you more information about the problem
discuss possible solutions with the employee
indicate further discussions are needed and set a specific date

3. the trainee receives feedback and "social reinforcement" from the other participants; and

4. ideally, transfer of this training to the workplace is achieved through continued encouragement, feedback and social reinforcement from superiors.

The original Goldstein & Sorcher (1974) research addressed the particular problems of one workplace. It did so by seeking to improve the interpersonal skills of foremen. The content of training modules was formulated from interviewing employees and asking them to identify what behaviours distinguish a good foreman from a poor one. Training modules included: avoiding racial discrimination, assisting the "disadvantaged [minority group] worker", motivating the poor performer, handling grievances, etc.

A special issue of Personnel Psychology was devoted in 1976 to evaluation studies of behavioural modeling training. Burnaska (1976) and Moses & Ritchie (1976) evaluated the interpersonal skills of trainees in role-playing situations conducted after the training period; Byham et al. (1976) asked employees if they had observed changes in their supervisor's behaviour following training. The results of these studies were inconclusive and have been severely criticised for lack of internal validity (McGee & Tullar, 1978). A more rigorous evaluative study was conducted by Latham & Saari (1979) which has received considerable applause in the psychological literature (Goldstein, 1980; Wexley, 1984).

Latham & Saari evaluated the success of a programme of Goldstein & Sorcher's training modules. They based this evaluation on four criteria: trainees were compared with a control group, over an extended period of time, on (1) their reactions to the training, (2) a test of their knowledge, (3) role-playing simulations, and (4) supervisor ratings. On all measures, the experimental group performed significantly better than the control group.

The difficulty with all these studies is that no measure of "results" criteria was ever taken. No attempt has been made to study if the behaviours prescribed to foremen do correlate with increased productivity or improvements to staff turnover, absenteeism and accident rates. The original job analysis by Goldstein & Sorcher was based on employees' impressions of the good foreman, and it is likely that changing the foreman's behaviour in this way may well improve employee satisfaction. However, whether or not this behaviour change assists productive ends depends on the problems faced by the individual industry.

The only published study in which productivity improvements were shown to result from behavioural modeling training, involved a very careful consideration of the causes of increased costs and lowered productivity in a forestry industry company (Porras & Anderson, 1981). The company identified its problems as rooted in the foreman-worker interaction. Foreman felt powerless to improve substandard worker performance in the face of increasing union power. A training programme was constructed based on ten specific problem situations

identified by foremen as the most difficult problems they faced in managing subordinates. Administration of this carefully conceived programme led to positive changes in productivity, turnover and absenteeism.

It has been the normal practice to take Goldstein & Sorcher's job analysis and training modules as a generic description of the actions of the good foreman, and apply them in any industry. There is some doubt about the effectiveness of prescribing such a generic description of effective foreman behaviour, as the variation in work performed by foremen in different industries may be too great to allow this. The success of the Porras & Anderson (1981) study in large part relied on modifying the training programme to suit the particular needs of the situation. A replication of Latham & Saari's research method to test a Goldstein/Sorcher programme was recently conducted in an automotive industry firm, and failed to show changes to foreman behaviour or performance ratings (Russell et al, 1984).

In summary, although behavioural modeling has used well-founded psychological knowledge to develop a method of training, the content of such training programmes requires further analysis. Only a thorough understanding of the specific work tasks and work problems faced by foremen in a company is likely to lead to productivity improvements. It is with this view in mind that this discussion now turns to look at what is known about the work of managers, and more particularly, of industrial foremen.

Studies Describing the Content of Managerial Work

To this point I have suggested that the traditional approaches to the training of foremen have only been marginally successful in bringing about productivity improvements. I have suggested that this lack of success is due to trainers failing to adequately analyse the content of foremen's work, and failing to address the production problems faced by foremen in individual industries. In this final section of the Introduction I will review the published studies of managerial and foreman's work to ask if it is possible to learn what the effective foreman does.

One classification which has remained the model of managerial work in management science is that presented by Fayol (1916, in Mintzberg, 1973). Fayol distinguised 5 classes of managerial tasks: planning, controlling, organising, staffing, and leading. This model has been used ennumerable times to guide the actions of students of management, and it may be valuable to examine how far these categories apply to industrial foremen.

A more research-based model, however, has been presented by the work of Henry Mintzberg (1973, 1975). Mintzberg undertook intensive study of the work activities of five chief executives. Each executive was observed on the job for one full working week. Observation categories were formulated on an ad hoc basis as the study proceeded (what Mintzberg in his 1970 paper titles "unstructured observation"). This had the advantage of not preempting results before the study commenced,

and helped retain maximum detail from the observation record. Mintzberg's major findings are given below -

- The work of a manager was rapidly paced. Activities were characterised by brevity, variety and discontinuity. Many activities were unplanned. Of the executives' verbal contacts, 93 percent were arranged on an ad hoc basis.

- Managers strongly favoured verbal media - conversations, telephone calls, meetings - for exchanging information. Such information is immediate.

- Many tasks were done superficially.

Another noteworthy study of the work of managers was conducted by John Kotter (1982). Kotter observed nine general managers on the job for some 35 hours each. Extensive interviews were also conducted with the managers and with their work collegues. Kotter provided a general description of the managers' work -

- They spent most of their worktime with other people. This included many other people besides their immediate work group.

- An enormous breadth of topics were discussed by managers at work. The manager asked many questions, and there was considerable social talk and joking.

- Most social contact was unplannned and not initiated by the manager.

- Conversations were short and disjointed.

Kotter raised two important points. Firstly, the effective manager had built a very large "network" of cooperative relationships with people beyond the immediate workgroup. Through these people the manager achieves a great deal of action. Secondly, seemingly inefficient behaviour could save the manager considerable time in a hectic workday. Unplanned exchanges of information were much more time-efficient than attempting to plan formal meetings for every exchange.

This picture of managerial work - as a rapidly paced, unplanned, verbal and social job - may provide valuable insight into the actions of the effective foreman. However, these studies have a limitation in that the researchers did not seek to ask if the behaviours observed correlated with job performance. Is it important for the goals of production that the foreman conduct his work in a hectic, unplanned manner? Or is it simply that the constraints of his/her job force the foreman to engage in brief, unplanned social exchanges?

Studies of the Foreman's Job : (1) Questionnaire Research

The questionnaire survey has been used to gain information on the most appropriate actions for a foreman as seen by wage workers, and the most appropriate actions as correlated with performance ratings. Bailey (1956) surveyed 769 employees at a U.S. Air Force base asking them to rate the importance of 60 actions of foremen. Table 1.4 presents the 16 most important of these factors. The results were somewhat disappointing. Some of the factors listed were merely descriptions of work tasks, such as "makes sure safe working practices are used". They failed to detail just how the foreman could best get these tasks done. Other factors were poorly defined and of little use in prescribing action - for example, that the foreman "is fair in all dealings with people". Finally, the researcher had not established whether or not these desired actions were associated with job performance. The study suffers the same limitations as the interviews of employees conducted by Goldstein & Sorcher (1973). It could be that what employees desire in a supervisor's behaviour could be quite counterproductive.

A study by Kay & Meyer (1962), also in the U.S.A., went some way to addressing this limitation. These researchers had 51 foremen report the percentage of time devoted to various work activities. These ratings were then correlated with supervisor performance ratings for the foreman. Table 1.5 presents those work actions correlating significantly with performance ratings. The results suggested that effective foremen spent less time on production matters, gave general

Table 1.4 What Employees want of Foremen (Bailey, 1956)

Firstly

makes sure safe working practices are used

is fair in all dealings with people

does a good job of planning and organising the group's work

trains workers to do a good job

knows what he is responsible for

has good self-control

Secondly

has good discipline in his workers' group

is a man you can believe and trust

sees that tools/machinery/equipment are in good working order

knows the rules & policies

makes workers want to turn out good work

Thirdly

understands his workers

lets workers know what he expects them to do in their jobs

gives credit for doing good work

checks work to make sure it is up to standard

does not allow materials to be wasted

Table 1.5 Actions Correlated Significantly with Effectiveness

(Kay & Meyer, 1962)

deal with fewer production problems
spend less time checking work progress
spend less time on materials checking
deal less with quality problems
get fewer action requests from employees
receive fewer inputs of all kinds
make fewer outputs of all kinds
give information to others less often
spend more time on cost control
receive more inputs from service personnel
spend more time on wage rates and time standards

rather than detailed supervision, spent less time checking employees work progress, and spent more time planning ahead such matters as cost control and wage rates.

It will be seen that these findings are very similar to those of other researchers using a behaviour-observation methodology. This may be the description of effective foreman behaviour we are seeking.

Studies of the Foreman's Job : (2) Observational Research

The fullest published study of the foreman's job was conducted by the Technology Project team of Yale University; results were published in Guest (1956), Jasinski (1956) and Walker et al. (1956). The researchers asked -

1. are there differences in the patterns of behaviour of the successful and unsuccessful foreman?

2. does the general conception of a foreman's duties agree with actual behaviour?

3. what is there about the pattern of interpersonal interaction which may indicate qualities of leadership?

Each of 56 production foremen in an automobile assembly plant were observed on the job for two full eight-hour days. Records were kept of the foreman's work behaviour: time, topic, activity involved in, with whom, and who initiated the interaction. Summary information from these studies is presented in Tables 1.6 and 1.7. It is obvious that the systems of classifying activity were very broad, and lack detail of just what specific behaviours had been observed.

Foremen were involved in an average 583 incidents per day, or one incident every 48 seconds (Guest, 1956). There was considerable variety in how individual foremen allocated their time. The foreman's

Table 1.6 Observational Studies: Percentage time spent by foreman by activity

Guest (1956)		Pinschof (1964)		Piersol (1958)		Ponder (1957)		
						most effective		least effective
quality	18.2	quality standards	8.0	quality & quantity	33.0	quality	6.0	6.0
work progress	13.2	production: quantity	7.0					
personnel admin	11.2	personnel admin	7.0			personnel	23.0	12.0
non-job topics	10.2			casual/social	20.0			
performance of work	8.1							
tools & fixtures	8.1	tools & machinery	12.5			equipment	14.0	8.0
materials	8.0	components	7.0			& materials		
employee job performance	7.6	direct control of work	2.5					
production schedule	5.2	plan & allocate work	13.0	plan & schedule	11.0			
grievances	5.0			grievances	7.0			
		layout of workplace	7.0					
				accidents & housekeep	3.0			
				explain company policy	3.0			
				job allocate & instruct	15.0			
						production	20.0	40.0

Table 1.7 Observational Studies: Percentage time spent by foremen by contact

Guest (1956)		Piersol (1958)		Ponder (1957)		
				most effective		least effective
own workers	26.4	subordinates & employees	30.0	own workers	19.0	17.0
service personnel	7.8			service	32.0	20.0
other foremen	7.0	other foremen	5.0			
general foremen	4.6	superiors	15.0	others	5.0	8.0
workers other teams	3.8					
dept superintendent	1.1					
TOTAL	57.3%	TOTAL	50.0%	TOTAL	56.0%	45.0%

day was one of unplanned discontinuity, variety and short duration of contacts. Foremen were often caught in a vicious circle of crisis management - dropping responsibilities to attend to immediate crises, then having less time to meet other responsibilities. Notably, poorer-rated foremen were busier; they also spent a larger proportion of their time in manual work. This description of the foreman's job is very similar to the description of managerial work presented by Mintzberg (1973) and Kotter (1982).

Traditional leadership studies have failed to look at the foreman's relationship with people outside his workgroup. This is the topic of Jasinski's (1956) paper. Only 46 percent of foreman's contact time was spent with the workgroup. The most effective foremen spent a significant amount of time with other foremen - those foremen immmediately preceeding and immediately succeeding him on the production line. The topic of conversation with other foremen was most often quality, and the more effective foreman tended to initiate the majority of these contacts. The effective foreman spent considerable time with service personnel, and with employees from other work groups.

An interesting set of studies was conducted in the early 1960's in British industry and reported in Thurley & Hamblin (1962, 1963). The researchers examined whether the effective actions for foremen could reliably be described across several industries. The work of 127 supervisors at three organisational levels - chargehand, first-line supervisor, second-line supervisor - was observed. The supervisors were from five different firms representing five industrial processes:

packaging, engineering, footwear manufacture, brewing and electronics manufacture. Two sampling techniques were used. During stage one, random samples of behaviour were observed for each supervisor over a two to six week period. Between 250 and 500 such samples were taken for each supervisor. During stage two continuous observations of individual supervisors were taken over a whole working day.

Figure 1.1 presents the results of these observations as piecharts displaying the profile of work activities of the "average" foreman in four of these industries. There was considerable variation in foremen's activities, not only between firms, but also between departments within the same firm. Because these results were averaged across up to 17 foremen, they could not be attributed to any `personality' differences or differences in individual `style' of supervision. The behaviour of foremen was thus influenced to a great extent by the type of production situation in which he or she worked.

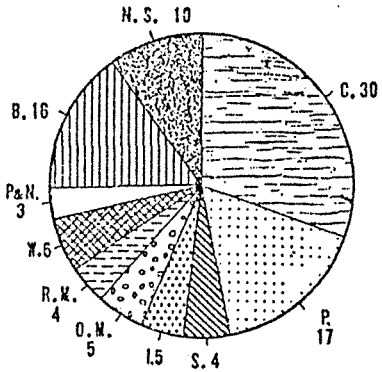
In the five firms studied, there was only one department of one firm where skill in instructing employees was important. Skill in improving work methods or undertaking special safety instructions were not a significant part of any foreman's job. (These are three of the four modules of instruction in the Training Within Industry scheme in New Zealand.) Only a minority of foremen were called on to exercise "leadership" or "supervisory" skills in their daily work. Across all firms studied, foremen engaged in supervisory activities between 0 and 4% of the time.

Figure 1.1 Work Activities of the Foremen in Four Industries (Thurley & Hamblin, (1962)

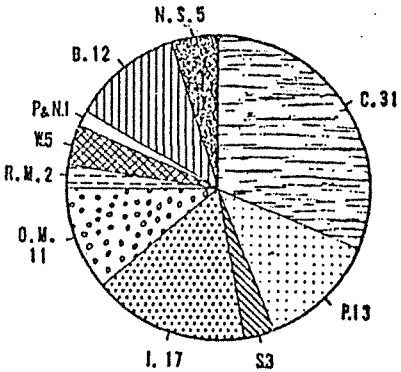
(Percentage of total working hours)
(Figures in brackets refer to number of supervisors covered)

PACKAGING LTD.

PREPARATION DEPTS. (2)

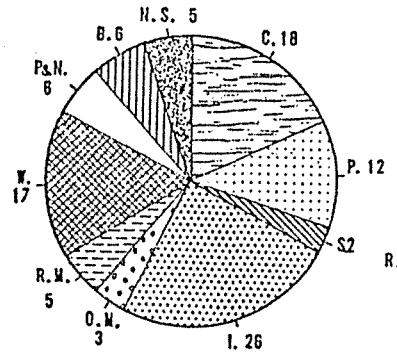


PACKING DEPTS. (17)

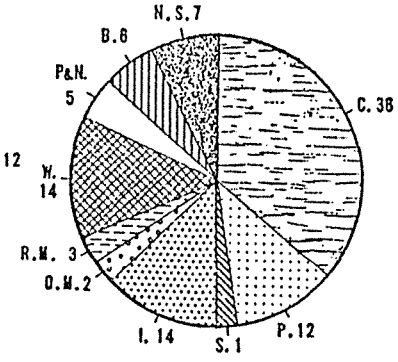


ELECTRONICS LTD.

DEPT. X (12)

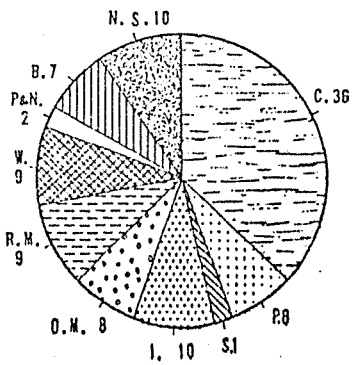


DEPT. Y (12)

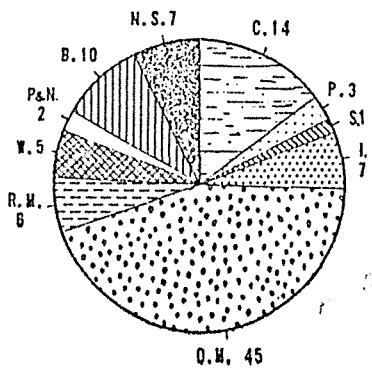


FOOTWEAR LTD.

LARGE DEPTS. (4)



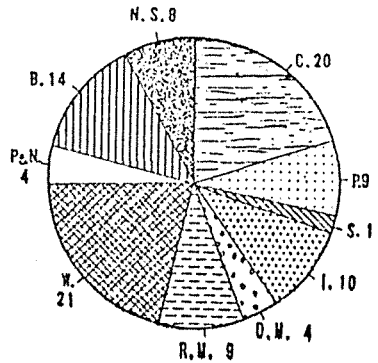
SMALL DEPTS. (3)



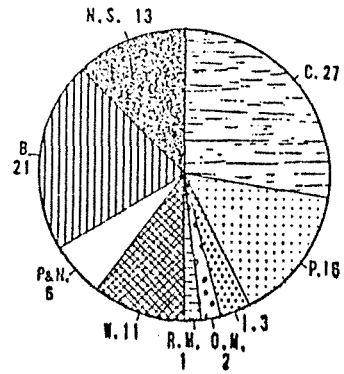
C. • communication
P. • paperwork
S. • stand & supervise
I. • inspection
O.M.• ordinary manual
R.M.• responsible manual
W. • walk
P&N.• personal&no apparent activity
B. • break
N.S.• not seen

BREWING LTD.

PROCESS FOREMAN (16)



CLEANING FOREMAN (6)



C • communication
P • paperwork
S • stand & supervise
I • inspection
O.M.• ordinary manual
R.M.• responsible manual
W. • walk
P&N.• personal&no apparent activity
B • break
N.S.• not seen

Thurley & Hamblin concluded that the role of foreman is to act as a troubleshooter. Like the subjects in the studies of Mintzberg, Kotter and the Yale Technology Project team, the foreman's job was one of rapid pace, discontinuity, largely unplanned activity and social interactions of brief duration. Foremen spent a considerable amount of their time dealing with breakdowns to management plans: machine breakdowns, labour shortages, material shortages or changes to production schedules. Often the foreman had to cope with a number of these problems occurring in a quick succession.

The final observational study, summarised here sought to correlate foreman behaviours with results criteria in the General Electric Company (Ponder, 1957). Subjects were defined as either effective or ineffective foremen according to four criteria: performance appraisal ratings, management opinion, productivity of the foreman's workteam, and worker attitudes. Unfortunately, the researcher did not detailed whether these criteria were combined statistically , and if so, what statistical weighting procedure was used. Twenty four foremen were each observed for 8 two-hour periods, and records kept on work behaviour: topic, reason for contact, with whom, who initiated the contact, direction of information flow. Striking results were reported which share many features with the results of the Yale group and with Kay & Meyer (1962) -

1. Effective foremen were involved in fewer different activities; they were better organised and spent more time on any single activity.

2. They spent less time on short-term production activities - job priorities, production schedules, materials acquisition, job progress.

3. They spent more time on personnel administration and more time with service personnel.

4. They spent more time in personal contact, both when they initiated the contact and when they did not. They gave and received more information with each contact.

"The least effective foreman spent the greatest percentage of time finding immediate solutions to short-range production problems, while the most-effective foreman spent the greatest percentage of time in activities which involved planning and organizing the longer-range aspects of their job... Probably because of greater emphasis on training employees, their belief in the employees' ability to carry out their assigned tasks without checking, and greater success in organizing the work of their groups, better foremen apparently didn't find it necessary to continually check the conditions in their area" (p. 48).

This presents the researcher with a model of effective foreman actions, with specific testable hypotheses.

Aims of Study One

The aim of Study One was to complete an intensive study of the job behaviours of foremen in a New Zealand industrial plant. The study sought -

a) to gain data on the work of New Zealand foremen;

b) to observe the similarities in the work of foremen working in different industrial processes within the one plant;

c) to test a Model of effective foremen action by correlating observed behaviours with the "results" criteria of productivity, personnel turnover, absenteeism, and accident rate. The model to be tested was based on the research findings of Kay & Meyer (1962) and Ponder (1957). The model concerned the foreman's activities and interpersonal behaviours. It was hypothesised that the effective foreman:

1. is involved in fewer different activities

2. spends more time on any single activity

3. spends less time on production activities

4. spends more time on administrative activities

5. spends more time in contact with personnel

6. spends less time in contact with his/her workers

7. is in contact with a greater number of people

8. has invested more effort in job-instruction for workers

9. spends more time in planning for performance improvements.

STUDY ONE

METHOD

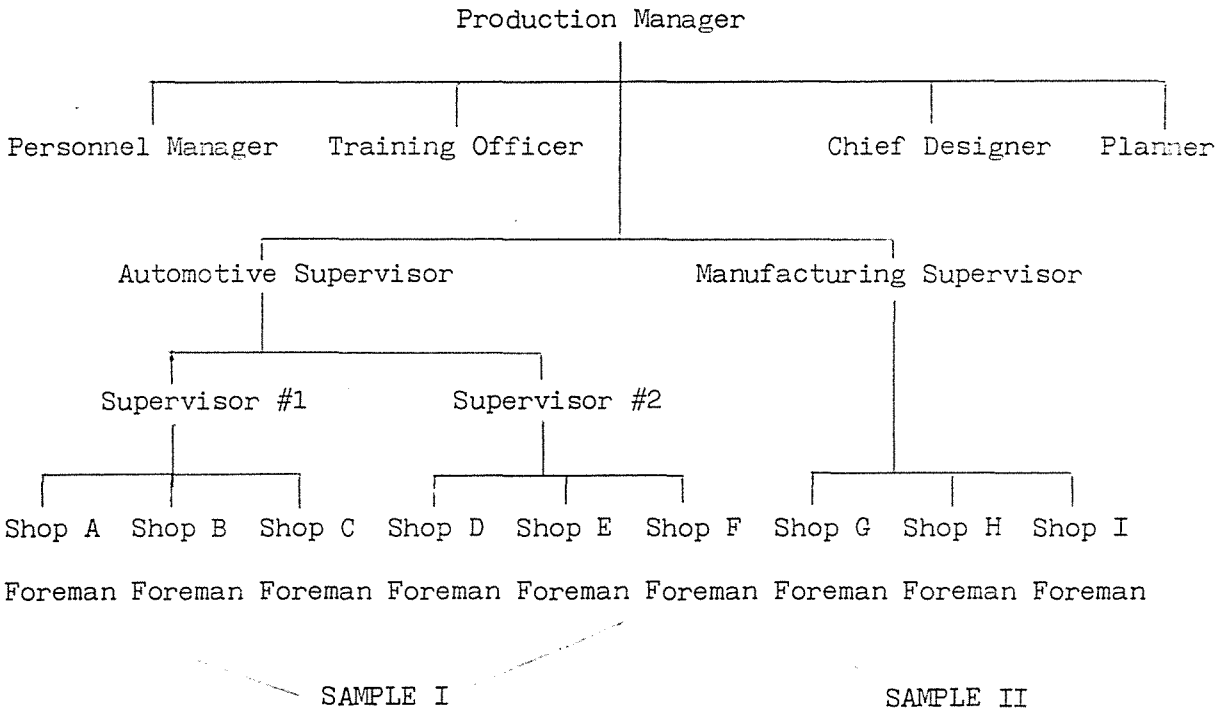
The Organisation

Firm Z at the time of the study was a major manufacturer of an automotive product. It employed 150 wage workers in the Production Department of its City plant; most of these workers were qualified tradespeople - panelbeaters, mechanics, joiners, apholsterers, automotive painters. The nine production shops (A-I) were each involved in a different industrial process. Each was headed by a Foreman, who in turn reported to a Supervisor. Fig. 2.1 presents a stylised organisation chart of Firm Z's Production Department.

Familiarisation with the Firm

Initial contact was made with Firm Z through the Personnel Manager. A meeting was arranged with the General Manager, at which Personnel and Production Managers were present. Agreement was reached that a training needs assessment be conducted for Foremen, with the possibility of developing a training programme for Foremen. This would involve interviews throughout the plant, and on-job observation of the Foremen. Access was gained to production, personnel and accounting

Figure 2.1 - Organisation Chart, Production Department, Firm Z



records.

An initial period of familiarisation included interviews with the Production Manager, Personnel Manger and Training Officer. Supervisors were interviewed concerning the performance goals and production problems of each of their Foremen.

Before on-job observations were made, background information was gained on each production shop through a structured interview with each Foreman. Questions covered production planning, quality standards,

difficulties encountered in production, steps taken to improve production, communication in the organisation, performance information systems, instruction of new workers and personnel and motivation problems.

Subjects

The Foremen in Firm Z were aged between 33 and 52 years old. Most were tradesmen - a plumber, a joiner, an auto-electrician, a panelbeater, a sheetmetal worker and an engineer. Six of the Foremen had previous supervisory experience.

Shop A - This Foreman supervised 27 workers in three separate workbays. Work involved chassis repairs, prefabrication of steeltube framing, and steeltube framework construction.

Shop B - 25 people worked in Shop B, rivetting sheetmetal panels to the steeltube framework.

Shop C - This shop had a workteam of 24 people. The Foreman here spent less time in contact with workers, toured jobs regularly, and gave general rather than detailed individual supervision. A variety of tasks were completed including joinery.

Shop D - Here the Foreman supervised 13 workers involved in process engineering. This was repetitive work in a noisy environment. The Foreman was newly appointed. He spent a large proportion of his time in manual work and proportionally less time with his workers.

Shop E - This Foreman supervised 11 workers involved in upholstering. This was the quietest section of the plant and the Foreman was able to converse freely and consult with his workers.

Shop F - This was an automotive painting shop with 11 workers. The Foreman was unable to spend much time with his workers because of a heavy workload of additional responsibilities.

The final three Foremen supervised fewer workers; their workers were generally involved in less skilled and complete tasks, and the tasks were undertaken alone rather than as a member of a team. These Foremen also spent a considerable portion of their workday in manual labour. For the purpose of future discussion, I will refer to these three Foremen as Sample II, and the other six Foremen as Sample I.

Shop G - Work in Shop G involved repetitive panelbeating tasks. The Foreman here spent 95% of his time in manual work, and left his 12 workers to continue on their own.

Shop H - Shop H was involved in sheetmetal pressing. Because the Foreman in Shop H was the only qualified sheetmetal worker, he spent a large proportion of his time checking blueprints and dies for his 15

workers.

Shop I - Here five engineering tradesmen were under the supervision of a tradesman engineer. The Foreman's job was only minimally supervisory, as all workers including the Foreman were busy at their respective tasks.

On-Job Observation

Each Foreman was observed on his job. The length of observation periods was variable (Appendix 1 gives a full schedule of the observation periods). Generally a half-day of observation was undertaken, either a morning or an afternoon depending on the Foreman's availability and constraints of the organisation. In the case of two Foremen, however, the observation periods were less, as it was discovered their jobs involved much less variation in activity, being mostly manual work. It was felt that the range of activities undertaken by these two foremen was adequately sampled within the shorter observation period.

Following Mintzberg's (1970) method of "unstructured observation", this recording of behaviours did not involve the use of pre-established categories. Rather, records took the form of continuous and full Observation Scripts. Details were recorded of:

1. the time of day

2. the activity the Foreman was involved in

3. if the activity was an interpersonal one, who was it with

4. if the activity was an interpersonal one, what was the subject matter of the interaction

5. if the activity was an interpersonal one, who initiated the interaction.

Appendix 2 provides a sample of one such Observation Script.

Time was recorded to the nearest minute; if the activity was briefer than one-minute, time was estimated to the nearest quarter-minute. Because a considerable amount of the Foreman's time is spent in motion, recording of walking activity required a separate procedure. Where the act of walking was purposeful (for example to go the stores, or to obtain equipment), time spent in motion was recorded to that activity. Where the act of walking was not purposeful, time was recorded simply as "Walking". At the conclusion of data gathering, the Observation Scripts formed a very large and rich source of data.

Observation Categories

When all data had been collected, it was tabulated according to two systems of categorisation.

SYSTEM I covered all activities of the Foreman. The categories of SYSTEM I grew on an ad hoc basis, seeking to represent the data fully. The system attempted not to sacrifice the detail contained in the observation scripts. At the completion of this content analysis SYSTEM I consisted of twenty one categories of activity (see Table 2.1). The researcher completed this categorisation whilst blind to the levels of criterion performance of the foremen. The system is considerably more detailed than the systems of categorisation reported in the published reports of previous observation studies (see Table 1.6). To account for the variable length of observation periods, all recordings were converted to a percentage of total time spent.

SYSTEM II focused on all interpersonal interactions. Firstly these were tabulated according to whom the interaction was with - supervisor, worker, designer, Production Manager, storeman, etc. TOTAL TIME spent with each category of person was established. Secondly, the PERCENTAGE of these INTERACTIONS INITIATED by the Foreman was tabulated. This information is presented in Table 3.4.

To test the Model of effective foreman actions, additional analysis of SYSTEM I and SYSTEM II information was required, to establish -

Table 2.1 - SYSTEM I Categories used for Classifying Foreman's Activities

1. gives instruction
2. gives advice
3. obtains equipment
4. inspects work
5. manual work
6. goes to stores
7. meeting
8. gets materials
9. answers design query
10. paperwork / administration
11. assists movement of products
12. goes to Store 2
13. sociable talk
14. looking for personnel
15. answers schedule enquiry
16. discussion with another foreman
17. reprimands worker
18. allocates work
19. answers query concerning job number
20. directs worker to housekeeping duty
21. provides quality control information

i) the percentage of the foreman's time spent in contact with personnel; this was calculated by dividing the TOTAL TIME spent with all personnel by the length of the observation period;

ii) the percentage of the foreman's time spent in contact with his workers; this was calculated by dividing the TOTAL TIME spent with workers by the length of the observation period;

iii) the number of different activities the foreman was involved in; this piece of information represents the number of separate SYSTEM I categories in which an observed behaviour was recorded for the foreman;

iv) the number of different people the foreman was involved with; this figure represented the number of separate SYSTEM II categories of personnel in which an observed interaction was recorded for the foreman;

v) the percentage of interpersonal interactions which were initiated by the foreman; this figure was calculated by dividing the total number of interactions initiated by the foreman, by the total number of interactions observed; and

vi) the average time spent on any single activity; this was calculated by dividing the total observation time by the number of incidents recorded in the observation script.

Criterion Measures

Four measures were chosen as criteria for the effectiveness of Foremen: a measure of productivity of his workteam, a measure of personnel turnover, absenteeism and accident rate.

1. Productivity - The nature of the industry made a definition of productivity difficult. Some nine distinct products were made under contract to customers. Figure 2.2 shows that when contracts involved repeated manufacture of a single product, Production Shops became more and more efficient each time the product was made. Figure 2.3, however, shows that when contracts involved the once-off manufacture of a product, no such "learning curve" exists. A definition of productivity must then be derived from some comparison of actual performance with expected performance.

Industry experience had dictated how long each step in the production process should take. A contract taking 1000-2500 hours was broken down into a manhours goal (or "quote") for each shop. Such a goal could be as few as 50 hours or as many as 650 hours, depending on the Shop. "Productivity" was therefore taken as the ratio between quoted hours and actual hours taken to complete the job :

$$\text{Productivity} = \frac{\text{Quoted Hours} - \text{Actual Hours}}{\text{Quoted Hours}} \times \frac{100}{1}$$

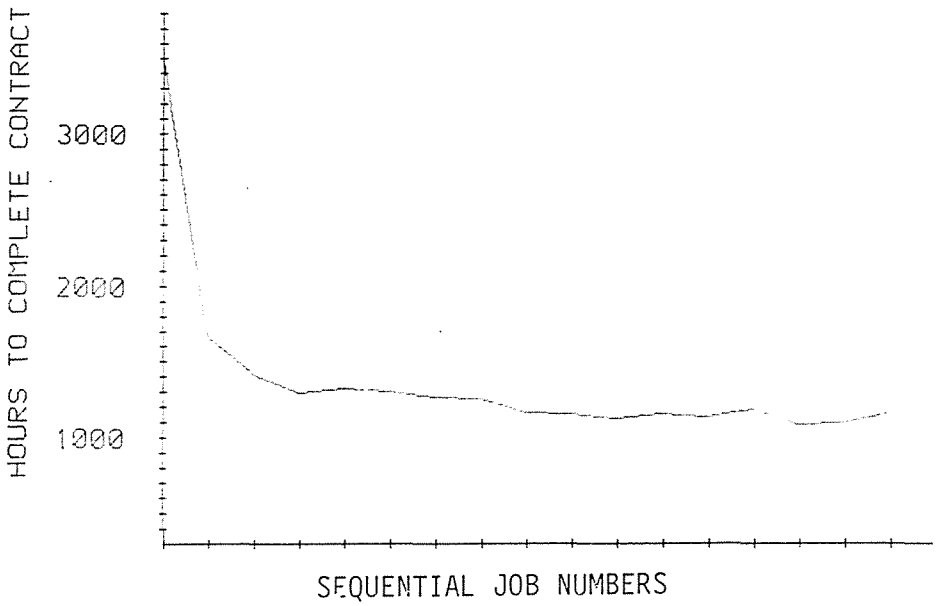


Figure 2.2 - Hours Taken to Complete Product P, Repeated Manufacture

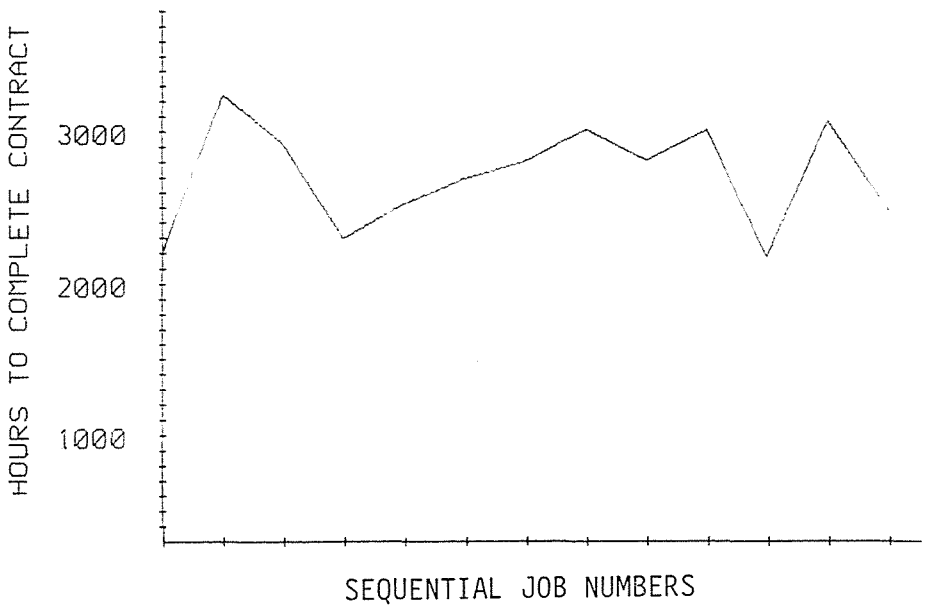


Figure 2.3 - Hours Taken to Complete Product Q, Once-Off Manufacture

In smaller New Zealand firms which undertake production on a jobbing basis, quotations are issued to customers based on "analytical estimating", that is, by a best guestimate of hours for the job based on previous experience. In such instances the above formula is an adequate definition of productivity (Productivity Centre, 1978).

A 12-month record of production was obtained for each shop, and productivity represented as the PERCENTAGE the shop had run OVER total HOURS QUOTED for all jobs. (N.B. In this instance, a high score indicates a poor productivity record).

2. Turnover - A record was obtained of the number of staff leaving each shop during the same 12-month period. Staff leaving without subsequently being replaced were considered "redundancies" rather than "turnovers". The average number of staff in each shop during the 12-month period was calculated. Turnover figures are represented as a PERCENTAGE of total staff leaving that shop to be replaced in the year.

3. Absenteeism - The question of the measurement of absenteeism has been discussed at length in the recent psychological literature. Chadwick-Jones et al. (1973) distinguish between A-Type (unavoidable) and B-Type (voluntary) absence. The latter is taken as a truer measure of work withdrawal. In a study by Youngblood (1984) one firm collected a continuous record of 15 separate indices of absenteesim; the researcher reduced this data to 5 major categories, of which "no-pay unexcused absence" most closely resembled voluntary withdrawal. Hamner & Landau (1981) debated the parametric properties of

frequency-of-absence versus total-time-lost data. They concluded that frequency measures are more stable indicators of absenteeism. Whatever the measure chosen in a study, the researcher is largely restricted to the recording system employed by the firm. In Firm Z a total-days-lost measure consisted of three separate indices: absence due to work accident, absence due to certified illness or accident outside of work hours, and unpaid absences for personal reasons. It was not possible to obtain a frequency measure, and the the last category was chosen as the truer measure of voluntary work withdrawal. Absenteeism figures represent days absent for personal reasons PER WORKER, for the baseline 12-month period.

4. Hours lost due to Accident - Workers in Firm Z were required to note every instance of injury, minor or major, in an accident register. This record however may not have been completely full. It also didn't discriminate between minor incidents and more serious accidents. A more representative record of accident rate was taken to be HOURS LOST due to work accident PER WORKER, in the baseline 12-month period. This figure was obtained from Accident Compensation Corporation records.

Measurement of these indices formed the major part of the final report sent to Firm Z management (Hyde, 1984), a summary of which appears in Appendix 3.

RESULTS

The Foreman's Job

The Supervisors in Firm Z agreed on the goals of work for their Foremen. Firstly the Foreman had to meet goal hours for production. Secondly the foreman had to ensure a minimum standard of quality was met for all work. The Foreman had to keep materials wastage to a minimum, ensure the safety of his workers, and ensure hours worked on each contract were accurately recorded.

Firm Z had some difficulties in achieving the goals of its Production Shops. Customers made an average of more than 20 changes to contract specifications while each contract was being worked on. This, together with the occasions when a shop did not meet its goal hours, resulted in frequent rescheduling of the work programme. Firm Z had a serious problem in the timely supply of materials, many of which had to be imported. The large number of product variations in Firm Z meant frequent relearning of tasks by workmen and women; often there was inadequate design information to follow or no standard procedure for a job. It was the job of the Foreman in Firm Z to encounter these difficulties and set about resolving them.

On the other hand, the Foreman did not have much difficulty in motivating worker effort. Most workers, at least in Shops A-F (Sample I), were tradesmen and women who worked in semi-autonomous teams. The

Foremen also felt that their workers required minimal job instruction, for they were experienced tradespeople who already knew their jobs.

Table 3.1 presents the information on criterion measures for the Foremen. There is variation in productivity. One shop had run 26

Table 3.1 - Foremen's Performance on Criterion Measures

	Shop								
	A	B	C	D	E	F	G	H	I
Productivity	0.28	11.9	-14.5	-2.1	1.2	11	-	-11.3	-26.3
Turnover	13.04	0.37	0	45.45	0	30.0	25.0	80.0	40.0
Absenteeism	27	32	36	40	37	35	22	26	10
Accident Rate	44	10	10	5	14	13	-	2	7

* Productivity = Percentage over total quoted hours for 12 months
(N.B. high score indicates low productivity)
* Turnover = Percentage of total staff leaving, to be replaced
* Absenteeism = Number of days unexpected absence, per worker
* Accident Rate = Hours lost due to accident, per worker

percent under quote for the 12 months; another shop had run 12 percent

over quote. With the measure of staff turnover, Shop H had an 80 percent turnover rate, Shops C and E have zero turnover. Absenteeism varied from 10 days per worker per year to 40 days; hours lost due to accident varied from zero to 44 per worker per year. It can also be seen from Table 3.1 that Sample II foremen account for a large proportion of the variance in criterion measures. Table 3.2 presents

Table 3.2 - Correlations Between Criterion Measures

	Turnover	Absenteeism	Accident Rate
Productivity	-0.13	-0.08	-0.23
	p>0.2	p>0.2	p>0.2
Turnover		-0.31	-0.40
		p>0.2	p>0.1
Absenteeism			0.07
			p>0.2

the Pearson product-moment intercorrelations among these criterion measures. No measure correlated significantly with any other, demonstrating the independence of the measures shown. This suggests that no one measure would suffice to delineate the effective foreman from the ineffective: multiple criteria are required.

Table 3.3 summarises the observation data for all Foremen. Figure 3.1 presents this information graphically as piecharts. It can be seen that there is considerable variation in the actions of the different foremen.

Bearing in mind this variation, some similarities in behaviour can be noted for the Foremen. The only "Planning" activity undertaken by the Foremen involved the allocating of jobs to the workers. On the average, the Foremen spent less than 2 percent of their time in this activity. As well, the Foreman's job was only minimally administrative. The Foremen spent on average less than 10 percent of their time on paperwork - and the bulk of this paperwork was the routine keeping of job cards and recording of materials used.

Only one Foreman spent any length of time on the instruction of workers. This Foreman had crews which lacked sufficient numbers of tradespeople.

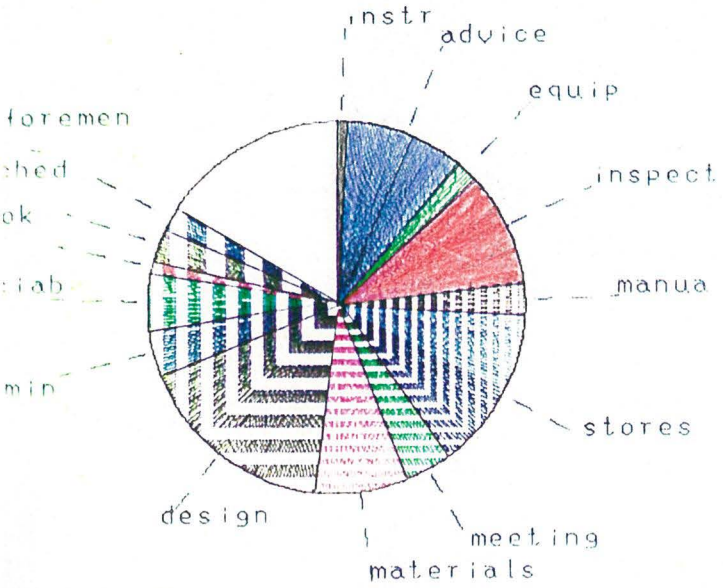
Some Foremen spent the bulk of their day in manual work; this is particularly so for Sample II Foremen. For other Foremen the only manual labour involved assisting workers with a few small lifting tasks.

The Foreman's key role was the servicing of his workers. This role is somewhat in contradiction with the concept of a Foreman as a leader of men. Because of the production difficulties encountered, the average Foreman spent some 10 percent of his time seeking materials for

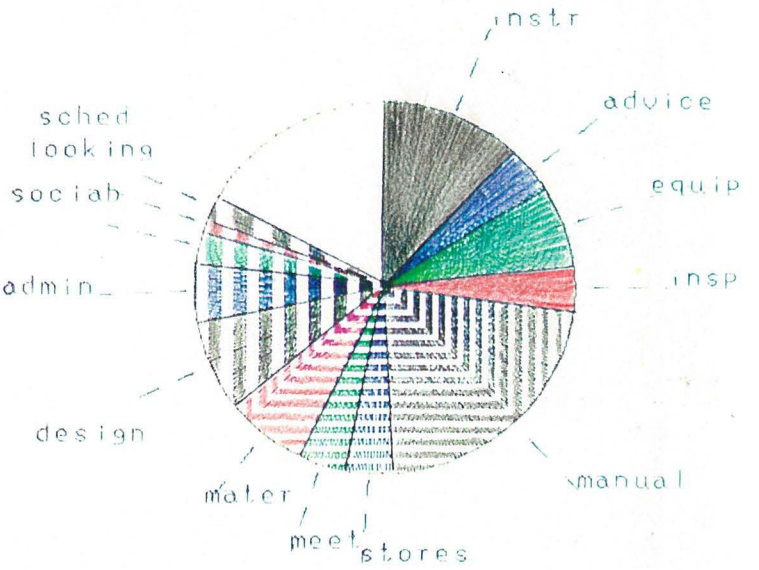
Table 3.3 - Percentage Time Spent on Activities, All Foremen

	Shop								
	A	B	C	D	E	F	G	H	I
1. give instruction	1	12		1	1				
2. give advice	10	4			4	2	1	8	
3. obtain equipment	2	7	5	2	24	7	4		8
4. inspect work	10	4	11	4	13	19		8	
5. manual work	3	22	5	49	2		95	3	70
6. go to stores	14	4	10	4		5		8	
7. meeting	4	4	4	4	4	4			
8. get materials	8	7	13	4	6	7			
9. design query	17	8	19	7	5	1		28	3
10. paperwork/admin	4	5	9	8	27	14		7	4
11. movement product						6			
12. go to Store 2						5			
13. sociable talk	5	3	2	4		3		1	
14 looking personnel	1	1	2						4
15. schedule enquiry	3	2	5	5	4				
16. discuss foremen	2			1	3			1	
17. reprimand worker		2							
18. job allocation			1	3	4	3		2	
19. job number query						1			
20. housekeeping						1			
21. quality control						2			
** ADDITIONAL ANALYSIS									
contact w. personnel	55	43	53	32	40	38	51	42	23
contact w. workers	27	26	20	19	26	17	49	20	4
no diff' activities	14	14	12	13	12	18	3	9	6
no diff' people	11	14	12	9	10	8	7	3	9
% incidents init'd	48.67	50.42	56.34	36.84	50.0	47.79	55.17	33.3	58.6
time any single actv'	2.57	2.73	2.0	2.41	2.51	1.43	11.67	2.33	4.6

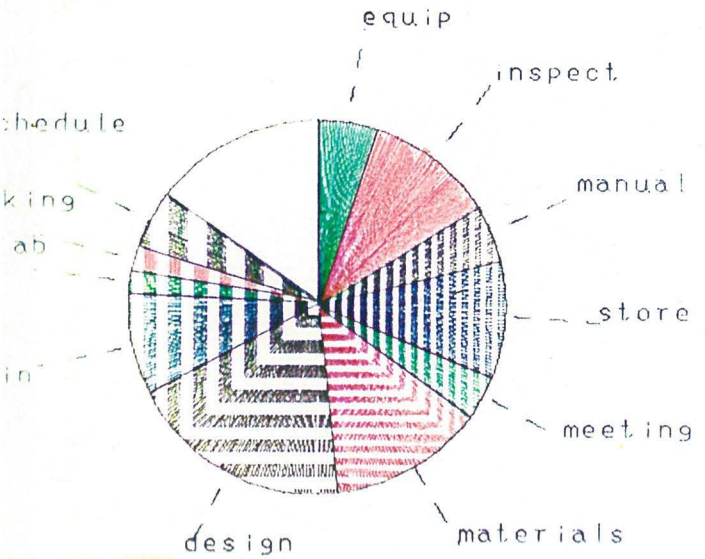
Figure 3.1 -Percentage Time Spent on Activities, All Foremen



Shop A



Shop B



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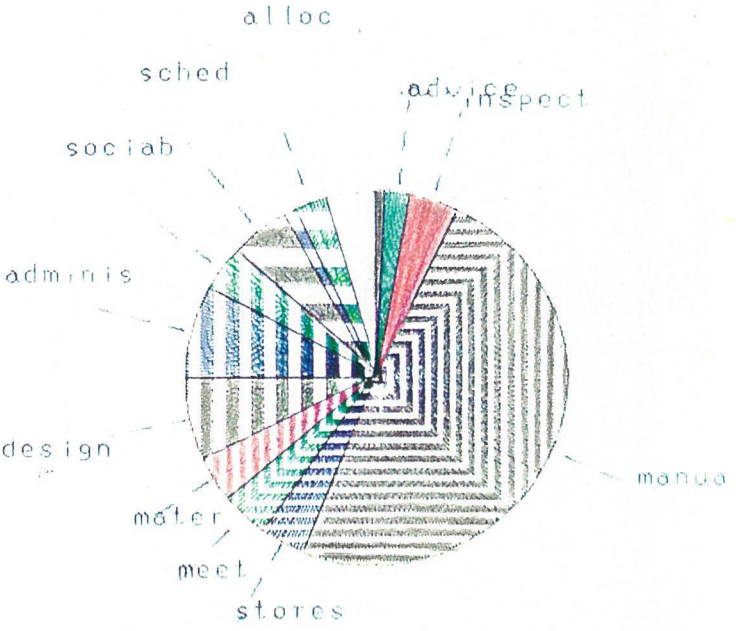
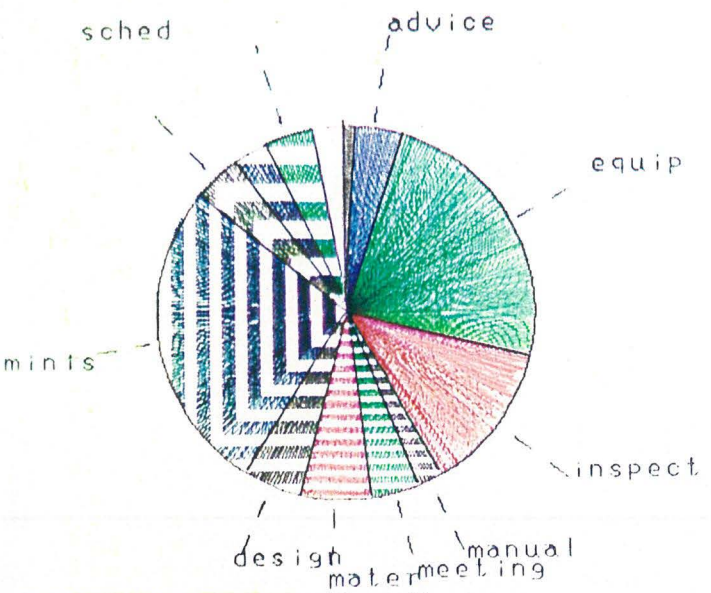
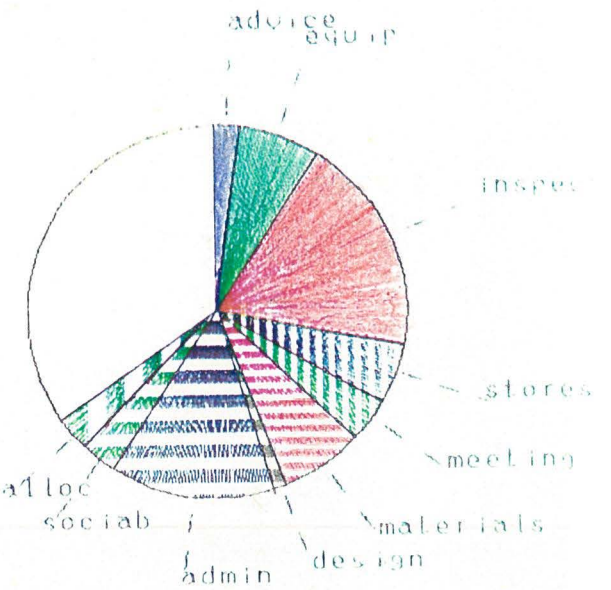


Shop D



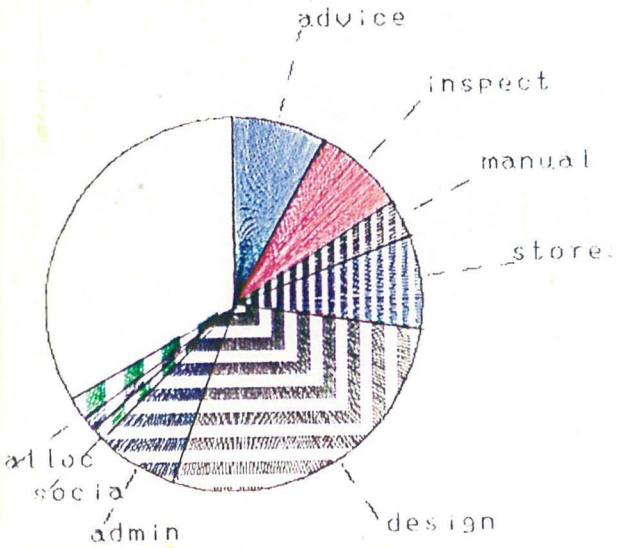
Shop E



Shop F

... see over for KEY

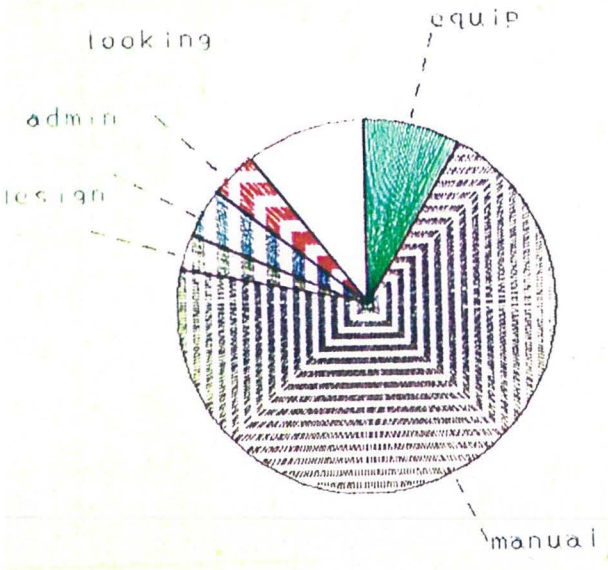
Shop G



Shop H

KEY

instr	= give instruction
advice	= give advice
equip	= obtain equipment
inspect	= inspect work
manual	= manual work
stores	= go to stores
meet	= meeting
design	= design query
admin	= paperwork/admin
sociab	= sociable talk
look	= looking for personnel
sched	= schedule enquiry
foremen	= discussion with other foremen
alloc	= job allocation



Shop I

his workers; some 10 percent of his time seeking information on product design; 7 percent of his time seeking equipment; and 3 percent of his time proferring advice on problems as they arose. In this service role, the Foreman's job was rapidly paced and unplanned. He spent an average of 2 minutes on any one activity, before commencing another. His day was one of regular interruptions by worker enquiries. Each enquiry lasted only 10-20 seconds and stimulated the Foreman to undertake a new activity in response. All in all, the Foreman was involved in between 3 and 18 different activities.

Analysing the observational data with SYSTEM II coding, it was found that the Foremen spent between 23 and 55 percent of their time in contact with other people. In all but one case, some one-half of this time was with people other than the foreman's own workers (Table 3.4). The very brief interactions to answer worker enquiries constituted the bulk of this time with workers. Foremen were involved with between 3 and 12 different categories of personnel; and initiated between 33 and 58 percent of these interactions.

Correlational Study

To test the Model outlined on page 35, correlations were calculated between observed behaviours and each of the four criterion measures.

Table 3.4 - SYSTEM II Categorisation; Percentage of Time Spent with Each Category of Personnel

	A	B	C	D	E	F	G	H	I
workers	27	26	20	19	26	17	49	20	4
storeman	4	2	3	2	2	7	3		1
supervisor	4	4	6	3	4	6		1	7
other foremen	6	2	3	4	4	1		1	1
workers other shop	7	3	11	3	1	6		1	4
designer	2	4						5	
production manager	1								
production storeman								12	
others	1	3	9	2	3	1			5

The small size of sample in this study (N=9) would suggest that the non-parametric Spearman's Correlation was the most appropriate statistic. Two factors however favour the parametric Pearson's Correlation. Firstly, the fact that the data is of a true ratio nature (the Foreman who spends 20 percent of his time on an activity spends twice as much time as the person who spends 10 percent of their time). Secondly, the many zero values in data cells could cause tied ranks which weaken the accuracy of the Spearman statistic. For this reason both correlation statistics are reported.

It was felt that the jobs of Sample II Foremen (Shops G-I) were sufficiently different to warrant partitioning them out of part of the analysis. Their number (N=3) was too small to analyse independently. Recall that these foreman spent a considerable proportion of their day in manual labour, that they supervised fewer employees, and that their workers were involved in less skilled work in contrast to Sample I Foremen. Secondly, these foremen presented different results on criterion measures (see Table 3.1). It was felt that the variance in both behaviours and criterion measures of Sample II might conceal a strong behaviour-outcome relationship existing only in Sample I. Two subject samples were thus tested - firstly the Total Sample, and then Sample I. Table 3.5 presents all Spearman and Pearson correlations for the Total Sample. Table 3.6 presents all correlations for the more homogeneous Sample I Foremen.

Those variables proving significant at $p<0.05$ on both correlation statistics are presented in Table 3.7, together with variables suggesting significance. (In the latter case, a variable may have proved significant on one of the statistical measures but not on the other). With the large number of correlations calculated here, chance alone dictates that one correlation in twenty may give a false-positive result. For the Total Sample, 216 correlations were calculated; 10 may be expected to be significant by chance alone; 29 were found to be significant. For Sample I, 216 correlations were also calculated; again 10 may be expected to be significant by chance; 10 were found to be significant.

Table 3.5 a) - Pearson Correlations Between Activities & Performance Criteria,

TOTAL SAMPLE

	productivity	turnover	absenteeism	accident rate
1. give instruction	.02	-.36	.16	.02
2. give advice	-.13	.13	-.03	.63 **
3. obtain equipment	-.08	-.53	.19	.02
4. inspect work	-.28	-.21	.59 **	.38
5.manual work	.56	.16	-.55	-.47
6. go to stores	-.34	-.02	.23	.65 **
8. get materials	-.29	-.71 **	.63 **	.48
9. design query	-.44	.32	.09	.18
10. paperwork/admin	-.30	-.28	.55	.06
11. movement product	.03	.05	.22	.04
12. go to Store	.03	.05	.22	.04
13. sociable talk	-.01	-.26	.43	.61 **
14 looking personnel	-.46	-.12	-.63 **	.06
15. schedule enquiry	-.25	-.23	.64 **	.25
16. discuss foremen	.14	-.38	.26	.47
17. reprimand worker	.04	-.32	.10	-.05
18. job allocation	.24	-.20	.59 **	-.19
19. job number query	.03	.05	.22	.04
20. housekeeping	.03	.05	.22	.04
21. quality control	.03	.05	.22	.04
** ADDITIONAL ANALYSIS				
contact w. personel	.41	-.42	.26	.41
contact w. workers	.90 **	-.26	.12	-.02
no diff' activities	.07	-.62 **	.63 **	.45
no diff' people	-.15	-.86 **	.28	.41
% incidents init'd	.20	.67 **	-.40	.10
time any single actv'	.85 **	.01	-.50 **	-.35

** Significant at $p<0.05$

Table 3.5 b) - Spearman Correlations Between Activities & Performance Criteria,

TOTAL SAMPLE

	productivity	turnover	absenteeism	accident rate
1. give instruction	.34	-.34	.45	.43
2. give advice	.38	-.08	-.14	.41
3. obtain equipment	-.01	-.51	.08	.40
4. inspect work	.00	-.39	.58	.70 **
5. manual work	-.03	.20	-.41	-.69 **
6. go to stores	-.14	-.03	.15	.35
8. get materials	.09	-.68 **	.50	.75 **
9. design query	-.43	-.03	.17	.12
10. paperwork/admin	-.21	-.26	.80 **	.42
11. movement product	.27	.14	.14	.28
12. go to Store	.27	.14	.14	.28
13 sociable talk	.38	-.07	.37	.35
14. looking personnel	-.46	-.29	-.32	.23
15. schedule enquiry	-.07	-.12	.65 **	.27
16. discuss foremen	.28	-.29	.30	.31
17. reprimand worker	.41	-.28	.00	.07
18. job allocation	.20	-.20	.68 **	.12
19. job number query	.27	.14	.14	.28
20. housekeeping	.27	.14	.14	.28
21. quality control	.27	.14	.14	.28
** ADDITIONAL ANALYSIS				
contact w. personel	.35	-.54 **	-.08	.22
contact w. workers	.64 **	-.48	-.09	.08
no diff' activities	.51	-.32	.49	.65 **
no diff' people	-.01	-.75 **	.37	.61 **
% incidents init'd	-.13	-.51	-.35	.00
time any single actv'	.28	-.06	-.58 **	-.26

** Significant at $p<0.05$

Table 3.6 a) - Pearson Correlations Between Activities & Performance Criteria,

SAMPLE I

	productivity	turnover	absenteeism	accident rate
1. give instruction	.55	-.29	-.28	-.17
2. give advice	.28	-.29	-.88 **	.92 **
3. obtain equipment	.09	-.48	.27	-.18
4. inspect work	.09	-.08	-.04	.16
5. manual work	-.00	.62	.47	-.46
6. go to stores	-.36	-.08	-.67	.71
8. get materials	-.57	-.60	-.26	.13
9. design query	-.71	-.42	-.43	.45
10. paperwork/admin	-.01	-.22	.47	-.26
11. movement product	.50	.39	.05	-.10
12. go to Store	.50	.39	.05	-.10
13. sociable talk	.16	.54	-.48	.47
14 looking personel	-.54	-.59	-.38	.17
15. schedule enquiry	-.38	.56	.22	-.18
16. discuss foremen	-.13	-.18	-.07	.44
17. reprimand worker	.54	-.31	-.27	-.21
18. job allocation	.00	.36	.76 **	-.46
19. job number query	.50	.39	.05	-.10
20. housekeeping	.50	.39	.05	-.10
21. quality control	.50	.39	.05	-.10
** ADDITIONAL ANALYSIS				
contact w. personel	-.41	-.65	-.72	.67
contact w. workers	.13	-.63	-.61	.55
no diff' activities	.70	.43	-.23	.10
no diff' people	-.05	-.69	-.43	.06
% incidents init'd	-.24	-.89 **	-.38	.16
time any single actv'	-.00	-.30	-.27	.23

** Significant at $p<0.05$

Table 3.6 b) - Spearman Correlations Between Activities & Performance Criteria,

SAMPLE I

	productivity	turnover	absenteeism	accident rate
1. give instruction	.46	.02	-.19	-.05
2. give advice	.62	-.18	-.71	.81**
3. obtain equipment	.35	-.54	.09	.22
4. inspect work	-.03	-.26	.03	.51
5. manual work	-.26	.20	.26	-.75 **
6. go to stores	-.09	.12	-.61	.28
8. get materials	-.06	-.44	-.64	.31
9. design query	-.37	-.37	-.31	-.09
10. paperwork/admin	-.26	-.32	.60	.03
11. movement product	.39	.40	-.13	.13
12. go to Store	.39	.40	-.13	.13
13. sociable talk	.23	.76 **	-.41	.01
14 looking personel	-.15	-.50	-.49	-.01
15. schedule enquiry	-.58	.43	.32	-.60
16. discuss foremen	-.21	-.09	.22	.52
17. reprimand worker	.65	-.13	-.39	-.27
18. job allocation	-.35	.00	.79 **	-.04
19. job number query	.39	.40	-.13	.13
20. housekeeping	-.39	.40	-.13	.13
21. quality control	-.39	.40	-.13	.13
** ADDITIONAL ANALYSIS				
contact w. personel	.03	-.55	-.71	.52
contact w. workers	.17	-.46	-.52	.57
no diff' activities	.79 **	.63	-.62	.18
no diff' people	.09	-.61	-.43	-.06
% incidents init'd	-.09	-.90 **	-.26	.06
time any single actv'	.43	-.20	-.43	.20

Significant at $p<0.05$

Table 3.7 - Activities Correlated Significantly with Criterion Measures [64]

	TOTAL SAMPLE	SAMPLE I
Productivity	+ contact with workers	(+ no. different activities)
	(- time any single acivity) *	
Turnover	- get materials	- % incidents initiated
	- no. different people	(+ sociable talk)
	(- no. different activities)	
	(- % incidents initiated)	
Absenteeism	+ schedule enquiry	+ job allocation
	+ job allocation	(- give advice)
	- time on any single activity	
	(+ inspect work)	
	(+ get materials)	
	(+ paperwork/admin)	
	(- looking for personnel)	
	(+ no. different activities)	
Accident Rate	(+ give advice)	+ give advice
	(+ inspect work)	(- manual work)
	(- manual work)	
	(+ get materials)	
	(+ sociable talk)	
	(+ no. different activities)	
	(+ no. different people)	

* Brackets indicate variable is only approaching significance level (significant on only one of the correlation measures); positive or negative sign indicates direction of relationship.

Testing the Model of Effective Foreman Actions

The model of effective foreman actions implied that a set of actions by a foreman would lead to job performance outcomes. The actions of Foremen in this study have been tabulated in Table 3.3; correlations of these actions with criterion measures have been tabulated in Tables 3.5 and 3.6; significant correlations have been summarised in Table 3.7. Each aspect of the Model will now be taken in turn, and the relevant correlation measures evaluated.

1. The effective foreman is involved in fewer different activities

For the Total Sample there is some suggestion that this action is related to reduced Absenteeism and increased Turnover and Accident rate. These relations are however not borne out for the homogeneous subsample. The action does correlate significantly with lowered Productivity, but only for Sample I.

2. The effective foreman spends more time on any single activity

This variable correlates significantly with reduced Absenteeism and approaches significant correlation with Productivity, but these relationships do not hold with Sample I on its own.

3. & 4. The effective Foreman spends less time on production activities and more time on administrative activities

Most Foremen in this study spent less than 10 percent of their day on paperwork, and greater than 90 percent of their day on production activities. There is some suggestion that time spent on paperwork

correlates positively with Absenteeism; otherwise the variable is unrelated to criterion measures.

5. The effective foreman spends more time in contact with personnel

This proposition was not borne out by any of the correlation measures.

6. The effective foreman spends less time in contact with his workers

A significant correlation between contact with workers and Productivity exists for the Total Sample, but not for Sample I.

7. The effective Foreman is in contact with a greater number of people

This variable shows some relationship to increased Accident rate, but the relationship does not stand for the subsample.

8. The effective Foreman has invested greater time in the instruction of his/her workers

The Foremen in this study agreed that their workers did not require instruction because they were tradespeople. Only one Foreman spent any length of time on instruction. The activity was unrelated to productive outcomes.

9. The effective Foreman spends more time in planning for performance improvements

The only Planning activity undertaken by Foremen in this study was the allocation of jobs for their workers. This activity shows a consistent strong relationship with increased Absenteeism.

In summary, the only relationships which do prove significant are: the greater the proportion of interpersonal interactions initiated by the Foreman, the lower the Turnover rate; the greater the time spent on job allocation, the greater the Absenteeism rate; the greater the time spent proferring advice to staff the higher the Accident rate; the more manual work done by the Foreman the lower the Accident rate. With the large number of correlations calculated in this exercise, many of these relationships may be merely chance occurrences.

Multidimensional Scaling Solutions

Because it might be some `profile' of job behaviours which predicts job performance rather than any single activity, a KYST-2 Multidimensional Scaling analysis was conducted to reduce the data set to its underlying dimensions (Coxon, 1982).

Multidimensional Scaling has much in common with Factor Analysis. The technique however relies on non-parametric scaling procedures and can be reliably used with a small sample of data points. Input data must be some representation of the similarity between variables (e.g. correlation scores). The underlying dimensions which are identified are each represented as the best weighted combination of input variables; that is, the end result of the analysis is a set of regression weights for each dimension identified. The quality of result obtained can be interpreted in terms of amount of data information lost in manipulation (titled data "stress"); as a rule of

thumb a value of <0.1 should be acceptable. Finally, Coxon (1982) suggests that the most meaningful M.D.S. solutions are those of only two dimensions; if a solution doesn't exist in two dimensions, it should certainly exist in three.

Scaling was undertaken with all activity variables where actions were recorded for at least two Foremen. Reference to Table 3.3 will indicate that these were variables: 1, 2, 3, 4, 5, 6, 8, 9, 10, 13, 14, 15, 16 and 18. A Pearson correlation matrix between activity variables formed the raw input for two scaling solutions. One solution was computed for the Total Sample, and another for Sample I.

In both instances the resultant solution was unstable, as indicated by stress values of 0.215 and 0.204. The three-dimensional solution for the Total Sample and Sample I are given in Appendices 4 and 5 respectively. By taking the highest loading variables an impression can be gained of the meaning of these dimensions. Table 3.8 summarises the dimensions for each solution by presenting these highest loading variables. (Note that the positive or negative direction of the dimensions is arbitrary). The attempt to reduce the data sets and find a common underlying `profile' of activities yielded little logic in either solution and little consistency between the two solutions.

A final check was conducted to explore whether a set of actions could be found which related to results criteria, and which could thus form the basis of prescribed behaviour for foremen. The M.D.S. solution generated for the more homogeneous subsample Sample I was

Table 3.8 - Summary of Multidimensional Scaling Solutions

	TOTAL SAMPLE	SAMPLE I
Dimension I	get materials paperwork/ admin vs. inspect work	inspect work sociable talk obtain equipment vs. go to stores paperwork/admin
Dimension II	schedule enquiry paperwork/admin go to stores vs. job allocation	give advice schedule enquiry vs. discussion other foremen
Dimension III	give advice obtain equipment vs. discussion other foremen	looking for personnel vs. job allocation get materials

correlated with performance criteria. This was done by firstly creating a dimension score for each foreman: observed frequency of behaviours (from Table 3.3) were multiplied by the regression weights of Sample I dimensions (Appendix 5). Appendix 6 presents these dimension scores. Finally, dimension scores were correlated with criterion measures; Table 3.9 displays the result of this analysis.

Table 3.9 - Correlation of M.D.S Dimensions with Criterion Measures

	Dimens I	Dimens II	Dimens III
Productivity	.2444	.0331	-.0907
	p=.320	p=.475	p=.432
Turnover	.5694	.2619	-.7845
	p=.119	p=.308	p=0.032 **
Absenteeism	.1780	-.5260	-.7605
	p=.368	p=.142	p=.040 **
Accident Rate	-.2526	.7076	.5832
	p=.315	p=.058	p=.112

Only Dimension 3 shows any relation to criterion measures. This dimension identifies the action of looking for personnel at one end of a continuum, and job allocation/looking for materials at the other. There is little logic in this prescribed dimension.

CONCLUSIONS

Based on a thorough analysis of the literature on foreman's jobs, a model of effective foreman's actions was presented (see page 35). This model suggested that there was a set of actions of the foreman which consistently correlated with productive performance of the job.

The sample chosen to test this model comprised nine production foremen in a single N.Z. plant. The foremen supervised a wide variety of production tasks.

The study has found considerable variety in the jobs of these foremen. Interpersonal interactions with workers were of brief duration, and offered very little scope for the foremen to express any individual style of "leadership" behaviour. The common element in these jobs was that all foremen were troubleshooters, seeking to resolve the many production difficulties of Firm Z. The foreman serviced the workers with materials, equipment and advice. The job was rapidly paced, with activities largely unplanned and frequently interrupted.

Only four actions were found to consistently correlate with productive outcomes:

- initiating more interactions correlated with lower turnover

- allocating jobs correlated with increased absenteeism

- offering advice correlated with increased accident rates

- manual work correlated with decreased accident rates.

This set of correlations does not provide support for the Model. There is little logic in these relationships, and they may have occurred by chance alone.

An attempt to establish consistent underlying dimensions of foremen's actions, and to correlate these dimensions with productive outcomes, also met with a lack of success.

The study has concluded that, even within the one New Zealand industrial plant, a single set of actions cannot be prescribed as effective for all foremen. The foreman's job is to a large degree controlled by the production system with which he/she works, and cannot accomodate a single approach to all jobs. In this the study has produced a result very similar to that obtained by Thurley & Hamblin (1962, 1963), who studied foremen's jobs across a variety of industries. Thurley & Hamblin suggested that attempts to link the way foremen behave with production variables, such as productivity or absentee rates, were doomed to fail, because a foreman's behaviour is largely a function of the production process.

The report presented to Firm Z management recommended that a training programme was not the way to improve productivity, nor to assist the foremen in completing their work more efficiently (Hyde, 1984; see Appendix 3 for a summary). The report highlighted changes other than training which might alleviate difficulties in the production system. However, the study did reveal an element common in the jobs of these foremen, training in which may appropriately assist foreman trainees in their jobs.

This critical aspect was simply to be able to cope with the pace of the job, the frequent change of activities on which to direct attention, the breaks to concerted effort caused by frequent interruptions, and the need to make snap decisions on the production problems at hand.

It would seem that to concentrate on the foreman's relationship with his work group as the only critical aspect of the job, would be to fail to see that the foreman is a troubleshooter in a production system.

STUDY TWO

INTRODUCTION

Study 1 concluded that a critical aspect in the jobs of the foremen studied was the ability to cope with pace of work, frequent changes to activity, frequent interruptions and the need to make snap decisions on production problems as they arose. Hereafter this aspect of the foreman's job will be referred to as "the Pacing Factor".

Study 2 was firstly an exploratory study, introducing an in-basket simulation of the foreman's job which focusses on the critical pacing factor. The study then employed this simulation as a dependent measure of the success of an exploratory training session; the training session was designed to assist subject's performance in dealing with the pacing factor. The in-basket constructed for this study encorporated practice in some of the key production problems encountered by Firm Z foremen. The discussion below explores the in-basket as a way of simulating managerial and foreman's work. Also covered is a survey of the background literature on decision-making under the pressure of workpace and under situations of ambiguity, to assist in the design of an appropriate training session.

The In-Basket as a Simulation of Supervisory/Managerial Work

An exercise was sought which would be a sample of the work of foremen, focussing in particular on their ability to cope with the pacing factor. Such an exercise could be used as a dependent measure when evaluating the success of a training session.

The in-basket, or in-tray, exercise presents subjects with a job incumbent's in-tray containing letters, memos, reports and telephone messages. Subjects are given a description of the job role to be played, and a description of the organisation they work in. The exercise is intended to be a sample of everyday work problems. Within a fixed time the subject is to write notes on their decisions and the actions they will take. A necessary element in the exercise is ambiguity. There is no instruction on how information should be analysed or organised, and no set categories of response. The subject is left to establish their own priorities for action, and own style of responding. Time allowed to complete the exercise is limited, and thus the stress induced by pace of work is a component of the exercise.

Gill (1979) reviewed several studies displaying the predictive validity of in-basket exercises for assessing managerial potential. What is of debate amongst researchers is just what the in-basket is testing, and how the exercise should be scored. Gill provides an exhaustive list of skills purported to be tested by the in-basket - "subjects recall and insight, analytical and critical thinking, logical reasoning and problem solving, creativity, judgement and sensitivity to

social subtleties, ability and willingness to make decisions, establish priorities and distinguish fact from opinion, delegate, written communication skills, coping with stress, and management control" (p. 195). Some studies have found the in-basket to measure a significant portion of the manager's job which is unique from intelligence and written skills (Bray & Grant, 1966; Meyer, 1970; Wollowick & McNammara, 1969).

On the question of scoring the exercise, traditional methods have sought to give subjects a score on each of several dimensions of behaviour; those behaviours considered critical to performance of the job in question. In an exhaustive multivariate study of the scoring of in-basket responses, Smith (1982) concluded that an overall score for each decision response (1 for a good decision, 0 for a poor decision, 1/2 for a decision showing some merit) was as good a predictor of job performance as any combination of dimensional scores. This method of scoring was adopted for the present study. Smith assessed a sample of chargehands who were prospective candidates for promotion to foremen, in a New Zealand freezing works. In-basket scores correlated significantly with supervisor's ratings of those individuals considered suitable for promotion. Smith concluded that the in-basket can be an easily administered and easily scored predictor of job performance.

In conclusion, research into the in-basket exercise suggests it is a valid measure of some critical aspect of managerial work, involving a subject's ability to organise ambiguous information and make decisions, under the pressure of workpace. The exercise can be scored easily.

Decision-Making Under Pressure of Workpace and Situations of Ambiguity

The psychological literature has generated a general model of decision-making. This general model could be represented as a four step process of the decision maker:

a) scanning the problem situation,

b) defining the problem,

c) identifying alternative solutions, and

d) weighing these alternatives. (Sime & White, 1971)

Similar representations of this model are frequently incorporated in programmes of supervisory training, suggested the trainee apply the model to his/her work decisions.

The bulk of the research literature has concerned itself with the question of how alternative problem solutions should be weighed (a prescriptive approach), and just how the human problem solver does weigh alternative courses of action (a descriptive approach). In its most involved form such research includes the building of computer programmes to simulate the human decision-maker. But such research is not of concern here. The current question is how the individual

generates alternative solutions, particularly in a situation where the options for action are ambiguous, and where the pace of work is high.

Mintzberg (1973) pointed out "it is not the decision making under certaintly, risk or even uncertainty of the text book that the manager faces, but decision making under ambiguity" (p. 191).

The ability to adapt to decision making under uncertainty has been investigated in an experimental study by Hunsaker (1975). Two hundred subjects responded to the GIAL (General Incongruity Adaptation Level) scale, which purports to measure tolerance for ambiguity. One hundred subjects - those scoring at the high and low ends of the scale - then participated in a decision making simulation and their responses were recorded. High GIAL subjects perceived less risk in the problem situations, made more risky decisions, and responded more rationally in ambiguous problem situations. The suggestion is that an individual's ability to adapt to ambiguity per se will influence their performance on decision making under ambiguity.

A related topic is the individual's ability to deal with the inherent stress of management decision making, in the face of uncertainty of information. McGrath (1976) identifies the perception of stress as a contributing factor to the amount of stress felt by a person at work. Zajonc's (1965) work on social facilitation suggested that the individual who perceives less stress in the situation at hand is able to generate a greater spectrum of response alternatives. This may imply that for the foreman or manager in a stressful work

environment, reducing his/her perception of stress will aid him/her in generating alternative problem solutions.

In a much cited piece of investigative work, Karasek (1979) presents a general model of work stress. Karasek considered the models of stress to that date had failed to predict human responses because they had failed to take into account a person's "decision latitude", which acts to reduce stress. Karasek's research suggested that work stress is a function of two factors: a) demands of the job, and b) the individual's perception of the amount of discretion they have to make decisions. By encouraging people to consider they have an active part to play in influencing the situation at hand (that is, they have discretion), work stress could be reduced.

In conclusion, a training session may be formulated which seeks to improve an individual's ability to make decisions while under pressure of workpace and ambiguity of information. This session could include the following points -

i) practise in the skills of scanning, assimilating and organising available information;

ii) encouraging the perception of a low level of stress;

iii) communicating the message that trainees have considerable discretion to make their own decisions and influence the situation at hand.

In summary it appears the in-basket can be used to simulate the foreman's job, and that the decision-making literature offers ideas for a training intervention relevant to improving a person's ability to deal with the pacing factor.

Study Two aimed:

i) To pilot test an in-basket simulation of one critical aspect of the foreman's job - the pacing factor;

ii) To assess the success of a training session designed to assist subjects in performance on the pacing factor.

METHOD

Subjects

Thirty five trainees in two separate Technical Institute courses acted as subjects. Twenty one trainees were from a Vocational Training Council "Introduction to Supervision" course run once-weekly for a full day, over 8 weeks. Seven of these people volunteered to receive training in decision skills (Experimental Group), the remainder acted as a control group (Control Group I). The fact that subjects volunteered for the experimental group restricts the strength of the present experimental design. Random assignment was not possible as only some trainees had time available to participate in the training, and others could not be compelled to participate. Fourteen further trainees were from a New Zealand Institute of Management (NZIM) course titled "Principles of Organisation", which forms one unit of the Certificate in Supervision and Basic Management. The course runs for 15 weekly seesions of 2 hours each, and these subjects formed a second control group (Control Group II).

Age and sex of participants is given in Table 4.1. All volunteers for the Experimental Group were male. This introduces an unfortunate, unavoidable bias into the experimental design. Background of the subjects was considerably diverse. The Vocational Training Council course including supervisors in the public service, in insurance, in sales and retailing, catering, hospitals, horticulture and industry;

Table 4.1 - Age and Sex of Subjects

	Age (years)	Male	Female
Experimental	range: 21-50 mean: 35	7	0
Control I	range: 20-53 mean: 36	6	8
Control II	range: 17-44 mean: 30	9	5

some participants were housewives. These people did not generally have previous tuition or training in organisational topics. Most of the trainees in the NZIM course had previously completed a course in "Human Resource Development"; some of these trainees had backgrounds in middle management.

Experimental Design

A three group design (experimental group and two control) was employed to test the hypothesis that training in decision-making skills would aid subjects performance on a job simulation. The Pretest measure was an in-basket titled "Dollrier", the Postest was another in-basket titled "Brown Engineering", and the intervention a short training session. The experimental design can be represented thus:

	Pretest	Intervention	Postest
Experimental (N=7)	Dollrier	training	Brown Engineering
Control I (N=14)	Dollrier	-	Brown Engineering
Control II (N=14)	-	-	Brown Engineering

The Experimental Group and Control I completed the Dollrier exercise on Week 1; the Experimental Group received training on Week 3; all three groups completed the Postest exercise on Week 4.

Apparatus

1. Two in-basket exercises were used. The Pretest measure was the Dollrier Freezing Works exercise developed by Smith (1982) for use with a sample of New Zealand freezing works chargehands seeking promotion to foreman level. The exercise puts the subject in the role of a foreman in a freezing works. The in-basket includes a description of the employing organisation, a job description and an organisation chart. Fifteen memos are included in the in-basket describing problems related to:

- a union complaint

- damaged product

- safety problems

- worker absence.

Some of the memos present more serious problems than others; some memos merely provide information to assist in solving the problems mentioned elsewhere in the in-basket. In its application in the present study, administration of the exercise included 5 Interruption Memos. This was an aspect not included in the original in-basket, but used here to more closely simulate the foreman's job. The memos cover minor incidents in the foreman's workday: permission for absence to attend to union duties, a request for workers to aid in a lifting task,

poor work standards from another department, an Inspector's permission to inspect meat quality, and a minor injury to a worker. These memos are included in Appendix 7. (Smith, 1982, contains a full copy of the Dollrier exercise.)

2. As a Postest measure a new in-basket exercise ("J. Brown Engineering") was constructed, based on the job analyses conducted in Firm Z in Study One. The exercise puts the subject in the role of a foreman in an engineering firm. A description of the organisation, a job description and organisation chart are included. A selection of the problems encountered by foremen in Firm Z was incorporated in the sixteen memos:

- materials shortage

- changes to the production schedule

- equipment shortage

- a lack of skilled labour

- tidiness of the workplace

- inadequate tuition of apprentices.

As with the Pretest measure, some memos present more serious problems than others; some memos provide information to assist in solving the problems at hand. The exercise also includes 5 Interruption Memos. These memos cover minor incidents in the foreman's workday: equipment shortage, materials shortage, poor work standards from another department, personnel being sought, equipment being sought. Appendix 8 contains the J. Brown Engineering exercise, including Interruption Memos.

3. Two items were created for the Training Intervention. Appendix 9 contains a case study in the day of a housewife. The study includes both problems and information related to the housewife's day. The job of housewife rather than foreman was chosen to avoid the error of many training evaluations where there is a tendency to train to the test. The case study seeks to sample the same basic skills as the in-basket, namely ability to work under pace of work, changes to activity and the need for snap decisions; the element of interruption was not included in the exercise. A set of suggested answers to the case study is also included in Appendix 9.

4. Subjects in the Experimental Group received a set of cue-cards covering the learning points of the Training exercise. A set of cards is included in Appendix 10.

5. Two separate Marker's Guides were created to assist in evaluating subject's performance on the in-basket exercises (see Appendix 11). They proffer suggestions on appropriate answers to each in-basket memo.

Procedure

Pretest & Postest - The in-basket exercises were administered by a standard procedure for all subjects. Subjects were seated at separate workdesks and provided verbal instructions:

" The following exercise is intended to be a simulation of a foreman's job. For the next hour you will be R. Roberts, a foreman in an engineering firm. You will be given a stack of memos to answer.

I am interested in the decisions you make. There is no one correct answer for these memos. You can answer the memos in any order you wish. This is your job to do as you see best.

In one way this is not a very good simulation of a foreman's job because very few foreman's jobs involve pens and paper like this. The memos represent the sort of thing that would be spoken to you. Most of a foreman's job is spoken.

As with a foreman's job, you can expect to be interrupted in your task by a worker or colleague with some new requests. My colleague and I will be interrupting you with further memos as the session proceeds. You will have to answer these memos immediately by writing a reply on them. We will stand and wait

for your reply. "

Ten minutes were allowed to read the description of the organisation, job description and organisation chart. These were loosely gathered with a paperclip. Subjects were then handed the set of memos held loosely by a paperclip, and told they had one hour to complete the exercise.

When 10 minutes had elapsed the 2 experimenters commenced distribution of the Interruption Memos. Firstly all subjects, in randomised order, received Interruption Memo 1; the experimenters waited by each subject to complete the memo before moving to another subject. At 10 minute intervals the experimenters distributed the remaining Interruption Memos, moving to one subject at a time, covering all subjects in randomised order.

Training Session - On Week 3 the experimenter returned to the Supervisor Course and requested volunteers for a training session which would take half an hour of the trainee's time. Ten male subjects volunteered. (Due to attrition across the three phases of the experiment, the final Experimental Group consisted of only 7 subjects).

The content of the training session was based on the author's literature review of research on decision-making. The trainer commenced the training session with an open discussion of several points about the in-basket exercise of Week 1:

- how do you deal with time pressure? how do you reduce workload?

- are some work matters more important than others?

- what should you do about these matters?

- can any extra information assist you to resolve these work problems?

The set of Cue Cards for Problem-Solving was then distributed and discussed. The cards (Appendix 10), based on the author's literature review, cover the following points:

a) set priorities in your work

b) put effort into priorities

c) search the information available

d) state your course of action clearly and state who will be involved

e) the trainee is free to do the job as he/she sees fit; the trainee will make good decisions. (This latter card was intended to reduce the level of stress perceived by subjects and increase their perception of discretion available in the task.)

Finally, the Housewife Case Study was distributed. Trainees were instructed to apply the cue cards they had received to decide how they would complete the housewife's workday. The session ended by displaying the model answer for the Case Study and discussing the decisions the trainees had made.

Assessing Subjects' In-basket Responses - Two independent markers graded subjects' responses on Pretest and Postest measures. Markers were blind to the group membership of subjects. Markers followed the Markers Guide and graded each memo: 1 for a good answer, 0 for a poor answer, 1/2 for an answer with some merit.

To account for the matter of some memos being more important than others, and some memos simply reporting information to help solve the problems at hand, grades for some memos were then halved, or deleted. In total Dollrier Freezing was graded out of 12.5; Brown Engineering was graded out of 13.

Reliability across markers was tested. Finally, consensus was gained on the grades for all subjects.

RESULTS

The two independent markers achieved a correlation of reliability of r(s)=0.81 on the Pretest measure before collaboration, and r(s)=0.93 after collaboration. On the Postest measure a correlation across markers of r(s)=0.91 was achieved before collaboration and r(s)=0.95 after collaboration. Subjects scores were subsequently taken to be the mean of the two independent gradings.

Subjects scores for the three groups are shown in Appendix 12. Group means are given in Table 5.1.

A Mann Whitney U Test between Experimental and Control I groups indicated there was no difference between groups on the pretest (U=42, $p>0.05$, nonsignificant). This ensured that these two groups were adequately matched prior to training. A Kruskal Walis test between the postest measures of the three groups proved significant (H=30.48, $p<0.001$). Further examination revealed that Control II (postest only) had scored significantly higher than either of the other two groups (Control II vs Experimental, U=17, $p<0.05$; Control II vs Control I, U=38, $p<0.05$), but that the Experimental group was no different to Control I (U=41, $p>0.05$, N.S.).

An uneven groups, repeated measures ANOVA was also conducted. Appendix 13 substantiates the finding that there has been no significant effect due to the intervention.

One final result was gained by tabulating the common errors subjects had made on the exercise. These errors are listed in Appendix 14, and will aid future development of the exercise.

Table 5.1 - Group Means on Pre- and Postest Measures

	Pretest	Postest
Experimental (N=7)	3.679	2.196
Control I (N=14)	3.446	2.464
Control II (N=14)		4.250

CONCLUSIONS

This exploratory study sought to simulate the critical pacing aspect of foreman's work. An initial impression of the utility of in-basket exercises to simulate the pacing factor has been gained.

Firstly, such exercises can be readily formulated given a first-hand knowledge of the jobs of incumbents; such a knowledge can best be gained through observation of people at work. Secondly, the in-basket can be easily and reliably scored. In-basket responses need not be assessed in a multiple dimension or multivariate fashion. Thirdly, the simulation exercise has shown that a series of interruptions can readily be incorporated, to simulate the stress of foreman's work.

The failure of the training intervention to produce any significant difference between experimental and control groups may be put down to the short duration of the training intervention (over a lunchhour) and the small size of the experimental group (N=7). The short duration of the training session seriously limited subjects' opportunity to practise the skills of scanning, assimilating and organising of information. The implication that trainees had considerable discretion to make their own decisions, and that the exercise was not intended to be stressful, may have even worked against success of the intervention. It was noted that several members of the experimental group completed

their memos well within the one hour limit set, and may have taken a laisse faire attitude to the problems presented in the exercise.

The superior performance of Control Group II provides some post-hoc validation for the in-basket. Many of these trainees had previously completed units in the NZIM certificate previously, and generally held responsible positions in their employing organisations, some at middle management level. The Human Resource Development unit which many had already completed included tuition in the management of worktime. It could be expected that these subjects would score higher on a test of supervisory skill.

However, without returning to the original subject sample of Study One foremen, the validity of the simulation remained doubtful. It seemed important to establish if the pacing factor of the work of foremen in Firm Z has been adequately simulated. Also, the establishment of what constitutes good foreman actions and what constitutes poor foreman actions in in-basket responses, needed validation against the opinions of job experts. Thirdly, one might expect that the Study One foremen in Firm Z would score more highly on the J. Brown Engineering in-basket than would the trainees in Study Two. This would provide a measure of concurrent validity for the simulation and its scoring. Study Three aimed to test the in-basket on the original sample of foremen.

STUDY THREE

In Study Three the researcher returned to Firm Z and administered the J. Brown Engineering exercise to the foremen available. A gap of eight months had elapsed between the data collected for Study One and the timing of Study Three. In the interim the firm had undergone several major structural and personnel changes, some arising from the report to management (Hyde, 1984). Study Three aimed to gain information on:

a) whether or not the pacing factor had been adequately simulated;

b) whether the researcher had correctly scored good versus poor in-basket responses; and

c) the concurrent validity of the simulation as a test of foreman's skills.

METHOD

Subjects

Five of the six Sample I foremen of Study One participated. The foreman from Shop D was unavailable for participation.

Apparatus

1. The J. Brown Engineering exercise together with its five Interruption Memos.

2. A post test questionnaire (Appendix 15) asking the foremen to discuss the realism, appropriateness and value for training of the exercise.

Procedure

The standard procedure of administration developed in Study Two was followed, with one exception. The pace of the exercise was increased by allowing only 50 minutes for foremen to complete the memos, instead

of 60 minutes. This was felt to be necessary, based on the observation of previous administrations, in which many subjects finished the memos within 50 to 55 minutes.

Foremen's responses were scored by two independent markers. The completed exercises of five Study Two subject's were also included in the stack of exercises to be marked. Markers were thus blind to the group membership of individual subjects.

RESULTS

There was considerable agreement in the ranking of subjects scores between the two markers before consultation ($r(s)=0.9$) and perfect agreement afterwards ($r(s)=1.0$). Individual grades of subjects on the exercise are given in Appendix 16; the mean of the scores was 4.7, higher than any of the groups previously tested.

Grades for the Foremen were compared with those of Study Two subjects, to establish whether the Foremen had scored higher or not. In Study Two, Control group II had scored significantly higher than Control I or the Experimental Group. A Mann-Whitney U Test was conducted between the Foreman Sample and Control II. The result was not significant ($U=31$, $p>0.05$, NS). Further Mann-Whitney tests indicated that the Foremen's had score significantly higher than the Experimental group ($U=5$, $p<0.05$) and approached significant differences from the scores of Control I ($U=16$, N.S.). Table 6.1 summarises the means and significance test results for the four subject samples.

Pearson correlations were calculated between the subjects in-basket scores and the criterion measures obtained eight months earlier in Study One (see Table 3.1). Table 6.2 presents the results of this analysis. The in-basket score does not correlate significantly with any of the criterion measures.

Table 6.1 - Mean Scores and Significance Levels on J. Brown Engineering Exercise

	Foremen ($\bar{X}$=4.70)	Control II ($\bar{X}$=4.25)	Control I ($\bar{X}$=2.46)	Experimental ($\bar{X}$=2.20)
Foremen	-	U=31, N.S.	U=16, N.S.	U=5, $p<0.05$
Control II	-	-	U=38, $p<0.05$	U=17, $p<0.05$
Control I	-	-	-	U=41, N.S.

Responses to the postest questionnaire are tabulated in Tables 6.3 to 6.6. Table 6.3 shows that all foremen considered that the in-basket exercise was simulating at least one critical aspect of their jobs. Table 6.4 shows that three subjects responded to the question "in what ways wasn't the exercise realistic". Two felt that the exercise was not like their job because it involved the use of memos rather than the spoken word.

Table 6.2 - Pearson Correlations between Foreman's In-basket Scores and Criterion Measures

	Productivity	Turnover	Absenteeism	Accident Rate
In-basket	.29	-.62	-.27	-.16
	NS	NS	NS	NS

Table 6.3 - "Was this exercise a realistic look at your job?"

	N(%)
yes, because it was fast paced	2 (40%)
yes, because I had to make quick decisions on problems	5 (100%)
yes, because it had frequent interruptions	3 (60%)
yes, because it had frequent changes to activities	2 (40%)

Two subjects felt that the exercise had provided some valuable insight (Table 6.5). In response to the question "do you think the exercise would be useful in training anyone starting work as a foreman", three subjects replied yes and one replied no. Table 6.6 indicates that at least some of the subjects had understood the purpose of the exercise, that is, to test decision-making under the pressure of workpace.

The final questionnaire item asked subjects "did you find it difficult expressing yourself in writing?" Three subjects replied yes and two subjects replied no.

Table 6.4 - "In what ways wasn't the exercise a realistic look at your job?"

"should be spoken, not memos" (2)

"spray painting is a different field"

Table 6.5 - "Did the exercise provide any insight into your work, or any lesson that you could apply?"

"safety on the shopfloor is important"

"I should keep chargehands and workers better informed"

Table 6.6 - "What do you think the exercise was testing?"

"ability to make quick decisions"

"work knowledge, planning and supervisory skills"

"how to keep your cool"

CONCLUSIONS

As in Study Two the in-basket exercise with interruptions was found to be easily administered and reliably scored.

This final study firstly addressed whether or not the Pacing Factor of formen's work had been adequately simulated. The postest questionnaire distributed to foremen showed that all felt some significant part of their jobs, particularly the need to make quick decisions on problems, had been realistically simulated. Other foremen felt that the fast pace, frequent interruptions and frequent changes to activities were also critical aspects of their jobs and realistically simulated. Most foremen felt the exercise would be valuable in training newcomers to the job of foreman. The most frequently quoted reservation concerning the exercise was that written communication was not a significant part of their work, and that the exercise should have been administered in an oral form.

The second aim of the study was to explore the validity of the scoring of in-basket responses. Appendix 17 will be helpful in future use of the in-basket. This appendix presents the best action responses from these five job incumbents. The responses reflect their experiences gained on the job, and the actions they consider best for meeting the problems of material shortage, changes to the production

schedule, equipment shortage, lack of skilled labour, tidiness of the workplace and inadequate tuition of apprentices.

The third aim of the study was to gain some measure of the concurrent validity of the simulation as a test of foreman's skills. Though the foremen had less time to complete the exercise, the mean score of the foremen was higher than that of any other group tested. The small sample size (N=5) made it very difficult to gain significance levels for these differences. The findings are however strongly indicative that the J. Brown Engineering exercise is testing a skill important to the work of foremen in Firm Z.

In-basket scores did not correlate with criterion measures for the foremen eight months previously. Again it appears that productivity, turnover, absenteeism and accident rate in Firm Z are under the sway of more powerful factors than the foremen's actions.

GENERAL DISCUSSION

This series of studies has addressed the question of the training of industrial foremen, with particular emphasis on the issue of the content of training, and criteria for evaluating its effectiveness. The findings support the argument that the content of any training programme for industrial foremen should be based on a thorough knowledge of the work of foremen and the critical actions they should undertake to fulfill the requirements of their jobs.

Any training effort seeks to address the gap between desired job performance and existing job performance, and it is argued that a "results" measure of job performance is the most appropriate criteria for evaluating the success of training. Psychologists have a long history of avoiding the use of "results" criteria. Because work results are considered to be out of the immediate control of job incumbents, some measure of work behaviour or rating by fellow workers is often assumed to be a sufficient criterion of training success. To a large extent rating scales (behavioural rating scales or performance appraisal scales) have been substituted for results criteria.

The question is a difficult one. If supervisors are to be held responsible for the results of their positions, then they must also be shown to be in control of those results. A criterion must be chosen which both indicates success on the job and control by the worker. One method for establishing such criteria has been adopted by Gilbert (1978). Called the ACORN test the method implies that the chosen

criterion should be a) an accomplishment rather than a behaviour, b) under the control of the worker, c) the main objective of the job, d) reconcilable with the objectives of other workers in the firm, and e) be expressable in numbers. Whatever criteria are chosen for evaluating the effectiveness of a training programme, the limits of their generality should be stated explicitly. It is not sufficient to say that job performance will be improved, if that performance is measured with a rating scale. A criterion such as worker satisfaction or supervisor-worker harmony is adequate, as long as the trainer makes this goal explicit and does not imply that performance goals will automatically follow.

Many of the traditional approaches to the training of foremen have been derived from the theories of leadership. The leadership approach to studying the work of foremen implies that adopting a prescribed approach to the handling of subordinates will lead to productive outcomes for the foreman's job as a whole. The approach also implies that "leadership" skills are critical in all supervisory and managerial jobs. Many New Zealand training courses reflect this assumption by providing one programme to train a great variety of staff. Reviews of the management and supervisory training literature have concluded that such training programmes have failed to produce measureable changes to productive outcomes (Campbell et al., 1970). A thorough understanding of managerial/supervisory work may assist the development of valid training programme content (Campbell, 1971; Campbell et al., 1970; Goldstein, 1980).

Study One had three aims - to gain data on the behaviour of New Zealand formen, to observe any similarities in the work of several foremen, and to test a model of effective foremen actions. The research information available on foreman's work related to the jobs of United States or United Kingdom foremen. Because New Zealand industries are generally much smaller, it was felt that the jobs of New Zealand foremen required separate investigation.

An intensive observation study was undertaken involving continuous recording of foremen's actions. Industrial psychology sorely needs this type of idiographic approach to information gathering. It was hoped that the observation data obtained from this study would provide valuable insight into the nature and critical aspects of the work of a small number of foremen - insight which could not be provided by a group-centred approach, such as surveying the opinions of several hundred job incumbents.

Considerable variety was observed in the jobs of nine foremen working in the one New Zealand plant. The foremen's jobs had little to do with planning, or administration, or job instruction. These would form inappropriate training modules for these foremen. Interactions with subordinates were of such brief duration that there was very little opportunity to express any individual style of "leadership". Leadership skills were not an important component of the foremen's jobs. One half of the foreman's time with personnel was spent with people other than his own workers. This suggests that skills in interpersonal relations with people other than subordinates is

important (Jasinski, 1956). The work was very similar to those managerial jobs described in previous observation research (Mintzberg, 1973; Kotter, 1982) - being rapidly paced, discontinuous and unplanned.

Rather than requiring a common interpersonal skill of "leadership", the critical aspect of the work of industrial foremen may be very different to the critical aspects of the work of supervisors in other work settings. The key role of foremen in this study was to act as Production Troubleshooters. Their role was to resolve production difficulties as they arose; such difficulties as material shortages, shortages of tools, design information required, and advice required on work methods.

Two alternative conceptions of foremen's work emerged from a review of observation studies conducted in the United States (Guest, 1956; Jasinski, 1956; Ponder, 1957; Walker et al., 1956) and those conducted in the United Kingdom (Thurley & Hamblin, 1962). The American studies suggested that a model could be built of effective foremen's actions. The British studies implied that a foreman's actions are greatly influenced by the production situation and that any attempt to attribute levels of productivity or staff turnover to the foreman's behaviour were bound to fail. In the present study, no support was obtained for the model based on the American research. The results of the present research agree with the results of the Thurley & Hamblin (1962, 1963) study conducted across industries; the jobs of foremen were too much at the sway of the production system to justify a

single approach to all jobs. Perhaps because New Zealand industries are generally small and can involve several different industrial processes, even within a single plant there can be considerable variety in foreman's jobs.

There was, however, one aspect common to the foremen's jobs studied, namely the Pacing Factor. This was identified as having four contributing aspects:

a) the work was rapidly paced;

b) decisions had to be made quickly on problems as they arose;

c) there were frequent interruptions to activities undertaken; and

d) there were frequent changes to activity.

It was this dimension which the in-basket used in Studies Two and Three sought to simulate.

Limitations of Study One

The adequacy of the observation samples taken requires some discussion. It is probable that if the standard observation period was lengthened, more new activities would be observed in the foreman's

work. But this becomes a question of utility. A researcher could lengthen the observation period to a full week to discover a small number of new activities. But only with more complex managerial positions would such a long period discover any appreciable number of new activities (Mintzberg, 1973). Thurley & Hamblin (1963) resolved the question of time sampling by employing two sampling methods - both a continuous record of one working day, and random sampling over a period of weeks. This appears a very sound method of time sampling for job observation.

The variable length of observation records in this study limits conclusions on the two activity categories "the number of different activities" of the foreman, and "the number of different people" the foreman was involved with. It was suggested earlier that the short observation periods for two foremen had adequately sampled the range of activities they undertake. This logic cannot be defended very far, and only a standard length of observation period can reliably measure these two observation categories.

It could be possible that some aspect of foreman behaviour not measured in this study relates to performance criteria such as foreman-worker relations. In essence this thesis has found that the apportioning of time by a foreman to particular activities does not lead to systematic changes in productive outcomes. The present study has not however addressed the question of the precise way in which a foreman might undertake to fulfill his necessary activities. This is particularly important in relation to examining interpersonal

activities. For example, given that a foreman must provide advice to his workers, are there different ways of giving advice? Are there different ways of requesting materials from a storeman? or different ways of explaining to a worker that he or she has not done a task well enough? The answer to these questions is obviously yes, there are differences in how a foreman fulfills these tasks. In the mileau of factory noise and the hectic activity of the foreman, a 30 second interaction which informs the worker that he or she has failed at a task may appear insignificant. But it may be a critical incident significant to the worker, which affects his or her job satisfaction or subsequent work performance. It becomes important to explore ways of obtaining observational data on how a foreman carries out these activities. One such method will be discussed shortly.

A further limitation to Study One concerns measurement of the criterion of productivity. In this study a productivity measure was calculated for each foreman from a 12-month record of production, and defined as the ratio of Actual Hours to Quoted Hours to complete a task. While this may be the only productivity measure which a small New Zealand firm undertaking jobbing work has, it is hardly satisfactory for the serious psychologist. The serious psychologist would demand that the Quoted Hours set as a goal for production were based on accurate historical information on times taken to complete meaningful units of production. Production engineers should be able to provide such a measurement system which would facilitate research such as this. In the meantime, a degree of uncertainty thus surrounds the conclusions reached in Study One regarding `productivity'. The

absenteeism, turnover and accident-rate data were also not without problems, but no more than has already been identified in the literature (Hamner & Landau, 1981).

Summary Comment for Study One

Study One has highlighted the value of intensive idiographic research. In the future, interested researchers could employ job observation to record the nature of foreman's work in different industries, or to record the work of office supervisors, and managers. Such information could be used to identify the elements of these jobs which are crucial and then design programmes which meet training needs.

The observational data from Study One presents a picture of the foreman as a Production Troubleshooter, with less emphasis placed on interpersonal skills. Workers about to be appointed to the position of foreman may benefit from practise in the Pacing Factor of foremen's work.

The training of foremen is often suggested as the means to resolve production or personnel difficulties. The experience with Firm Z questions the assumption that training is always the answer to an organisation's problems. When an empirical relationship cannot be established between behaviours and productive outcomes, then training is not the answer. Rather, some set of intervening difficulties in the work system may account for the level of productivity or performance

encountered. The resolution of those difficulties would appear more important to the productivity of the firm than any effort to train its foremen. Firm Z had particular difficulties in the timely supply of materials and design information. Production rescheduling was frequent. These problems are not uncommon in New Zealand industry and the training of line foremen would do little to overcome them.

This raises the question of what purpose the training of foremen can fulfill. If production levels or personnel related criteria are not under the foreman's control then a training effort must have a more specific goal. Training is appropriate when some aspect of work performance is below the level desired, and this deficit can be attributed to a lack of skill, knowledge or attitude (Baynes, 1975). Training might be instituted to resolve some specific difficulties such as poor worker-foreman relations, lack of production planning, lack of worker satisfaction with a foreman's supervision, or lack of the ability by the foreman to resolve production problems in the face of the pace of his or her work. Resolution of these specific difficulties becomes the explicity stated goal of the training effort.

Studies Two and Three

In Studies Two and Three a simulation of the Pacing Factor of foremen's work was pilot tested because this factor was seen as critical in the foreman's job. The simulation consisted of an in-basket exercise with physical interruptions. The exercise was in a

written medium.

Study Two showed that such a simulation could be readily constructed if the trainer was familiar with the jobs concerned. The study also demonstrated that the exercise could be simply and reliably scored. As a pilot study, Study Two's finding that Control group II scored significantly higher than did the Experimental group or Control I provided post-hoc validity for the in-basket. The lack of success of the training intervention is perhaps not surprising. It was of short duration, it did not teach to the test as is done in many training evaluation studies, and the sample size was small.

In Study Three the foremen whose jobs were originally observed completed the in-basket. Further concurrent validity for the in-basket was gained by the strong indication that foreman's scores were higher than those of supervisory trainees. The foremen also rated the exercise highly in its ability to simulate the Pacing Factor, and considered this factor crucial in their jobs.

Future Developments

There is much future research which could be undertaken to develop this simulation exercise, and others like it. The foremen whose jobs the exercise aimed to simulate identified the written form of the simulation as unrealistic and some found it difficult to express themselves in writing. A worthwhile step would therfore be to

transform the exercise into a role-play. Such a role-play would more closely resemble the foreman's job by having few written components, by presenting the trainee with production problems orally, and by continuing the frequent physical interruptions used in the J. Brown Engineering exercise. The role-play could be used as a diagnostic tool to pinpoint skill deficits in the work behaviour of foremen; or as a training tool to improve trainees' ability to cope with the pacing factor.

I have suggested that there is a level of foremen's behaviour which has not been addressed in Study One, namely, the detail of behaviours presented in interpersonal interactions. To research this level of question on the job would require the researcher to be right on the subject's shoulder throughout his/her workday, and record on audio tape the exact words used in the interaction. (The interested researcher may also be keen to record facial and bodily expressions on video tape). Such research would be very difficult, given the rapid movement of the foreman about the shopfloor, the need to remain somewhat unobtrusive, and the high levels of factory noise which would interfere with recording. Perhaps the question could be resolved in a sophisticated role-play simulation, such as employed in the work of McCall & Lombardo (1982) to study managerial activities. The content of such role-plays should be based like the J. Brown Engineering exercise on a knowledge of the critical aspects of the jobs observed. The content should present common problems encountered by incumbents and be couched in the language of the organisation (perhaps taken from interactions tape-recorded during job observation). Correct versus

poor responses to the work problems presented should be defined by job experts. In some cases the best actions to meet problems could be explored in the simulation itself. Finally, a record could be made of the common mistakes made by trainees and the results presented to them in post-test feedback sessions.

SUMMARY & CONCLUSIONS

Valuable insight can be gained into the nature of foreman's work through the use of an intensive case study approach to research. Within a single New Zealand plant, the work undertaken by different foremen can show great variety. A single approach to foremen's work could not be prescribed as the most effective for all the foremen studied, as the foremen's behaviour was largely under the control of the production system. Rather than requiring a common interpersonal skill such as "leadership", the critical aspects of industrial foremen's work may be very different to the critical aspects of the work of supervisors in other work settings. The key role of the foremen in this study was to act as Production Troubleshooters, not as leaders of men. One critical aspect of their work was the Pacing Factor, which had four aspects; a) pace of work, b) need to make rapid decisions, c) frequent interruptions, and d) frequent changes to activity. Training in this aspect of foreman's work may benefit new appointees to the position of foreman. Levels of productivity, staff turnover, absenteeism or accident rate were more under the control of aspects of the production system than under the control of the foremen's behaviour.

When an empirical relationship cannot be established between a job incumbent's work behaviour and productive outcomes, training may not be the answer to an organisation's problems. In such a case, if training is required at all, its goal must be the relief of some more specific work difficulty or skill deficit, such as the improvement of

foreman-worker relations, or improvement of abilities in troubleshooting production problems.

An in-basket simulation of foreman's work can be readily constructed and simply and reliably scored. Such an exercise can be used to simulate the Pacing Factor in foreman's work. Although further development is required, the J. Brown Engineering Exercise appears to offer a useful tool for training people in the ability to cope with the pacing factor. Future research into the training needs of foremen may fruitfully involve the observation of foreman's behaviour in roleplay simulations of their work. This could help establish detailed knowledge of the best actions to meet the work problems of foremen.

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Appendix 1: Schedule of On-Job Observations

Shop A Foreman	Tuesday 29th May	07.30-09.50, 10.00-12.30, 13.00-14.45 (390 minutes)
Shop B Foreman	Friday 1st June	07.30-09.50, 10.00-11.45, 12.15-2.15 (360 minutes)
Shop C Foreman	Tuesday 5th June	07.30-10.00, 10.15-11.40 (200 minutes)
Shop D Foreman	Tuesday 5th June	12.15-14.45, 14.55-15.25 (180 minutes)
Shop E Foreman	Friday 8th June	07.30-09.50, 10.00-11.45 (225 minutes)
Shop F Foreman	Friday 8th June	13.10-14.45 (95 minutes)
Shop G Foreman	Monday 11th June	08.45-09.50, 10.00-11.40 (165 minutes)
Shop H Foreman	Monday 11th June	13.10-14.20 (70 minutes)
Shop I Foreman	Tuesday 12th June	08.45-09.50, 10.00-11.45 (170 minutes)

Appendix 2 - Sample of an Observation Script

7.30 examine Bill of Material

7.32 sociable talk with worker

commence work on job cards

7.33 sociable talk with worker

7.34 worker request for drill bit

telephone rings: someone is looking for the maintenance man

7.35 ask worker if he's seen maintenance man

7.36 advice worker on job method

7.37 back to work on job cards

7.38 worker request

7.39 worker enquiry about work method

walk to job to inspect work

7.40 back to job cards

7.41 worker request

provide advice

7.43 job cards

worker request

provide advice

7.44 another worker requests spray can

7.45 job cards

worker returns spray can

7.48 completed job cards

work to stores for 20 sets of ear plugs

7.51 talk to storeman about component required urgently

7.52 walk from stores

7.54 worker request

provide advice

7.55 another worker tells foreman of progress on job

they talk over materials and work progress

7.59 point out work quality to another worker

exchange information on what to do about the job

measure job to offer further advice

issue set of ear plugs

8.02 walk to meeting

Report to Firm Z on the Operation of Production Departments

Ken Hyde, Massey University.

This is a summary of an earlier report presented to the Production Manager in June 1984. The report recommends ways to improve productivity in Firm Z. It is based on a six week investigation conducted in May and June of 1984, involving interviews throughout the plant, on-job observation of all foremen, and analysis of production, personnel and accounting records.

Production Records

Records were examined for just over 12 months production, totalling 158 vehicles of 8 different models. By comparing the average time to complete any of these vehicles with the lowest time in any contract, it is estimated there is the potential for a 16 percent improvement in productivity. This potential might be realised by -

a) setting performance standards for foremen
b) standardising models
c) better provision of materials and tools.

From the study of production records the following conclusions can be drawn: shop A ran 8 percent over quoted hours overall, shop B ran 24 percent under, shop C 8 percent over, shop D 12 percent over, shop E 11 percent over, shop F 2 percent under, shop G 1 percent over and shop H 15 percent under.

a) Performance Standards

Production shops have two goals to work to: MANHOURS allocated to a shop, and QUALITY of product. The existing computer record of manhours worked on a job is inadequate to guide a foreman's task. Job cards should provide a daily record of the shop's performance for foremen.

b) Product Standardisation

Because models are not standard, production shops have to learn the best method of production for each new contract. When making several identical products for the one contract, shops get faster and faster at their work.

c) Materials

Material shortages are a serious problem for production shops. Up to 10 percent of the foreman's workday can be spent chasing up materials. Shortages include consummable items, items prompted by Sales Modifications, and standard Bill of Material items.

Staff Turnover

Turnover of staff in the past 12 months was 45 percent in shop E and 30 percent in shop G. These figures are high.

Safety

There were 152 incidents requiring treatment in the past 12 months. 14 were serious enough to cause a loss of 40 hours work for the worker. A high number of accidents to the eyes occurs in shop C; a high number of accidents to the hands occurs in shop D and shop H. A large number of hours were lost from time off work in shop B and shop C.

Firm Z's Foremen

With the high level of skilled work and workers in most Firm Z shops, few foremen have a problem in motivating staff. Firm Z has a team of skilled and dedicated foremen. The foreman's role is to service his staff with advice, materials and equipment. The foremen have to deal with the present difficulties of the production system: material shortages, sales modifications, lack of information on design, a

shortage of tools, and schedule delays.
Each foreman was observed on the job, for up to one full working day. The attached sheet is an example of the record that was kept. From this record it was calculated how much of each foreman's time was spent on such activities as advising staff, providing instruction, seeking materials. This information is given in the attached table.

Shop A
Good work relations exist in Shop A. The foreman spends most of his time in contact with plant personnel, little time in manual operation. Questions of design arise often and take some 17 percent of the foreman's time to answer.

Shop B
There is concern in Firm Z that Shop B's work is not always to time, and that the quality of workmanship sometimes requires improvement. Any steps taken to improve the supply of design information and materials to the plant in general will assist Shop B's performance. The Shop B foreman was the only foreman observed having to spend any length of time instructing his workers; he did so in a competent manner.

Shop C
The Shop C generally has difficulty working to quoted hours. This can be due to erratic schedule changes, and an extreme problem with lateness of customer information and the supply of materials. Under ideal conditions, Paint shop could achieve a real improvement in efficiency.
The problem of staff turnover in Paint shop may have several sources: the fragmented production schedule may dishearten staff, work conditions (paint spray bays are the coldest part of the plant), lack of close supervision (because of the foremans's busy work schedule), rotation of staff doesn't give workers the opportunity to identify with a team effort.
The Shop C foreman is the busiest of Firm Z's foremen, having the additional responsibilities of maintaining a dangerous goods store, and assisting in the shifting of products.

Shop D
Standardisation of product components may assist Shop D to better plan its work efforts. The high staff turnover in Shop D is partly due to the less interesting nature of the work here. But with better planning of product requirements, staff could be motivated with clear goals to work to, and the work may become less fragmented too. The foreman here spends up to 50 percent of his time in manual work, and less time in contact with plant personnel. He has had less experience in his present position and may benefit from a course in supervision.

Shop E
Shop E is a pleasant workplace, quiet and well-lit. The foreman encourages collaborative discussion of work scheduling and design problems, fostering a sense of team effort. Up to one-quarter of the foreman's time is spent on paperwork, keeping a full record system.

Shop F
Shop F consistently works under quoted hours, and contributes a great deal to Firm Z meeting its vehicle delivery dates on time. Though in charge of a large workforce, the foreman has fostered worker skills to the level where he can give general rather than detailed supervision. He handles his considerable work responsibilities in an unhurried and relaxed manner.

Appendix 4 - Multidimensional Scaling Solution, TOTAL SAMPLE

	dimens 1	dimen 2	dimens 3
give instruction	.611	-.482	.232
give advice	-.335	-.239	-.884
obtain equipment	.570	.170	-.823
inspect work	1.198	.169	.230
manual work	-.363	-.220	-.174
go to stores	-.071	-.778	.673
get materials	-1.165	.226	-.240
design query	-.165	.788	-.484
paperwork/admin	-.790	-.836	.082
sociable talk	-.557	.664	.622
looking personnel	.318	.452	.329
schedule enquiry	.545	-.865	-.538
discussion foremen	-.005	-.028	.984
job allocation	.228	.979	-.009

* Stress of solution = 0.215

Appendix 5 - Multidimensional Scaling Solution, SAMPLE I

	dimens 1	dimen 2	dimens 3
give instruction	.543	-.241	.650
give advice	.379	-.997	.104
obtain equipment	-.716	.609	.133
inspect work	-.791	-.306	-.512
manual work	.345	.279	-.689
go to stores	1.067	.320	.091
get materials	.268	.651	.783
design query	-.784	-.686	.447
paperwork/admin	.749	-.424	-.506
sociable talk	-.735	.597	.216
looking personnel	-.323	.314	-1.053
schedule enquiry	-.098	-.787	-.401
discussion foremen	.324	.880	-.176
job allocation	-.227	-.209	.912

* Stress of solution = 0.204

Appendix 6 - Scores of each Foreman on M.D.S. Dimensions

	Shop					
	A	B	C	D	E	F
Dimension I	-0.868	8.339	-7.39	14.909	-6.743	-5.648
Dimension II	17.662	1.057	-6.435	7.82	-2.201	-5.994
Dimension III	6.354	-2.375	3.849	-30.897	-7.385	-7.51

INTERRUPTION

FROM: A.L. Robinson (Foreman)

I've got a piece of heavy equipment to lift. Can you spare a couple of men for five minutes ?

Action What I will do

INTERRUPTION

FROM: T. Fraser (union rep)

I'd like to take 10 minutes to see a worker in the Boning Shed concerning union matters

Action What I will do

INTERRUPTION

FROM: C Smith (worker)

They're making a real hash of their work up the line. How can we be expected to do our jobs properly when this sort of work comes our way?

Action What I will do

INTERRUPTION

FROM: Barry East (Ministry of Agriculture and Fisheries)

I'd like to take a look at some of the carcasses coming through.

Action What I will do

INTERRUPTION

FROM: J. Holland (worker)

Joes cut himself. He's gone to get his hand bandaged and will be away for 10 to 20 minutes. Is there anyone to take his place?

Action What I will do

J. BROWN ENGINEERING

J. Brown Engineering is a light engineering firm in a provincial North Island town. Its single plant employes 120 people, mainly qualified tradespeople. The work entails a great deal of skill and shopfloor workers need little motivating to maintain interest in their work.

The industry however has its ups and downs, being very much under the sway of market forces. Large contracts with a single customer can mean a great deal to the profitability of the firm. Management is at pains to provide a quality product to exact customer specifications.

Management and supervisory staff must work as a team to produce customer requirements in appropriate quantity and quality, to scheduled completion dates. The Production Manager is one of four managers reporting to the General Manager; the Sales Manager, Purchasing Manager and Personnel Manager also have important roles.

You are R. Roberts, a foreman in J. Brown Engineering. Both workers and chargehands report to you, and you in turn are responsible to your Production Supervisor. The role of foreman in J. Brown Engineering is very much that of a troubleshooter. Shortages of appropriate materials are common, as customers are known to change product requirements late in the production process. Completion dates are a very firm goal for production shops to work to.

Communication between staff is generally on an informal and spoken basis, but there are some frictions between Production, Sales and Purchasing. In an industry where there is pressure to produce on time, tempers can be short, and some staff are quick to apportion blame to other departments.

It is 7.30 a.m. on July 1st. The calender for this month is shown below:

JULY

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

A number of memos await you on your workbench. As with all working days, it is likely your early morning paperwork will be interrupted by enquiries from workers and other plant personnel.

JOB DESCRIPTION

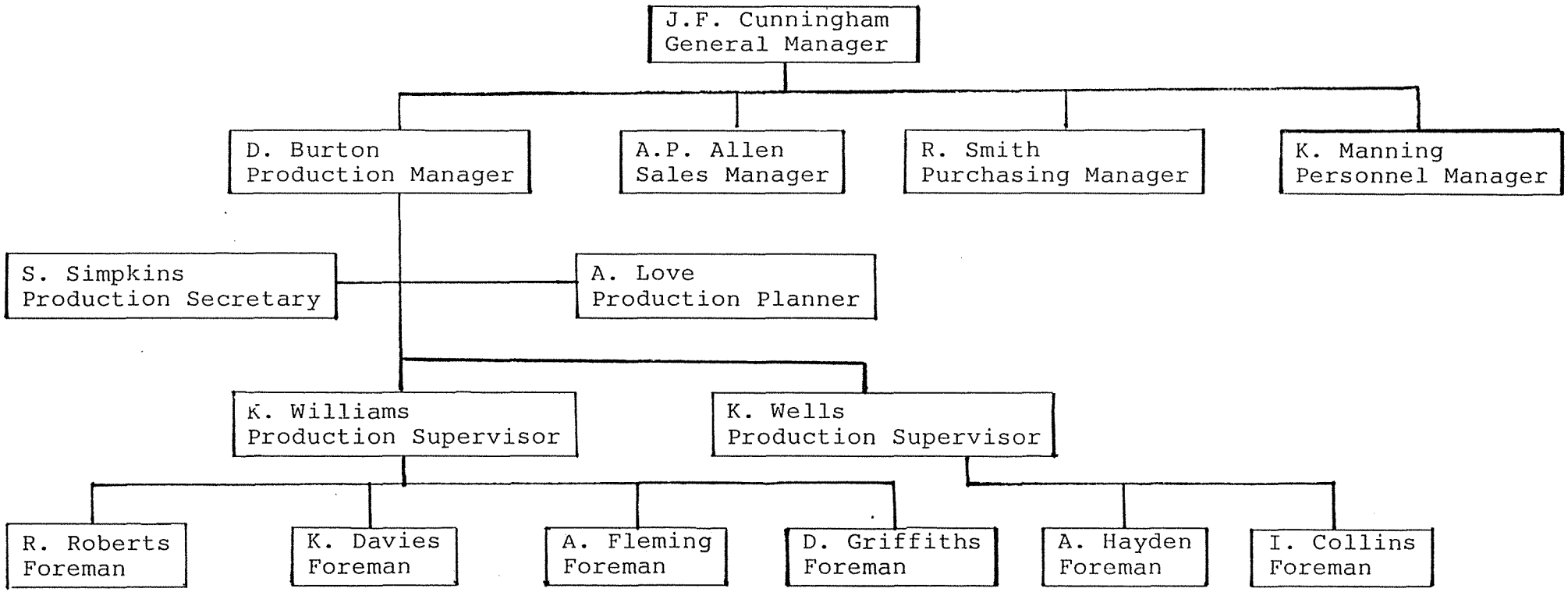
J. BROWN ENGINEERING

JOB TITLE FOREMAN

Key Responsibility To meet production targets for customer products in his shop. To ensure target dates are met and quality of product is maintained.

Duties

1. Supervises the work of production staff in his shop.
2. Maintains orderly and timely production in his shop.
3. Maintains the quality of all products produced.
4. Ensures harmonious work relations are maintained amongst his staff.



ORGANISATION CHART OF J. BROWNS ENGINEERING

ITEM 1

MEMO

J. BROWN ENGINEERING

From: K. Manning

To: R. Roberts

As per your May request, new staff are being hired for your section.

- David White, aged 29, a certified welder
- Karena Cooper, aged 17, a new apprenctice

Both workers will be inducted on Monday 8th July and be introduced to your shop just before lunch.

Action What I will do

ITEM 2

MEMO

J. BROWN ENGINEERING

From: The Safety Officer

TO: R. Roberts

On Friday morning I did a spot tour of your shop and was appalled to notice the shoddy state of the shopfloor. I noted 3 separate instances of tools lying around where they could be tripped over. I was also greatly dismayed to see two young apprentices using power tools in an unsafe fashion.

Action What I will do.

MEMO

ITEM 3

J. BROWN ENGINEERING

FROM: D. Burton

TO: All Foreman

A meeting has been called to discuss each Shops workload for the new Grollier contract. Because of the urgency of filling this order, we will need to meet in the conference room at 10.00 a.m. tomorrow 2nd July.

Bring your ideas and suggestions

Action What I will do

MEMO

ITEM 4

J. BROWN ENGINEERING

FROM: Pat Evans (chargehand)

TO: R. Roberts

Have borrowed spare heavy-duty drill to complete work on the Fenton over-bridge site. If you need to reach me, the phone number is 367-199.

Action What I will do.

MEMO

ITEM 5

J. BROWN ENGINEERING

FROM: K. Manning

TO: R. Roberts

A representative of the Southern Cross Medical Society will be calling on members of your staff on the morning of July 5th. The rep would like to meet with groups of 5-6 workers at a time for up to 15 minutes.

Action What I will do

MEMO

ITEM 6

J. BROWN ENGINEERING

FROM: S. Simpkins

TO: R. Roberts

Peter McKay's wife phoned to say Peter had injured his hand over the weekend. He is having it attended to, but the doctor says he will be off work for a week.

Action What I will do

MEMO

ITEM 7

J. BROWN ENGINEERING

FROM: A.P. Allen

TO: K. Williams

All items produced for Schultz & Barnett contract are now to be finished in brushed aluminium (Part No 2941-15), not matt finish as previously stated.

Action What I will do

- -

MEMO

ITEM 8

J. BROWN ENGINEERING

FROM: K. Williams

TO: R. Roberts

Because of the delay in Shop C completing work we are going to have to re-schedule tomorrows production. Can you have Crews 3 and 4 ready to weld superstructures on the Case job.

Action What I will do

MEMO

ITEM 9

J. BROWN ENGINEERING

FROM: D. Burton

TO: R. Roberts

I am dismayed that Crew 3 is consistently running a day behind schedule. What is the trouble?

Action What I will do

MEMO

ITEM 10

J. BROWN ENGINEERING

FROM: A.P. Allen

TO: Production Manager, Production Supervisors, Production Foremen.

Mr Davies, General Manager, and Mr Smith, Production Manager for Goult & Davies will be calling to view operations on July 8th. Please have your sections spotless and orderly.

Action What I will do

MEMO

ITEM 11

J. BROWN ENGINEERING

FROM: A. Lowe

TO: R. Roberts

A reminder that production for the Schultz and Barnett contract is scheduled to begin in your section on Friday.

Action What I will do

MEMO

ITEM 12

J. BROWN ENGINEERING

FROM: Training Officer

TO: R. Roberts

Some of the young apprentices working in your section don't understand the basics about use of power tools. Can you arrange for someone to show them the proper methods?

Action What I will do.

MEMO

ITEM 13

J. BROWN ENGINEERING

FROM: Pat Evans

TO: R. Roberts

I have recieved complaints from some people that they have nowhere to hang tools after use. Can you arrange something?

Action What I will do

MEMO

ITEM 14

J. BROWN ENGINEERING

FROM: K. Monroe (worker)

TO: R. Roberts

Stores tell me they're running short on brushed aluminium. I hope we don't need any for these up and coming contracts.

Action What I will do

MEMO

ITEM 15

J. BROWN ENGINEERING

FROM: D. Doyle (chargehand)

TO: R. Roberts

I'd like to bring to your attention the matter that since John Curran left Crew 3 has been without experienced welders. The four blokes left are taking some time to settle into a routine. And I don't know if young Daniels is getting the supervision an apprentice should there.

Action What I will do

MEMO

ITEM 16

J. BROWN ENGINEERING

FROM: D. Murphy

TO: R. Roberts

The heavy duty drill is bust. I don't know what's wrong but it went with an almighty bang. Look's like it'll be out for a few days. Can I get a hold of the spare?

Action What I will do

INTERRUPTION

FROM: John Fraser (Worker)

I've just been to stores. They say they haven't any 3/4 inch washers left. I can't finsih this job without them.

Action What I will do

INTERRUPTION

FROM: Catherine Smith (Worker)

You'll have to come and look at the mess Shop A has made of this job. I don't know how we're going to fix it.

Action What I will do

INTERRUPTION

FROM: T. Brown (Worker)

Can you get me a five-eights drill bit?

Action What I will do

INTERRUPTION

FROM: V. Watson (maintenance staff)

I'm looking for one of your blokes, Sid Hutton. Have you seen him around?

Action What I will do

INTERRUPTION

FROM: T. Packer (apprentice)

Where can I find a soldering gun ?

Action What I will do

Appendix 9 - 'Housewife' Case Study for Training Session

You are Mrs Glover, a housewife. It is 11.30 Thursday morning.

Gregson Electrical phones to enquire about your overdue account.

Your mother has a superb recipe for birthday cake.

You enjoy a midday break from your housework to watch the lunch-hour soap opera on the T.V.

There is no flour or butter in the house.

Your husband has asked you to take the family car to the garage for an oil and grease. You estimate this will take two hours.

Today is your daughter's birthday. You have been left to organise a party and food. The party will be at 4.00 tonight.

Your good friend Jane phones, but she's a real talker. Unless you politely end the conversation you could be held up for an hour.

The toilet has blocked.

You promised yourself you would stake out the tomatoes today. You have delayed this job for a week and the plants are looking quite wilted.

You should really visit the school soon as your son is quite unhappy in his new class. You want to know why.

Your daughter has invited six of her friends to her birthday party.

The house is in a mess.

I must immediately check the toilet, and find out how serious the blockage is. If I can fix it myself I will. If I can't fix it I will ask the plumber to come straight away : I will insist that the toilet must be fixed today.

I will then telephone the garage and ask "Can I drop the family car off then be driven home" to continue working while the grease and oil change is done.

Next I will telephone mother and get her to dictate the cake recipe to me.

Before dropping the car at the garage I will stop at the supermarket to buy flour, butter and any other cake ingredients suggested by mother.

While the birthday cake is cooking and the car is being fixed, I will tidy the house. The children can do their share when they get home from school.

how do you take the pressure off?

set
PRIORITIES

* **do now**
* **do later**

---

how do you avoid crises?

put
EFFORT

into priorities

how do you get the right answer?

INFORMATION SEARCH

Get all the facts

---

what makes a good decision?

state clear ACTIONS to take

state WHO will be involved

---

why will you succeed?

this is YOUR JOB: do as you see fit

your decisions will be GOOD decisions

Appendix 11 - MARKERS GUIDE - IN-BASKET EXERCISE

This exercise was designed to test the quality of decision-making of subjects under pressure.

Each memo is to be graded 1 for a good answer, 0 for a bad answer, 1/2 for an answer with some merit. A GOOD ANSWER states actions, not some clicky statement like "will discuss the situation" or "delegate the job", which say nothing.

Reliability of grading across markers will be tested. Our goal is

CONSISTENCY

Suggested Procedure:-

1. Take all subjects at once. Look at their replies to Memo 1. Grade all subjects for this memo.
2. Take one memo at a time and grade all subjects for it.
3. HALVE THE GRADE for the Half-Mark Memos.
4. Sum the 0's 1/4's 1/2's and 1's for a total score for the subject.

JOHN BROWN ENGINEERING
Suggested good answers to memos

This is an information-based inbasket. There are set answers, set actions to take, if the subject has used the information provided throughout the memos.

Item 1 9 15 David White experienced welder must be put into Crew 3 to improve the performance of that crew.

Item 2 12 13 15 Someone must be delegated the job of making a rack to hang tools on. There are too many complaints about inadequate supervision/tuition of apprentices: a long-term solution in the form of organised training must be suggested.

Item 4 16 Pat Evans has the heavy-duty drill. If he doesn't require it urgently it must be returned.

Item 7 11 14 Perhaps the most urgent matter of the day. Stores of brushed aluminium are running very low and are required for the Shultz and Barnett contract; completion date this Friday. Foreman must push stores hard to get more urgently.

HALF-MARK MEMOS:
Item 3 - write in diary, bring list of workers' committments for the days ahead; be prepared to compromise work committments to get Grollier done on time
Item 5 - this week's workload is particularly busy; answer "no" to this request or reduce 15 minutes to only 5 minutes
Item 8 - examine work schedule for today and tomorrow. Can something be reorganised to free up Crews 3 and 4?
Item 13 - make a rack.

NO MARKS FOR MEMOS:
4 6 10

DOLLRIER FREEZING WORKS
Suggested good answers to memos

Items 1 2 6 Discuss with Fred his concerns over safety, investigate what is contributing to unsafe actions; get his thoughts on agenda. Bring your thoughts together to staff meeting

Item 4 8 Instruct employment officer of Bellow's illness. Because of Bellow's illness, B. West is unlikely to get his weeks holiday.

Item 12 Meet with Diamond and suggest round-table discussion of this delicate union issue.

Item 14 Contact employment officer. Why does he want this information?

Item 3 Sensible suggestions on accident prevention (from discussion with Fred) and strike early warning

Item 9 11 These require urgent action. Why is some lamb being damaged? Why are some people not complying with health regulations?

HALF-MARK MEMOS:
Item 5 inform all your men
Item 7 check what B. West knows about the mysterious Mr Brown
Item 10 note in diary, sketch out quick notes as time allows
Item 13 see Rose. What in particular is "slack"? What new procedures does he require?
Item 15 it is not your job to approach Simpkins directly, nor to spend much time on this problem. Perhaps suggest counselling with employment officer.

Appendix 12 - Subjects Scores on Pre- and Postest Measures

Group	Pretest	Postest
1	3.375	1.0
1	3.0	2.0
1	4.5	1.75
1	4.375	5.625
1	4.5	3.75
1	4.75	0.75
1	1.25	0.5
2	3.625	1.75
2	4.375	0.75
2	3.375	2.25
2	4.375	3.125
2	5.5	1.0
2	2.375	2.625
2	1.625	4.875
2	0.75	0.875
2	4.125	1.375
2	5.75	5.125
2	3.25	1.5
2	0.625	0.875
2	2.25	5.0
2	6.25	3.375
3		4.0
3		4.875
3		3.875
3		1.875
3		6.125
3		0.75
3		4.25
3		6.125
3		3.875
3		4.75
3		6.875
3		7.375
3		2.0
3		2.75

Appendix 13 - ANOVA Experimental Group versus Control I

	SS	df	MS	F	p
total	118.88	41	2.90		
subjects	15.95	20	0.80	0.16	NS
conditions	0.03	1	0.03	0.01	NS
sub X cond	102.90	20	5.15		

Appendix 14 - Common Mistakes made in Response to In-basket Items

. the answer to all problems is to "talk it over" with the men, rather than investigating the extent and cause of the problem;

. to take action on all problems yourself rather than utilising the people around you, such as your superior, the Personnel Officer, the Safety Officer;

. that the only planning that needs to be done for a meeting is to note the date in your diary, rather than prepare information and ideas for the meeting;

Appendix 15 - Postest Questionnaire

WHAT DID YOU THINK OF THIS EXERCISE ?

1. Was this exercise a realistic look at your job?

Tick those boxes you agree with -

[ ] the exercise was realistic because it was fast paced, like my job

[ ] the exercise was realistic because I had to make quick decisions on problems, like on my job

[ ] the exercise was realistic because it had frequent interruptions, like my job

[ ] the exercise was realistic because it had frequent changes to tasks, like my job.

Anything else? Any comments?

\- -

\- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

2. In what ways wasn´t the exercise a realistic look at your job?

\- -

\- -

3. Did the exercise provide any insight into your work, or any lesson that you could apply?

\- -

\- -

4. Do you think the exercise would be useful in training anyone just starting work as a foreman?

_ _

5. What do you think the exercise was testing?

_ _

_ _

6. Did you find it difficult expressing yourself in writing?

_ _

Appendix 16 - Foremen's Scores on the Inbasket Exercise

Shop	Score
A	4.375
B	8.0
C	3.625
D	-
E	4.375
F	2.875

Appendix 17 - Good Responses to In-basket Memos, provided by Foremen

. With new staff members arriving, insure safety gear and tools are ready, introduce them to all personnel in the shop, show them around the plant, explain the standard of work expected, decide what crew to put them in, put them under an experienced worker for the first week, observe their work over the first few days, take them to the canteen for lunch.

. If you're told there are housekeeping and safety problems check out the shopfloor yourself, ask the Safety Officer what actions he has taken, arrange a permanent solution.

. Be prepared to delegate problems to appropriate personnel, such as Safety Officer or Training Officer

. If requested to change your production schedule, then check your existing workload

. Be prepared to approach upper management if you think they have more information on a problem

.Preparation for a new job coming should include: checking materials are available, ensuring your staff are informed, checking that sufficient workers are available, obtaining appropriate tools and equipment

. If a crew or worker is running behind look into the problem yourself.

. When there are requests from outside organisations, arrange a time when your shop is not working flat stick.

. Share ideas, information and concerns with your chargehands