

# Modelling Employee Motivation and Performance

by

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## **Abstract**

This research reviewed the history of motivation and performance modelling, with particular regards to the performance of employees in a work environment. The evolution of motivational theories was discussed before the motivational models arising from these theories were examined and critiqued.

The wide range of, often conflicting, studies and theories in this area has led to a situation where no single model has been able to capture all the complexities of the internal and external influences on human motivation and performance. Models have broadly fallen into one of two categories: cognitive, focusing on the individual's thought processes and social-cognitive, focusing on the influences from social and contextual variables.

Bong [1996] suggested that a broader model of motivation may be developed by adopting either an integrative approach, whereby a general model is built that incorporates the wide range of potential motivational variables, or by building several models that focus on each dimension separately.

Needs based and process based motivational theories, which will provide the foundation of any model of motivation, were reviewed in Chapter Three. Chapter Four then introduced the two existing models of motivation models that are the main focus of this study, Hackman and Oldham's Job Characteristics model and Porter and Lawler's Expectancy model. Each model

was reviewed and critiqued before being amended and expanded to more fully explain the social and cognitive motivational processes and satisfy the criticisms identified.

Although there are no obvious areas of overlap between the largely social-cognitive Job Characteristics model and the largely cognitive Expectancy model, Chapter Five explains that by changing the terms used to describe the variables in each model the similarities between them may be identified. Identifying the areas of overlap allows the two models to be integrated into one. This new model of motivation expands upon the original models in that it combines both the social-cognitive and cognitive approaches and also incorporates more of the motivational theories discussed in Chapter Three than either of the two original models.

The new model of motivation was tested via a data survey in four organisations. In each case, the level of correlation between the levels of the recorded variables, such as satisfaction and motivation, and those predicted by the model were generally high. The results of the data survey and the performance of the model were discussed in Chapter Six.

One of the main aims of this thesis was to produce a model of motivation that was of practical use to the management of an organisation. Such a model should go beyond the existing theoretical models and allow those responsible for motivating a workforce to experiment with alternative job design strategies and evaluate their likely effects upon motivation and performance. Chapter Seven describes the spreadsheet-based model that was built in this study.

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# **CHAPTER ONE**

## **1 INTRODUCTION**

### **1.1 PROBLEM AREA**

Motivating the workforce of an organisation to work more effectively towards the organisation's goals is perhaps the most fundamental task of management. Organisations motivate their workforce to perform effectively by offering them rewards for satisfactory performance and perhaps punishing them for unsatisfactory performance. Over the past hundred years or so there has been an evolution in the view of what the term 'rewards' actually means in an organisational context.

In the age of Scientific Management, forwarded by Frederick Winslow Taylor in the 1890's, only monetary rewards were considered to be important to employees. This rather limited view of employees' needs and rewards gave way in the 1920's when a series of experiments at the Western Electric Company's Hawthorne plant led to a new paradigm of worker motivation. The Hawthorne experiments, as they came to be known, led to a view that saw employees motivated more by social needs rather than by purely economic ones. This viewpoint, known as the Human Relations Movement, attempted to identify and satisfy the social needs of the worker in the belief that a satisfied worker worked harder than an unsatisfied worker. Rewards under the Human Relations viewpoint, therefore, also included the relationships employees form with their fellow workers. It was thus seen to be in the organisation's interest to provide an environment that allows and encourages social

relationships to develop. Finally, the Human Resources Movement began to concentrate more on the needs of the individual rather than the interactions within working groups. The Human Resources Movement views the worker as being largely 'pre-motivated' to perform to the best of their abilities and it becomes the task of management to provide conditions whereby workers can meet their own individual goals at the same time as meeting those of the organisation. Rewards under the Human Resources Movement therefore include a wide range of factors, such as money, affiliation, achievement and performing a meaningful job.

The changing view of organisational rewards and employee motivation has led to a multitude of theories of exactly how the job rewards influence the motivation and performance of employees. Steers [1987] stated that "a comprehensive theory of motivation at work must address itself to at least three important sets of variables which constitute the work situation" i.e. the characteristics of the individual, the characteristics of the job and the characteristics of the work environment. These three sets of variables, along with examples of each, are depicted in Figure 1. Steers points out that, at present, no model exists that accounts for variables from each of the three major areas, stating that "what does exist is a set of different theories that address themselves to one or more of these sets of variables, none of which, however, is completely and thoroughly comprehensive". (Steers [1987]).

<b>Individual Characteristics</b>	<b>Job Characteristics</b>	<b>Work Environment Characteristics</b>
Interests	Types of intrinsic rewards	Immediate work environment <ul style="list-style-type: none"> <li>– Peers</li> <li>– Supervisors</li> </ul>
Attitudes <ul style="list-style-type: none"> <li>– Toward self</li> <li>– Toward job</li> <li>– Toward aspects of work situation</li> </ul>	Degree of autonomy	Organisational actions <ul style="list-style-type: none"> <li>– Reward practices</li> <li>– Systemwide rewards</li> <li>– Individual rewards</li> <li>– Organisational climate</li> </ul>
Needs <ul style="list-style-type: none"> <li>– Security</li> <li>– Social</li> <li>– Achievement</li> </ul>	Amount of direct performance feedback	
	Degree of variety in tasks	

Figure 1: Variables affecting the motivational process in organisational settings (Steers [1987])

Bong [1996], in a paper highlighting the problems in academic motivation research, stated that the fact that no single model has been able to capture the full dynamics of motivated behaviours was due to “different theoretical orientations of investigators working in the field, who tend to emphasise a particular dimension of motivational phenomena over the others” (Bong [1996]). Generally, motivation models may be classed as belonging to one of two theoretical orientation groups – cognitive models and social-cognitive models.

Cognitive models of motivation “place greater weight on understanding learners’ covert thought processes, often overlooking the impact of social and contextual variables” (Bong [1996]) i.e. they focus on the individual characteristics at the expense of the job and work environment characteristics. A social-cognitive approach focuses on formulating and testing specific hypotheses regarding the nature and direction of influence from social and contextual variables. These different theoretical orientations often lead academic motivation researchers

to different conclusions as to which potentially relevant variables to include in or exclude from their conceptualisations. Bong [1996] suggests that there are two solutions to the formulation of a broader model of motivation.

One possible solution for integrating numerous motivational constructs and findings is to create a general model. The need for a comprehensive model which can fully incorporate the dynamic interactions among motivational variables has been expressed by a wide range of authors (e.g. Meece, Wigfield & Eccles [1990]). This may be referred to as the integrative approach.

Another approach would be to construct several models, each of which reflects a separate dimension of motivation. Examples of models of this type are Cognitive Evaluation Theory (Deci [1975]) which focuses on the interaction between different types of rewards and their combined effect upon motivation, and Goal Setting Theory (Locke [1968]) which examines the effect of task difficulty on motivation (see Section 3.3).

Bong [1996] points out that this approach has an advantage over integrative models due to the relative ease in carrying out an investigation that fully incorporates variables specified for a given dimension. The obvious disadvantage is that it cannot capture potential interactions among variables that are not considered in that dimension. For example, an investigation into the effects of multiple rewards upon motivation would fail to identify the potential effects of task difficulty.



## **1.2 THE AIM OF THE RESEARCH**

“One of the problems facing current academic motivation research is that despite a proliferation of theories and models testing specific relationships and hypotheses, no single model can capture the full dynamics of motivated behaviours” (Bong [1996]). Although Bong was commenting on the research of motivation in an educational setting, the statement is equally true when applied to the research of motivation in a work environment.

As explained in Section 1.1, models of motivation approach the area from one of two theoretical orientations, cognitive or social-cognitive, and the models themselves may attempt to describe multiple dimensions of the problem or limit themselves to describing only one dimension.

The two models discussed in Chapter 4, The Expectancy Model and the Job Characteristics Model, whilst expanding on the theories examined in Chapter 3 in that they both deal with multiple dimensions of the problem, are still limited in that they approach the task from one of the two orientations proposed by Bong. The Expectancy Model is largely a cognitive model while the Job Characteristics Model may be seen to be largely social-cognitive.

It is the aim of this research to produce a model of employee motivation and performance that incorporates many of the theories discussed in Chapter 3 into an integrated model, therefore combining both the separate dimension and the integrative approaches proposed by Bong, whilst also addressing both the cognitive and social-cognitive orientations. It is proposed that

by modifying the Job Characteristics and Expectancy models and then integrating them a more complete model of motivation in the workplace may be produced.

The new model is also designed to be of use as a management tool and must therefore be simple and flexible enough to be of use to the management of an organisation. Typical management questions would involve the likely motivational impact of job redesign, such as increasing workers' level of control and responsibility over their work behaviour or introducing a scheme whereby workers participate in certain management decisions. The model should therefore allow managers to manipulate a host of job characteristics and investigate the likely effects upon the motivation and performance of the workforce.

### **1.3 STRUCTURE OF THE THESIS**

In order to understand the evolution of the motivational paradigm and the various theories that have been developed from the motivational beliefs prevalent at the time, it is necessary to examine the types of organisational structure that exist and their possible influences on the control and motivation of the workforce within those organisations. Chapter 2 examines the factors that determine the type of organisation within which an employee may work. The increasing size and complexity of organisations since the industrial revolution has resulted in a wide range of different organisational structures and cultures. The effect of these differing structures and cultures, as well as the environment in which the organisation operates, upon the methods used to control employees' behaviour are examined in Chapter 2. Referring to Figure 1, these factors will influence both the job characteristics and the work environment characteristics.

The ways in which the two main categories of organisational structure, mechanistic and organic, deal with changes in their working environment are also discussed. Mechanistic organisations, for example, tend to respond to increases in the complexity of their environment by tightening formal control procedures and narrowing managers' spans of control. Employees who desire freedom to work creatively towards solving work problems and enjoy having responsibility over their work are likely to feel stifled in such an environment and display low levels of motivation as a result. Organic organisations, by contrast, are more likely to encourage employees to act creatively and use their talents to overcome problems and increase employee discretion to facilitate such behaviour. An employee who does not enjoy high levels of responsibility and prefers the relative safety of working to strict rules and procedures may also feel unhappy and poorly motivated in such an environment.

Chapter 2 then examines the evolution of the theories of motivation in the workplace. The evolution of organisational control through the three stages mentioned in Section 1.1 (i.e. scientific management, human relations and human resources) is discussed in more detail as it is from these fundamental beliefs about human nature and the needs of the worker that the motivation theories discussed in Chapter 3 were conceived.

The motivation theories examined in Chapter 3 exhibit an increase in complexity and sophistication that follows the changes in the motivational paradigm. Under scientific management principles, motivation of the workforce is a relatively simple process as workers are assumed to behave in a perfectly rational way and be motivated purely by economic

rewards. The human relations movement, however, began to recognise that workers had needs that went beyond the economic needs of scientific management. Of primary importance were the workers' needs to feel useful and important and to belong to a social group. Various need based theories have been developed to better explain this motivational paradigm. Maslow's Hierarchy of Needs, ERG Theory and McClelland's Theory of Needs are perhaps the best-known needs based theories.

The advent of the Human Resources approach to motivation greatly increased the complexity of the problem. Workers were now seen as being motivated by a vast array of interrelated factors. It is this complexity that has led many researchers to abandon efforts aimed at producing a general model of motivation and concentrate instead on separate dimensions of the problem. CET Theory, Goal Setting Theory and Equity Theory are examples of theories adopting this approach, all of which are discussed in Chapter 3.

Chapter 4 then introduces two existing models of motivation and assesses their validity as well as their usefulness as a management tool. The two models, Hackman and Oldham's Job Characteristics Model and Porter and Lawler's Expectancy Model, are singled out for particular study for a variety of reasons. Firstly, both models have a significant amount of empirical support lending weight to their validity as models of motivation in the workplace. Secondly, both are more 'complete' models of motivation than the theories discussed in Chapter 3. The Expectancy Model for example, while being built around Vroom's Expectancy Theory, may be seen to include elements of Equity Theory, Reinforcement Theory as well as need-based theories. Thirdly, the two models approach the problem area from

different perspectives. The Job Characteristics Model is a social-cognitive model while the Expectancy Model is cognitive based.

Each model is examined in terms of its validity and its usefulness as a management tool. It is shown that although each model has substantial empirical evidence supporting it, there are several areas where they may be improved, particularly in terms of their usefulness to the management of an organisation.

Chapter 5 then describes how the two models may be modified independently in order to address the criticisms outlined in Chapter 4 and then integrated to form an improved model of motivation that combines both the cognitive and social-cognitive approaches to motivation modelling.

The validity of the new motivation model is examined in Chapter 6. The model is tested using data collected from employees from four organisations. A modified version of the questionnaire designed by Warr, Cook and Wall [1979] was used to collect the data from a sample of employees at each organisation and the stated levels of satisfaction and motivation are compared to the values predicted by the motivation model.

Chapter 7 discusses how the proposed motivation model may be used by managers in an organisational context.

# **CHAPTER TWO**

## **2 EVOLUTION OF THE ORGANISATION AND MOTIVATIONAL THINKING**

### **2.1 INTRODUCTION**

This Chapter discusses the factors that determine the ways in which organisations attempt to control the behaviour of employees. The context in which control issues arise in organisations is made up of a series of interrelated and interacting variables including:

- The organisation's structures;
- The various cultures to which members of an organisation refer and defer in making sense of their 'worlds' and in constructing meaningful action; and
- The social economic and political environments in which the organisation exists.

The ways in which these variables influence the control of employees in organisations is discussed in Section 2.2. Section 2.3 then discusses how the view of control and motivation of employees has evolved throughout the course of the last century.

### **2.2 THE EVOLUTION OF THE ORGANISATION**

Offe [1976] introduced the concept of 'task-continuity' to explain how the process of organisational control has evolved from the early stages of the Industrial Revolution. The organisation structure in the companies of the early Industrial Revolution was not dissimilar to those that predated industrialisation. They were typically small, simple and characterised by

task-continuity – where the organisation’s status and knowledge hierarchies coincide. In task-continuity the hierarchy of the organisation is based on expert knowledge, the entrepreneur or manager has detailed knowledge and experience of the production process. Clegg [1990] has categorised this type of organisation by the “unity of simple, direct and personal surveillance, ownership and control, premised on an intimate mastery of all the tasks at hand”.

As organisations increased in size and complexity, combining both larger concentrations of capital and different types of production processes, the organisation became characterised by ‘task-discontinuity’. Under these conditions it became “increasingly unlikely that any one person would have sufficient knowledge of all their processes to be able to control them in an adequate manner” (Clegg [1990]). The issue of control in the organisation therefore became increasingly important and complex. The main variables that determine control in an organisation are the environment within which it operates and its structure and culture.

### **2.2.1 THE ORGANISATION’S ENVIRONMENT**

An organisation’s environment consists of a social and material element. The social element consists of other organisations and groups of people, such as regulatory bodies, customers and suppliers. The material element consists of both the natural resources on which many companies depend and natural forces that can influence the ability of many companies to operate. The structure of an organisation must account for the external conditions posed by the environment. Figure 2 highlights the elements of an organisation’s social and material elements.

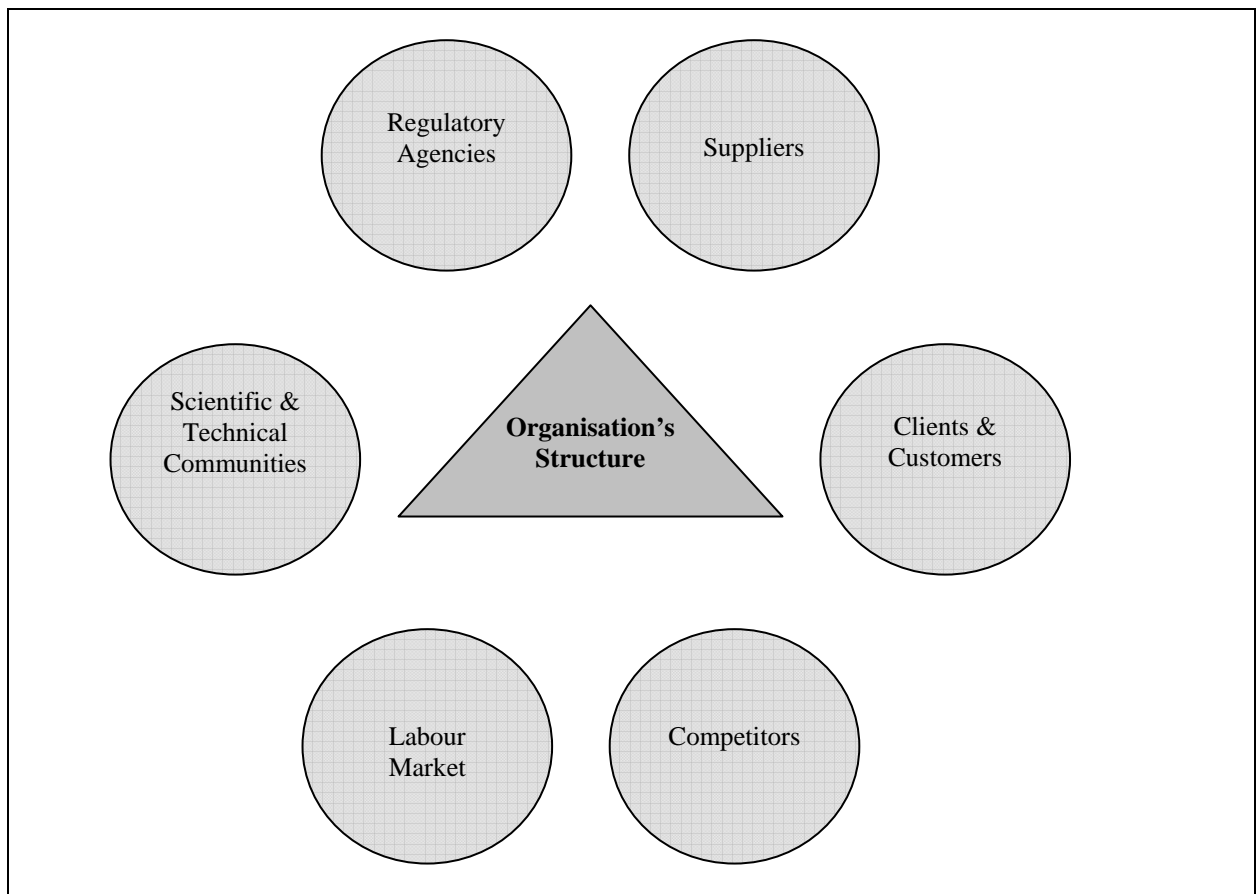


Figure 2: Organisational Structure and the Environment

Robey and Sales [1994] state that there are two fundamental ways in which the environment can affect an organisation. Firstly, the environment can be seen as a source of uncertainty for the organisation or, secondly, it can be seen as a source of resources.

#### 2.2.1.1 THE ENVIRONMENT AS A SOURCE OF UNCERTAINTY

An organisation operating under ideal circumstances would have no problem in obtaining all the inputs it required for production and would be able to measure precisely the level of demand for its output. In a real environment, however, these things are constantly changing and are not able to be accurately predicted. The availability of resources and supplies may fluctuate due to natural forces or problems with suppliers. The demand for output is rarely



stable and predictable due to changing tastes and fashions or the promotional campaigns of competitors. All these factors lead to increased environmental uncertainty, which Robey and Sales [1994] define as the lack of patterning in the elements of an organisation's environment.

When an organisation is operating in an environment of high uncertainty and unpredictability it is difficult for that organisation to plan in the long term and to establish routine rules and procedures. This has important implications for the structural design of an organisation operating under these circumstances.

#### 2.2.1.2 THE ENVIRONMENT AS A SOURCE OF RESOURCES

The resources that the environment provides for an organisation include raw materials, labour, machines, technical knowledge and financial resources. Organisations depend on the environment for resources to differing degrees. Some organisations, for example, have little or no need of raw materials while others depend solely upon their continuous supply. Some raw material may be available from a variety of sources while others may be fairly scarce and therefore harder to maintain in constant supply. Finally, some resources will have a higher level of demand than others which means that there will be more competing firms trying to secure their supply. All these factors affect the extent to which an organisation is dependent upon the environment. Organisational structure can be a major determinant in the organisation's ability to cope with shortages in environmental resources. In particular, structures that span organisational boundaries and link with other organisations enable more dependable flows of inputs and outputs (see Robey and Sales [1994]).

## **2.2.2 ORGANISATIONAL STRUCTURE AND CULTURE**

### **2.2.2.1 CENTRALISATION AND DIFFERENTIATION**

The result of increasing size and complexity of an organisation is the need for a certain amount of delegation of decision-making to subordinates. The degree to which organisations delegate decision-making will play a large part in influencing the culture of that organisation. Child [1984] examines the advantages of both centralised and delegated approaches to decision-making in organisations. Concentrating decision-making among a relatively small number of individuals facilitates the co-ordination of organisational activities and allows the opportunity of strong leadership as power lies with those who should have the greatest amount of strategic knowledge. Such a structure also avoids the proliferation of managerial hierarchies, thus minimising managerial overheads. Conversely, delegation, by relieving the burden on senior management, gives subordinates greater discretion and immediate control over their work. This can have important motivational implications as it may improve job satisfaction and commitment (see Section 4.2). Delegation may also improve flexibility within an organisation as it allows the person who is directly involved with a problem and who should have 'local knowledge' of the task area to handle that problem in the most appropriate way without having to seek approval from a remote source.

There are a number of factors that determine which of the two approaches – centralisation or delegation – is the most suitable. The most important of these factors are summarised by Johnson and Gill [1993]:

- *Size* – although many entrepreneurs may resist the need for delegation, organisational growth will eventually demand a certain amount of delegation in order to avoid work overload.
- *Geographical Dispersion* – centralised control of a geographically dispersed organisation may result in considerable delays from the relaying of information between the place of work and the decision-making centre. The remoteness of the decision-makers may also limit their amount of ‘local knowledge’ and therefore their ability to deal with the problems passed on to them.
- *Technological Complexity* - as the organisation’s technological complexity increases, so does the demand for people with different kinds of specialist knowledge and skill. It is unlikely that the senior managers will possess expert knowledge in all the production processes and therefore must delegate control to those with the appropriate skills and abilities.
- *Environmental Stability* - a stable, predictable environment enables long-term planning and therefore facilitates centralised control. Where the environment is unstable there is an increased need for organisational flexibility in order to adapt to changing circumstances and delegated control is therefore more appropriate. Child [1984], however, points out that small, simple organisations may be better able to adapt to changes in the environment by a concentration of decision-making at the top, allowing strong leadership and incisive decision-making.

The increasing size, complexity and geographical dispersity of organisations increases the need for horizontal differentiation, in which the organisation is divided into segments, each segment taking control of one of the organisation's activities.

Vertical differentiation (the distribution of power and authority in an organisation) occurs from a need for some means of co-ordinating the disparate and specialised activities resulting from horizontal differentiation. This creates a hierarchy of responsibility, with different individuals having different amounts of power and authority to influence the different segments of the organisation.

#### 2.2.2.2 MECHANISTIC AND ORGANIC STRUCTURES

In stable environments, where organisations are able to predict to a large extent what their future inputs and outputs will be, it is possible for organisations to put into place long term plans and elaborate task specifications so that the majority of tasks become simply the assiduous following of rules and procedures. It is under these conditions that mechanistic organisational structures can function effectively.

Many environments, however, are highly unpredictable, which makes the pre-planning of organisational activities far more difficult and tasks are often less well defined. These environments may evolve more organic organisational structures.

Robey and Sales [1994] state that the most evident feature of mechanistic organisations is their predictability. In its extreme form, every task is pre-planned in detail and task performance is

highly regulated. A precise and highly specialised system of roles and procedures cover almost every eventuality so that every worker always knows what is expected of him or her in any circumstance. There is a clear, explicit structure of relationships for reporting and an unambiguous reward structure. Every employee knows what he or she must do and what they will get for doing it. The following characteristics describe a mechanistic structure (Robey & Sales [1994]):

1. Jobs are narrow in scope, permitting employees to become experts in specialised functions.
2. Tasks are so well defined by rules and procedures that standard performance can be achieved.
3. Responsibilities are clear; people know what is expected of them.
4. A clear hierarchy of authority exists to control and co-ordinate the work of specialists. Everyone knows whom reports to whom, and each employee reports to only one person.
5. Rewards are tied directly to job performance.
6. Employees are selected based on their ability to do the work required and not based on other personal attributes such as age, sex, race or relationship to owners or managers.
7. Employees relate to one another on an official basis only. Private concerns are considered irrelevant to the conduct of work.

The term bureaucracy is often used to describe mechanistic organisations. Although increased bureaucracy can lead to the negative consequences of inflexibility, sluggish response to

change, increased stress on employees and higher cost of operations, the result of mechanistic structures is that control and accountability can be retained even in the face of increasing environmental uncertainty.

An organic structure implies a flexible, evolving, fluid quality that changes and adapts to changing circumstances. Organic structures can be thought of as being opposite to mechanistic structures. Specifically, they have the following characteristics (Robey & Sales [1994]):

1. Jobs are broadly defined, permitting employees to perform a wide variety of different tasks.
2. Tasks are not governed by standard rules or procedures.
3. Responsibilities are somewhat ambiguous, and often a team of employees will share responsibility for an outcome.
4. A hierarchy of authority may exist, but it is often bypassed or ignored in the interests of finding persons with the expertise needed to solve a particular problem.
5. It is difficult to link rewards to job performance, so little emphasis is given to formal reward systems.
6. Employees are selected based on both objective and intangible criteria.
7. Employees relate to one another informally as well as officially, and social relationships comprise an important part of organisational life.

As the expertise necessary for task completion is more widely dispersed, the authority at lower levels is increased. People are freer to think for themselves and make decisions. The lines of

communication are likely to be less formal to accommodate this increased autonomy as people share pooled knowledge and expertise.

Figure 3 summarises the characteristics and conditions for mechanistic and organic structures.

	<i>Mechanistic</i>	<i>Organic</i>
<i>Characteristics</i>	Jobs narrow in scope. Rules and procedures. Clear responsibilities. Hierarchy. Objective reward system. Objective selection criteria. Official and impersonal.	Broadly defined jobs. Few rules or procedures. Ambiguous responsibilities. Diffuse channels. Subjective reward system. Subjective selection system. Informal and personal.
<i>Conditions</i>	Task and goals are known. Divisible tasks. Simple tasks. Valid performance measures obtainable. Employees responsive to monetary rewards. Authority accepted as legitimate.	Task and goals vague. Indivisible tasks. Complex tasks. Valid performance measures unobtainable. Employees motivated by complex needs, some intrinsic. Authority challenged.

Figure 3: Characteristics and Conditions for Organic and Mechanistic Organisations (Robey & Sales [1994])

## 2.2.3 THE FIT BETWEEN ORGANISATIONAL STRUCTURE AND THE ENVIRONMENT

### 2.2.3.1 CONTINGENCY THEORY

The early writers on organisational structure, such as Fayol [1914], Gulick [1937] and Urwick [1943], used their own practical experiences to formulate a body of principles that would be universally applicable to any work organisation irrespective of its context or purposes. These principles, usually called the classical theory, prescribe a structure such as that in Figure 4, where authority descends from the apex to the base, so that no subordinate receives

instructions from more than one superior who, in turn, controls no more subordinates than he or she can effectively manage (Mooney and Reiley [1939]).

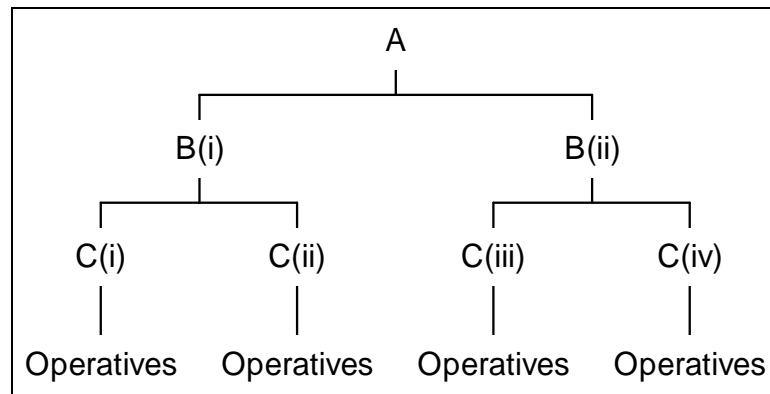


Figure 4: The 'Classical' Organisation Structure

The major criticism of these classical theories (see Morgan [1986] and Bennis [1966]) is that they largely ignore behavioural issues and assume that workers are primarily motivated by economic reward.

Subsequent empirical research has suggested that the classical theories were limited in their appropriateness and applicability (see Lawrence and Lorsch [1967]). The term 'contingency theory' was first used by Lawrence and Lorsch [1967] and maintains that the suitability of different forms of organisation is dependent (contingent) on certain environmental conditions (stability and dynamism). Generally, mechanistic organisations are thought to be most appropriate in stable environments and organic structures are more suitable for organisations operating in more dynamic and uncertain environments. As stated by Johnson and Gill



[1993], “contingency theory does not suggest that classical theory is wrong; rather that it is appropriate or inappropriate depending on the organisation’s particular circumstances”.

Contingency theory states that the effectiveness of an organisation depends on the fit between an organisation’s structure and the contingencies it faces (Robey & Sales [1994]). In highly certain environments, where there is little deviation from the norm, mechanistic structures are able to set up efficient procedures for dealing with routine tasks. In an uncertain environment, these routine procedures are not able to cope with the high number of contingencies. A more organic structure is needed that is ready to deal with non-routine operations. According to contingency theory, both mechanistic and organic structures can be effective if they fit their respective environments.

It is far too simple, however, to say that mechanistic structures work in certain environments and organic structures work in uncertain environments. In the real world, both types of structures can be found operating successfully in a variety of environmental situations. Organisations are not designed, they will evolve over time, moving through many different environmental situations as they grow. The structure of organisations, therefore, is not based on a purely rational analysis of the present environmental circumstances but also on a multitude of precedents and traditions built up over the organisation’s history. These organisational paradigms will be unique to each organisation and may well simply reflect the beliefs of the organisation’s founder. One cannot assume, for example, that a mechanistic organisation suddenly faced with increasing uncertainty in their market will simply change

their structure to a more organic form. It is important, therefore, to understand how each type of organisation reacts to changing environmental circumstances.

#### 2.2.3.2 ADJUSTMENTS TO THE MECHANISTIC FORM

Once a bureaucracy has been formed, it is very difficult for an organisation to move away from that structure to a more organic form. Moving to a more organic structure involves reducing the level of direct control and accountability at management level, something many managers would be reluctant to do. It may also be the case that moving to a more organic structure may well make many managers' jobs superfluous. As it is the senior management that make the decisions it is not surprising that many bureaucracies persist in the most uncertain of environments.

Mechanistic organisations generally adapt to increasing levels of uncertainty in the following ways:

- *Rules* - The company may incorporate more rules and procedures in order to cope with the increasing number of contingencies encountered by its staff. Although this may solve the problem in the short-run, as the number of contingencies encountered increases it becomes increasingly time consuming and expensive for the company to continually update the policy manuals and cater for every eventually. Eventually it will become impossible to do so.
- *Narrower Span of Control* - In a hierarchical control structure, each supervisor handles the exceptional cases of several employees doing similar or related work. Obviously, as the environment becomes less certain the number of

exceptional cases each manager is asked to deal with also increases. By adjusting to narrower spans of control the organisation overcomes the problem of overloading the managers with subordinates' questions and queries whilst still maintaining a mechanistic organisational structure.

- *Addition of Staff* - Although narrowing the span of control increases the capacity of the hierarchy to handle exceptions, the supervisors may not have the expertise to do so. Other staff with expert knowledge will be employed to advise on the exceptional cases.

Robey and Sales [1994] state that the major advantage of mechanistic structures operating in uncertain environments is the retention of control. Top management is always able to control what is going on in the organisation by maintaining rules and a clear hierarchy of authority. Maintaining this level of control, however, does not come cheap. More rules, proliferation of staff and more supervisors per employee greatly increase personnel costs. Thus, if the volume of sales does not increase, the effect of increased uncertainty is to lower profits. The organisation may also become slow to respond to future environmental changes. Figure 5 highlights changes to structure that a mechanistic organisation may go through when adjusting to increasing environmental uncertainty.

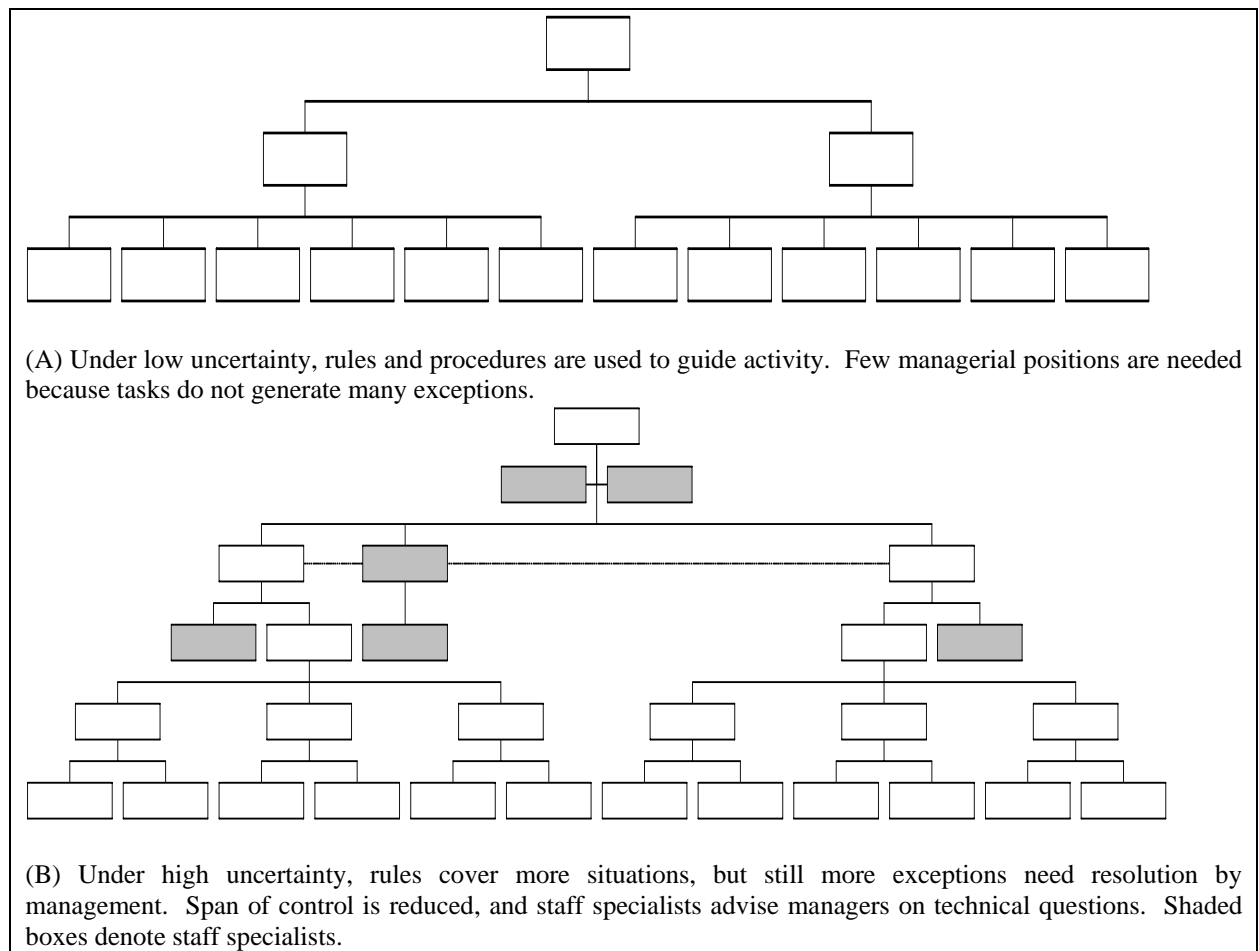


Figure 5: Mechanistic Structures under Different Degrees of Environmental Uncertainty (Taken from Robey & Sales [1994])

It is clear from Figure 5 that the administrative cost will be far higher where environmental uncertainty is high due to the high number of supervisors and consultant specialists. The top-heavy organisation depicted in Figure 5(B) can be thought of as the price of adjusting to environmental uncertainty with the mechanistic structure.

### 2.2.3.3 ADJUSTMENTS TO THE ORGANIC FORM

Organic structures typically respond to increased environmental uncertainty with increased discretion and professionalisation, expansion of communication channels and the use of output controls.

- *Increased Discretion and Professionalisation* - When confronted with increasing environmental uncertainty, instead of trying to control employees' actions by providing rules and procedures for each eventuality, organic structures allow employees greater freedom in making their own decisions. One important consequence of this is that the organisation must have confidence in its workforce to make the right decisions. If it does not, it must hire personnel of a higher calibre in which it can confidently place the increased responsibility.
- *Expansion of Communication Channels* - As personnel in organic structures are given more responsibility for decision making, they must also have all the necessary information available to them to make the right decisions. To this end, communication channels are expanded and informal channels formed to allow personnel to consult with sources of expertise throughout the whole organisation. Figure 6 illustrates the difference between hierarchy and a more dispersed system of communication.
- *Output Controls* - Giving personnel greater discretion over their actions obviously reduces the organisation's control over individual behaviour. In order to maintain a certain level of control, organic structures often hold subordinates responsible for meeting specific output goals. The use of output controls allows

the organisation to maintain a level of control over output while still allowing subordinates sufficient freedom over the means of achieving that output.

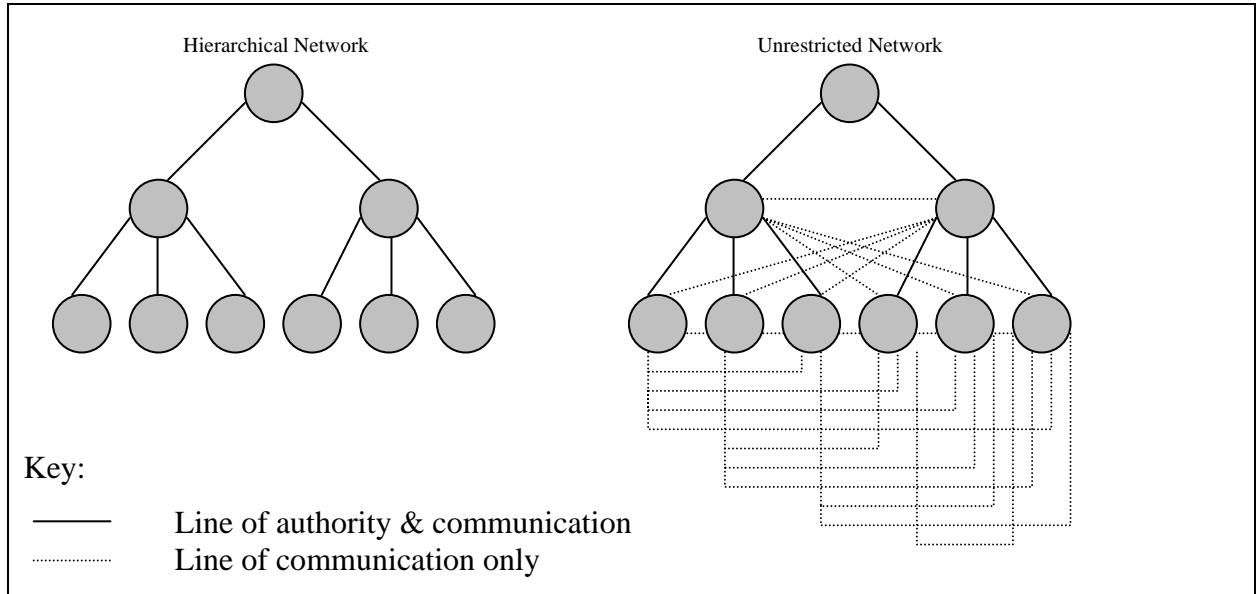


Figure 6: Hierarchical and Unrestricted Communication Networks in Organisations (Taken from Robey & Sales [1994])

Organic structures, while allowing more discretion over subordinates' actions also place greater responsibility on them in doing so. As a result, as the organisation relies on subordinate's individual judgements, the task of selecting the right people for the job becomes increasingly important. Any increase in wage costs in relation to mechanistic structures is compensated for by avoiding the high administration costs encountered in mechanistic responses to uncertainty discussed above. Organic organisations typically respond quicker to environmental changes than mechanistic structures and are more likely to develop innovative and original solutions to unique problems. The predominant disadvantage of organic structures is the loss of formal control.

Figure 7 summarises the ways in which organisational structures might emerge in response to increasing environmental uncertainty.

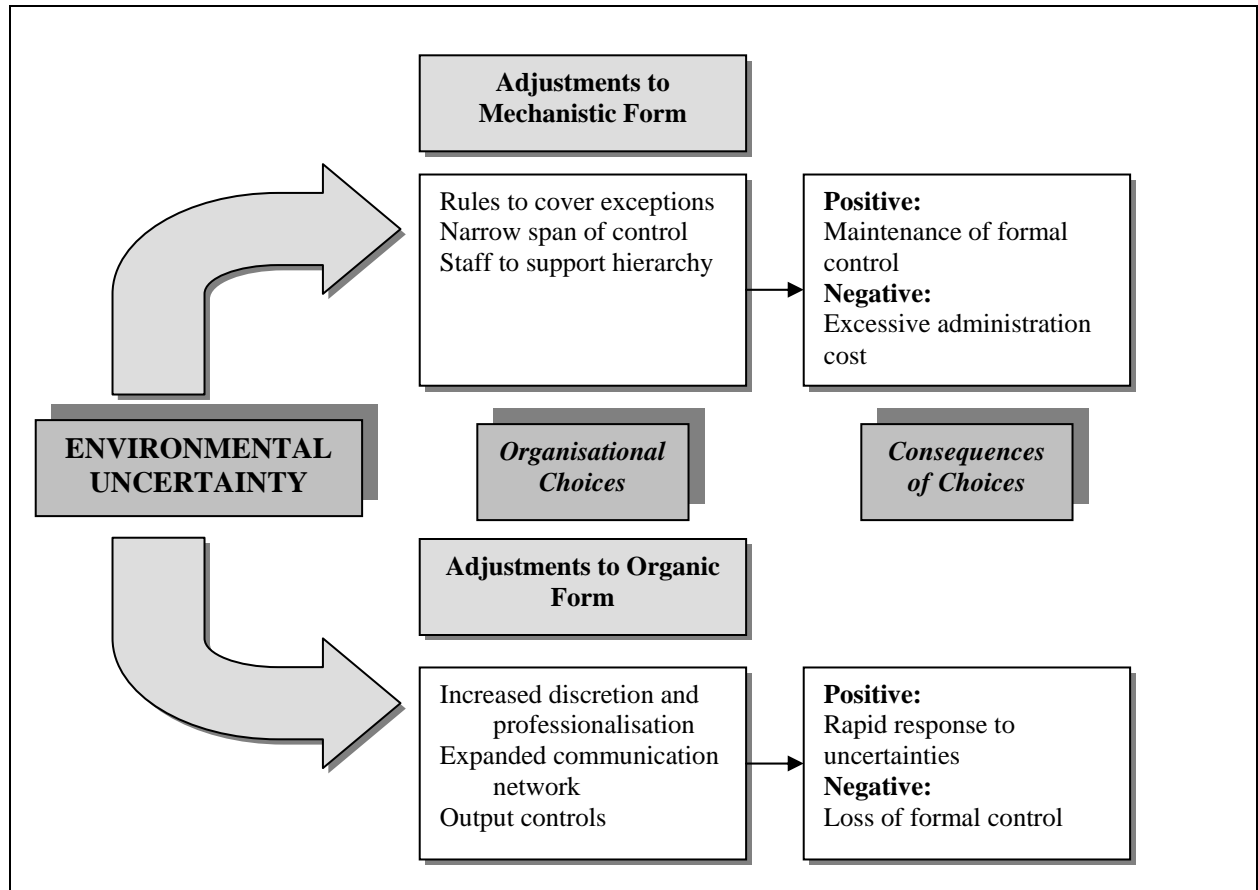


Figure 7: Summary of Structural Variations used to cope with Task Uncertainty (Taken from Robey & Sales [1994])

#### 2.2.4 CONTROL INFLUENCES

Whatever the structure of the organisation, there remains the problem of ensuring that the members of that organisation actually do what they are supposed to do in an efficient and effective manner. Organisational control is primarily concerned with how members can be motivated to expend effort in attaining the wishes of hierarchical supervisors.

As described above (see Section 2.2), in small, simple organisations characterised by task-continuity, organisational control can be achieved through personal supervision. In larger, more complex organisations characterised by task-discontinuity, however, this form of control is no longer appropriate, or even possible.

Evans [1975] warns that in the absence of proper control in work organisations there is a tendency for members to begin, intentionally or unintentionally, to ‘do their own thing’ by working towards their personal goals and perceived self-interests. One of the objectives of organisational control, therefore, is to “control and integrate members’ diverse activities” (Johnson and Gill [1993]).

Dalton [1971] and Hopwood [1974] identified three different types of control influence in organisations. Although the terminology they used was different – Dalton describes categories of organisational, informal and individual control where Hopwood categorises them as administrative, social and self-control – the two can be roughly mapped on to each other.

#### 2.2.4.1 ADMINISTRATIVE CONTROLS

This category refers to those mechanisms, techniques and processes that have been consciously and purposefully designed in order to try to control the organisational behaviour of other individuals, groups and organisations. These type of controls fall into several categories.



#### *2.2.4.1.1 Rules and Procedures*

Mintzberg [1979] classed this type of control as an attempt to standardise work processes. Through a system of monitoring members' behaviour and implementing sanctions where behaviour does not correspond to the body of rules and procedures in place, organisations are able to constrain the range of members' actions and direct behaviour towards the organisational goals.

It has already been mentioned that strict rules and procedures and the bureaucratic structure that they create are most suited to organisations operating in relatively stable environments. Perrow [1967] also argues that the extent to which tasks can be pre-programmed through rules and procedures depends on the number of 'exceptional cases' (unfamiliar situations encountered during task completion) and the extent to which the exceptional cases can be solved through logical, analytical means. Where the problem is vague and poorly conceptualised, the job-holder must rely on a "residue of un-analysable experience or intuition" (Perrow [1967]).

#### *2.2.4.1.2 Output Controls*

Output control involves the standardisation of work outputs rather than the standardisation of work processes (Mintzberg [1979]). Output controls allow workers to use their own judgement and discretion in task completion by focusing attention on the worker output i.e. the consequences of their behaviour rather than their behaviour itself.

#### *2.2.4.1.3 Internalised Objectives*

Organisations may attempt to ensure subordinates' behaviour by encouraging them to internalise the values, beliefs and attitudes supportive of the goals and objectives of the

organisation. This may be done through the selective hiring of individuals who appear to share the attitudes, values and beliefs considered appropriate for effective task performance or by restructuring the values and beliefs of the current workforce.

The three types of administrative controls discussed are summarised in Figure 8.

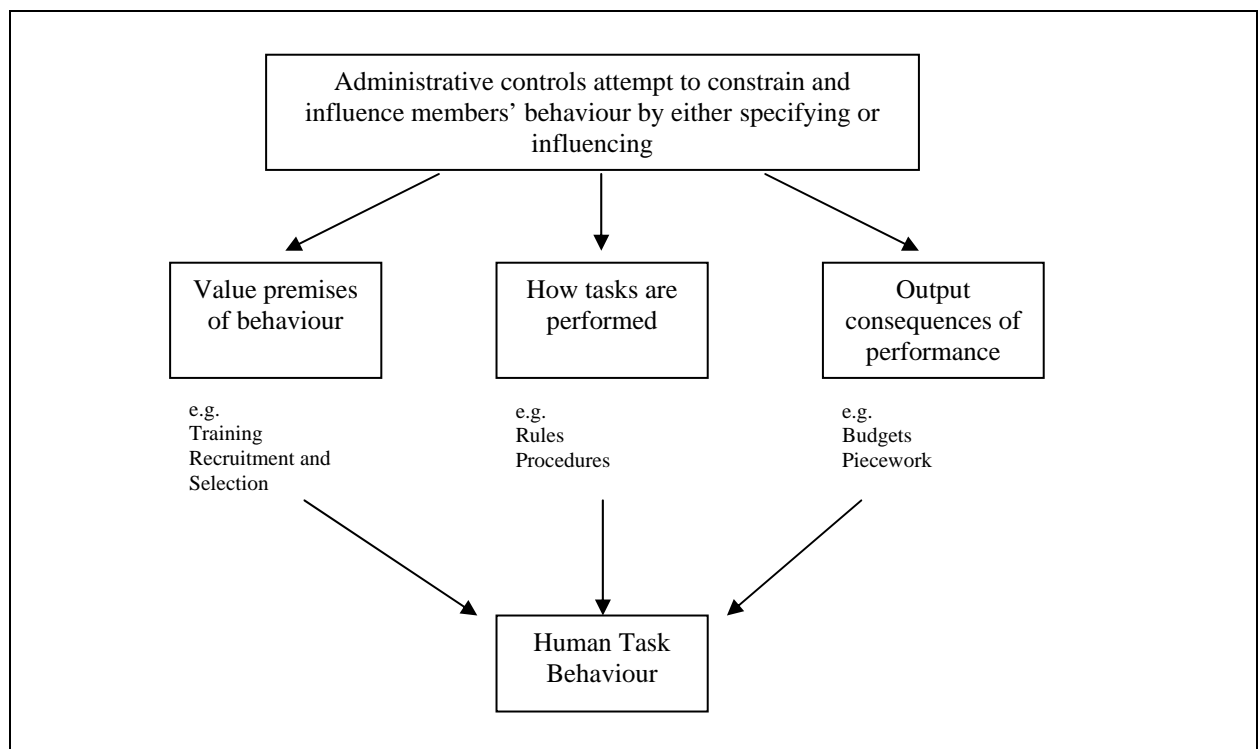


Figure 8: Three types of administrative control (Adapted from Johnson and Gill [1993])

#### 2.2.4.2 SOCIAL CONTROLS

Social controls bear many similarities to administrative control through internalised objectives (see Section 2.2.4.1.3) in that they both produce regularised behaviour by influencing members' beliefs and values. In social control, however, this arises spontaneously out of the social interaction among members rather than through formal, planned strategies. Another important aspect of social controls is that they may not influence behaviour in the way desired

by management. In many production organisations, for example, it is common for groups of production workers to informally agree levels of productivity deemed reasonable. Workers producing over this rate are seen as ‘rate busters’ and are chastised by the group.

#### 2.2.4.3 SELF CONTROLS

Administrative and social controls will only be effective if the individual member allows himself or herself to be influenced. In order for this to happen the administrative or social controls must be “either directly or indirectly...internalised by the members of the enterprise and operate as personal controls over attitudes and behaviour” (Hopwood [1974, p.31]). Hopwood argues that for this to happen, the administrative and social controls must convey rewards the individual values and desires. Figure 9 presents this situation in diagrammatic form.

In Figure 9, the individual is influenced to maximise productivity through administrative controls whilst at the same time being influenced to regulate output to the level deemed appropriate by the social group to which he or she belongs. Deviation from the group norms, whilst producing financial rewards, may result in exclusion from the social group. The individual’s response will therefore depend on their own personal motives in response to the two opposing influences.

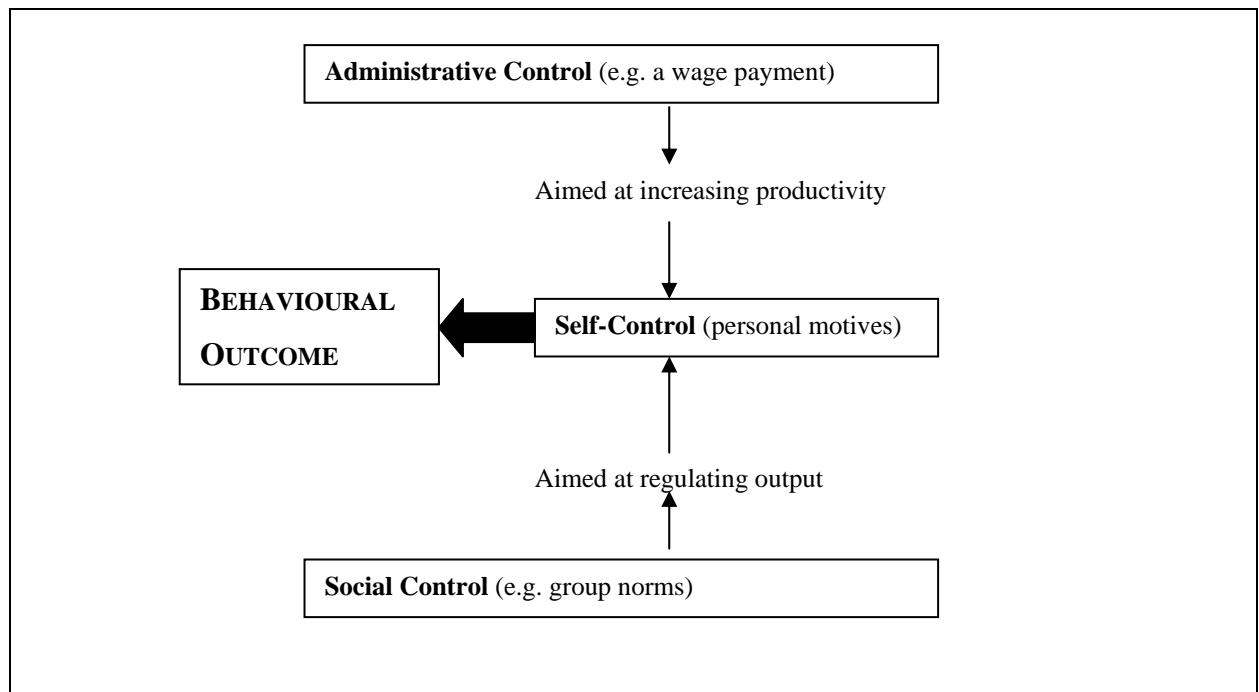


Figure 9: Interaction of the three control types (Adapted from Johnson and Gill [1993])

Various authors (see Kelman [1961] and Kanter [1968]) have expanded on the notion of internalisation and have distinguished between different levels of conforming response depending on the level to which the individual adopts the imposed values and beliefs as their own. Kelman [1961], for example, proposes ‘compliance’ as the form of conforming behaviour aimed purely at the gaining of rewards or avoidance of punishments and ‘identification’ as a conforming response to social influence resulting from a desire to be like the people who are exerting the influence. Kelman suggests that internalisation is only achieved when the individual adopts the beliefs, norms and values of the influencing group.

## **2.3 THE EVOLUTION OF MOTIVATIONAL THINKING**

### **2.3.1 SCIENTIFIC MANAGEMENT**

Scientific management was aimed primarily at measuring and controlling people's work on the shop floor. The principles were formally recorded and popularised by Frederick Winslow Taylor during the 1890's (Taylor [1911]). Taylor believed that it was management's lack of understanding of what actually happened on the shop floor that lead to their inability to control worker behaviour effectively. Scientific management, therefore, is largely an attempt to abolish the sources of shop floor inefficiency.

The principles underlining scientific management are Utilitarian and Hobbesian. According to Utilitarian theories, people are 'rational-economic' beings primarily motivated by economic reward. People will only work harder, therefore, if they are convinced that such expenditure will give them a monetary reward that they feel is sufficient. Hobbesian approaches assume that people, in their 'natural state', are lazy, aggressive, self-centred, hedonistic and greedy. Taylor, therefore, viewed shop floor problems of inefficiency to be the result of a lack of control, or inappropriate control, allowing the workers to return to their 'natural state'.

In order to convince workers that extra effort would result in greater rewards, management must be able to do two things:

1. Measure the amount of effort an employee is putting into his or her job so that rewards can be awarded in proportion to that expended effort.

2. Design and specify tasks independently of the job-holder. It will then be possible to identify the most efficient way to do the tasks.

In order to measure the effort expended by workers, Taylor proposed that complex tasks be broken down into the simplest, constituent elements. This allowed the effort necessary from an 'average worker' to complete the task to be determined and also allowed tasks to be analysed in order to find those procedures that would maximise an operative's productivity with minimum expenditure of effort. Taylor also recommended the specialised division of labour, whereby each worker would specialise in performing one simplified task, thereby maximising individual productivity.

The division of labour, however, is not without its drawbacks. It has been well documented (see Chinoy [1955]) how the introduction of scientific techniques can lead to dissatisfaction and alienation of the workforce. Blauner [1964] attributed the causes of alienation to the inability to exert control over the work process, the lack of a sense of purpose due to workers being unable to relate his or her role to the overall production process, the failure to become involved in work as a form of self expression and the lack of a sense of belonging. These behavioural and organisational problems related to scientific management, together with the alternative philosophical assumptions about the nature of human beings, lead to the development of alternative approaches to human motivation in the workplace.

### **2.3.2 HUMAN RELATIONS**

The human relations movement began from a series of experiments carried out at the Western Electric Company's Hawthorne plant, which, in the late 1920's led to a new paradigm of worker motivation and output. The studies highlighted the fact that performance of an individual depended not only on the incentives aimed at the individual but also on the network of relationships within which the employee worked. The basic premises of the human relation movement are that people respond primarily to their social environment, that motivation depends as much, or more, on social needs than on economic needs and that satisfied employees work harder than unsatisfied employees.

The research led to Elton Mayo [1945] producing a very different set of assumptions about human nature:

- Social needs are the prime motivator of human behaviour, and interpersonal relationships the prime shaper of a sense of identity.
- As a result of the mechanisation entailed in the Industrial Revolution, work had lost much of its intrinsic meaning, which now must be sought in social relationships on the job.
- Employees are more responsive to the social forces of the peer group than to the incentives and controls of management.
- Employees are responsive to management to the extent that a supervisor can meet a subordinate's needs for belonging, for acceptance and for a sense of identity.

These assumptions have several implications on management theory:

- Managers should not limit their attention to the task, but should also concern themselves with the needs of their subordinates.
- Instead of being concerned with directing and controlling subordinates, managers should be concerned with their psychological well-being.
- Managers should think in terms of group incentives instead of individual incentives.
- The manager's role shifts from planning, organising, and controlling to acting as an intermediary between employees and higher management, representing the needs and feelings of subordinates to higher management.

Under these assumptions, the initiative for work (the source of motivation) shifts from the manager to the worker. The manager becomes the facilitator of work, ensuring the needs of the worker are catered for in order to achieve a satisfactory level of output. The psychological contract<sup>1</sup> in such organisations involves a commitment on the part of the organisation to care for the personal and social needs of employees in return for a high level of loyalty, motivation and output from the workers.

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<sup>1</sup> A psychological contract is the unwritten set of expectations that exist between any organisation and its employees. The organisation's expectations of the employee will involve such things as the type and level of output as well as more subtle expectations such as loyalty and that the employee will keep organisational secrets, etc. The employee will have their own set of expectations regarding such things as pay, working conditions, working hours, opportunities for advancement, etc.



One of the best known Human Relations writers, Douglas McGregor, summarised the two opposing perspectives of scientific management and human relations by formulating two theories that he believed typified managerial views of employees.

#### 2.3.2.1 THEORIES X AND Y

McGregor [1960] argued that the structure of organisations tended to be determined by the managerial assumptions about human nature and behaviour. Traditionally, these assumptions were based on the philosophy of hedonism, which argues that people seek to maximise their self-interest and leads to the following assumptions regarding employee behaviour (Schein [1980]):

- Employees are primarily motivated by economic incentives.
- Since economic incentives are under the control of the organisation, the employee is essentially a passive agent to be manipulated, motivated and controlled by the organisation.
- Irrational feelings must not be allowed to interfere with a person's rational calculation of self-interest.
- Organisations should be designed in such a way as to neutralise and control people's feelings and, therefore, their unpredictable traits.

These assumptions are the foundation for scientific management and led McGregor to develop his 'Theory X' about how organisations behave towards people, which can be outlined as follows:

- People are inherently lazy and must be motivated by outside incentives.

- People's natural goals are contrary to those of the organisation.
- Due to their irrational feelings, people are basically incapable of self-discipline and self-control.
- People can be divided roughly into two groups – those who fit the above assumptions and those who are self-motivated, self-controlled and less dominated by their feelings. This latter group must assume the management responsibilities for all the others.

The assumptions of Theory X imply that a psychological contract is essentially a purchase of services. The organisation gives the employee economic rewards in return for their service and controls their behaviour through rules and regulations enforced by the designated positions of authority. The primary emphasis of an organisation operating under these assumptions is efficient task performance. This is achieved through the design of job and relationship structure and implementing efficient incentive and control procedures. The responsibility for output lies entirely with the management as employees are only expected to do what the incentive and control systems encourage.

McGregor felt that the model of human motivation underpinning Theory X was fundamentally misconceived. McGregor concluded that organisations designed under the principles of scientific management and Theory X ignored the fact that human needs were dynamic. McGregor, therefore, developed an alternative philosophy, Theory Y, which allowed the

individual's need for self-actualisation to be integrated with the organisational goals. The main principles of Theory Y are:

- Human motives fall into a hierarchy of categories e.g. Maslow's hierarchy of needs.
- The individual seeks to be mature on the job and is capable of being so, in the sense of exercising of a certain amount of autonomy and independence, adopting a long-range time perspective, developing special capabilities and skills and exercising greater flexibility in adapting to circumstances.
- People are primarily self-motivated and self-controlled; externally imposed incentives and controls are likely to be threatening and to reduce the person to a less mature adjustment.
- There is no inherent conflict between self-actualisation and more effective organisational performance. If given a chance, employees will voluntarily integrate their own goals with those of the organisation.

Under these assumptions, the manager's task changes from trying to fulfil the worker's social needs to trying to make the work meaningful so that the worker can achieve a sense of pride and self-esteem. The motivating and controlling roles are replaced with a delegatory role in which the manager tries to give each employee just as much responsibility as he or she thinks they can handle.

Self-actualisation is gained from controlling and developing oneself through to the conclusion of a problem. Under Theory Y assumptions, the basis for motivation changes from something that the organisation must arouse in each employee to something that already exists in each employee, all the organisation must do is direct the employee's motivation towards organisational goals. The manager's role becomes one of communicating the task requirements.

As organisations operating under Theory Y assumptions allow employees more autonomy in doing their task they tend to have a much broader power base and employees often have an input into organisational decision-making. According to Argyris [1964], employees will only behave in a responsible adult manner if managers and organisations adopt these assumptions. If Theory X assumptions are adopted the organisation will end up treating workers as children, expecting them to behave in a dependent, submissive manner. It should be no surprise in these organisations if workers often act in a rebellious and emotional way and feel uninvolved with organisational goals.

### **2.3.3 HUMAN RESOURCES**

“Human resources models generally view humans as being motivated by a complex set of interrelated factors (such as money, need for affiliation, need for achievement, desire for meaningful work)” (Steers [1987]). It is no longer assumed that employees will have the same goals in a job and individuals may therefore act very differently to similar situations. Under the human resources conceptualisation, employees are viewed as reservoirs of potential talent and management's responsibility is to learn how best to tap such resources.

Once again, this new paradigm requires a change in the assumptions about the nature of people and their jobs. The assumptions of the human resources view may be summarised as follows:

- People want to contribute to their job and may be thought of as being ‘pre-motivated’.
- Work does not necessarily have to be distasteful. Job enrichment and job redesign may increase the potential meaningfulness of the job by adding greater amounts of task variety, autonomy, responsibility, etc.
- Employees are quite capable of making significant and rational decisions affecting their work and that allowing greater latitude in employee decision-making is actually in the best interests of the organisation.
- The increased self-control and discretion allowed on the job, plus completion of more meaningful tasks, may increase the level of job satisfaction.

The last point is particularly important as it suggests that, under the human resources paradigm, “good and meaningful performance leads to job satisfaction and not the reverse, as is assumed in the human relations model” (Steers [1987]).

The implications for management are that it should first attempt to understand the complex nature of motivational patterns before attempting to determine how best to use the potential resources available to it. The aim of management becomes one of meeting employees’ own

*personal* goals within the organisational context. The importance of a greater degree of participation and autonomy on the part of employees is also emphasised.

## **2.4 SUMMARY**

This Chapter has examined the factors influencing the type of organisation within which an employee may work and the types of control typical of each. It was shown how the structure and culture of an organisation is a result of the environment within which it operates as well as the historical background of the company. The type of organisation within which an individual works will to a large degree determine the motivational influences operating on that individual. For example, an individual working in a highly organic organisation, especially one operating under conditions of high uncertainty, is likely to have a high degree of freedom, discretion and responsibility in their work. This, for many people, will be enough to encourage a high level of effort. Conversely, an individual working in a highly mechanistic organisation, especially one operating in a highly certain market, is likely to be greatly restricted in their work methods and have little or no responsibility. Companies of this type will need to find other means of motivating their workforce, usually through economic incentives.

The evolution of the motivational paradigm through the stages of scientific management, human relations and human resources was also examined. The following Chapter examines the most popular theories and models that have been developed to explain how the control methods of the organisation are transferred into motivation and effort on the part of the employee.

# **CHAPTER THREE**

## **3 THEORIES OF MOTIVATION**

### **3.1 INTRODUCTION**

Johnson and Gill [1993] describe motivation in work organisations as “the processes by which people are enabled to and induced to choose to behave in particular ways”. Motivation is therefore associated with a search for the means by which members’ job performance and productivity may be improved or maintained.

### **3.2 NEED BASED THEORIES**

The earliest views on human motivation were based around the concept of hedonism: the idea that people seek pleasure and comfort and try to avoid pain and discomfort. This assumption, whilst seeming perfectly reasonable, cannot explain many kinds of human behaviour. For example, why do volunteer charity workers give their time and effort for no personal rewards? Why do amateur athletes exert such high levels of effort, whereas a hedonist would prefer to relax? Researchers began to realise that people had other needs and desires that could not be explained under such a limited view of human behaviour as hedonism. The basic premise of need theories is that human motivation is caused primarily by deficiencies in one or more important needs or need categories.

### **3.2.1 MASLOW'S HIERARCHY OF NEEDS**

Argyris [1957] suggested that in formally designed organisations, with an emphasis on hierarchy and task specification, there tended to be a lack of congruency between the needs of the healthy adult and the demands of the organisation. In these types of organisations, employees have little control over what they do, are expected to have a short-term perspective, be dependent upon and subordinate to hierarchical superiors and are expected to exercise only a few superficial skills and abilities. All of which, argues Argyris, are personality traits more commonly associated with children. Employees' natural desires for a certain level of autonomy are therefore repressed, resulting in feelings of frustration and failure, lowering worker morale and increasing the risk of conflict.

Maslow [1954] saw motivation as a constantly changing desire to fulfil changing needs. Maslow believed that human needs occurred in a hierarchy of importance, which he called 'prepotency'. Only the next level of needs in the hierarchy will act as motivators. Once a level of needs has been satisfied they no longer act as motivators and the individual then directs attention towards the next level of needs in the hierarchy. Maslow's hierarchy of needs is shown in Figure 10.



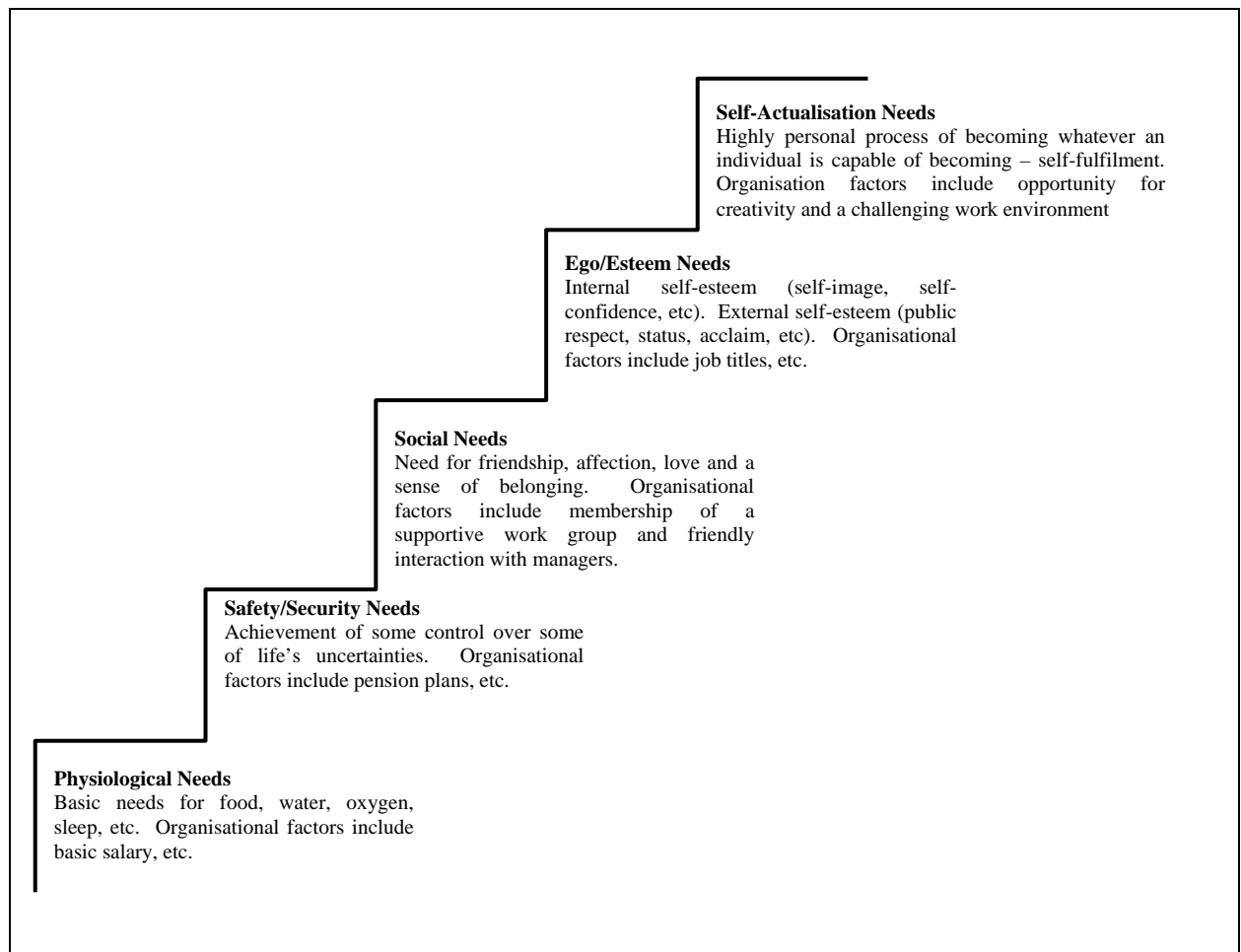


Figure 10: Maslow's Hierarchy of Needs

### 3.2.2 MOTIVATION-HYGIENE THEORY

The Herzberg, Mausner and Snyderman [1959] research examined the relationship between job satisfaction and productivity among 200 engineers and accountants. The result of the research was Herzberg's motivation-hygiene theory of motivation, which suggests that certain factors (motivator factors) lead to job satisfaction, whereas others (hygiene factors) prevent dissatisfaction but cannot engender satisfaction.

Motivator factors are factors that are intrinsic to the job, such as the content of the work itself and the availability of opportunities for responsibility, advancement and recognition for achievement. Hygiene factors are extrinsic to the job and relate to the environment in which the job is performed. Such factors include the organisation's policy and administration, working conditions, salary, supervision and interpersonal relations.

Herzberg argued that the extrinsic aspects of work (the hygiene factors) could not provide a source of motivation for people but could, if 'bad', provide a source of dissatisfaction and thus demotivate people. Hygiene factors should be seen as the necessary precondition to allow the motivator factors to influence people's motivation.

In a situation in which there were 'good' hygiene factors, the employee would be in a state of 'no dissatisfaction'. The motivator factors, which Herzberg [1959] described as "complex factors leading to this sense of personal growth and self-actualisation", would then be able to act on that employee and increase job satisfaction and productivity. Thus, in order to motivate workers towards higher productivity, "while it is important to ensure that the hygiene factors are correct, the manager must manipulate the motivators by attending to job-content issues (e.g. job-enrichment)" (Johnson and Gill [1993]). Job-enrichment entails redesigning jobs to make them more interesting and challenging by allowing provisions to be made for increased responsibility, creativity and autonomy.

Herzberg's motivator and hygiene factors can be mapped onto Maslow's hierarchy of needs with the motivator factors corresponding to the higher order needs of ego and self-

actualisation. This relationship, along with the management prescriptions for each factor, can be seen in Figure 11.

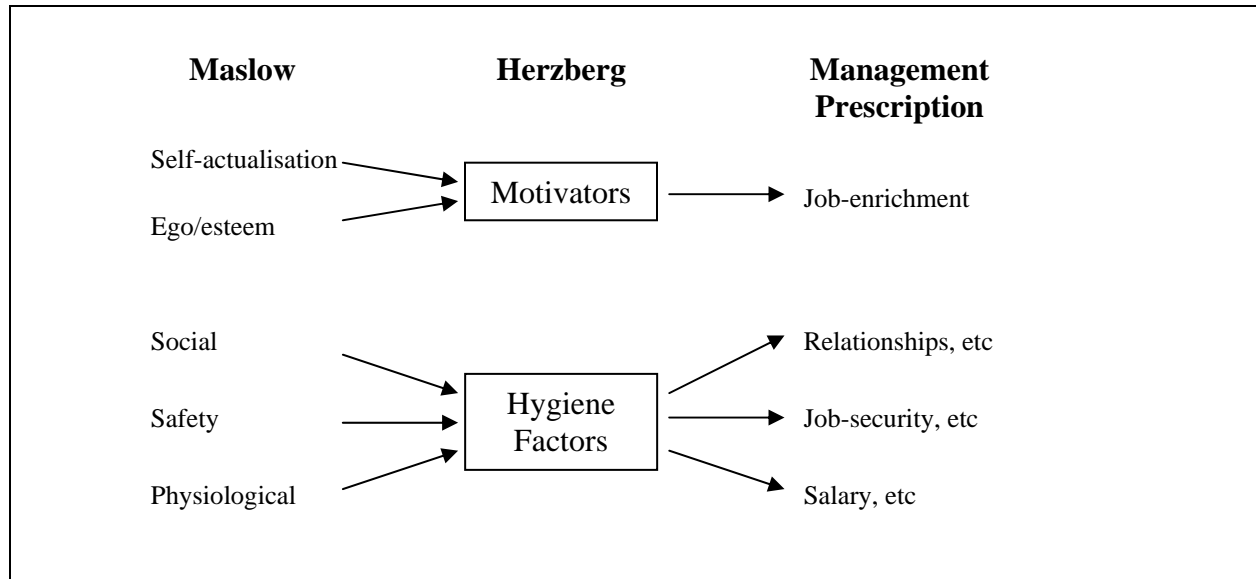


Figure 11: The Correspondence between Maslow and Herzberg (Taken from Johnson and Gill [1993])

The research conducted by Herzberg has, however, been the subject of considerable criticism in terms of the form of the research itself and the biased selection of the sample (see Holloway [1991]). Holloway [1991] claims that since the clerical and production workers ‘did not produce the accounts he was seeking, he didn’t sample them’. Goldthorpe [1968] suggests that other types of employee (such as assembly-line workers) may indeed view work in the way expressed by scientific management and be primarily motivated by financial incentives. A case of workers being primarily motivated by what Herzberg regards as a hygiene factor.

The important point to be made from the criticism of Herzberg and from the work of Goldthorpe *et al.* is that no one theory, be it human relations or scientific management, is likely to apply universally. Different socio-economic groups appear to attach different

meanings to, or have different orientations towards, work (Parker [1972]). While different groups of people may have different attitudes towards work, they are also likely to react differently towards management policies. Stanworth [1977] points out that whilst well-meaning ‘human relations’ policies on the part of management may appeal to certain groups of workers, they may engender feelings of unwelcome paternalism and claustrophobia in others. A model of worker motivation should therefore be able to differentiate between different types of worker and treat the wants, expectations and attitudes towards work as ‘culturally determined variables, not psychological constants’ (Goldthorpe [1968]).

### **3.2.3 ERG THEORY**

ERG theory, developed by Alderfer [1972] is a re-working of Maslow’s need hierarchy to align it more closely with the empirical research. In ERG theory there are three groups of core needs – Existence, Relatedness and Growth. The existence group is concerned with providing basic material existence requirements and includes the items that Maslow termed physiological and safety needs. Relatedness needs are the needs for maintaining important interpersonal relationships and align with Maslow’s social need and the external part of the esteem need. Finally, growth needs involve the intrinsic desire for personal development and include the intrinsic element of Maslow’s esteem category as well as self-actualisation needs.

The principal difference between Maslow’s need hierarchy and ERG theory is that ERG theory does not assume that a lower need must be satisfied before an individual develops the desire for a higher level need. ERG theory therefore allows individuals to seek satisfaction of various needs from different levels of the hierarchy simultaneously.

ERG theory also postulates that when a higher order need is frustrated, an individual will increase their level of desire for a lower level need. For example, where an individual is unable to satisfy their growth needs, due perhaps to a restrictive work environment, their desire for rewards such as money is likely to increase.

### **3.2.4 McCELLEND'S THEORY OF NEEDS**

McCellend's theory of needs focuses on just three needs: achievement, power and affiliation.

They are defined as follows:

- Need for achievement – The drive to excel, to achieve in relation to a set of standards, to strive to succeed.
- Need for power – The need to make others behave in a way they would not have behaved otherwise.
- Need for affiliation – The desire for friendly and close interpersonal relationships.

McCellend suggests that people with a high achievement need have a compelling drive to succeed. They strive for personal achievement rather than rewards and have a desire to do something better or more efficiently than it has been done before. They seek situations where they can attain personal responsibility for finding solutions to problems, where they can receive rapid feedback on their performance so they can tell easily whether they are improving or not, and where they can set moderately challenging goals. It is important to note that high achievers, as described by McCellend, avoid what they perceive to be very easy or very difficult tasks. They receive feelings of achievement and satisfaction from overcoming

difficulties and obstacles, but they need to feel that their success (or failure) is due to their own actions. McClelland postulates that high achievers will perform best when they perceive there to be an approximately equal chance of success or failure.

The need for power is the desire to have impact, to be influential, and to control others. Individuals who have a high power need enjoy being in charge, strive for influence over others, prefer to be placed into competitive and status-oriented situations, and tend to be more concerned with prestige and gaining influence over others than with effective performance.

The need for affiliation is the desire to be liked and accepted by others. Individuals with high affiliation motive strive for friendship, prefer co-operative situations rather than competitive ones, and desire relationships involving a high degree of mutual understanding.

### **3.2.5 SUMMARISING THE NEED THEORIES**

Despite the obvious differences between the need theories discussed in this Section, there are several points at which the theories intersect. Figure 12 illustrates the similarities among the four theories examined. All need-based theories, however, share an inherent weakness in that “they do an adequate job of describing the factors that motivate behaviour, but they tell us very little about the actual processes of motivation” (Moorhead & Griffin [1995]). Process based motivation theories provide a better understanding of the ways in which motivation occurs.

Hertzberg's Motivation-Hygiene Theory	Maslow's Hierarchy of Needs	Alderfer's ERG Theory	McClelland's Theory of Needs
<b>Motivation Factors</b> Achievement Work Itself Responsibility Advancement & Growth	Self-Actualisation Needs	Growth Needs	Need for Achievement
.....	.....	.....	.....
Recognition	<i>Self-Esteem</i> ..... Ego/Esteem Needs ..... <i>Respect of Others</i>		Need for Power
<b>Hygiene Factors</b> Supervision Interpersonal Relationships	Social Needs	Social Needs	Need for Affiliation
.....	.....	.....	.....
Job Security Company Policies	<i>Interpersonal Security</i> ..... Safety/Security Needs ..... <i>Physical Security</i>		
.....	.....	.....	.....
Pay Working conditions	Physiological Needs	Existence Needs	

Figure 12: Parallels Among the Need Based Perspectives on Motivation (Adapted from Moorhead & Griffin [1995])

### 3.3 PROCESS BASED THEORIES

The general distinction between the need-based theories discussed in Section 3.2 and the more advanced theories introduced in this Section rests on the difference between content and

process. The need-based perspectives reflect a content perspective in that they attempt to describe what factors motivate behaviour; that is, they try to list specific things that motivate behaviour. The more sophisticated process based perspectives focus on the ways in which motivated behaviour occurs. They attempt to explain how people go about satisfying their needs and choose between behavioural alternatives.

### **3.3.1 COGNITIVE EVALUATION THEORY**

It has generally been believed by motivation theorists that intrinsic motivations such as achievement, responsibility and competence are independent of extrinsic motivators such as pay and working conditions. Cognitive evaluation theory (CET) proposes otherwise. CET argues that when extrinsic rewards are offered for work effort that had previously been intrinsically rewarding, the overall level of motivation is likely to decrease due to a decline in the intrinsic interest in the job in the mind of the individual. Intrinsic rewards (i.e. rewards that determine intrinsic motivation) are those intangible rewards that influence feelings of achievement, responsibility and self-worth. Job characteristics such as the levels of autonomy, skill variety, task significance, task identity and feedback (see Section 4.2 for definitions of these variables) may all be considered to be the intrinsic rewards of the job. Although the organisation is able, through job design, to determine the levels of intrinsic rewards available in a job, the perceived levels of intrinsic rewards in the mind of the worker will be highly subjective. One worker may view a job as being highly significant, offering a high level of autonomy, while another worker may perceive the same job as being insignificant and restricting. The levels of intrinsic rewards are therefore often seen as being beyond the direct control of the organisation.



The founder of CET, Deci, suggests that there are two processes by which rewards affect intrinsic motivation. The first process is through a change in the perceived locus of causality. When behaviour is intrinsically motivated, the perceived locus of causality is said to be internal. When an individual receives extrinsic rewards, their perceived locus of causality becomes external and they do the behaviours only if they believe that the extrinsic rewards will be forthcoming (Deci [1975]).

The second process by which intrinsic motivation may be affected is through what Deci calls “a change in feelings of competence and self-determination” (Deci [1975]). Rewards that convey to people that they are competent and self-determining increase their intrinsic motivation, whereas rewards that convey to people that they are not competent and self-determining decrease their intrinsic motivation.

CET therefore asserts that every reward has two components – a controlling aspect and an informational aspect. The controlling aspect initiates the change in the perceived locus of control. The informational aspect provides individuals with information about their effectiveness at the rewarded activity and thereby determines their feelings of competence and self-determination. Figure 13 summarises the two propositions of cognitive evaluation theory.

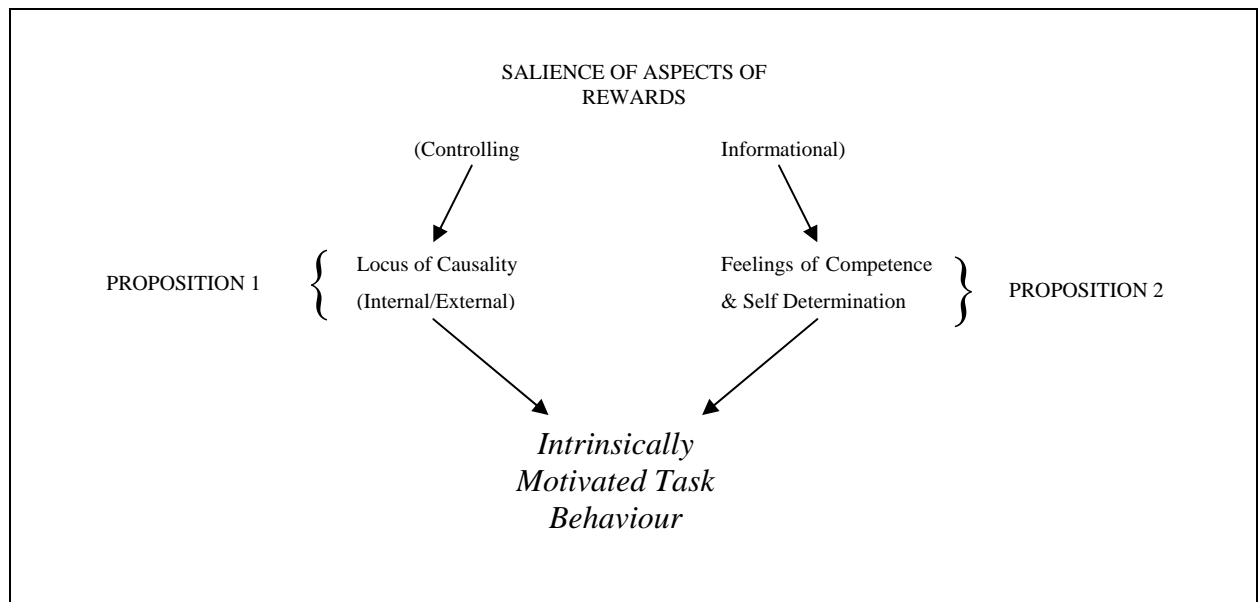


Figure 13: The Two Propositions of Cognitive Evaluation Theory (from Boal & Cummings [1981])

The main implication of CET with regards to the management of organisations is that they should “pay to attract and ensure the participation of people in organisational activities, but that they should rely upon such techniques as job enrichment and participative management to motivate performance by employees” (Boal & Cummings [1981]).

In a review of the research that has investigated the validity of CET, Boal and Cummings reported that only 14 out of the 24 reviewed studies supported the theory. Also, of the 14 supportive studies, all were open to major criticism limiting their support of the theory (Boal & Cummings [1981]). Firstly, no consistent measure of intrinsic motivation was used throughout the studies. Comparing the results of different studies therefore becomes dependent on the variables the researcher has used as indicators of intrinsic motivation. For example, Deci (1971, 1972, 1975) operationalised intrinsic motivation as free choice behaviour; Arnold (1976), Calder and Staw (1975) and Farr (1976) examined the subjects

volunteer rate; Farr [1976, 1977] and Fisher [1978] considered performance measures while others have used measures of task interest or satisfaction (Farr [1976], Kruglanski, Alon & Lewis [1972] and Pinder [1976]).

Secondly, none of the reported studies investigated CET in a work environment. The vast majority of studies used samples of college students as their respondents and in each study the tasks that the sample were asked to complete were simple puzzles or sorting tasks set under laboratory conditions. It is debatable, therefore, to what extent any conclusions from studies of this nature may be relevant to work situations. Indeed, it has been suggested that the scope of CET may be so limited that it has no practical utility for understanding rewards and motivation in a work environment (Guzzo [1979]).

Boal and Cummings tested CET in a ‘natural work setting’ and, although they found some support for the contention that performance contingent rewards may decrease intrinsically motivated behaviour, they did not support either of the two hypothesised processes as explanatory frameworks.

### **3.3.2 GOAL SETTING THEORY**

Goal setting theory, which is largely attributed to Locke [1968], proposes that intentions to work towards a goal are a major source of work motivation. Specifically, it suggests that specific goals increase performance, difficult goals, when accepted, result in higher performance than do easy goals and that feedback leads to higher performance than does non-feedback.

It is assumed that, holding other variables constant, the more difficult the goal, the higher the level of performance. However, it is also true that the goal must be accepted by the individual and that easier goals are more likely to be accepted. The task difficulty must therefore be easy enough to ensure acceptance from the employee but difficult enough to encourage a high level of effort.

Feedback helps identify discrepancies between what an individual has done and what they want to do, and therefore guides them as to how well they are progressing toward their goals. Evidence has also shown that self-generated feedback, where the employee is able to monitor his or her own progress, is a more powerful motivator than feedback from external sources, such as supervisors.

It has been suggested (see Moorhead & Griffin [1995]) that where employees have the opportunity to participate in setting their own goals, their effort exerted in achieving those goals will be greater than where the goals have been assigned to them. Although the evidence is mixed as to the validity of this hypothesis, employee participation in goal setting has been found to influence the likelihood of the employee accepting difficult goals. Where an employee has had an active input into the setting of his or her own goals, therefore, they will be more inclined to accept those goals and exert effort towards achieving them. Kennish [1994] points out that “control stifles motivation while involvement creates a more productive environment”.

Three other factors have been found to influence the goals – performance relationship. Firstly, goal commitment occurs where the individual is determined not to lower or abandon the goal. This is most likely to happen when goals are made public, when the individual has an internal locus of control (see Section 3.2.5 for a description of ‘locus of control/causality’) and when the individual participates in the goal setting. Secondly, the individual’s level of self-efficacy, their level of belief that they have the ability to perform the task, has been found to influence the amount of effort an individual is willing to exert to achieve a difficult goal. Additionally, individuals high in self-efficacy seem to respond to negative feedback with increased effort and motivation while those low in self-efficacy are likely to lessen their effort when given negative feedback. Lastly, goal setting theory suggests that it will be most appropriate in cultures where workers expect and seek a certain level of independence and challenging goals and where the level of performance is considered to be important.

In a study examining the effects of task challenge upon motivation, Taylor [1981] found considerable support for the validity of a direct, causal relationship between task challenge and subsequent performance. Taylor concluded that “the experience of working on a high-challenge vs. a low-challenge assignment was found to increase subjects’ performance standards on a subsequent assignment, to result in a higher level of satisfaction with their performance, and to yield greater performance attributions made to skill”. The results, say Taylor, “suggest a developmental process occurring over time whereby individuals are assigned challenging tasks, stretch themselves to perform well, receive positive feedback which increases their perceptions of skill competence and positive job attitudes, and set higher standards for their performance on subsequent assignments”.

Taylor's study also found support for the suggestion by Katz [1978] that in the early months on the job, new employees are either insensitive or react negatively to challenging job characteristics such as autonomy and skill variety. Taylor found that poorer performance resulted from high rather than low-challenge initial assignments, suggesting that the negative psychological effects of performing poorly on an initial assignment may have long lasting negative effects on their confidence and self-efficacy.

There is a wealth of empirical evidence supporting the positive effect of feedback on intrinsic motivation (Arnold [1976]; Deci [1972]; Kim & Schuler [1979]), motivation to perform well (DeNisi, Randolph & Blencoe [1982]), effort (Ilgen, Mitchell & Fredrickson [1981]) and behavioural change (Conlon [1980]; Komaki, Heinzmann & Lawson [1980]). Many researchers have argued that the source of feedback is an important influence on how the individual relates the feedback to motivation. It has been postulated that individuals actively seek feedback from external sources such as formal performance appraisals, supervisors, co-workers and the task itself (Greller & Herold [1975]). Ilgen, Fisher and Taylor [1979] argued that subordinates respond more to feedback from sources that possess power over them. Ilgen et al. [1979] also postulated that the nature of the feedback message itself is also of importance. Perhaps contrary to Ilgen et al.'s findings, Grellar and Herold [1975] found that individuals are more sensitive to feedback from sources closer to them in a psychological sense. This contention was supported in studies by DeNisi et al. [1982] and Pavett [1983], who found that peer feedback had a greater effect on perceptions of group performance and motivation than did supervisory feedback.

Research on employee participation also suggests that the effects vary depending on the type of participation. Programs that involve employees directly in how work is done, give them decision making authority, focus on job issues, and link compensation to worker efforts significantly increase productivity (Levine and Tyson [1990]; Eaton and Voos [1992]). Moreover, the more channels of communication, and the broader the issues subject to participation, the greater the effect of employee participation (Mitchell et al.[1990]). On the other hand, programs that give employees only informational and consultative roles, like quality circles, have few effects (Levine and Tyson [1990]) and tend to be short lived (Lawler et al, [1992]; Drago [1988]).

Additionally, Ben-nér and Jones [1995] have suggested that different types of participation and control may interact in a non-linear way to influence motivation and performance. They identify two types of employee participative control, control rights and return rights. Control rights entail the determination of the 'objectives of the organisation, the positions that individuals occupy, what are the functions of these positions, who occupies them and how their occupants are induced to carry out their functions' (Ben-nér and Jones [1995]). Return rights include the 'financial and physical payoffs generated from the operation of the organisation; these can be distributed as profits, wages, working conditions, or through output quality and price' (Ben-nér and Jones [1995]). The conclusions of the research by Ben-nér and Jones is that employee participation in decision making by itself increases productivity only when it is fairly restricted. At higher levels of employee control, productivity was also found to depend crucially on the level of return rights the employees' control. Generally, the

effects of employee participation were greater where both control rights and return rights were high. Certain combinations, such as moderate return rights coupled with moderate control rights, were even found to result in a decrease in performance. Ben-ner and Jones therefore conclude that statements such as ‘profit sharing is good for productivity’ “are not very meaningful unless accompanied by a specification of employee control rights; it also matters whether little or much profit is being shared” (Ben-ner and Jones [1995]).

### **3.3.3 REINFORCEMENT THEORY**

While goal-setting theory is a cognitive approach, proposing that it is an individual’s intentions that direct his or her action, reinforcement theory is a behaviouristic approach, which argues that reinforcement conditions behaviour. Behaviourists see behaviour as being environmentally caused by reinforcers – any consequence that, when immediately following a response, increases the probability that the behaviour will be repeated. Reinforcement theory ignores the inner state of the individual and concentrates solely on what happens to a person when he or she takes some action.

As reinforcement theory does not concern itself with what initiates behaviour, it is not, strictly speaking, a theory of motivation. In its pure form, reinforcement theory ignores feelings, attitudes, expectations, and other cognitive variables that are known to have an influence on behaviour.

### **3.3.4 EQUITY THEORY**

The Equity theory of job motivation was put forward by Adams [1963]. The theory proposes that individuals are concerned not only with the absolute amount of rewards they receive for



their efforts, but also with the comparison of this amount to what others receive. Equity theory states that employees make comparisons of their job inputs and outcomes relative to those of others. Employees perceive what they get from a job situation (outcomes) in relation to what they put into it (inputs), and then compare their outcome/input ratio with that of relevant others. Evidence suggests that the referent with which an individual compares himself or herself is an important variable in equity theory. There are four referent comparisons an employee can use:

1. *Self-inside* – An employee's experiences in a different position inside his or her current organisation.
2. *Self-outside* – An employee's experiences in a situation or position outside his or her current organisation.
3. *Other-inside* – Another individual or group of individuals inside the employee's organisation.
4. *Other-outside* – Another individual or group of individuals outside the employee's organisation.

When people perceive an imbalance in their outcome/input ratio relative to others, tension is created. This tension provides the basis for motivation, as people strive for what they perceive as equity and fairness. Equity theory proposes that when employees perceive an inequity they can be predicted to make one of six choices:

1. Change their inputs (e.g., an individual may decrease the amount of effort they are willing to exert).
2. Change their outcomes (e.g., individuals paid on a piece-rate basis can increase their pay by producing a higher quantity of units of lower quality).

3. Distort perceptions of self (e.g., individuals may decide that they actually work harder than other colleagues).
4. Distort perceptions of others (e.g., an individual may decide that a colleagues job is not as desirable as they originally perceived it to be).
5. Choose a different referent (e.g., an individual may decide to compare himself or herself with a friend in a lesser job rather than a more successful work colleague).
6. Leave the field

Specifically, equity theory establishes four propositions relating to inequitable pay:

1. *Given payment by time, over-rewarded employees produce more than equitably paid employees.* Hourly and salaried employees generate high quantity or quality of production in order to increase the input side of the ratio and bring about equity.
2. *Given payment by quantity of production, over-rewarded employees produce fewer, but higher quality, units than equitably paid employees.* Individuals paid on a piece-rate basis increase their effort to achieve equity, which can result in greater quality or quantity. However, increases in quantity only increase inequity, since every unit produced results in further over-payment. Therefore, effort is directed toward increasing quality rather than increasing quantity.
3. *Given payment by time, under-rewarded employees produce less or poorer quality of output.* Effort is decreased, which brings about lower productivity or poorer output quality than equitably paid workers.
4. *Given payment by quantity of production, under-rewarded employees produce a large number of low-quality units in comparison with equitably paid employees.* Employees on piece-rate pay plans can bring about equity because trading off

quality of output for quantity results in an increase in rewards with little or no increase in contributions.

The four propositions of equity theory have generally been supported (Moorhead & Griffin [1995]). It has been found, however, that inequalities due to overpayment do not have a very significant impact on behaviour in most work situations. Employees appear to be more tolerant of overpayment inequalities than of underpayment inequalities, or are better able to rationalise them.

Although it is accepted that employees' satisfaction with organisational rewards is determined, in part, by comparisons with significant others, the process by which individuals arrive at their conclusions would be practically impossible to model. While an individual is able to make a rational calculation as to their own outcome/input ratio, they are unlikely to have the necessary information to do so with others. The whole process is more likely to be a subconscious 'feeling' that a particular referent is 'better off' or 'worse off' than oneself. This highly subjective process may or may not be a rational one and is, in any case, likely to be largely influenced by the psychological profile of the individual. For example, some individuals will have a tendency to view other people as being 'better off' than themselves, regardless of the actual situation.

### **3.3.5 EXPECTANCY THEORY**

Expectancy theory, first formulated by Vroom [1964], rejects the idea that people have fixed sets of needs and attempts to take into account human variability and complexity. Rather than

assume that all people act alike, Nadler and Lawler [1983] summarise the assumptions of expectancy theory as follows:

1. People make conscious decisions about their own behaviour in organisations, especially with regard to the amount of effort they are prepared to direct towards performing their jobs.
2. Different people have different attitudes and orientations towards work, which are expressed as different needs, desires and goals, and which can be systematically analysed.
3. People make choices between the possible alternative modes of behaviour of which they are aware. They consider the degree to which a particular course of action will lead to outcomes they desire, or at least which they think are likely to lead to such outcomes.
4. Essential to understanding human motivation in work organisations is the need to discover the different meanings people attach to work and their working environments.

Expectancy theory argues that the strength of a tendency to act in a certain way depends on the strength of an expectation that the act will be followed by a given outcome and on the attractiveness of that outcome to the individual. The theory states, therefore, that an employee is motivated to exert a high level of effort when he or she believes effort will lead to a good performance appraisal; a good appraisal will lead to organisational rewards like a bonus, a salary increase, or a promotion; and the rewards will satisfy the employee's personal goals. The theory, therefore, focuses on three relationships:

1. *Effort-performance relationship* – The probability perceived by the individual that exerting a given amount of effort would lead to improved performance.
2. *Performance-reward relationship* – The degree to which the individual believes that performing at a particular level will lead to the attainment of a desired outcome.
3. *Rewards-personal goals relationship* – The degree to which organisational rewards satisfy an individual's personal goals or needs and the attractiveness of those potential rewards for the individual.

Mathematically, the theory may be defined as:

$$F_i = E_{ij} V_j \quad \text{where} \quad \begin{array}{ll} F_i & \text{is the force to perform act } i \\ E_{ij} & \text{is the expectancy that } i \text{ (effort) will lead to outcome } j \text{ (performance)} \\ V_j & \text{is the anticipated satisfaction (valence) from outcome } j \text{ (performance)} \end{array}$$

and,

$$V_j = V_k I_{jk} \quad \text{where} \quad \begin{array}{ll} V_k & \text{is the anticipated satisfaction with outcome } k \text{ (reward)} \\ I_{jk} & \text{is the degree to which outcome } j \text{ (performance) is perceived as instrumental for the attainment of outcome } k \text{ (reward).} \end{array}$$

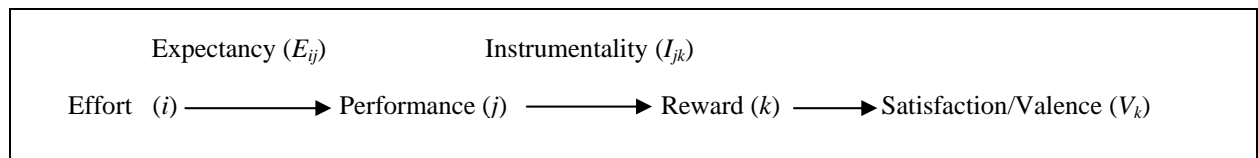


Figure 14: Summary of Vroom's Expectancy Theory

As illustrated in Figure 14, Expectancy theory states that motivation is determined by the expectancy that effort (*i*) will lead to performance (*j*), the belief that performance (*j*) will be instrumental in achieving outcome (*k*) and the attractiveness of outcome (*k*).

The concepts of expectancy and valency are central to the understanding of expectancy theory. Expectancy is defined by Vroom [1964] as the “beliefs an individual holds about the outcomes likely to result from a given work behaviour or performance”. The individual must subjectively assess the rewards receivable for achieving different levels of output and the expected necessary effort to reach those levels. The individual’s prior experience of the interaction between actions and outcomes, as well as the individual’s level of self-esteem, influence his or her subjective appraisal of these relationships and his or her subjective estimation of the probability that a particular course will lead to particular outcomes (Lawler [1973]).

Valence describes the level of satisfaction or dissatisfaction an individual expects to receive from various outcomes resulting from different actions and behaviour. Once again, expectancy theory does not assume that peoples’ perceptions of desirable outcomes (positive valency) and undesirable outcomes (negative valency) will be universal. The individual’s attitudes and orientations towards work will be a large influence on their perceptions of desirable and undesirable outcomes.

The management implications of expectancy theory are that in order to increase motivation and productivity the management must ensure that the outcomes employees perceive as positively valent are also seen by those employees as being the actual outcomes of prescribed levels of job performance. It is also important that employees see negative valencies as being associated with low levels of job performance.

Generally, expectancy theorists consider there to be two types of rewards available to individuals in work environments: intrinsic and extrinsic rewards. Intrinsic rewards are the rewards that an individual receives subjectively from actually doing the job, such as feelings of achievement, challenge, competence and self-worth. As mentioned in Section 3.3.1, organisations are unable to give these rewards directly, but they are able to develop a structure and culture that makes them more likely. Extrinsic rewards are rewards administered by agents external to the individual and include payment systems, promotion, fringe benefits and job security. The interaction of the two types of rewards may not produce a simple, linear relationship with satisfaction and motivation. CET theory (see Section 3.2.5) suggests that increasing extrinsic rewards may have a negative effect on intrinsic motivation for some people.

There is a vast amount of empirical research investigating the validity of expectancy theory as a model of employee motivation (Baker, Ravichandran and Randall [1989]; Liddell and Solomon [1977]; Peters [1977]; Stahl and Harrell [1981]). One of the most complete tests of the model was conducted by Peters [1977] who concluded that the “expectancy theory variables are causally related to effort expenditure” and that the subjects under study were only willing to work longer than needed to complete a task when “increases in effort were associated with increases in performance, and increased performance resulted in the greater likelihood of attaining a valued outcome” (Peters [1977]).

“Expectancy theory is so complicated that researchers have found it quite difficult to test. In particular, the measures of various parts of the model may lack validity, and the procedures for investigating relationships among the variables often have been less scientific than researchers would like” (Moorhead and Griffin [1995]). As a result of the difficulty in testing the model as a whole, many researchers have designed studies to test particular aspects of the model.

### 3.3.5.1 TEST OF THE TRANSITIVITY POSTULATE

Liddell and Solomon [1977] tested whether subjects were able to preference order job outcomes ( $V_k$ 's) in a transitive manner. “Expectancy theory is based on the premise that people subjectively assign values to the expected outcomes ( $V_k$ 's) of various courses of action, and therefore have preferences among the outcomes” (Liddell and Solomon [1977]). This premise makes consistent preference ordering of outcomes ( $V_k$ 's), or a demonstration of transitivity (if  $V_{k1} > V_{k2}$  ;  $V_{k2} > V_{k3}$  ; then  $V_{k1} > V_{k3}$  *not*  $V_{k3} > V_{k1}$ ), critical to the validity of expectancy theory.

Behling and Starke [1973] and Wahba and House [1974] maintained that people are not completely transitive and therefore questioned the validity of expectancy theory. Liddell and Solomon [1977], however, question the research methods that were used in the studies that concluded that people are not transitive. They claim that the reason for the studies finding a high level of intransitives is that indifference judgements were not permitted. As Edwards [1954] points out, “If subjects are truly indifferent and are forced to make a choice, the decision might be made on a random basis. This would result in an intransitivity one-fourth of the time”.



Moreover, all of the transitivity studies up to Liddell and Solomon [1977] used single observations to determine subject preferences between outcomes. It was assumed that the chosen alternative was the preferred outcome with total certainty. Davis [1958] claims that where the subject is indifferent or close to indifference and is forced to make a choice between outcomes, he or she might not always prefer the same outcome. Liddell and Solomon [1977] used repeated stimuli to enable them to test against stochastic transitivity criteria, where subjects have a probabilistic preference, rather than static or total transitivity used in earlier studies.

In their study, Liddell and Solomon [1977] found that of the 94 intransitive triads found, only 13 could not be accounted for by some level of stochastic transitivity. As these 13 unaccounted for findings were the only ones out of a potential 3,472 intransitives, they concluded that “expectancy theory cannot be rejected on the basis of failure to meet the transitivity assumption” (Liddell & Solomon [1977]).

#### 3.3.5.2 ALTERNATIVE FORMULATIONS OF THE EXPECTANCY MODEL

In his original formulation of expectancy theory, Vroom [1964] hypothesised a multiplicative motivational-force model in which valence and expectancy interacted with each other to produce motivational effort ( $V_j \times E_{ij}$ , where  $V_j$  = valence of outcomes and  $E_{ij}$  = expectancy level). In this formulation, expectancy theory maintains that the total force for an action is not increased by outcomes without valence or by outcomes viewed as improbable results from the actions. The multiplicative formulation has received extensive empirical support (Lawler

[1974]; Bartol [1976]; Parker & Dyer [1976]; Sheridan, Richards & Slocum [1974 & 1975]; Vroom [1964 & 1966]).

It has been suggested (Harrell & Stahl [1986]) that a simpler additive function usually explained most of the variance in decisions reached by most individuals. Harrell and Stahl [1986] as well as Slovic, Fischhoff and Lichtenstein [1977] suggest that the multiplicative model of the interaction between valence and expectancy is too complex a cognitive process for many individuals to employ. Thus, individuals may rely on a cognitively simple decision making approach and add together cues about valence and expectancy ( $V_j + E_{ij}$ ). This alternative formulation has also received considerable empirical support (Butler & Womer [1985]; Harrell & Stahl [1986]; Mitchell [1982]; Rynes & Lawler [1983]; Stahl & Harrell [1981]).

As well as altering the interaction between the valence term and the expectancy term, the valence term itself may be modelled as linear or non-linear. Naylor, Pritchard and Ilgen [1980] have suggested that an individual's assessment of valence may be a utility type function, which characteristically exhibits a curvilinear relationship between units of an object and the ability of that object to satisfy some need. Increasing levels of an outcome, therefore, may not be reflected in uniform increases in valence. Increases in outcome may even result in decreases in valence after a saturation point is reached. These effects can be modelled by including a non-linear valence term in the formulation. Cohen and Cohen [1975] have suggested that such a non-linear, utility type relationship may be modelled with a squared valence term in either the additive or multiplicative formulations ( $V_j^2 + E_{ij}$  or  $V_j^2 \times E_{ij}$ ).

Baker, Ravichandran and Randall [1989] tested all four proposed expectancy model formulations ( $V_j \times E_{ij}$ ;  $V_j + E_{ij}$ ;  $V_j^2 + E_{ij}$  and  $V_j^2 \times E_{ij}$ ). They found considerable support for each of the formulations and concluded that the results indicated that individuals do employ different decision processes when selecting a job and that neither the simple additive model nor Vroom's original multiplicative formulation of expectancy theory adequately mirror all of these processes. To fully represent the range of functional forms that expectancy calculations can take, it is necessary to include non-linear valence terms in the expectancy equations for some individuals (Baker, Ravichandran and Randall [1989]).

Various factors have been suggested to influence the functional form of the valence and expectancy calculations. Mischel [1976] and Shiflett and Cohen [1982] have suggested that situational factors such as information complexity, ambiguity, concreteness, outcome type, sign, frequency, range and magnitude may influence the form decision models take. For example, complex or ambiguous decision information may cause individuals to use simple decision rules because of their cognitive processing limitations (Brehmer [1974]; Landy & Becker [1987]; Miller [1956]).

The impact of situational factors on expectancy model formulations may be moderated by intelligence, personality and norms (Naylor, Pritchard & Ilgen [1980]). Cognitive ability, due to lack of aptitude or limited training and practice, may limit an individual's capacity for manipulating more complex formulations of valence and expectancy (Harrell & Stahl [1981]; Zedeck [1977]). Personality factors, such as need for achievement, may also affect

expectancy model calculations by influencing the perceived level and functional form of outcome valences (Mayes [1978]; Staw [1977]).

### 3.3.5.3 THE EFFECT OF FEEDBACK ON PERCEPTIONS OF INSTRUMENTALITY AND EXPECTANCY

Lawler [1973] stated that communications from others influence one's perceptions of both instrumentality and expectancy. Information about past performance clarifies the individual's understanding of good performance. Hence, when rewards are administered for that performance, the individual can establish a link between performance and the reward (Ilgen et al. [1979]). The expectancy component of motivation is based upon the individual's belief that increased effort will produce increased performance. Since feedback enhances the recipient's perceptions of competence, it also enhances the perceived likelihood that effort will result in the desired performance level.

Pavett [1983] examined the relative salience of feedback from supervisors, co-workers and the job itself as predictors of motivation and ratings of performance within an expectancy theory framework. Pavett found that while no relationship was found between feedback and expectancy perceptions, "motivation, as formulated via expectancy theory, is significantly related to feedback" (Pavett [1979]). Supporting earlier work by Deci [1972], Pavett concluded that feedback not only influences intrinsic motivation, but is "also related to the instrumentality of performance for the organisationally mediated rewards of pay and promotion" (Pavett [1979]).

# CHAPTER FOUR

## 4 MODELS OF MOTIVATION

### 4.1 INTRODUCTION

Business modelling is concerned with describing the inter-relationships between the different aspects of a business using a system of mathematical and logical relationships in order to reduce uncertainty and aid management decision-making. McInnes and Carleton [1982] state that “models appear principally to be developed to represent and deal with complexity, providing an efficient means of formally capturing understanding about the workings of the enterprise, and the calculational capability to generate outcome projections from a set of input assumptions”.

This Chapter focuses on two existing models of motivation, Hackman and Oldham’s Job Characteristics Model and Porter and Lawler’s Expectancy Model of Motivation. The two models are differentiated from the theories discussed in Chapter 3 in that they offer a more complete motivational framework. Whilst both models are integrative in their approach (see Bong’s classification in Section 1.1), Hackman and Oldham’s model is primarily social-cognitive while the Porter and Lawler model is primarily cognitive based. The empirical evidence supporting each model is examined before a critique forwarded in terms of the model’s validity and usefulness as a management tool.

## 4.2 HACKMAN AND OLDHAM'S JOB CHARACTERISTICS MODEL

The Job Characteristics Model by Hackman and Oldham [1976] focuses on the interaction between the psychological states of employees, the job characteristics that are believed to determine these states and the attributes of individuals that determine how positively a person will respond to a complex and challenging job. Figure 15 is a diagrammatic representation of the Job Characteristics Model.

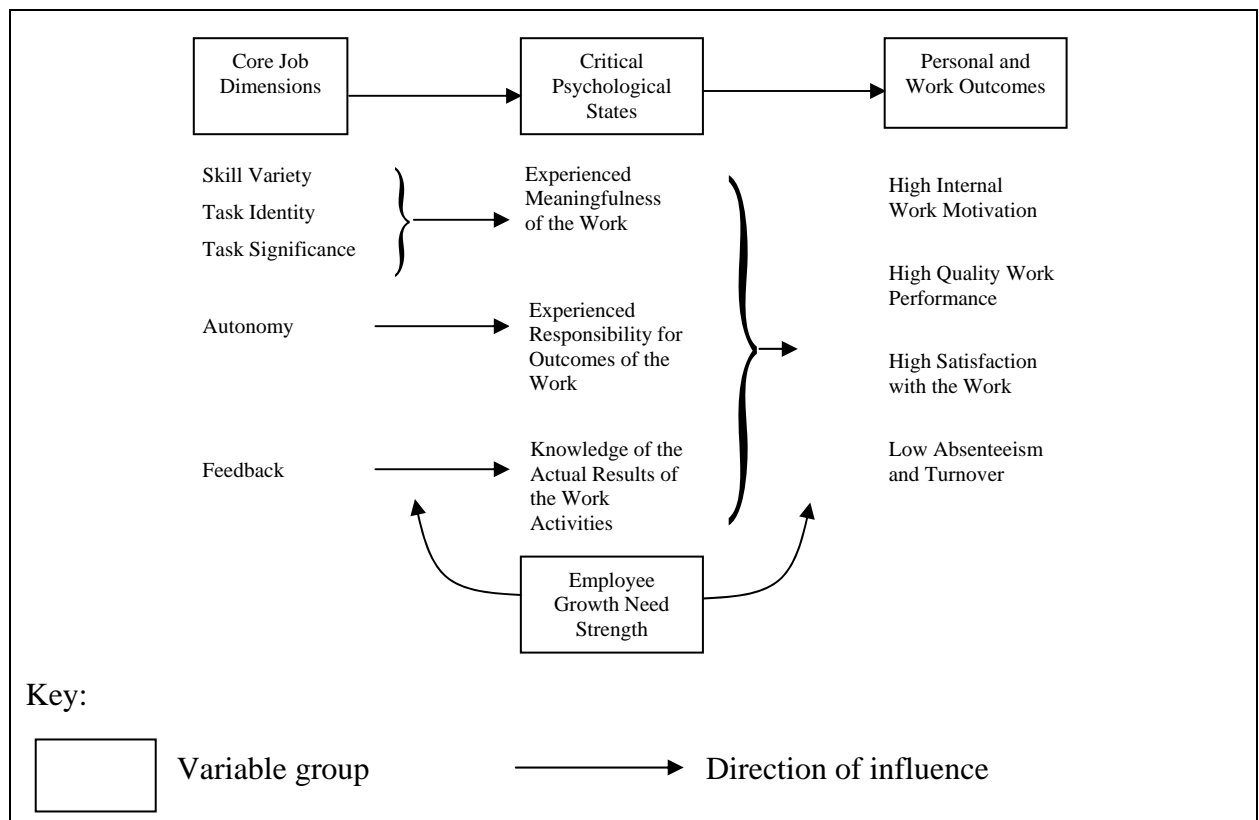


Figure 15: Hackman and Oldham's Job Characteristics Model

The core job dimensions are seen as prompting three psychological states that, in turn, lead to a number of beneficial personal and work outcomes. The critical psychological states are defined as follows:

1. *Experienced meaningfulness of the work.* The degree to which the individual experiences the job as generally meaningful, valuable and worthwhile.
2. *Experienced responsibility for the work outcomes.* The degree to which individuals feel personally accountable and responsible for the results of their work.
3. *Knowledge of results.* The degree to which individuals continuously understand how effectively they are performing.

The theory proposes that employees who experience these states at sufficiently high levels are likely to feel good about themselves and respond favourably to their jobs. The model suggests that five core job dimensions can be seen as determining the extent to which employees experience the three critical psychological states:

1. *Skill variety.* The degree to which the job requires a variety of activities that involve different skills and talents.
2. *Task identity.* The degree to which the job requires completion of a 'whole' and identifiable piece of work, that is, a job that has a beginning and an end with a tangible outcome.
3. *Task significance.* The degree to which the job affects the lives or work of other people, both in the immediate organisation and in the external environment.
4. *Autonomy.* The degree to which the job allows the individual substantial freedom, independence and discretion to schedule the work and determine the procedures for carrying it out.
5. *Feedback.* The degree to which the job activities give the individual direct and clear information about the effectiveness of his or her performance.

Specifically, skill variety, task identity and task significance are seen combining to form the experienced meaningfulness of the work. It is proposed, therefore, that jobs that require the use of several different skills, allow employees to complete a substantial piece of work (as opposed to the continuous repetition of a simple task) and are seen as having an impact on other people will be thought of as worthwhile and meaningful by the workers in those jobs. Job autonomy is seen as determining experienced responsibility for the outcomes of the work and feedback is seen as determining knowledge of the actual results of the work activities.

The three psychological states are then seen as combining to determine various personal and work outcomes such as high internal work motivation (i.e. intrinsic motivation), high-quality work performance, high satisfaction with the work, and low absenteeism and turnover.

To summarise, the model postulates that an individual experiences positive affect to the extent that he/she *learns* (knowledge of results) that he/she *personally* (experienced responsibility) has performed well on a task that he/she *cares* about (experienced meaningfulness).

There is substantial evidence that differences among people moderate how they react to their work (see Section 3.2 for a description of how peoples differing needs may influence their work behaviour). The Hackman and Oldham model incorporates this effect by including a variable termed ‘growth need strength’ (GNS), which may be thought of as the attributes of individuals that determine how positively a person will respond to a complex and challenging job. Hackman and Oldham propose that an individual with a high GNS will react more



positively to a job high in the five core job dimensions than an individual with a low GNS. Furthermore, GNS may influence the link between the objective job dimensions and the psychological states or at the link between the psychological states and the outcome variables. The first link suggests that people with a high GNS are more likely (or better able) to experience the psychological states while that latter suggests that individuals with a high GNS react more positively to the psychological states.

Hackman and Oldham used a multiplicative model to determine the overall motivating potential of a job. The Motivating Potential Score (MPS) was calculated using the formula:

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

In order to test the Job Characteristics Theory, Hackman and Oldham developed the Job Diagnostic Survey (JDS), which measures employee perceptions of job characteristics, various psychological states, personal and work outcomes, and strength of growth needs. Appendix I shows the JDS questionnaire and the guidelines for analysing the data.

Figure 16 illustrates the use of the data obtained from the JDS. The graph on the left summarises the level of each of the five job characteristics for two hypothetical jobs while the graph on the right shows each job's MPS calculated using the formula shown above.

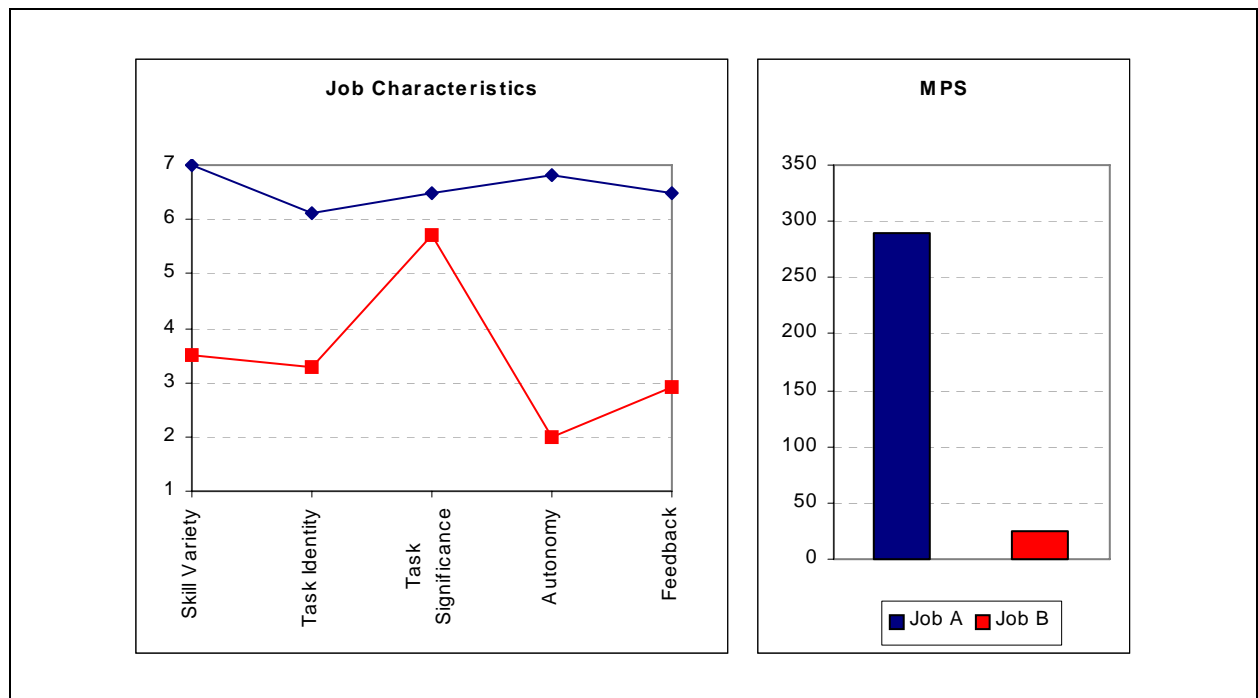


Figure 16: JDS Profile of 'Good' and 'Bad' Jobs

#### 4.2.1 EMPIRICAL EVIDENCE AND EVALUATION

Although it may be argued that the inclusion of the psychological states in the Job Characteristics Model is an attempt to incorporate the cognitive processes involved in motivation, the model is primarily social-cognitive in that it relates job dimensions to motivation and other personal outcomes. The model also clearly follows an integrative approach in that it includes elements of more than one motivational theory discussed in Chapter 3. Firstly, the structure of the model indicates influences from the need-based theories. By listing five core job dimensions that determine three psychological states the model implies that meaningful work, responsibility for the work outcomes and knowledge of the outcomes are the pertinent needs for workers and that skill variety, task identity, task

significance, autonomy and feedback are the job attributes that satisfy these needs. Moreover, the needs for meaningful work, responsibility and knowledge of outcomes all relate to higher order needs (i.e. ego and self-actualisation needs in Maslow's hierarchy or growth needs in Alderfer's ERG theory). The model also draws from need theories in that it acknowledges that people will desire these higher order needs to differing degrees. The 'Growth need strength' variable essentially places workers at different levels of their need hierarchy and the model proposes that workers' responses to the job dimensions will vary accordingly.

Although the model does not specifically mention task difficulty as a job characteristic, it is reasonable to assume that Skill Variety could incorporate its influences. Jobs that involve the repetition of one activity, requiring few skills or talents may be assumed to be low in task difficulty while jobs that involve a wide variety of activities and skills may be thought of as being high in task difficulty. Given that the model also includes Feedback as one of the five measured job characteristics, it may be argued that the model incorporates some of the principles of Goal Setting Theory (see Section 3.3.2).

#### 4.2.1.1 HACKMAN AND OLDHAM'S EMPIRICAL EVIDENCE

Hackman and Oldham provide strong support for their Job Characteristics Model. Appendix II summarises the results of their test of the theory (Hackman & Oldham [1976]).

Generally, strong support was found for the proposition that the psychological states mediate between the job dimensions and the outcome measures. However, two anomalies were found in the data that were not predicted by the model. Firstly, experienced responsibility was found

to be determined not only by autonomy, but by other job dimensions as well and, secondly, autonomy was found to have direct effects upon certain outcome variables that equalled or exceed its predicted indirect impact via experienced responsibility. Hackman and Oldham explained these anomalies by stating that they may derive partly from the relationships among the job dimensions themselves. “The five dimensions are not empirically independent, nor would they be expected to be. Jobs that are ‘good’ are often good in several ways, and jobs that are ‘bad’ often are generally bad. Thus, it may be that autonomy, at least in part, serves to summarise the overall complexity of a job, and that it therefore is both more multiply determined and has a greater diversity of effects than do the other job dimensions.” (Hackman and Oldham [1976]).

A moderate amount of variance in the psychological states was found to be controlled by the model-specified job dimensions. However, as stated above, it was found that experienced responsibility was predicted almost equally by all five of the job dimensions. This indicates that the actual relationship between the job dimensions and psychological states may not be exactly as the model predicts.

Differences in the magnitude of the correlations for high vs. low ‘growth need strength’ (GNS) employees on the psychological state-outcomes relationship were all in the predicted direction and statistically significant. The relationships between the core job characteristics and the psychological states for high vs. low GNS employees showed differences in the predicted direction and were (except for Task Identity) statistically significant. GNS seems, therefore, to mediate at both links.

The form of the model was tested for goodness of fit against four alternative formulations. The five formulations and the correlations obtained are shown in Figure 17.

Alternative models	Outcome Measures (Correlations)		
	Internal Motivation	General Satisfaction	Growth Satisfaction
MPS $\left[ \left( \frac{SV + TI + TS}{3} \right) \times A \times F \right]$	.46	.49	.63
Full multiplicative [SV x TI x TS x A x F]	.44	.45	.58
Simple additive [SV + TI + TS + A + F]	.51	.52	.67
Multiple regression	.52	.53	.69
Cross-validated regression	.52	.53	.68

Figure 17: Comparison of Several Models for Combining the Job Dimensions (Hackman and Oldham [1976])

It was found that the regression model had the highest correlation and full multiplicative the lowest, but differences were very small. Therefore, the original Motivating Potential Score formulation (MPS) was not disconfirmed by the data, nor was it shown to be better than other, simpler methods.

#### 4.2.1.2 WALL, CLEGG AND JACKSON'S EMPIRICAL EVIDENCE

Whereas Hackman and Oldham's test of the theory focused on testing a heterogeneous group of 658 employees in 62 different jobs in seven different organisations, the research of Wall, Clegg and Jackson (Wall, Clegg and Jackson [1978]) explored the validity of the model upon an homogeneous group of 47 shop floor workers. Wall et al. also examined the causal links

specified by the model, as well as the possibility of the existence of causal links not specified, using path analysis.

Analysing the data by zero-order correlation of the relationships amongst the model-specified variables, Wall et al. found considerable support for the model. In fact, their data was slightly more supportive of the model than that of Hackman and Oldham.

A test of the mediating function of the critical psychological states between the job dimensions and the outcome variables using multiple regression also found moderate support for the model, comparable to the support found by Hackman and Oldham. On the basis of these results, Wall et al. stated that “the present findings provide equal support showing that it [the model] can be as valid in the limited range as it is with the large heterogeneous sample on which it was developed” (Wall, Clegg and Jackson [1978]).

However, Wall et al. go on to explain that analysis by stepwise multiple regression falls short of a full evaluation in three ways. “First, entering the core job dimensions as a single category into the regression equation precludes examination of the model’s predictions concerning the particular pattern of relationships that should be found between these variables and the critical psychological states. Secondly, by treating the critical psychological states as a single category the respective contributions of its constituent variables are left unexplored. Is it the case, for example, that all three critical psychological states play an equal part as predictors of the outcome variables? Finally, the particular job dimensions which violate the model’s predictions, by relating to the outcome variables independently from the critical psychological

states, remain unidentified. Path analysis allows examination of all these issues within a single framework, providing not only a test of the finer aspects of the Job Characteristics Model but also an evaluation of its adequacy as a whole” (Wall, Clegg and Jackson [1978]).

Path analysis separates each relationship between variables into two components (Land [1969]). The *direct component* reflects the posited causal effect of one variable on the other and the *indirect component* reflects the sum of all effects on that relationship attributable to other variables in the system. This enables the examination of specified causal relationships in isolation from secondary effects that may otherwise confound the issue. Path analysis also allows the specified model to be statistically tested against an alternative model.

Wall et al. tested the Job Characteristics Model against one which incorporates causal paths from all five core job dimensions to each of the three critical psychological states and to each of the three outcome variables (Wall et al. considered only general satisfaction, internal work motivation and growth satisfaction as the outcome measures). The specified and alternative models were tested using both their own data and the data collected by Hackman and Oldham. The results are shown in Figure 18 and Figure 19. In both figures, the causal links of the specified model are shown in bold lines and those of the alternative model encompass both these and the broken lines. The specified model comprises 14 causal links while the alternative model incorporates 39.

In both cases, using both their own data and that of Hackman and Oldham, Wall et al. found that the alternative model accounted for a significantly greater proportion of the total variance

than the specified model. Thus, wall et al. concluded that “there are important causal paths other than those included in the job characteristics model” (Wall, Clegg and Jackson [1978]).

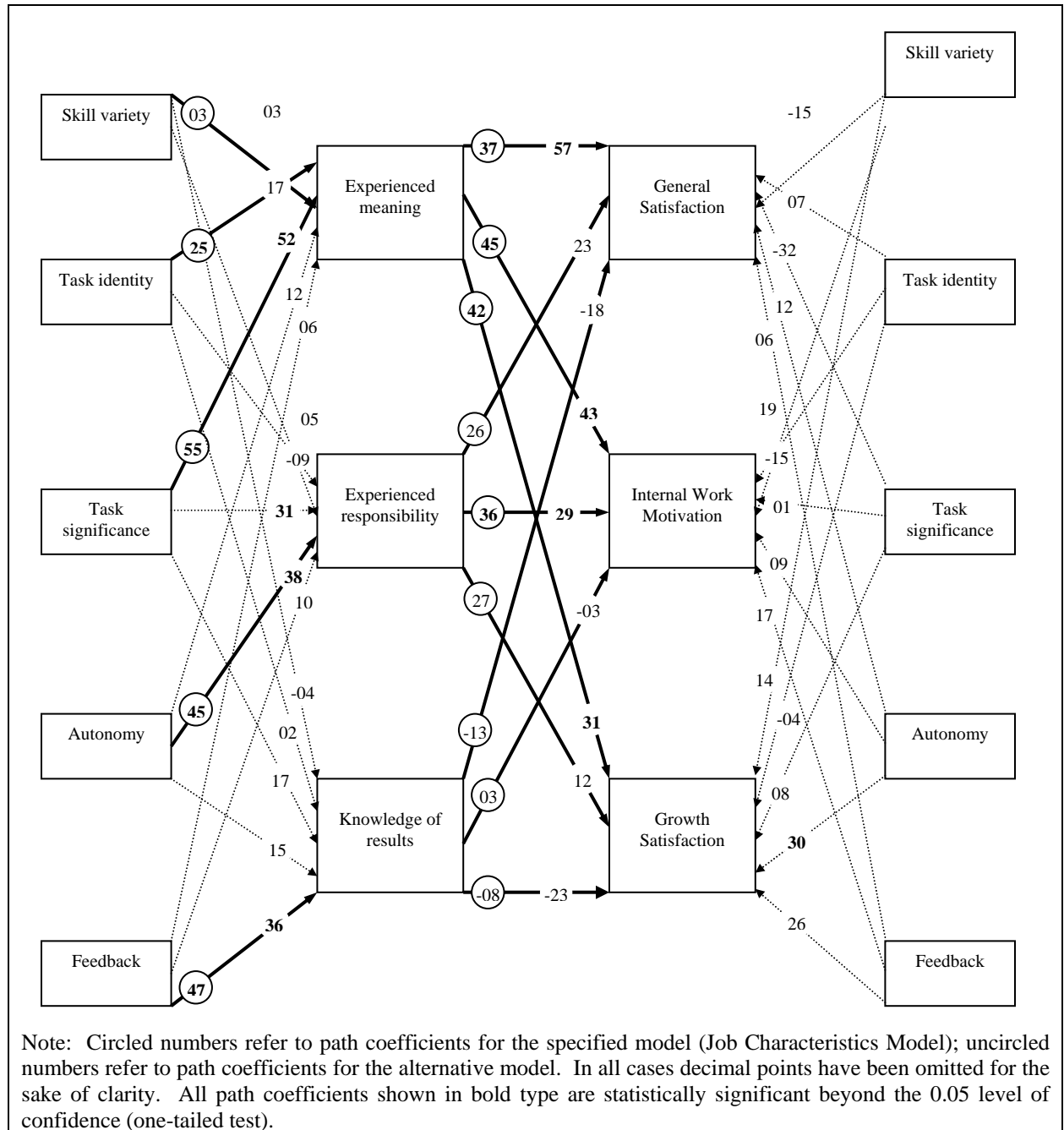


Figure 18: Path Analysis of the Job Characteristics Model using Wall, Clegg and Jackson data (Wall, Clegg and Jackson [1978])



From Figure 18 it may be seen that only one path, between task significance and experienced responsibility, violates the specified model between the job dimensions and the psychological states using the Wall et al. data. This is not sufficient in itself to add significantly to the variance accounted for in the psychological states. The Hackman and Oldham data, however, shows nine of the ten path coefficients which the Job Characteristics Model requires to be negligible (those depicted by broken lines) are in fact substantial and the addition of the relationships represented by the broken lines significantly increases the variance in each critical psychological state accounted for by the job dimensions. The one relationship that was not found to be significant was between task identity and knowledge of results. Wall et al. concluded that “this part of the Job Characteristics Model [the relationship between the job dimensions and psychological states], therefore, fits the present findings better than those of Hackman and Oldham in that fewer relationships precluded by the model are found to exist” (Wall, Clegg and Jackson [1978]).

Considering the relationships between the job dimensions and the outcome variables, similar results are found. The specified model predicts no direct relationship between the job dimensions and the outcome measures while the alternative model incorporates 15. The data from Wall et al. showed only one significant relationship, between autonomy and growth satisfaction. In Hackman and Oldham’s data seven violations are found. Skill variety is directly and significantly related to internal work motivation and growth satisfaction; task significance to general satisfaction; autonomy to general and growth satisfaction; and feedback to internal work motivation and growth satisfaction. The addition of these relationships gives a statistically significant increase in the variance of the outcome variables

accounted for by the job dimensions. “Both sets of findings, but more particularly Hackman and Oldham’s, contain evidence of direct relationships between core job dimensions and outcome variables which should not exist according to the Job Characteristics Model” (Wall, Clegg and Jackson [1978]).

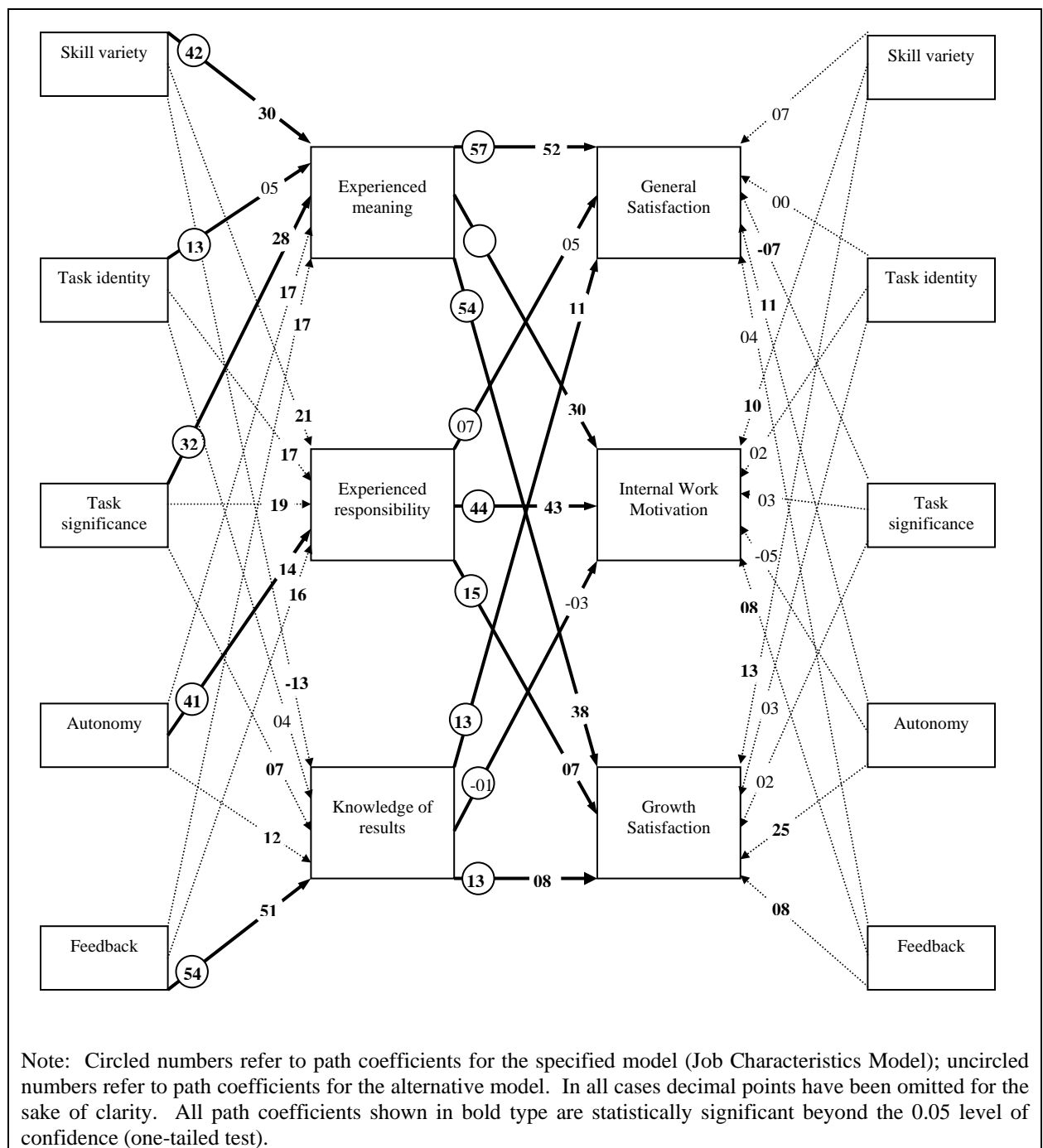


Figure 19: Path Analysis of the Job Characteristics Model using Hackman and Oldham data (Wall, Clegg and Jackson [1978])

The research of Wall et al. emphasised the fact that although the model was found to be applicable to a homogeneous group as well as a large cross-section of employees, the structure

of the model itself may be questioned. The mediating function of the critical psychological states (considered collectively) received some support but, at a more specific level, several violations were found to exist. Each of the psychological states had a different status within the model, with meaning playing an important role, knowledge of results an insignificant one, and responsibility falling between the two. Moreover, several relationships specified by the model were not found to exist and some job dimensions were related to the psychological states and outcome measures in ways not specified by the model.

#### **4.2.2 CRITIQUE**

##### **4.2.2.1 THE EFFECTS OF ORGANISATIONAL STRUCTURE**

Hackman & Oldham's model can be thought of as having three 'levels'. The 'personal and work outcomes' are seen as being influenced by the 'psychological states', which, in turn, are seen as being influenced by the 'job characteristics'. Chapter 2 explained how the characteristics of a job are influenced by the structure of the organisation. The model may therefore be considered to be incomplete and it seems reasonable to include a fourth level into the model, with the organisational structure determining the job characteristics. These modifications are discussed in Section 5.2.1.

##### **4.2.2.2 EXTRINSIC REWARDS AND MOTIVATION**

The three psychological states used in the model – experienced meaningfulness of the work, experienced responsibility for the outcomes of the work and knowledge of the actual results of the work activities – can all be classed as intrinsic to the job itself. As a result the model predicts only intrinsic (internal) motivation. The effects of extrinsic rewards, such as pay and

other benefits, hours of work and working conditions, and the resulting extrinsic motivation are ignored. The modifications to the model to incorporate the extrinsic factors are discussed in Section 5.2.2.

#### 4.2.2.3 ADDITIONAL JOB CHARACTERISTICS

There are several job dimensions that have been found to have an effect on worker satisfaction and motivation that are not included in Hackman and Oldham's formulation of the model. For example, social relationships (see ERG Theory in Section 3.2.3 or McClelland's Theory of Needs in Section 3.2.4), participation in the setting of goals and work load (see Goal Setting Theory in Section 3.3.2) as well as the extrinsic elements mentioned in Section 4.2.2.2 have all been found to play an important role in determining worker motivation. Section 5.2.2 discusses the modifications required to include the additional job characteristics.

#### 4.2.2.4 THE MEDIATING FUNCTION OF THE CRITICAL PSYCHOLOGICAL STATES

In light of the empirical evidence provided by Wall et al. and Hackman and Oldham's own admission that "the links between the job dimensions and the psychological states are not as neat and clean as suggested in [the model]" (Hackman and Oldham [1980]), it may be argued that the role of the psychological states needs to be re-examined. Indeed, the hypothesis that satisfaction and motivation can be determined from the existence of certain felt psychological states, such as experienced responsibility, may be misconceived. An individual may experience a great deal of responsibility in their job but if they do not desire that responsibility it is unlikely to have a positive effect on their motivation. The restructuring of the influence of the psychological states is discussed in Section 5.2.3.

#### 4.2.2.5 COGNITIVE PROCESSES

It may be argued that the Job Characteristics Model does not really explain the cognitive process by which the receipt of rewards are converted into motivation and effort on the part of the worker. For example, the model classes satisfaction, motivation and performance as independent outcome measures and does not attempt to explain the interactions between them. Porter and Lawler's Expectancy Model of Motivation (see Section 4.3) goes some way towards explaining the cognitive processes involved in human motivation and performance and the relationships between satisfaction, motivation and performance. Section 5.2.4 discusses how the model can be modified to incorporate the cognitive processes of motivation.

#### 4.2.2.6 USEFULNESS AS A MANAGEMENT TOOL

The Job Characteristics Model does allow a certain amount of 'what if' analysis to be conducted. The effects of varying the amounts of the five job characteristics upon the three psychological states and the outcome measures may be examined, although the three psychological states used in the model – experienced meaningfulness, experienced responsibility and knowledge of results – are likely to be of little real interest to management. Most managers would be far more interested in variables that are familiar to them, such as satisfaction, motivation, effort and performance. This, coupled with the fact that the psychological states play an uncertain role in the formation of motivation and effort (see Section 4.2.2.4) and the other criticisms cited in Sections 4.2.2.1 to 4.2.2.4 severely limits the overall usefulness of the model to the management of an organisation.

### 4.3 PORTER AND LAWLER'S EXPECTANCY MODEL OF MOTIVATION

Porter and Lawler's expectancy model of motivation (Porter and Lawler [1968]) is built around the principals of Vroom's expectancy theory (see Section 3.3.5). A summary of the model is shown in Figure 20.

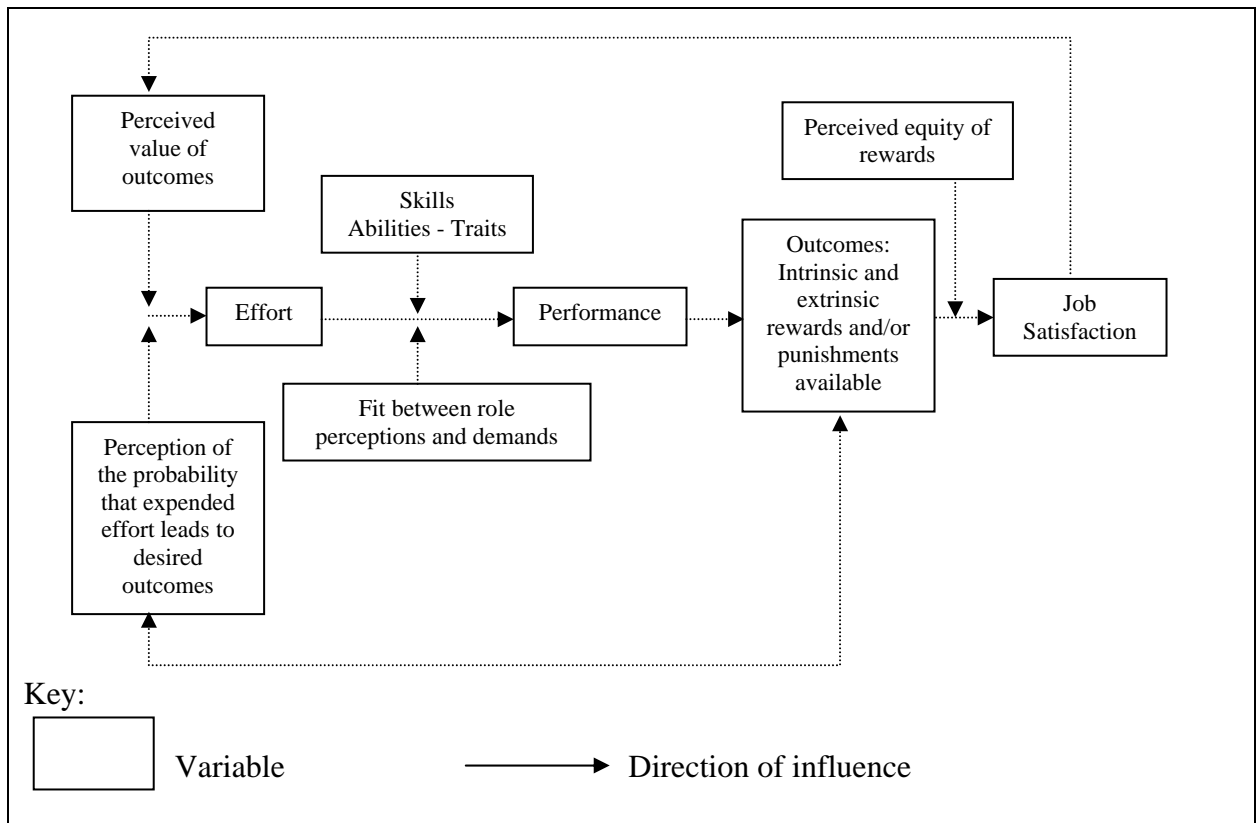


Figure 20: The Expectancy Model of Motivation (Taken from Johnson and Gill [1993])

If the model is compared to the explanation of expectancy theory provided in Section 3.3.5 (summarised in Figure 21 below), the foundations of Porter and Lawler's model become obvious. Specifically, the model proposes that two factors determine the amount of effort expended in the completion of a task. Firstly, the rewards that the individual receives from doing the job, including both extrinsic rewards such as pay and intrinsic rewards such as a

sense of achievement, form the perception that expended effort will lead to the receipt of desired rewards in the mind of the individual. This forms the expectancy and instrumentality part of Vroom's theory. Secondly, the rewards received combine with the level of desire the individual has for those rewards to form a level of job satisfaction. This then forms a perceived value of the rewards, which is analogous to the valence part of Vroom's theory. As dictated by expectancy theory, the perception that effort leads to desired rewards (expectancy) and the value of outcomes (valence) combine to form the level of motivation<sup>2</sup>.

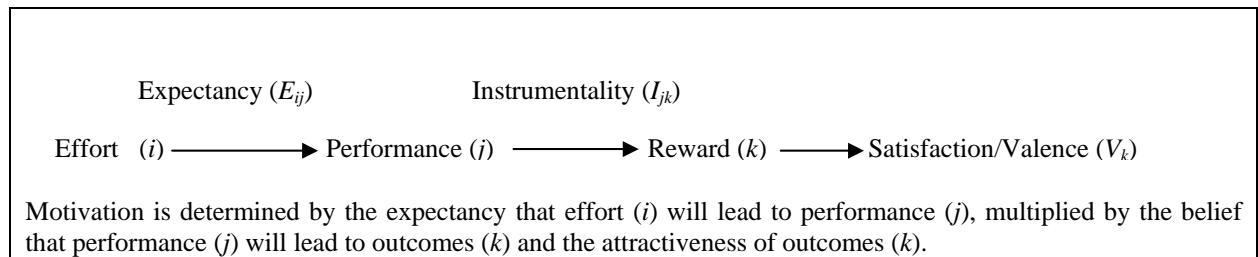


Figure 21: Summary of Vroom's Expectancy Theory

The expectancy model of motivation thus proposes that there are two ways in which an individual's motivation and effort may be increased. Firstly, through increasing the quantity of rewards received, thus increasing both the perception that effort leads to desired rewards and the perceived value of the rewards. Secondly, the individual's desire for the rewards may increase, thus increasing job satisfaction and therefore the perceived value of the rewards.

In the original formulation of the Expectancy Model of Motivation (see Figure 20), the level of skills and abilities the individual possesses and the fit between their perceived role and the

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<sup>2</sup> Although a motivation term is not shown in Figure 20 one may be inserted directly before the effort term at the point where the perception and value terms meet.



actual demands of the job combine with the level of effort to determine the level of performance. As the relationship between effort and performance is not the primary concern of this research and as the interaction between ability and motivation as posited by the model has been called into question (Terborg [1977]), a direct relationship between effort and performance is assumed. The two contributing variables of abilities and role perceptions are therefore omitted from subsequent discussion of the model.

#### **4.3.1 EMPIRICAL EVIDENCE AND EVALUATION**

The empirical evidence supporting expectancy theory, around which Porter and Lawler's model is based, was reviewed in Section 3.3.5.

#### **4.3.2 CRITIQUE**

##### **4.3.2.1 THE CONCEPTUALISATION OF THE EFFORT – DESIRED REWARDS RELATIONSHIP**

It is believed by the author that the influence from the 'Rewards' variable directly into the 'Perception of the probability that expended effort leads to desired rewards' is misplaced. The important point to note is that the perception variable is determined by the receipt of *desired* rewards, not by the receipt of rewards per se. Thus, if an individual receives rewards that are undesirable to them, then their perception that effort leads to desirable rewards will be low, regardless of the quantity of rewards received. For this relationship to be modelled correctly, a measure of the importance of the rewards to the individual must also be a determinant of the perception variable. This is not the case in the Porter and Lawler model.

As an example, it seems perfectly reasonable to presume that a worker who does not value intrinsic rewards may nevertheless have a high level of satisfaction with intrinsic rewards.

Indeed, the very fact that they are not concerned with the intrinsic aspects of the job may be found to positively influence their level of satisfaction with those rewards. Such a worker would not, though, perceive a high correlation between effort and desired rewards, as the intrinsic rewards received would not be desired. The modifications to the model to correct this problem are discussed in Section 5.3.1.

#### 4.3.2.2 CONCEPTUAL DIFFERENCES BETWEEN SATISFACTION AND MOTIVATION

As stated in Section 4.3.2.1, a worker may be satisfied with a reward without actually valuing that reward. It may be argued, therefore, that the relationship between satisfaction, motivation and effort in the original model is misconceived. In the Porter and Lawler conceptualisation of the model, the rewards received combine with the employee's perception of equity to form a level of job satisfaction. The point of concern here is whether satisfaction can be equated with motivation and therefore be regarded as a reasonable predictor of effort. It is the conviction of the author that it cannot. It seems entirely consistent for an employee to be highly satisfied with the level of a reward but still display low levels of motivation and effort where their level of desire for that reward is low.

Satisfaction with, say, the level of skill variety in a job may be high where the individual has a high desire for skill variety and the job provides a high level of skill variety. In this situation, the individual would indeed be expected to display high levels of motivation and effort. However, satisfaction with the level of skill variety may also be high where the job provides little skill variety but the individual has little desire for that reward. In this instance, although satisfaction would be high, the positive influence on motivation and effort would be expected

to be low. This would not be the case in the original model where high satisfaction equates in all circumstances to high effort.

To illustrate to point, consider a worker who has won a large amount of money on the lottery, but who continues to work to enjoy their social relationships with colleagues. Such a person would have little need for the rewards of the job, save perhaps the need for social relationships, but may report that they are perfectly satisfied with their job. The Porter and Lawler model would predict this person to be highly motivated and display a high level of effort. It is perhaps more reasonable, however, to assume that this worker, although highly satisfied, may not display high levels of motivation and effort.

The modified model, therefore, needs to explicitly model satisfaction and motivation variables as different entities to take account of these conceptual differences. These modifications to the model are discussed in Section 5.3.2.

#### 4.3.2.3 THE DIFFERENCES BETWEEN INTRINSIC AND EXTRINSIC FACTORS

It is clear from the points made in Sections 4.3.2.1 and 4.3.2.2 that in order to fully account for the differences in individual workers needs, intrinsic and extrinsic factors must be considered separately. By grouping the two factors together the model may make unrealistic predictions relating the level of rewards to motivation and effort. Section 5.3.3 describes how the modified model separates the intrinsic and extrinsic factors.

#### 4.3.2.4 THE EFFECTS OF INDIVIDUAL DIFFERENCES

Although it may be assumed that the effects of individual differences are partly taken account of in the ‘perceived equity’ term, it is felt by the author that this is insufficient to fully account for the complexities of the concept. The ‘perceived equity’ term is a measure of the individual’s perception of the overall ‘fairness’ of the rewards received. This aggregated term provides little information about the needs and desires of the worker and is therefore of little use to the management of an organisation. A manager would be interested to know how important each of the rewards were to the workers as well as their levels of satisfaction with each reward. For example, is the workforce motivated more by intrinsic rewards such as receiving a sense of achievement from doing the job or by extrinsic rewards such as pay and benefits? Aggregating the individual’s perceptions and satisfaction on all the rewards into one variable may lead the organisation to believe that increasing any of the rewards received by the workers will lead to an increase in job satisfaction and motivation. This is not the case, as increasing a reward that has little value to the employee is unlikely to have much effect. Cognitive Evaluation Theory suggests that increasing extrinsic rewards may even have a negative effect on motivation (see Section 3.2.5).

Section 5.3.4 describes how the modified model expands on the ‘Perceived equity’ variable to more fully incorporate the needs of the individual worker.

#### 4.3.2.5 THE EFFECTS OF THE INDIVIDUAL GROWTH NEED STRENGTH

There is substantial evidence that people with differing work related values will react differently to identical job experiences (see Hackman & Oldham [1976]; Oldham [1976];

Stone [1976]). The premise is that “people who have a high need for personal growth and development will respond more positively to a job high in motivating potential than people with low growth need strength” (Hackman & Oldham [1976]). The validity of this premise was discussed in Section 4.2.1.1 and in Appendix II. The Job Characteristics Model conceptualises these differences as ‘Individual Growth Need Strength’ but no equivalent variable exists in the Expectancy Model of Motivation.

Section 5.3.5 explains how an ‘Individual Growth Need Strength’ variable may be incorporated into the Expectancy Model of Motivation.

#### 4.3.2.6 THE RELATIONSHIP BETWEEN PERFORMANCE, REWARDS AND SATISFACTION

The Expectancy Model of Motivation proposes that the level of performance determines the levels of intrinsic and extrinsic rewards received. This, however, is not always the case in reality. Although extrinsic rewards such as pay may be linked to performance, intrinsic rewards would rarely be influenced so directly by the level of performance.

The level of performance may also have a direct effect on the worker’s levels of satisfaction without altering the levels of rewards. Workers may use their perceived level of performance to gauge their level of satisfaction with the rewards received. Workers who perceive their level of performance as being lower than their co-workers may be more satisfied with their rewards than a worker who perceives their performance as being higher than their co-workers. This is the basic premise of Equity Theory (see Section 3.3.4).

Performance may also be a source of intrinsic satisfaction and motivation in its own right. Certain workers, particularly those with a high work ethic or growth need strength (see Section 4.2), may derive intrinsic satisfaction from performing at a high level (the feeling of 'doing a good days work'), which may influence further effort to maintain that high level of performance.

Section 5.3.6 explains how the links between performance, rewards and satisfaction may be restructured to allow for the effects outlined above.

#### 4.3.2.7 CLARIFICATION OF THE LINKS TO VROOM'S EXPECTANCY THEORY

Although not strictly speaking a criticism of the model, the existence of Expectancy Theory as the 'engine' of the model may be made clearer by renaming two of the variables. Section 5.3.7 discusses the models relationship with Expectancy Theory.

#### 4.3.2.8 THE EFFECTS OF ORGANISATIONAL STRUCTURE AND JOB CHARACTERISTICS

The Expectancy Model of Motivation, as it stands, makes no inclusion of the effects of job characteristics. As a result, the only way of varying the amount of rewards received is to vary the level of performance. This may be true of rewards such as performance related pay, but it is certainly not true of intrinsic rewards such as feedback and skill variety, which are determined largely by the job characteristics (see Hackman and Oldham's Job Characteristics Model in Section 4.2). It is suggested, therefore, that the model may be greatly improved by incorporating the effects of organisational structure and job characteristics. Section 5.3.8 describes the modifications to the original model necessary to incorporate these factors.

#### 4.3.2.9 USEFULNESS AS A MANAGEMENT TOOL

The Expectancy Model of Motivation, despite providing managers with a useful way of thinking about the cognitive processes of motivation and effort, does not allow managers to conduct any 'what if' analysis. The only variable directly manipulable by management is the 'Outcomes' variable, but there is no indication what factors aggregate to form this variable or the way it influences the 'Job Satisfaction' variable. To make the model more useful to managers, therefore, the 'Outcomes' term must be expanded to show exactly what rewards form the variable and the relationship between 'Outcomes', 'Perceived Equity' and 'Job Satisfaction' needs to be clarified.

# **CHAPTER FIVE**

## **5 DEVELOPING A NEW MODEL OF MOTIVATION**

### **5.1 INTRODUCTION**

Chapter 4 provided a critical examination of two well-established models of motivation and performance. This chapter explains how the two models may form the foundation for a new motivation model that incorporates the cognitive approach of the Expectancy Model with the more social-cognitive approach of the Job Characteristics Model. Each model is modified separately to deal with the criticisms outlined in the previous chapter before being integrated into one model.

### **5.2 MODIFYING THE JOB CHARACTERISTICS MODEL**

The criticisms of Hackman and Oldham's Job Characteristics model from Section 4.2.2 may be summarised as follows:

1. The effects of organisational structure on the job dimensions are not included.
2. The model ignores the effects of extrinsic rewards, such as pay and work conditions.
3. The model ignores the effects of several important intrinsic elements, such as social relationships, participation, task difficulty and work load.
4. The mediating function of the psychological states may not be as specified by the model.
5. The model does not explain the cognitive processes involved in human motivation and performance.



6. The model is of limited use as a management tool.

### **5.2.1 INCORPORATING THE EFFECTS OF ORGANISATIONAL STRUCTURE**

Oldham and Hackman [1981] hypothesised that organisational structure could be viewed as “significantly affecting the overall amount of challenge and complexity (autonomy, skill variety, task identity, task significance, feedback) in the employees’ jobs” and that “job challenge and complexity are seen as directly influencing employees’ reactions to the work and the organisation” (Oldham and Hackman [1981]).

Many empirical studies support the notion of a relationship between organisational structure and job characteristics as perceived by the employees in those jobs. Pierce and Dunham [1978], for example, found that formalisation and centralisation were significantly and negatively related to employee descriptions of autonomy, task identity, feedback and skill variety. Ford [1976] found that the size of the organisation has a significant effect on the ‘routineness’ of employees’ tasks. The number of hierarchical levels in an organisation has been found to have a significant effect on the complexity of the work, with workers in organisations with many formal hierarchical levels tending to perform jobs that were more “substantially complex” (i.e. requiring more thought and independent judgement) (Kohn [1971]). Perhaps conflicting results have been found by Gannon and Paine [1974] who showed that employees in flat organisational hierarchies described their jobs responsibilities as “more adequate” than employees in tall hierarchies. Finally, Rousseau [1978] found generally negative relationships between four properties of departmental structure (i.e. size, number of levels, centralisation and formalisation) and job characteristics and employee satisfaction.

Oldham and Hackman's [1981] study went one stage further than the research cited above and suggested that both job characteristics and personal attributes may act as mediators between organisational structure and employee reactions. The 'attraction-selection framework', as it was termed by Oldham and Hackman, proposed that "organisations with certain structural properties or conditions attract and/or select employees with particular personal and background attributes" (Oldham and Hackman [1981]). They then suggest that "employee reactions to the work and the organisation are, in large part, explained by the personal attributes of the employees; that is, individuals with different personal and background attributes have different work attitudes and behaviours" (Oldham and Hackman [1981]).

Oldham and Hackman's study therefore tested the effects of four structural properties – size, number of hierarchical levels, formulisation and centralisation – on seven employee reactions – internal work motivation, growth satisfaction, general satisfaction, social satisfaction, supervisory satisfaction, security satisfaction and pay satisfaction – mediated by five job characteristics – skill variety, task identity, task significance, autonomy and feedback – and three personal attributes – gender, age and education. After analysing the data collected from 2,960 employees from 36 organisations, Oldham and Hackman concluded that the findings "strongly suggest that the relationship between an organisation's structure and employees' satisfaction and motivation can be explained jointly by the characteristics of the jobs within the organisation's structure and by the attributes of the individuals who are employed by the organisation" (Oldham and Hackman [1981]). Moreover, the results showed that that "the combined framework, which includes both personal and job characteristics as mediators, is

more effective in explaining structure-reaction associations than frameworks using either the employees' personal attributes or job characteristics alone as mediators" (Oldham and Hackman [1981]).

Brass [1981] adopted a different approach for examining the relationships between the organisation's structural context, job characteristics and the attitudes and behaviours of individual employees. In his study, Brass conceptualised the organisation as a network of interrelated task positions, based on the assumption that "each individual job is embedded in a larger organisational structure" (Brass [1981]). Furthermore, task positions and the workers occupying those positions were viewed as being interrelated on the basis of the flow of work through the organisation. Structure, in Brass's study, is therefore defined as "the arrangement of differentiated task positions into an integrated workflow and the relationships that result from this arrangement" (Brass [1981]). Three structural relationships were then investigated:

1. Centrality – the extent to which a worker's task position is central to the workflow network.
2. Criticality – the degree to which a worker's task position is critical to the continued flow of materials (inputs and outputs) through the workflow network.
3. Transaction alternatives – the number of different positions available to a task position for the acquisition of the same inputs or the distribution of the same outputs.

Brass investigated these three structural conditions against the five Hackman and Oldham job characteristics – skill variety, task identity, task significance, autonomy and feedback – as well as two interpersonal variables – task support and feedback from agents. Task support refers to

“the degree to which the person an individual must work with (supervisors, co-workers, clients, etc) provide active support, help and co-operation to the individual in the performance of his or her task” (Brass [1981]). Feedback from agents is considered to have three dimensions that reflect the source of the information – supervisors, co-workers and others (including clients, customers and friends).

The hypothesised effects of centrality were that people occupying more central positions would be more influential and more satisfied with their tasks due to a higher level of autonomy (Leavitt [1951]). Brass also hypothesised that if the performance of centralised tasks affected many other positions, persons occupying centralised positions would likely receive more feedback from agents than would persons occupying peripheral positions and may also require a greater variety of skills for dealing with a large number of surrounding position holders.

Due to the potential disruption to the entire workflow of a worker in a highly critical position failing to perform their tasks adequately, Brass hypothesised that criticality would be positively related to task significance, feedback from agents and task support. Brass also stated that the lack of alternative workflow routes associated with a highly critical task position might be a source of autonomy.

Finally, a task position holder with a high number of transaction alternatives may be able to choose those that will provide him or her with active support in the completion of the task. It

was therefore hypothesised that transaction alternatives would be positively related to task support.

The main findings of Brass's study were as follows:

- Except for feedback from co-workers and feedback from others, all the job characteristics related positively and significantly to the measures of satisfaction and performance.
- The sub-unit measure of centrality related positively to autonomy, skill variety, task significance and feedback from agents. The organisational measure of centrality was negatively and significantly related to all the job characteristics except task support and feedback from co-workers. This negative relationship may be explained by Thompson's [1967] notion that uncertainty is removed as the work proceeds sequentially through the organisation. By the time the work reaches the organisation's core, much of the uncertainty has been removed and jobs are characterised as highly standardised.
- Criticality related positively and significantly to all of the variables except performance.
- Transaction alternatives related positively and significantly to task support and satisfaction.

The fact that the structural relationships failed to increase significantly the amount of variance explained in the dependent variables (satisfaction and performance) beyond that accounted for by the job characteristics suggests that the job characteristics mediate the relationship between

structure and individual responses. Brass concluded “the results show that the structural relationships investigated relate significantly to the job characteristics, which in turn relate significantly to employee satisfaction and performance”.

Both the Oldham and Hackman [1981] and the Brass [1981] studies propose a model whereby organisational structure influences job characteristics, which in turn influence employee behaviours. The Oldham and Hackman study then goes on to highlight the importance of personal attributes as a further mediating factor. The two studies, however, adopt vastly different methods of modelling organisational structure. Oldham and Hackman view structure in terms of four categories – size, number of hierarchical levels, formalisation and centralisation. Brass conceptualises structure as a network of task positions interrelated on the basis of workflow and considers three structural relationships – centrality, criticality and transaction alternatives.

Both approaches may be easily incorporated into the job characteristics model. Figure 22 below shows the Job Characteristics model modified to incorporate the effects of the Oldham and Hackman conceptualisation of organisational structure while Figure 23 shows the modifications for the Brass conceptualisation.

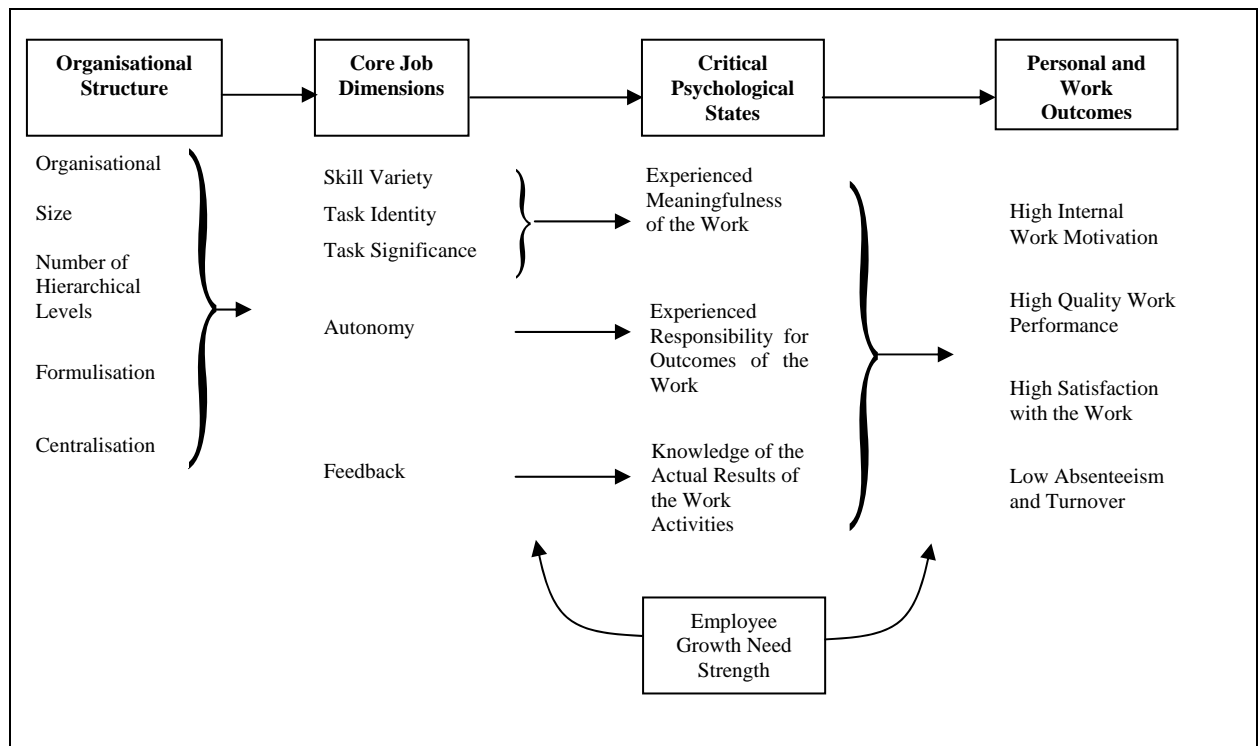


Figure 22: Oldham and Hackman's Conceptualisation of Organisational Structure Integrated into The Job Characteristics Model

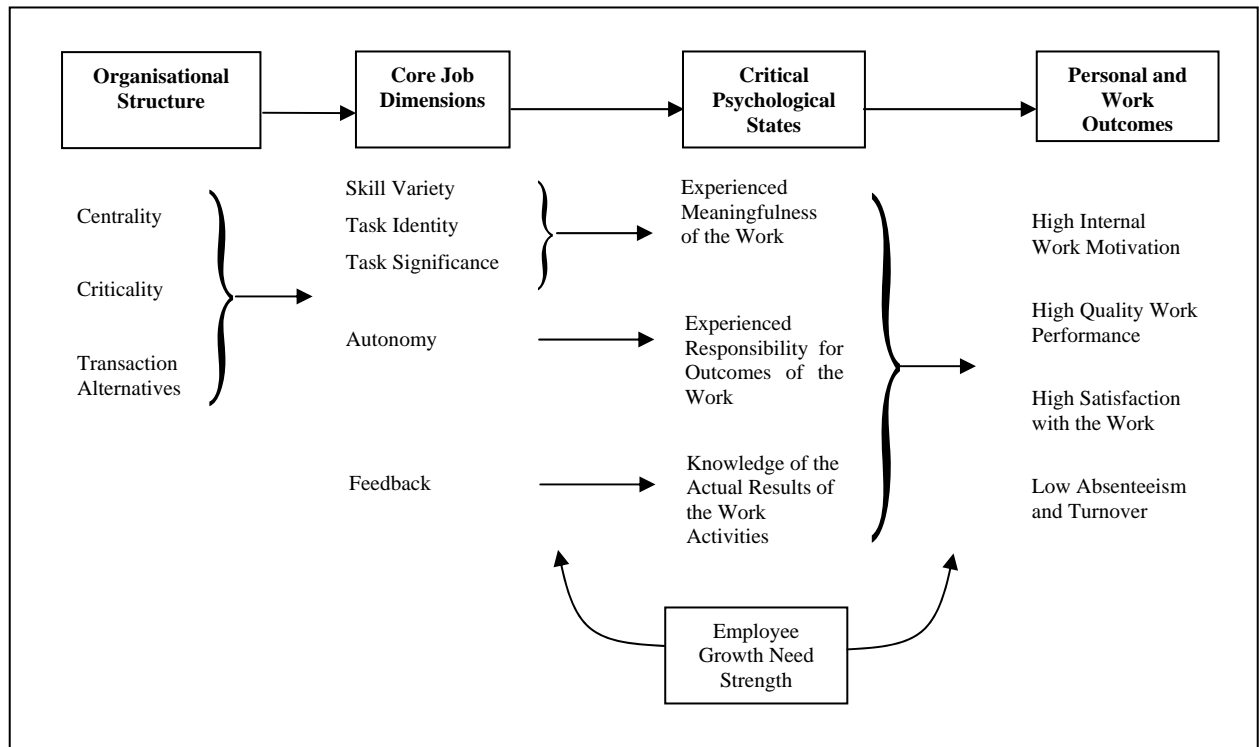


Figure 23: Brass's Conceptualisation of Organisational Structure Integrated into The Job Characteristics Model

## 5.2.2 INCORPORATING THE EFFECTS OF THE 'MISSING' INTRINSIC AND EXTRINSIC FACTORS

Expanding the Job Characteristics Model to include additional job characteristics may be done by simply adding the new variables to the five original job characteristics. Figure 24 shows how the factors mentioned in Sections 4.2.2.2 and 4.2.2.3 may be incorporated into the model.



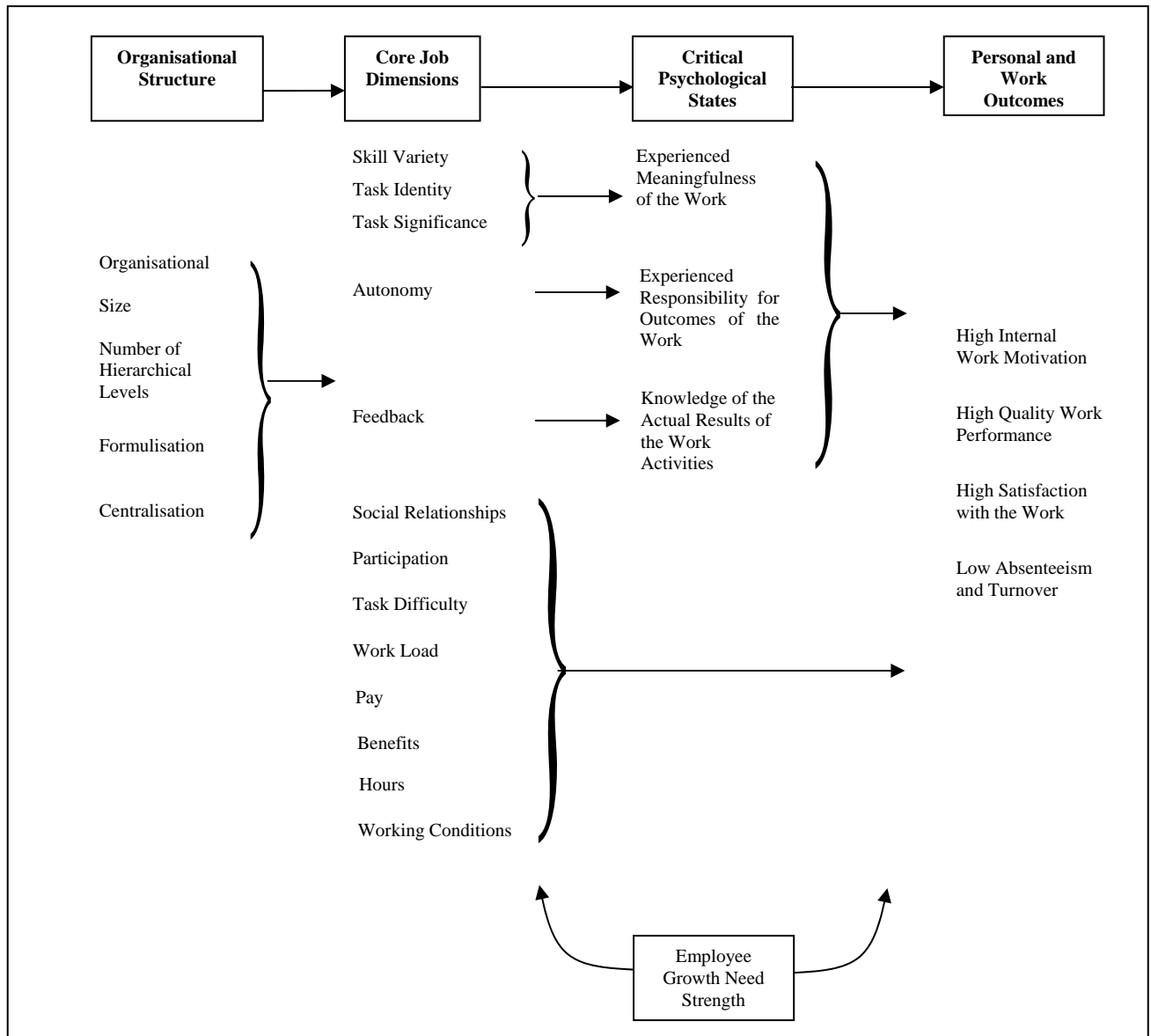


Figure 24: Incorporating further Intrinsic and Extrinsic Factors into The Job Characteristics Model

### **5.2.3 RESTRUCTURING OF THE PSYCHOLOGICAL STATES**

It has already been stated that most managers would not be interested in abstract variables such as ‘experienced responsibility’ or ‘knowledge of results’ used in the Job Characteristics Model (see Section 4.2.2.6) and that the variables themselves form an unclear relationship with the output measures (see Section 4.2.2.4). It was also stated that viewing satisfaction and motivation as dependent upon the levels of certain felt states may lead to erroneous conclusions where the individual does not desire those felt states (see Section 4.2.2.4).

When Hackman and Oldham talk of ‘experienced meaning’, ‘experienced responsibility’ and ‘knowledge of results’ they are essentially talking about the workers’ levels of satisfaction with those factors. For example, the model proposes that the level of autonomy in the job will determine the workers’ level of experienced responsibility, which, in turn, has an influence on overall work satisfaction and motivation. If one substitutes the term ‘Satisfaction with Autonomy’ for ‘Experienced Responsibility’ the model not only becomes more meaningful to managers but it also allows for the possibility that an individual may react in a negative way to a job that is high in a ‘reward’ that they do not desire.

The ‘Critical Psychological States’ term may therefore be replaced with ‘Reward Satisfaction’ and the three psychological states replaced with individual satisfaction variables for the individual job characteristics. The basic premise of the model remains unchanged, the job characteristics determine the worker’s internal state, now conceptualised as satisfaction with the job characteristics rather than as critical psychological states, which, in turn, are seen as influencing the outcome measures. Thinking of the psychological states as levels of

satisfaction also has important benefits when integrating the Job Characteristics Model with Porter and Lawler's Expectancy Model (see Section 5.5.1). Figure 25 shows the Job Characteristics Model with the Critical Psychological States restructured in this way.

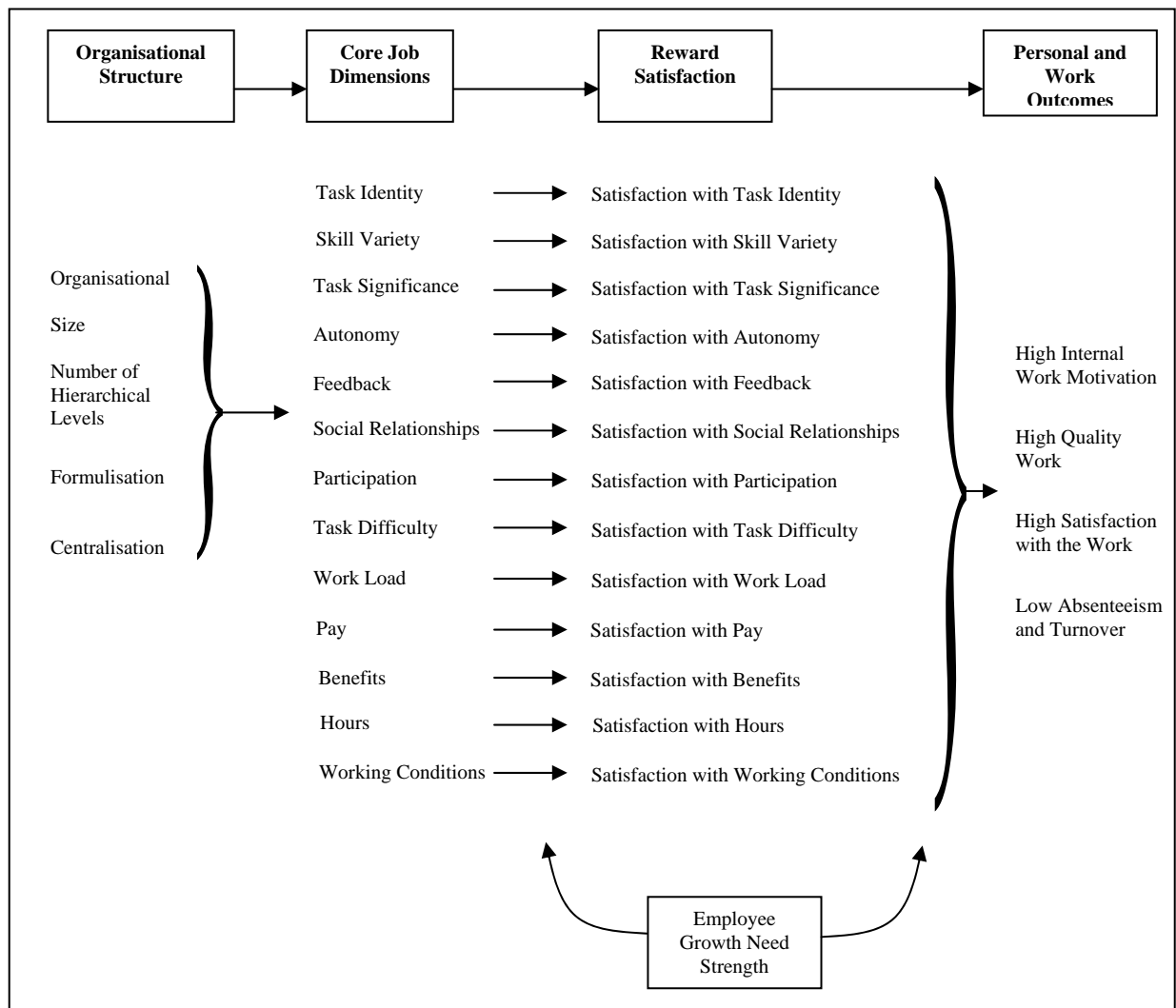


Figure 25: Modifying the Critical Psychological States in The Job Characteristics Model

#### **5.2.4 THE COGNITIVE PROCESS OF MOTIVATION**

Section 4.2.2.5 stated how the Job Characteristics Model does not explain the cognitive process through which the receipt of rewards is converted into motivation, effort and performance. The Expectancy Model of Motivation provides a model of this process based around Vroom's Expectancy Theory. The two models may therefore be integrated in order to produce a far more robust and complete model of motivation. Section 5.5 explains the process by which the two models may be integrated into one.

### **5.3 MODIFYING THE EXPECTANCY MODEL OF MOTIVATION**

The criticisms of the expectancy model of motivation were discussed in Section 4.3.2 and may be summarised as follows:

1. The relationship between rewards and the perception that effort leads to the receipt of desired rewards is not modelled correctly.
2. The conceptual differences between satisfaction and motivation are not modelled.
3. There is no consideration of the differences between intrinsic and extrinsic needs, rewards or motivation.
4. The model does not adequately take into account the individual needs of the worker.
5. The model does not take into account Growth Need Strength.
6. The links to Expectancy Theory are not clear.
7. The effects of organisational structure and job characteristics are not taken into consideration.
8. The model is of limited use as a management tool.

### **5.3.1 CORRECTING THE EFFORT – DESIRED REWARDS RELATIONSHIP**

As mentioned in Section 4.3.2.1, if the term ‘Perception of the probability that expended effort leads to desired outcomes’ is to represent a measure of the degree to which an individual believes that effort will result in the receipt of *desired* rewards, some measure of what rewards are actually desired must also be a determinant. However, in the original model, the term is influenced only by the level of rewards received. It is proposed, therefore, that the model is restructured in order to correct the criticisms detailed in Section 4.3.2.1.

Firstly, a variable labelled ‘Individual Reward Satisfaction’ is added to the model to represent the worker’s level of satisfaction with each individual reward (i.e. satisfaction with feedback, satisfaction with pay, etc).

Secondly, a variable termed ‘Individual Reward Importance’ is added to the model to represent the level of importance of each of the intrinsic and extrinsic rewards in the mind of the individual. The individual reward satisfactions are then weighted by their importance to form levels of ‘Intrinsic reward satisfaction’ and ‘Extrinsic reward satisfaction’. The intrinsic (or extrinsic) rewards that are more important to the individual will therefore play a larger role in determining the intrinsic (or extrinsic) satisfaction.

Another importance variable, termed ‘Intrinsic and Extrinsic importance’, is added to the model, representing the importance of intrinsic and extrinsic rewards overall rather than of the individual rewards. The two satisfaction levels (intrinsic and extrinsic) are then weighted by the intrinsic and extrinsic importance to form the ‘Satisfaction with desired rewards’ variable.

For example, if a worker had a very high need for extrinsic rewards but little desire for intrinsic rewards, their ‘Satisfaction with desired rewards’ will be determined primarily by their level of satisfaction with extrinsic rewards. The ‘Satisfaction with desired rewards’ variable then determines the ‘Perception of the probability that expended effort leads to desired outcomes’.

Restructuring the model in this way ensures that the criticism detailed in Section 4.3.2.1 is corrected and that the ‘Perception of the probability that expended effort leads to desired outcomes’ variable is determined only by those outcomes that are desired by the individual. These modifications to the Expectancy Model of Motivation are shown in Figure 26 below.

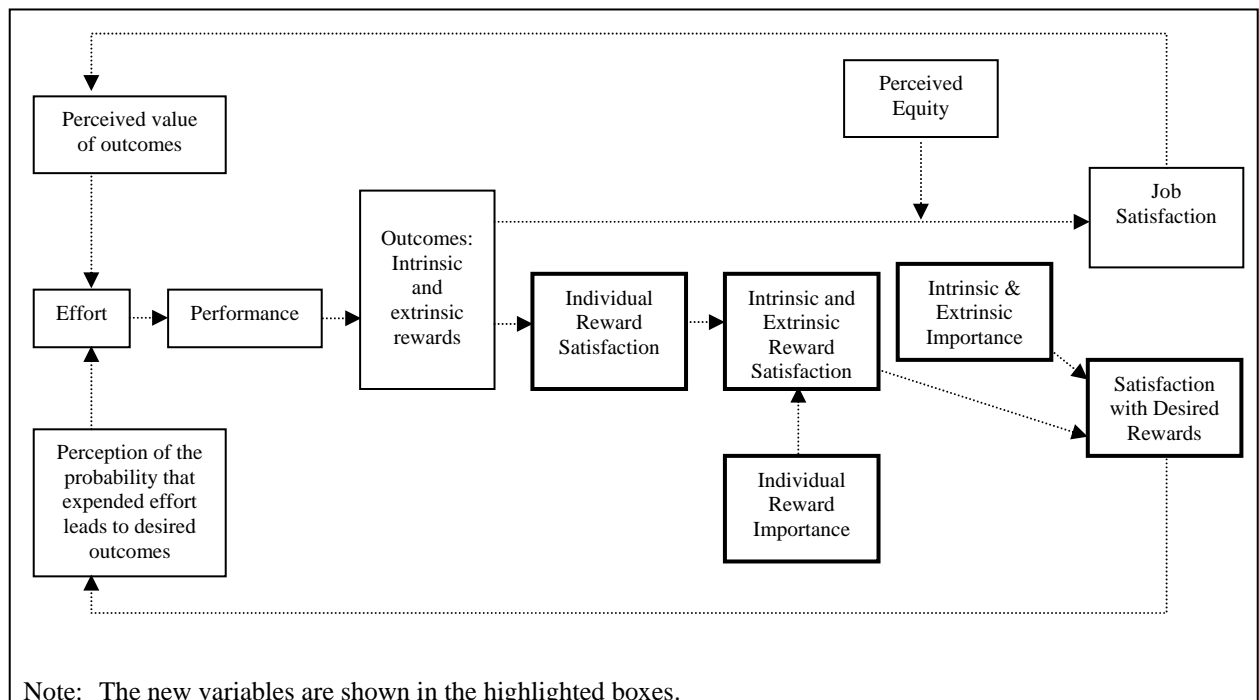


Figure 26: Incorporating the ‘Satisfaction with Desired Rewards’ variable into the Expectancy Model of Motivation

### 5.3.2 MODELLING SATISFACTION AND MOTIVATION

In order to clarify the relationships between perceived equity, reward satisfaction, motivation and effort (see Section 4.3.2.2), several modifications to the original model are necessary. Firstly, the 'Perceived equity' variable is to be replaced by two 'individual need' variables. The 'Individual Reward Importance' variable comprises the individual's levels of desire for each individual intrinsic reward, such as skill variety and autonomy, and each individual extrinsic reward, such as pay and working conditions. The 'Intrinsic and Extrinsic Importance' variable comprises measures of the individual's needs for intrinsic rewards and extrinsic rewards *per se*. The 'Individual Reward Importance' variable therefore measures how important the individual rewards such as feedback and autonomy are to the individual relative to the other individual rewards, such as skill variety and task significance. The 'Intrinsic and Extrinsic Importance' variable measures how important the two groups of rewards, intrinsic and extrinsic, are to the individual, relative to each other. Secondly, two variables are incorporated into the model representing measures of intrinsic and extrinsic satisfaction. These variables were described in Section 5.3.1 above.

Another two variables are added to the model to represent the individual's levels of intrinsic and extrinsic motivation. The relationship between intrinsic and extrinsic satisfaction and intrinsic and extrinsic motivation is a very simple one. Motivation is conceptualised as satisfaction multiplied by importance (i.e. intrinsic motivation is equal to intrinsic satisfaction multiplied by the importance of intrinsic rewards to the worker). For motivation to be high, therefore, two conditions must be met. Firstly, the worker must be satisfied with the level of rewards received and, secondly, the rewards must be important to the worker.

Intrinsic and extrinsic motivation are then weighted by intrinsic and extrinsic importance to form a level of total motivation. Weighting the two motivation levels in this way seems the most theoretically sound method of combining the intrinsic and extrinsic motivation levels into a level of total motivation. The important question to ask is: 'Is a worker who is highly motivated by both intrinsic and extrinsic rewards more motivated than a worker who is highly motivated by only one type of reward?'. If the answer to this question is 'yes', then the two levels of intrinsic and extrinsic motivation may simply be added to form a level of total motivation. It is the author's conviction, however, that it is more reasonable to assume that a worker who is only interested in extrinsic rewards, for example, should be able to achieve the same levels of motivation and effort as a worker who is equally interested in intrinsic and extrinsic rewards. A weighted total is therefore the most appropriate method of combining the two individual levels of motivation. The 'Total motivation' variable then replaces the Job satisfaction variable. These modifications to the Expectancy model are shown in Figure 27 below.



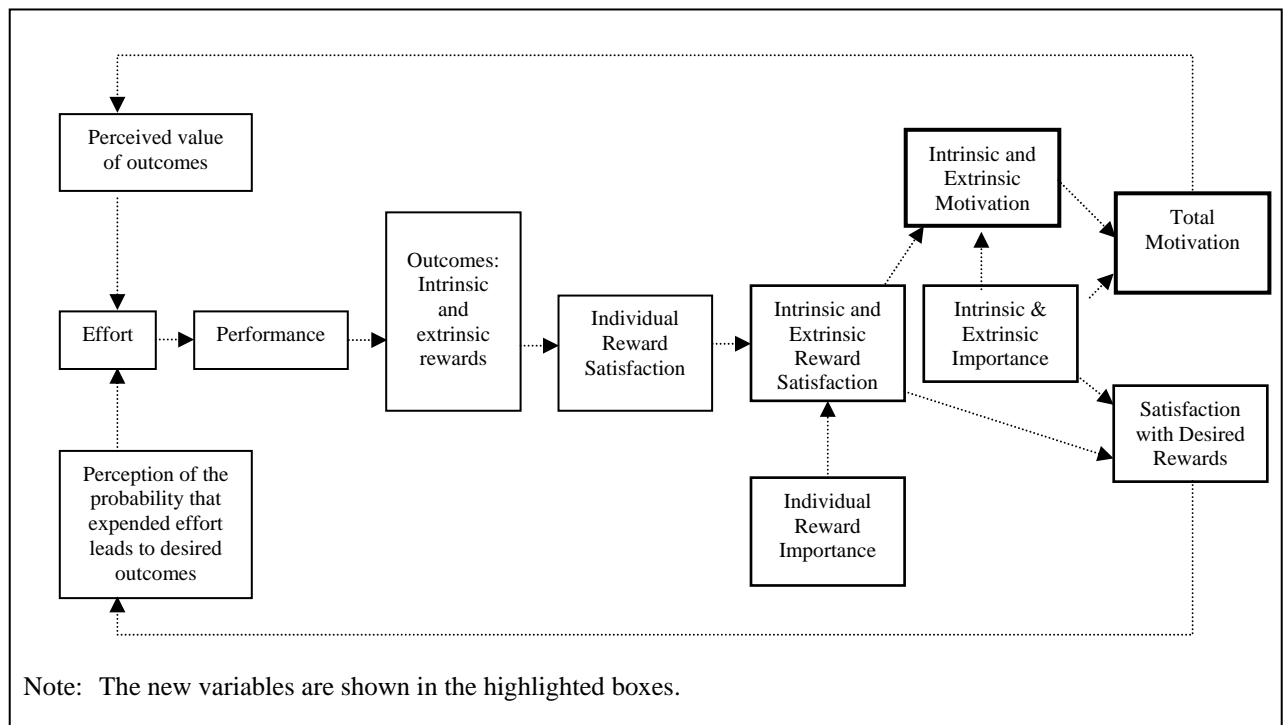


Figure 27: Incorporating Motivation variables into the Expectancy Model

### 5.3.3 INCORPORATING INTRINSIC AND EXTRINSIC FACTORS

Following on from the point made in Section 5.3.1 above, that different employees are likely to have different needs and desire different rewards, it seems clear that levels of intrinsic and extrinsic motivation will also differ from employee to employee. It seems sensible, therefore, to treat intrinsic and extrinsic satisfaction and motivation as separate entities. This is also absolutely necessary if the effects of Cognitive Evaluation Theory are to be incorporated into the model. Sections 5.3.1 and 5.3.2 described how intrinsic and extrinsic variables for satisfaction and motivation have been incorporated into the model and so further discussion is not needed here.

#### **5.3.4 INCORPORATING THE EFFECTS OF INDIVIDUAL DIFFERENCES**

In order to fully incorporate the individual needs and desires of the work force the ‘Perceived equity’ variable in the original model was replaced with ‘Individual Reward Importance’ and ‘Intrinsic and Extrinsic Importance’ variables. These variables have already been discussed in Section 5.3.2. Firstly, the ‘Individual Reward Importance’ variables are used to weight the individual reward satisfactions into levels of intrinsic and extrinsic satisfaction. Secondly, the ‘Intrinsic and Extrinsic Importance’ variables are used to determine to levels of intrinsic and extrinsic motivation and to weight the two motivation levels into a level of ‘Total motivation’. These modifications to the model are shown in Figure 27 above.

#### **5.3.5 INCORPORATING THE EFFECTS OF INDIVIDUAL GROWTH NEED STRENGTH**

Section 4.3.2.5 highlighted the fact that the Expectancy Model of Motivation does not include a variable to allow for the moderating effect of work related values. The variable is proposed to moderate the ways in which workers react to the motivating potential of their job. Hackman and Oldham [1976] proposed that the motivating potential of a job could be calculated as:

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

This formula therefore assumes that the motivating potential for a job will be identical for each worker. It is proposed here, however, that the characteristics of the individual will alter the motivating potential of a job. A particular job may be high in motivating potential when applied to an office junior, for example, but low in motivating potential when applied to a managing director. It is proposed here, therefore, that the motivating potential of a job is best represented by the individual’s stated levels of satisfaction with the job rewards and that the

ways in which individuals respond to this motivating potential is manifested as their displayed levels of motivation.

It was proposed in Sections 4.3.2.2 and 5.3.2 that reward satisfaction (now also thought of as the motivating potential of a job) and motivation are conceptually different and that the level of desire for the rewards received moderates the relationship between the two. It is now proposed here that ‘Growth need strength’ also moderates the relationship between ‘Intrinsic satisfaction’ and ‘Intrinsic motivation’. The premise is that the rewards received from doing a job will produce a level of satisfaction with those rewards which, when combined with the individual’s levels of desire for the rewards and their growth need strength, will determine their level of motivation. Due to the intrinsic nature of growth need strength, however, it is only assumed to influence intrinsic motivation. Figure 28 shows the ‘Growth need strength’ variable incorporated into the Expectancy Model in this way.

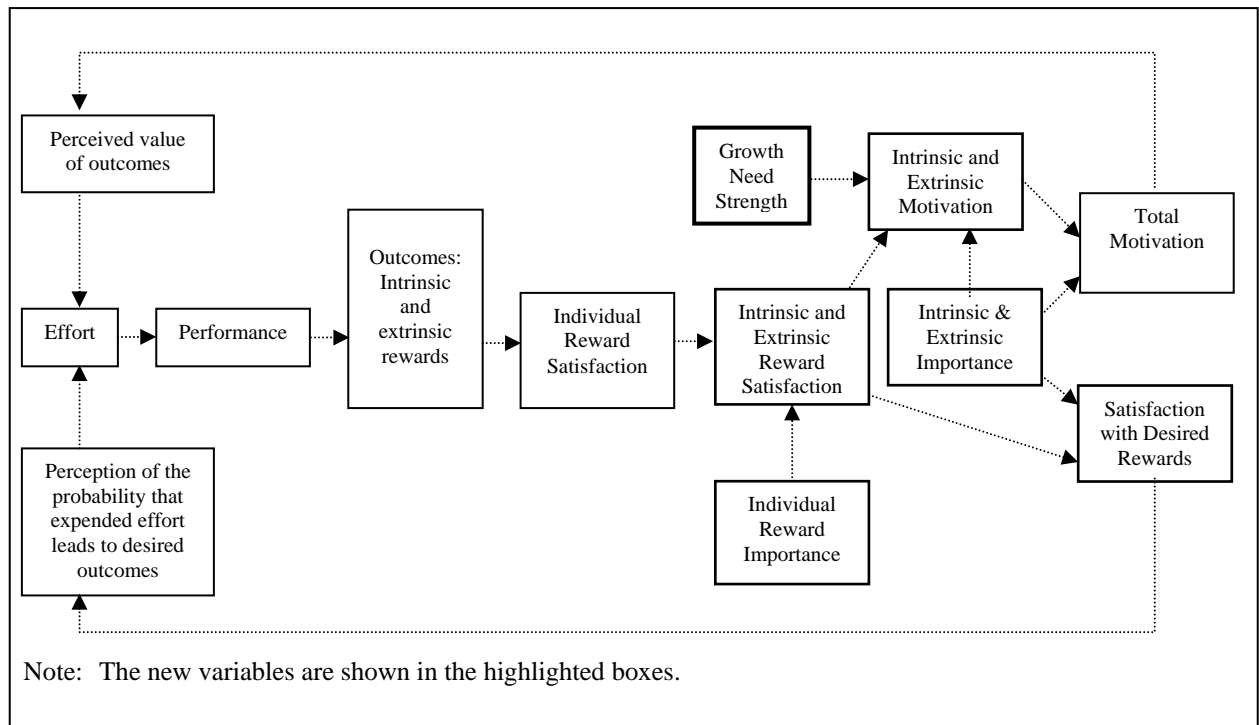


Figure 28: Incorporating Growth Need Strength into the Expectancy Model

### 5.3.6 THE RELATIONSHIP BETWEEN PERFORMANCE, REWARDS AND SATISFACTION

Section 4.3.2.6 explained how the level of performance might not determine the levels of rewards received in all circumstances and may have a more direct influence on rewards satisfaction. By including a further link between performance and intrinsic and extrinsic satisfaction it is possible to test this hypothesis. Figure 29 shows the Expectancy Model with this additional link added.

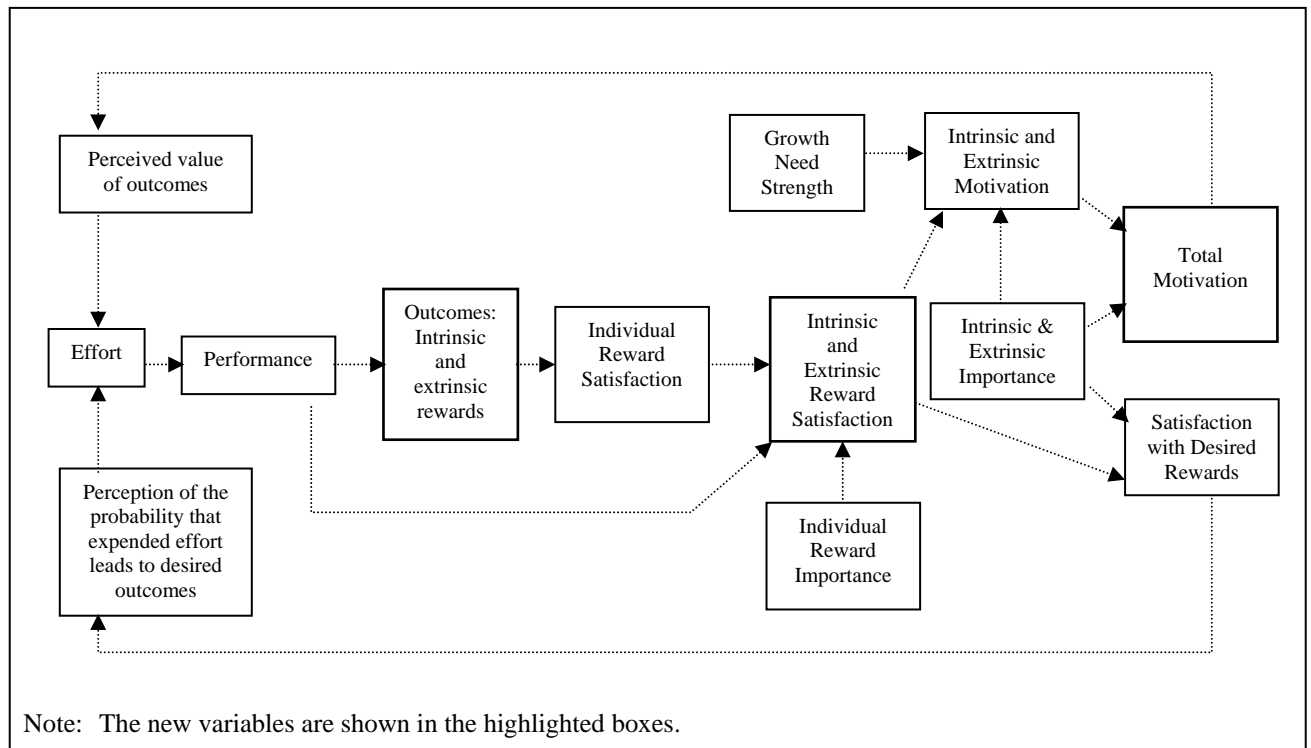


Figure 29: Incorporating a direct Influence between Performance and Satisfaction

### 5.3.7 CLARIFYING THE LINKS TO VROOM'S EXPECTANCY THEORY

As discussed in Section 4.3.2.7, the terms used in Porter and Lawler's Expectancy Model of Motivation are not the same as the terms used by Vroom in his original formulation of Expectancy Theory. The way in which Porter and Lawler's model relates to the theory may not, therefore be obvious. By renaming two of the variables in the model, however, the situation may be clarified.

Referring to Section 3.3.5 it can be seen that Vroom proposed that the force to perform a certain act (i.e. the level of effort) was equal to the product of the expectancy that effort will lead to the desired level of performance ( $E_{ij}$ ), the degree to which performance is perceived as

instrumental for the attainment of the rewards ( $I_{jk}$ ) and the anticipated level of valence with those rewards ( $V_k$ ).

$$F_i = E_{ij} I_{jk} V_k$$

Transposing these terms onto the Expectancy Model of Motivation it is clear that the  $F_i$  term relates to the ‘Effort’ variable and that the  $V_k$  term relates to the ‘Perceived value of outcomes’ variable. The ‘Perception of the probability that expended effort leads to desired outcomes’ variable is concerned with the relationship between effort and rewards. Vroom’s theory divides this relationship into two separate parts; the relationship between effort and performance (expectancy) and the relationship between performance and rewards (instrumentality). The ‘Perception of the probability that expended effort leads to desired outcomes’ variable may therefore be seen as incorporating both the expectancy ( $E_{ij}$ ) and instrumentality ( $I_{jk}$ ) terms of Vroom’s theory.

Figure 30 illustrates the relationship between the Expectancy Model and Expectancy Theory. It may be seen that the upper part of the model is concerned with the valence ( $V_k$ ) part of the equation, while the lower part is concerned with the expectancy ( $E_{ij}$ ) and instrumentality ( $I_{jk}$ ) part of the equation.

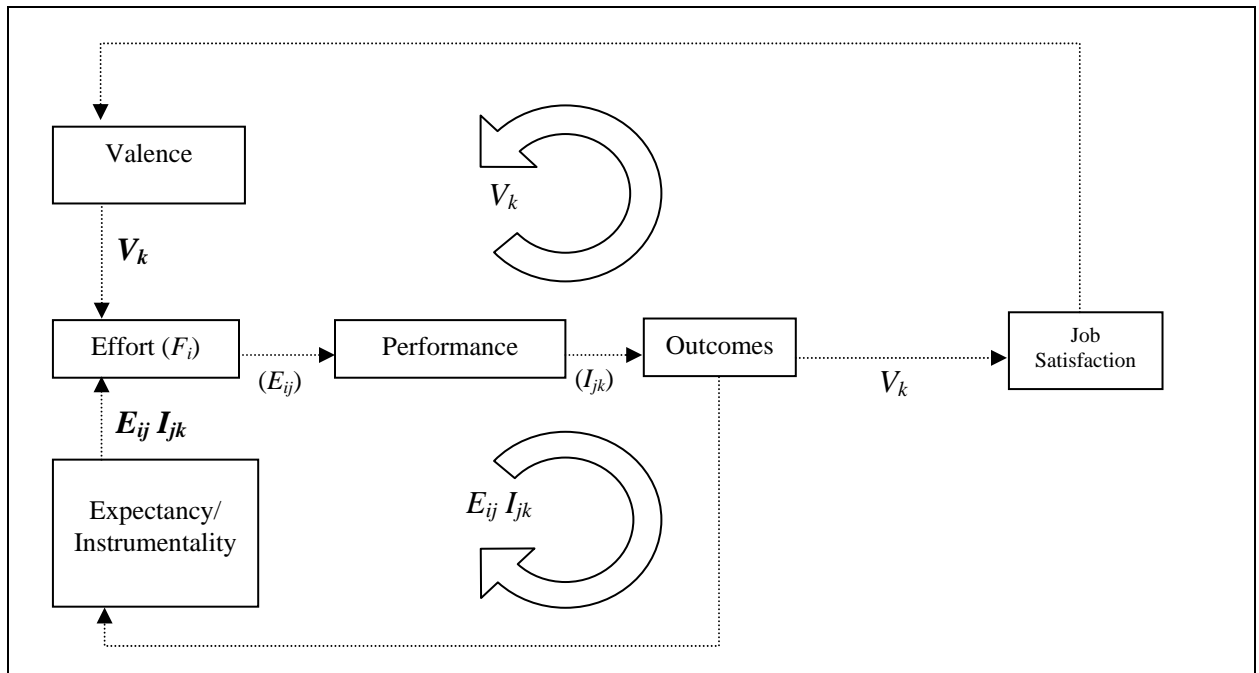


Figure 30: Simplified Expectancy Model showing the Relationship with Expectancy Theory

In order to make clearer this relationship with Vroom's theory, the 'Perceived value of outcomes' variable may be renamed as 'Valence' and the 'Perception of the probability that expended effort leads to desired outcomes' variable may be renamed as 'Expectancy/Instrumentality'. Figure 31 shows the modified Expectancy Model with the variables renamed in this way.

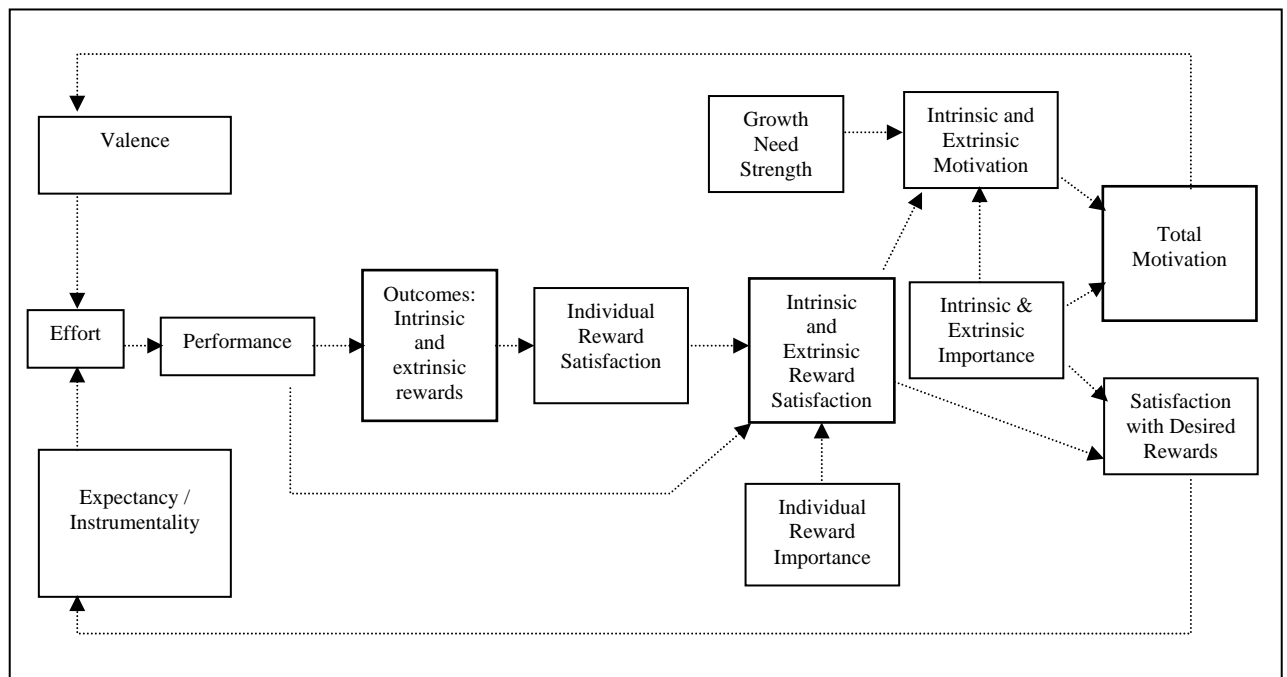


Figure 31: Incorporating Valence, Expectancy and Instrumentality terms onto the Expectancy Model

### 5.3.8 INCORPORATING THE EFFECTS OF ORGANISATIONAL STRUCTURE AND JOB CHARACTERISTICS

One of the aims of this research is to produce a model that incorporates both the social elements of the Job Characteristics Model with the Social-cognitive elements of the Expectancy Model. The simplest way of doing this is to incorporate the two models into one and this process is discussed in Section 5.5.

### 5.3.9 USEFULNESS AS A MANAGEMENT TOOL

The assessment of the usefulness of the model as a management tool is discussed in Section 7 in order to first assess the validity of the model.



## 5.4 COMPARISON BETWEEN THE ORIGINAL AND MODIFIED EXPECTANCY MODELS

The modifications to the original Expectancy Model of Motivation discussed in Sections 5.3.1 to 5.3.7 result in the Modified Expectancy Model of Motivation shown in Figure 32.

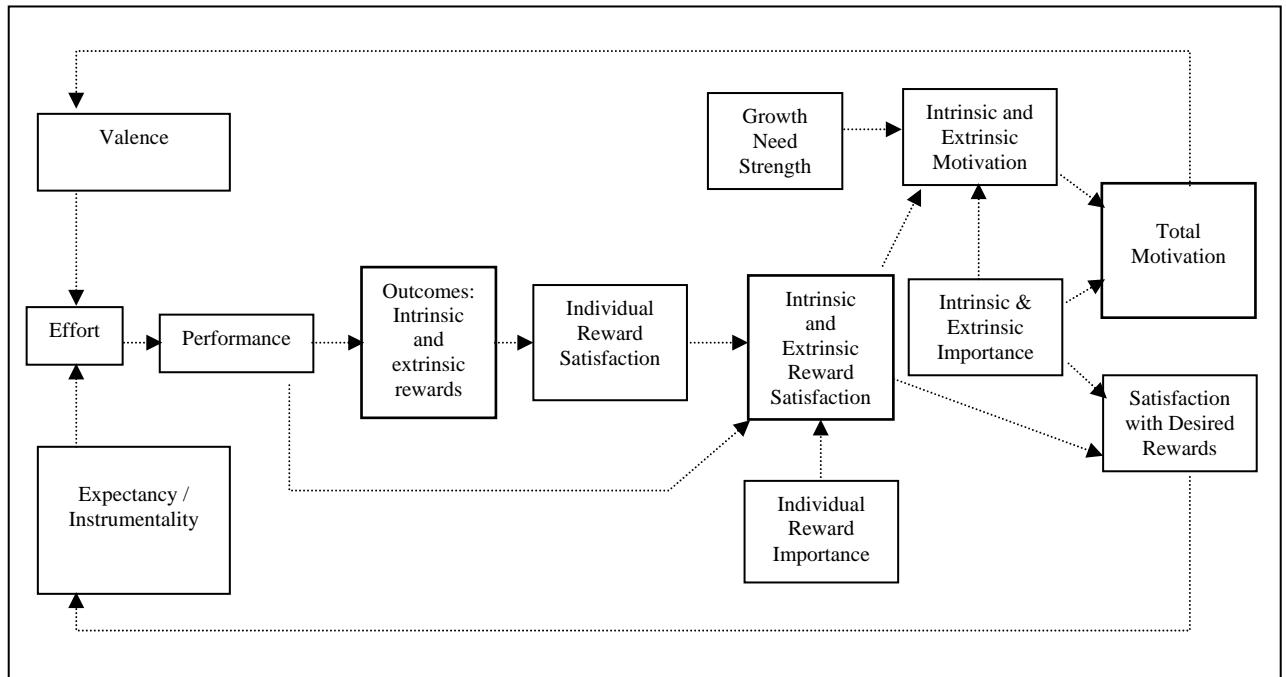


Figure 32: The Modified Expectancy Model of Motivation

Comparing the original and modified models, Figure 20 and Figure 32 respectively, it can be seen that the first part of the model (i.e. the effort → performance → outcomes relationship) remains unchanged. The way in which the receipt of rewards is transformed into motivation and effort, however, is considerably altered.

Appendix III provides a detailed examination of the mathematical relationships between the variables in the modified model and, in order to highlight the differences in behaviour between

the original and modified models, Appendix IV discusses a hypothetical scenario and the differing predictions of the two models under that scenario.

## **5.5 INTEGRATING THE JOB CHARACTERISTICS AND EXPECTANCY MODELS**

Section 4.2.2.5 explains that one of the criticisms of the Job Characteristics Model is that it does not model the cognitive process by which motivation is increased. The Job Characteristics Model may therefore be considered primarily a social-cognitive model. In contrast, Section 4.3.2.8 explains that the Expectancy Model of Motivation is primarily a cognitive model in that it does not include any social or contextual variables (see Section 1.1 for definitions of cognitive and social-cognitive models). By combining the two models, however, both these criticisms may be rectified. Section 5.5.1 describes how the terms used in the two original models may be standardised in order to facilitate the integration of the two models.

### **5.5.1 STANDARDISING THE TERMS OF THE JOB CHARACTERISTICS AND EXPECTANCY MODELS**

At first glance, Hackman and Oldham's Job Characteristics Model and Porter and Lawler's Expectancy Model appear to have little in common. The two models use different terms to describe essentially the same groups of variables and even use the same name to describe completely different groups of variables. Once one examines what is meant by the terms used in the two models, however, the similarities between them become apparent. Figure 33 shows the main terms of the two models and their meanings.

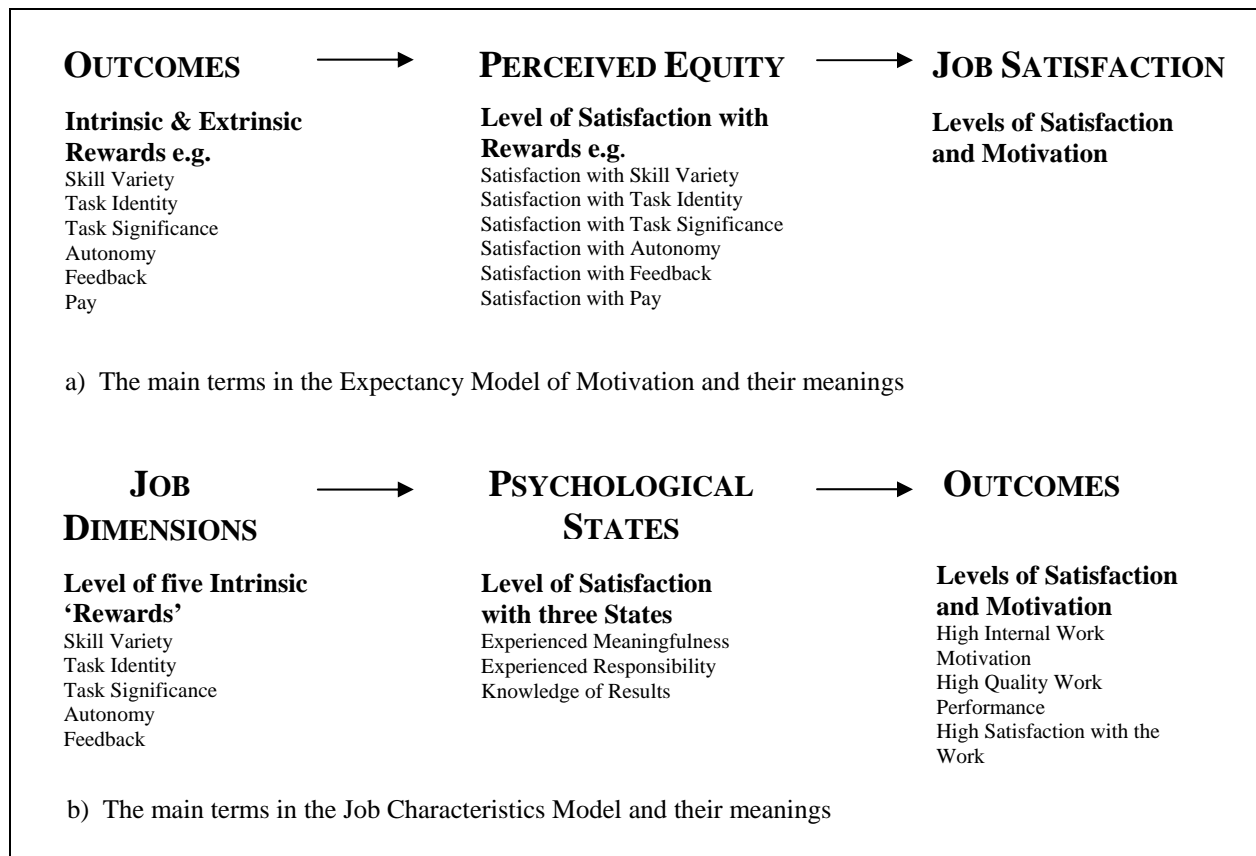


Figure 33: The Main Terms of the Expectancy and Job Characteristics Models and their meanings

The main terms in the Expectancy Model of Motivation are shown in the top part of Figure 33. Here, Porter and Lawler use the term 'Outcomes' to refer to the intrinsic and extrinsic rewards of the job. As discussed in Section 3.3.1, intrinsic rewards are those intangible rewards that influence a feeling of responsibility, competence and self-worth in a worker, such as skill variety, task identity and autonomy. Extrinsic rewards are those tangible rewards that are controlled directly by the organisation, such as pay. The first term in the Job Characteristics model (lower part of Figure 33) is Job Dimensions. The five job dimensions identified by Hackman and Oldham are Skill Variety, Task Identity, Task Significance, Autonomy and Feedback. As mentioned above, these job dimensions are essentially the intrinsic rewards of the job. The similarity between Porter and Lawler's 'Outcomes' variable and Hackman and

Oldham's 'Job Dimensions' variable now becomes obvious. Both variables describe the rewards the individual receives for doing the job, the only difference being that the Job Characteristics Model specifies five intrinsic rewards while the Expectancy Model includes both intrinsic and extrinsic rewards but does not identify any individual rewards. The two terms, 'Outcomes' and 'Job Dimensions', may therefore be renamed as 'Rewards'.

The 'Perceived Equity' term in the Expectancy Model is a measure of the satisfaction the individual has with the individual rewards (see Section 4.3). Section 5.2.3 explained how the 'Psychological States' term in the Job Characteristics Model may be renamed as 'Reward Satisfaction' and the three individual states thought of as levels of satisfaction with the five intrinsic rewards. Both terms may therefore be renamed as 'Reward Satisfaction'.

The 'Job Satisfaction' variable in the Porter and Lawler model is a rather vague term reflecting the level of satisfaction the individual has for their job overall. However, as the variable is a predictor of 'Effort', the 'Job Satisfaction' term must also be seen as encompassing the individual's level of motivation. It is highly dubious that the terms 'job satisfaction' and 'motivation' are interchangeable and the problem of grouping job satisfaction and motivation into one variable was discussed in Section 4.3.2.2. However, for the purpose of standardising the two models, it seems reasonable to rename the 'Job Satisfaction' variable as 'Motivation'.

Hackman and Oldham also use a term labelled 'Outcomes'. However, whilst Porter and Lawler use the term to describe the job rewards, Hackman and Oldham use the term to

describe the levels of satisfaction and motivation. In order to standardise the model with the expectancy model, the ‘Outcomes’ term may also be renamed ‘Motivation’. Again, as in the Porter and Lawler model, the variable is used as a fairly broad term encompassing several elements such as satisfaction, motivation and performance (see Figure 15).

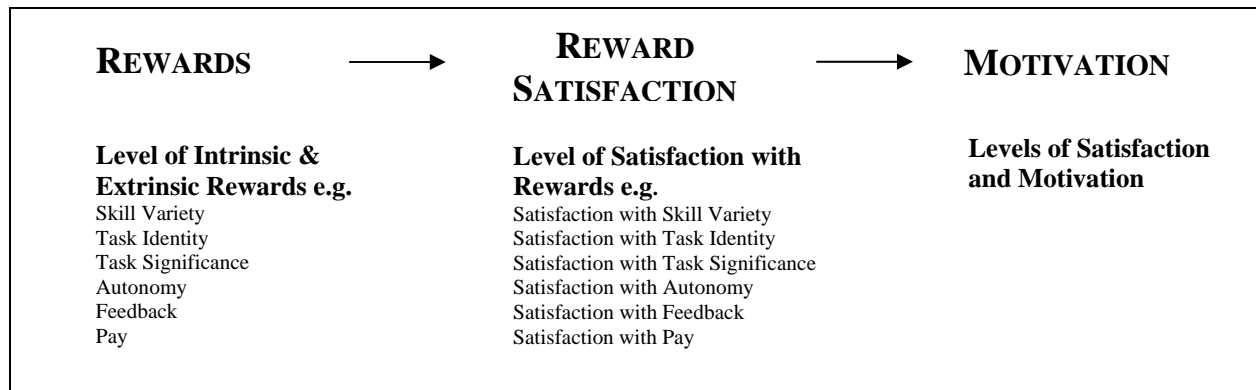


Figure 34: Standardising the Terms in The Job Characteristics Model and The Expectancy Model of Motivation

Figure 34 shows the standardised terms and their meanings. It is important to note that the essence of both models has not been changed; the terms have merely been altered to allow the similarities between them to become apparent. Hackman and Oldham’s Job Characteristics Model proposes that the levels of five job dimensions (now thought of as five intrinsic rewards) lead to the levels of three psychological states (now thought of as levels of satisfaction with the intrinsic rewards) which, in turn, determine the levels of job satisfaction and motivation. Porter and Lawler’s Expectancy Model proposes that the ‘Outcomes’ of job performance (rewards), combined with the ‘Perceived Equity’ of those rewards (satisfaction), determine the level of job satisfaction. Both models are therefore represented by the model shown in Figure 34.

Appendix V shows the two original models (Figure 15 and Figure 20) with the terms standardised as described above.

### **5.5.2 INTEGRATING THE MODELS**

Once the similarities between the two models have been identified the task of combining them becomes a very simple one. Indeed, once the main terms have been redefined as described in Section 5.5.1, the Job Characteristics Model may be thought of as being already embodied in the Expectancy Model. Figure 35 shows the two models integrated in this way with the Job Characteristics Model shown in the bold outline. The ‘Rewards’ variable includes the five intrinsic job dimensions from the Hackman and Oldham model, the ‘Reward Satisfaction’ variable represents the psychological states of the worker in response to the rewards received and the ‘Motivation’ variable represents the levels of job satisfaction and motivation.

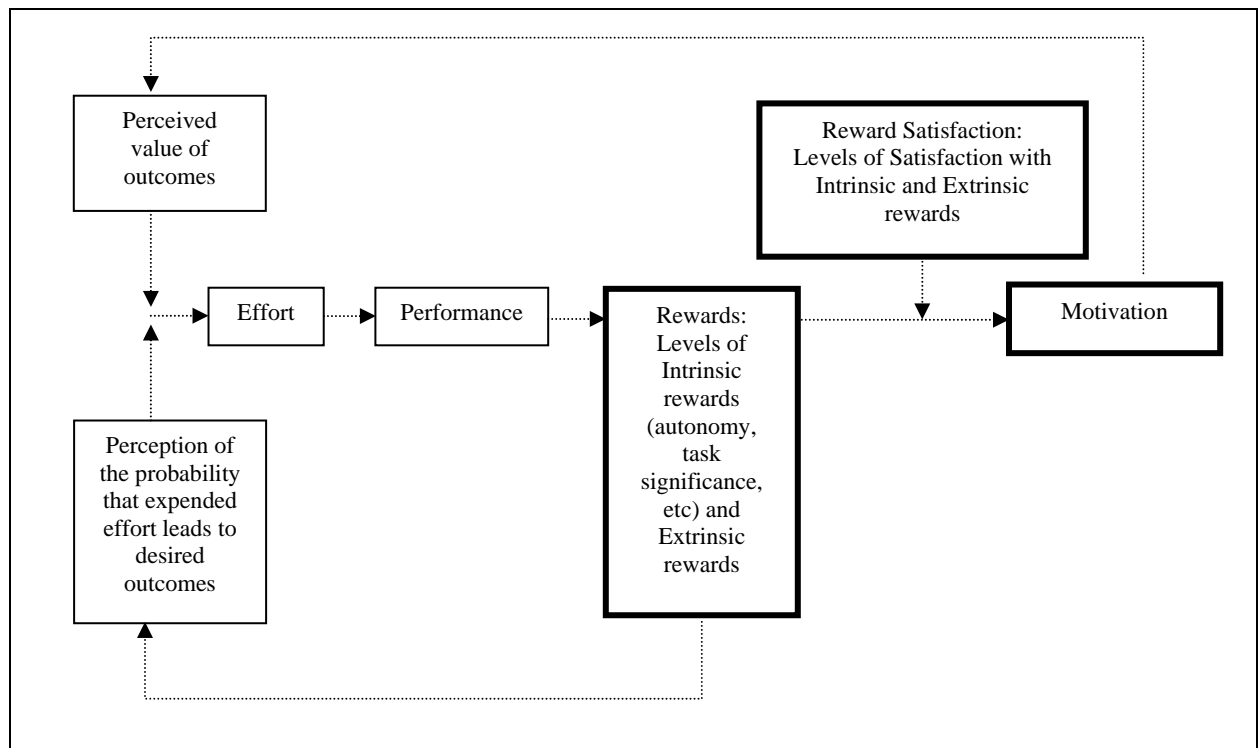


Figure 35: The Integrated Original formulations of the Job Characteristics and Expectancy Models

Once it has been shown how the two original models may be integrated, it is a simple task to integrate the two modified models in the same way. Only the Organisational Structure variable needs adding to the current Expectancy model to fully incorporate the modified Job Characteristics Model. Section 5.2.1 explained the addition of the Organisational Structure dimension to the Job Characteristics Model as a determinant of the Job Dimensions (now redefined as Rewards). Figure 36 shows the resultant integrated, modified model with the Organisational Structure variable included as a determinant of Rewards. Again, the components of the Job Characteristics Model are shown as the bold outlined variables.

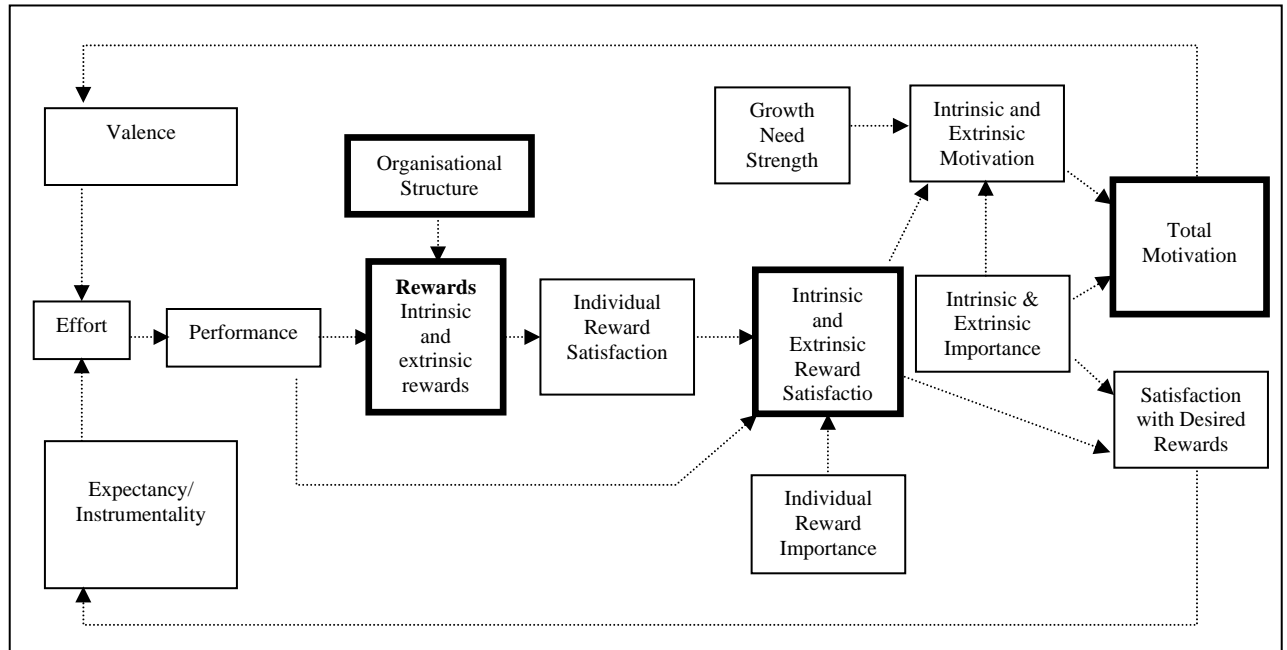


Figure 36: The Integrated Modified formulations of the Job Characteristics and Expectancy Models

The fully integrated model shown in Figure 36 thus combines the two approaches to modelling motivation forwarded by Porter and Lawler's Expectancy Model and Hackman and Oldham's Job Characteristics Model, whilst simultaneously addressing each of the criticisms outlined in Sections 4.2.2 and 4.3.2.

## 5.6 ANALYSIS OF THE NEW MOTIVATION MODEL

### 5.6.1 FEEDBACK LOOPS

In order to better understand the new motivation model shown in Figure 36, it is useful to identify the feedback loops that govern the system. The influence diagrams in Appendix VI show the four feedback loops present in the model.

The four feedback loops in the model may be divided into two intrinsic loops (shown in Figure A6 - 1 and Figure A6 - 2) and two extrinsic loops (shown in Figure A6 - 3 and Figure A6 -



4). Expectancy theory proposes that effort may be increased either by increasing the value of the rewards to the individual (i.e. valence) or by increasing the perception that effort will result in desired rewards (i.e. expectancy and instrumentality). The feedback loops may also, therefore, be divided into two (one intrinsic and one extrinsic) that effect the valence term and two that effect the expectancy/instrumentality term. Each of the four feedback loops in the model is positive or reinforcing and is controlled or moderated by both the job characteristics and the individual characteristics. As the level of performance is proposed to influence satisfaction in two ways, directly and via changes in the rewards received, the feedback loop should, strictly speaking, be thought of as two separate feedback loops. For the purposes of simplicity, however, each of the four feedback loops discussed here include both the direct and indirect influences from performance to satisfaction.

Figure A6 - 1 shows the intrinsic motivation feedback loop, which increases the 'Valence' term via increases in intrinsic satisfaction and intrinsic motivation. The increases in valence will produce further increases in effort.

The moderating variables prevent the loop from producing ever-increasing levels of effort. The feedback loop is first moderated by the job characteristics that determine the levels of rewards actually received by the worker. Thus, although an increase in performance would be assumed to lead to an increase in the intrinsic rewards received, the characteristics of the job may prevent further increases once a certain level is reached.

The feedback loop is also moderated by the characteristics of the individual. Firstly, the ‘Rewards Importance’ variable moderates how the increase in intrinsic rewards received will increase the level of intrinsic satisfaction. For example, if the individual desires more autonomy in their work and this is not increased, the level of intrinsic satisfaction may not increase significantly either. Secondly, the level of intrinsic importance moderates how an increase in intrinsic satisfaction will increase intrinsic motivation. If the individual has little desire for intrinsic rewards, or considers extrinsic rewards to be more important than intrinsic ones, then an increase in intrinsic rewards and intrinsic satisfaction will have less of an effect on their levels of total motivation.

Finally, the feedback loop is also moderated by the growth need strength. Even if an increase in performance does lead to an increase in intrinsic rewards and the individual desires those rewards, the individual’s level of growth need strength is proposed to moderate how the increase in intrinsic satisfaction is manifested into intrinsic motivation.

Figure A6 - 2 shows the intrinsic satisfaction feedback loop, which increases the ‘Expectancy/Instrumentality’ term via increases in intrinsic rewards. This loop proposes that increases in effort and performance will produce increases in intrinsic rewards. These increases in rewards received will increase the perception that effort leads to desired rewards (i.e. the ‘Satisfaction with Desired Rewards’ variable), which will, in turn, produce further increases in effort. Again, this process is moderated by both the job characteristics and the desires of the individual in the ways explained above.

Figure A6 - 3 and Figure A6 - 4 show the feedback loops for changes in extrinsic satisfaction and motivation and follow the same logic as those described for intrinsic satisfaction and motivation described above.

### **5.6.2 'COMPLETENESS' OF THE NEW MODEL OF MOTIVATION**

Section 1.1 discussed the various ways in which models of motivation may be grouped and classified. For example, Bong [1996] claimed that the main reason for the lack of a comprehensive model of motivation was due to the different theoretical orientations adopted by the modeller, namely cognitive and social-cognitive. Bong also proposed that a broader model of motivation might be formulated through an integrative approach, whereby a comprehensive model is built, or by constructing several models concentrating upon different aspects of motivation.

Steers [1987] also noted that no comprehensive model of motivation exists. However, rather than focusing upon the cognitive or social-cognitive orientation of the researcher, Steers identified three sets of variables that must be included in a comprehensive model; the characteristics of the individual, the characteristics of the job and the characteristics of the work environment. Steers claimed that no model adequately dealt with all three sets simultaneously.

The aim of this research is to produce a model of motivation that is more comprehensive than previous models by incorporating both the cognitive and social-cognitive orientations proposed by Bong and the three sets of variables proposed by Steers. This integrative

approach to the problem area must also incorporate the various theories of motivation discussed in Chapter 3, each of which focuses on a particular dimension of motivation. This section therefore examines the extent to which the model achieves these aims.

#### 5.6.2.1 STEER'S 'THREE CATEGORIES' APPROACH

Steers [1987] stated that a comprehensive model of motivation at work must incorporate three sets of variables - the characteristics of the individual, the characteristics of the job and the characteristics of the work environment (see Figure 1). The new model of motivation shown in Figure 36 clearly includes all three sets of variables. The 'Individual Reward Importance', 'Intrinsic/Extrinsic Importance' and 'Growth Need Strength' variables represent the characteristics of the individual, the 'Intrinsic and Extrinsic Rewards' represent the job characteristics and the 'Organisational Structure' variables represent the work environment characteristics.

#### 5.6.2.2 BONG'S COGNITIVE/SOCIAL-COGNITIVE APPROACH

By integrating the cognitive based Expectancy Model and the social-cognitive based Job Characteristics Model the new model may be seen to encompass both approaches.

#### 5.6.2.3 INCORPORATION OF SEVERAL THEORIES OF MOTIVATION

The fact that the new model of motivation includes measures of a wide range of intrinsic and extrinsic rewards, together with their levels of importance and satisfaction to the individual, allows for the proposals of the need based theories discussed in Section 3.2 to be incorporated. For example, a worker who expressed a greater need for pay and other tangible rewards than for intangible rewards would be assumed to be at the 'Psychological Needs' level of Maslows'

Needs Hierarchy. A worker with high need for good relationships with supervisors and co-workers would be characterised as being at the 'Social Needs' level and a worker who is most interested in rewards such as autonomy and task significance could be said to be at the 'Self-Actualisation Needs' level.

Hertzberg's Motivation-Hygiene Theory proposes that extrinsic rewards do not lead to high levels of motivation but could, if not at satisfactory levels, lead to low levels of motivation. In Hertzberg's theory only the intrinsic rewards determine the workers' levels of motivation. The extrinsic rewards must be of a satisfactory level, however, to provide the conditions for the intrinsic rewards to have an effect. The implications of this theory are that a worker who does not desire or receive high levels of intrinsic rewards will always display relatively low levels of motivation regardless of the levels of extrinsic rewards. Similarly, a worker who is highly satisfied with their levels of intrinsic rewards will only display high levels of motivation when their extrinsic rewards are also at satisfactory levels. As intrinsic and extrinsic factors are kept separate in the new model, it is possible to examine the effects of each upon motivation and effort. If Hertzberg's theory were correct, one would expect levels of total motivation and effort to correlate more highly with intrinsic motivation than with extrinsic motivation. It could also be argued that one should expect respondents to rate the intrinsic rewards (i.e. Hertzberg's 'motivators') as being more important to them than the extrinsic rewards (i.e. 'Hygiene factors'). This would also have the effect of making total motivation determined more by intrinsic rather than extrinsic factors, as per Hertzberg's theory.

The process-based theories discussed in Section 3.3 are also clearly incorporated into the new model. Cognitive Evaluation Theory proposes that the levels of extrinsic rewards may influence the level of intrinsic motivation by altering the individual's perceived locus of causality and feelings of competence and self-worth. One may test this theory using the new model by investigating the relationship between extrinsic rewards and satisfaction and intrinsic motivation for jobs with similar levels of intrinsic rewards. One would expect to find those employees who received greater extrinsic rewards to express a lower level of intrinsic motivation.

Goal Setting Theory suggests that the degree of task challenge, the level of participation the individual has in setting the goal and the level of feedback on performance all have a positive effect on the level of effort and performance. As the new model includes variables for task difficulty, participation and feedback, one may investigate the relationship between these variables and the levels of effort and performance.

The feedback loops discussed in Section 5.6.1 are evidence of Reinforcement Theory being incorporated into the model. For example, the intrinsic and extrinsic satisfaction feedback loops (Figure A6 - 2 and Figure A6 - 4 respectively) represent the Expectancy Theory concepts of instrumentality and expectancy, which represent the individual's perception of the relationship between effort, performance and rewards. In effect, it is a measure of the degree to which they have learned, through positive reinforcement, that increased effort will lead to better performance and greater desired rewards.

Equity theory is concerned with the relationship between rewards and satisfaction and proposes that workers compare their levels of performance and rewards to those of co-workers in making satisfaction judgements. Section 3.3.4 described how the subjectivity and possible irrationality of such equity comparisons makes the theory extremely difficult to model and the theory is therefore not incorporated into the new model. Although equity comparisons are not explicitly modelled it may be assumed that, as respondents to the questionnaire are asked to rate their levels of satisfaction with the rewards received, any equity comparisons made would be included in such ratings. What is not clear, however, is how equity comparisons will effect satisfaction judgements following a change in either the levels of effort and performance or rewards received.

# CHAPTER SIX

## 6 MODEL VALIDATION AND RESULTS

### 6.1 DATA COLLECTION SURVEY

In order to test the validity of the proposed model it is necessary to conduct a data collection survey from sample organisations. Data is required to measure, for a sample of employees, the characteristics of their particular job, their personal attributes and general attitudes towards work, their levels of desire for the various job rewards as well as their levels of satisfaction, motivation and performance.

#### 6.1.1 SURVEY QUESTIONNAIRE DESIGN

A multitude of previous research exists in the area of work attitudes and motivation, each with a largely unique method of measurement. As a result, there are no accepted, robust measurement instruments that have been used successfully across a number of studies. Among the previously used instruments for measuring employees' responses to their jobs are the Brayfield-Rothe Satisfaction Index, Miller's Alienation Questionnaire, Patchen's Involvement in the Job Measure, Wollack's Survey of Work Values and the Minnesota Satisfaction Questionnaire.

One attempt to create robust instruments in the quality of working life area has been made by Warr, Cook and Wall [1979]. Warr *et al.* built upon the work from various sources to produce eight scales covering work involvement, intrinsic job motivation, higher order need strength, perceived intrinsic job characteristics, job satisfaction, life satisfaction, happiness and self-



rated anxiety. It is these scales that, after several modifications, form the questionnaire used in this study.

Firstly, the three sections dealing with general issues rather than the respondent's working life were omitted. The self-rated anxiety section measured respondents' level of anxiety about general aspects of life, such as growing old, health and family. The life satisfaction section dealt with areas such as living arrangements, leisure time, government and the state of the country. Finally, the happiness section asked respondents in one question how happy they were.

Two new sections were then added. The effort and performance section attempts to determine the worker's own perception of their personal levels of effort and performance and the workplace section determines the respondent's perception of the organisation in which they work.

Finally, several of the individual questions from the original questionnaire were reworded or omitted and several new questions were added. The resulting questionnaire is shown in Appendix VII.

### **6.1.2 QUESTIONNAIRE RESPONDENTS**

Four organisations agreed to participate in the survey and issue the questionnaire to a small sample of their workforce. The four organisations were The Halifax Plc, NIG Insurance, Pearl Assurance Plc and Elster Jeavons Ltd.

The Halifax is the UK's largest mortgage lender and provides a wide range of banking and insurance services. The survey questionnaire was issued to the staff at one branch based in Cambridge.

NIG (The National Insurance and Guarantee Corporation PLC) is one of the UK's leading insurance providers, providing insurance products protecting motorcars, motor cycles, homes and businesses. The survey questionnaire was issued to staff at NIG's Peterborough office.

Pearl Assurance Plc has been one of the main providers of life assurance, pensions and other financial services in the UK for over 100 years. The survey questionnaire was completed by staff at Pearl's Head Office in Peterborough.

Elster Jeavons Ltd has been a major supplier to the UK gas industry for over 70 years. The company manufactures a full range of gas pressure regulators and safety devices for both natural and LP gas industries. The survey questionnaire was completed by the factory floor staff of the company's Tipton factory.

## **6.2 SUMMARY OF QUESTIONNAIRE RESPONSES**

Appendix VIII summarises the results of the questionnaire responses for each questionnaire section separately for each organisation as well as for the combined set of results. This section examines the degree of association between the results from the different organisations and identifies the major trends in the data.

### **6.2.1 DEGREE OF ASSOCIATION BETWEEN THE ORGANISATIONS**

Appendix VIII shows the graphs of the mean values for perception of job characteristics, importance of job characteristics and satisfaction with job characteristics for each organisation. This section examines the degree of association between the organisations in each of these categories.

Figure 37 summarises the levels of correlation between the four organisations for each category (perception, importance and satisfaction).

Considering first the respondents' perception of the job characteristics, it was found that the three groups of office workers (Halifax, NIG and Pearl) were moderately correlated with R-values of 0.63 to 0.66 (all of which were significant at the 1% level)<sup>3</sup>.

One would expect the perceived characteristics of the job at Jeavons to be less associated with the other three organisations due to the fact the Jeavons surveyed factory floor workers and the

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<sup>3</sup> The R-value is Pearson's correlation coefficient and is a measure of the strength of the association between the two variables. The value ranges from -1 (strong negative correlation) to 1 (strong positive correlation) with 0 denoting no correlation.

other three surveyed office workers. It is perhaps surprising, therefore, to find that the strongest correlation is between The Halifax and Jeavons, with an R-value of 0.71. By examining Figure A8 - 1 and Figure A8 - 2 in Appendix VIII it can be seen that respondents from both organisations rated task significance, social relations, hours and skill variety as the four most prominent aspects of their job. Two job characteristics, pay and work load, were also rated in the bottom three for both organisations.

		Halifax	Jeavons	NIG	Pearl
<b>Perception of Characteristics</b>	Halifax	1			
	Jeavons	0.71	1		
	NIG	0.65	0.44**	1	
	Pearl	0.63	0.16***	0.66	1
<b>Importance of Characteristics</b>	Halifax	1			
	Jeavons	0.14***	1		
	NIG	0.30***	0.64	1	
	Pearl	0.57*	0.13***	0.16***	1
<b>Satisfaction with Characteristics</b>	Halifax	1			
	Jeavons	0.65	1		
	NIG	0.64	0.21***	1	
	Pearl	0.31***	0.08***	0.70	1

Note: All values are significant at the 1% level except: \* significant at 5% level \*\* significant at 10% level  
\*\*\* not significant

Figure 37: Correlations between the Results for the four Participating Organisations

Less correlation was found between the perceived job characteristics at Jeavons and those at NIG and Pearl (0.44 and 0.16 respectively). The correlation of 0.16 between Jeavons and

Pearl showed the lowest level of association between those two companies. By examining Figure A8 - 2 and Figure A8 - 4 in Appendix VIII it can be seen that the two groups of workers perceive their jobs to be vastly different. For example, while the workers from Pearl rated feedback from supervisors as the second most highly rated job characteristic, the workers from Jeavons rated it as the second least highly rated.

When considering the ratings for importance, the only significant correlation at the 1% level was between Jeavons and NIG, although the correlation between The Halifax and Pearl was found to be significant at the 5% level. The graphs of the mean importance levels for each organisation are shown in Figure A8 - 6 through to Figure A8 - 10.

The mean satisfaction results from The Halifax were found to be significantly correlated to both Jeavons and NIG at the 1% significance level. The satisfaction results from NIG were also found to be significantly correlated to the results from Pearl at the 1% significance level. Figure A8 - 11 through to Figure A8 - 14 show the graphs for the mean satisfaction results from the four organisations.

### **6.2.2 CORRELATIONS BETWEEN PERCEPTION, IMPORTANCE AND SATISFACTION WITH JOB CHARACTERISTICS**

Figure A8 - 16 through to Figure A8 - 19 in Appendix VIII show the graphs of the mean levels of perception of job characteristics, importance of job characteristics and satisfaction with job characteristics.

One would expect to find a fairly high level of correlation between the respondents' perceptions of the job characteristics and their levels of satisfaction with those characteristics, with higher levels of perceived characteristics producing higher levels of satisfaction. Figure 38 shows that this was indeed the case, with each organisation showing a highly significant correlation between perception of characteristics and satisfaction.

		Perception of Characteristics	Importance of Characteristics	Satisfaction with Characteristics
<b>Halifax</b>	Perception	1		
	Importance	0.48*	1	
	Satisfaction	0.61*	0.45**	1
<b>Jeavons</b>	Perception	1		
	Importance	-0.34***	1	
	Satisfaction	0.73	-0.43**	1
<b>NIG</b>	Perception	1		
	Importance	0.08***	1	
	Satisfaction	0.84	0.01***	1
<b>Pearl</b>	Perception	1		
	Importance	0.72	1	
	Satisfaction	0.86	0.59*	1
<b>All</b>	Perception	1		
	Importance	-0.02***	1	
	Satisfaction	0.73	-0.23***	1

Note: All values are significant at the 1% level except: \* significant at 5% level \*\* significant at 10% level \*\*\* not significant

Figure 38: Correlations between Perception and Importance of, and Satisfaction with, Job Characteristics

One would not expect to find such a strong correlation between respondents' perception of the job characteristics and their levels of importance with those characteristics or between the levels of importance and satisfaction. Again, Figure 38 confirms this supposition, with only the results from Pearl showing a significant correlation between perception of job characteristics and the importance of those characteristics.

One possible explanation for this positive correlation in the results from Pearl is that those job characteristics that were perceived as being more evident in the job, such as Feedback and Social Relations (see Figure A8 - 4 and Figure A8 - 19), may become more important to the workers simply as a result of their prominence in the job. If, for example, a worker has a job that provides a high degree of feedback, after some time in the job they may feel that job feedback is very important to them and would not be happy in a job that didn't provide feedback.

The negative correlations for the results from Jeavons, although not significant at the 1% or 5% level, do suggest that the characteristics that were perceived as being most prominent in the job were not the characteristics that were important to the workers and that the workers were least satisfied with the job characteristics that were most important to them. By examining Figure A8 - 6 and Figure A8 - 12 in Appendix VIII it can be seen this is indeed the case, with the two most important job characteristics (pay and work conditions) both scoring very low satisfaction ratings. Indeed, if these two characteristics are removed from the analysis the correlation between perception and importance changes from  $-0.34$  to  $0.31$  and the correlation between importance and satisfaction changes from  $-0.43$  to  $0.26$ . It may also

be seen that the job characteristic perceived as being most prominent in the job (task significance) was also rated as one of the least important.

## **6.3 MODEL PERFORMANCE**

This section examines the accuracy of the model in predicting the workers' levels of satisfaction, motivation, effort and performance. Section 6.3.1 considers the five regression equations contained in the model and examines the strength of the independent variables in predicting the dependent variable. Section 6.3.2 then examines the correlations between the model predicted values and the actual values given by the questionnaire respondents.

### **6.3.1 REGRESSION COEFFICIENTS**

The model contains five regression equations to determine the predicted values of intrinsic and extrinsic satisfaction, intrinsic motivation, effort and performance. Figure 39 shows the position of the regression equations in the model. Regression equations 1 and 2 are multiple regression equations with weighted intrinsic/extrinsic rewards and performance as the independent variables and intrinsic/extrinsic reward satisfaction as the dependent variables. Regression equation 3 is a multiple regression equation with intrinsic reward satisfaction multiplied by intrinsic importance and growth need strength as the independent variables and intrinsic motivation as the dependent variable. Regression equation 4 is a linear regression with the sum of the valence and expectancy terms as the independent variable and effort as the dependent term and equation 5 uses effort as the independent term and performance as the dependent term. See Appendix III for a more detailed explanation of the regression equations.



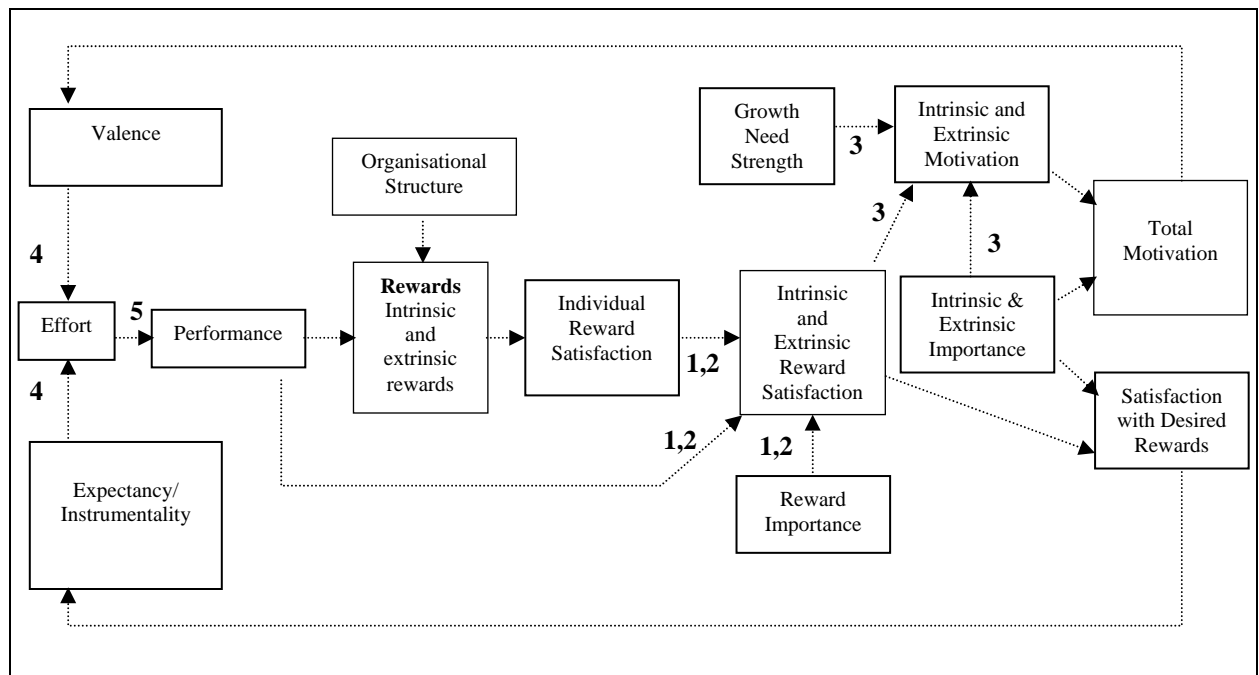


Figure 39: The Position of the Five Regression Equations

The independent variables for each regression equation along with their significance (P-value) are shown in Figure 40<sup>4</sup>. The table also shows the goodness of fit for the regression model ( $R^2$ ) and the significance of this value (Sig F)<sup>5</sup>. Appendix IX contains the full regression model output for each regression equation in Figure 40.

Examining first the regression equation for intrinsic satisfaction, the regression model for the data from each organisation and for the combined dataset achieved high levels of goodness of fit. The  $R^2$  value of 0.95 for the Halifax data, for example, means that 95% of the variation in

<sup>4</sup> The P-value is a measure of the significance of each independent variable. A value of 0.05 denotes the variable is significant at the 5% level.

<sup>5</sup> The  $R^2$  value is an indicator of how well the regression model fits the data. A value of 0.95 means that 95% of the variation in the data is explained by the model. The Sig F value is a measure of the significance of the regression model as a whole. A value of 0.05 denotes the model is significant at the 5% level.

intrinsic satisfaction may be explained by the regression equation. Each regression equation achieves a very high level of significance with Sig F values close to 0 in each case.

However, when one examines the significance of the independent variables individually it is found that the performance variable does not achieve a satisfactory level of significance for any of the datasets. It may be concluded, therefore, that performance does not significantly influence intrinsic satisfaction and may be removed from the regression equation. It was also found that performance did not have a significant effect on extrinsic satisfaction and may therefore also be removed from that regression equation.

Section 6.3.1.1 discusses the revised model with the performance variable removed as a determinant of intrinsic and extrinsic satisfaction and Figure 43 shows the goodness of fit of the regression equations recalculated for the revised model.

Dependent Variable	Independent Variables	Halifax	Jeavons	NIG	Pearl	Combined
Intrinsic Satisfaction	Intercept	0.29	0.15	0.47	0.70	0.24
	Weighted Reward Satisfaction	0.00	0.00	0.00	0.01	0.00
	Performance	0.21	0.78	0.35	0.85	0.70
	Regression Model – R <sup>2</sup> / Sig F	0.95 / 0.00	0.66 / 0.00	0.78 / 0.01	0.82 / 0.01	0.77 / 0.00
Intrinsic Motivation	Intercept	0.00	0.14	0.03	0.03	0.00
	Work Ethic	0.09	0.03	0.14	0.73	0.00
	Intrinsic Sat x Intrinsic Imp	0.00	0.03	0.27	0.54	0.00
	Regression Model – R <sup>2</sup> / Sig F	0.70 / 0.00	0.39 / 0.00	0.51 / 0.09	0.30 / 0.41	0.43 / 0.00
Extrinsic Satisfaction	Intercept	0.05	0.23	0.15	0.63	0.04
	Weighted Reward Satisfaction	0.00	0.00	0.01	0.03	0.00
	Performance	0.06	0.38	0.20	0.46	0.08
	Regression Model – R <sup>2</sup> / Sig F	0.93 / 0.00	0.74 / 0.00	0.68 / 0.02	0.80 / 0.02	0.80 / 0.00
Effort	Intercept	0.36	0.16	0.48	0.76	0.02
	Valence + Expectancy	0.00	0.00	0.00	0.06	0.00
	Regression Model – R <sup>2</sup> / Sig F	0.66 / 0.00	0.76 / 0.00	0.65 / 0.00	0.46 / 0.06	0.77 / 0.00
Performance	Intercept	0.17	0.75	0.04	0.09	0.07
	Effort	0.00	0.00	0.08	0.05	0.00
	Regression Model – R <sup>2</sup> / Sig F	0.72 / 0.00	0.93 / 0.00	0.34 / 0.08	0.51 / 0.05	0.86 / 0.00

Figure 40: Significance of the Independent Variables (P-values) and the Regression Model (R<sup>2</sup> & Sig F)

#### 6.3.1.1 REVISED MODEL

The previous section explained that the performance variable was not found to have a significant effect on either intrinsic or extrinsic satisfaction as proposed by the model and may

therefore be removed from the regression equations. However, in its current form the model only predicted that performance would influence total intrinsic and total extrinsic reward satisfaction. Whilst the data did not support this, it is not clear whether performance would have a significant influence on individual reward satisfaction. In order to test whether performance would have a significant influence on the individual reward satisfaction levels a regression model was run for each tested job characteristic with and without performance as an input.

Figure 41 shows the results of the regression analysis. It can be seen that performance was significant in predicting the level of satisfaction with individual rewards in all job characteristics except Feedback from Supervisors, Social Relations, and Workload. Consequentially, the inclusion of performance as a variable improves the  $R^2$  value of all the regression models except the three mentioned above. It can therefore be concluded that although the level of performance was not shown to have a direct influence on the level of total intrinsic or extrinsic satisfaction, it was shown to have a significant influence on all but three of the satisfaction levels with the individual rewards.

	Regression with Perception and Performance		Regression with Perception only	
	Sig F of Performance	R <sup>2</sup>	Sig F of Performance	R <sup>2</sup>
Autonomy	0.00	0.46	-	0.22
Benefits	0.00	0.60	-	0.23
Feedback from doing the Job	0.00	0.51	-	0.30
Feedback from Supervisors	0.51	0.53	-	0.52
Hours	0.07	0.57	-	0.55
Participation	0.00	0.63	-	0.46
Pay	0.00	0.81	-	0.69
Skill Variety	0.01	0.28	-	0.20
Social Relations	0.92	0.31	-	0.31
Task Difficulty	0.01	0.29	-	0.20
Task Identity	0.00	0.34	-	0.24
Task Significance	0.00	0.35	-	0.20
Work Conditions	0.00	0.84	-	0.76
Work load	0.56	0.37	-	0.36

Figure 41: Regression equation results for individual reward satisfaction with and without Performance as a variable

It is therefore possible to revise the motivation model with performance used as an input into 'Individual Reward Satisfaction' rather than 'Intrinsic and Extrinsic Reward Satisfaction' and Figure 42 shows the model revised in this way.

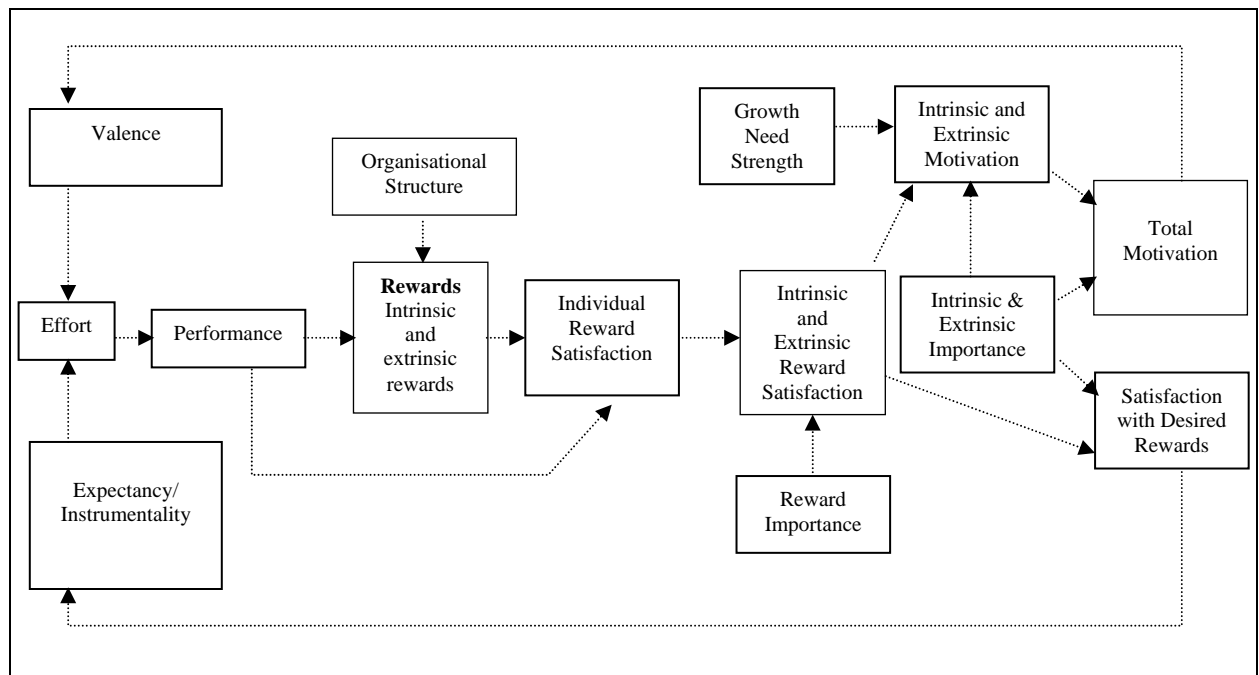


Figure 42: The Revised Motivation Model

Appendix IX contains the regression output for the equations used in the revised model and Figure 43 summarises this data.

Dependent Variable	Independent Variables	Halifax	Jeavons	NIG	Pearl	Combined
Intrinsic Satisfaction	Intercept	0.79	0.14	0.11	0.67	0.26
	Weighted Reward Satisfaction	0.00	0.00	0.00	0.00	0.00
	Regression Model – R <sup>2</sup> / Sig F	0.95 / 0.00	0.66 / 0.00	0.75 / 0.00	0.82 / 0.00	0.77 / 0.00
Intrinsic Motivation	Intercept	0.00	0.14	0.02	0.03	0.00
	Work Ethic	0.07	0.03	0.19	0.76	0.00
	Intrinsic Sat x Intrinsic Imp	0.01	0.04	0.14	0.48	0.00
	Regression Model – R <sup>2</sup> / Sig F	0.65 / 0.00	0.38 / 0.00	0.57 / 0.05	0.32 / 0.39	0.44 / 0.00
Extrinsic Satisfaction	Intercept	0.34	0.10	0.40	0.91	0.05
	Weighted Reward Satisfaction	0.00	0.00	0.01	0.00	0.00
	Regression Model – R <sup>2</sup> / Sig F	0.90 / 0.00	0.73 / 0.00	0.59 / 0.01	0.76 / 0.00	0.79 / 0.00
Effort	Intercept	0.37	0.23	0.26	0.74	0.14
	Valence + Expectancy	0.00	0.00	0.00	0.07	0.00
	Regression Model – R <sup>2</sup> / Sig F	0.63 / 0.00	0.72 / 0.00	0.76 / 0.00	0.45 / 0.07	0.67 / 0.00
Performance	Intercept	0.17	0.75	0.04	0.09	0.07
	Effort	0.00	0.00	0.08	0.05	0.00
	Regression Model – R <sup>2</sup> / Sig F	0.72 / 0.00	0.93 / 0.00	0.34 / 0.08	0.51 / 0.05	0.86 / 0.00

Figure 43: Significance of the Independent Variables (P-values) and the Regression Model (R<sup>2</sup> & Sig F) for the Revised Model

Examining the data for the intrinsic motivation regression equation (see Figure 43 above and Figure A9 - 2) it may be seen that the goodness of fit was, whilst still being highly significant, considerably lower than for the other regression equations. This may be due to the difficulty in accurately measuring intrinsic motivation and the possible tendency for respondents to exaggerate their intrinsic motivations over their extrinsic motivations.

Perhaps the most important regression equation in the model is the one used to predict effort as this is the variable that the whole model is designed to predict. The table shows that the regression equation using the sum of the valence and expectancy terms as the independent variable achieved a fairly good level of fit with the recorded level of effort. Only the results from Pearl failed to reach significance at the 1% level.

#### 6.3.1.2 ALTERNATIVE FORMULATIONS OF THE EXPECTANCY MODEL

Section 3.3.5.2 discussed the alternative expectancy formulations that have been tested in previous studies. In Figure 40 above, the formulation used was the additive model (valence + expectancy) as this formulation was found to produce the highest  $R^2$  value for two out of the four organisations and for the combined dataset. Figure 44 shows the resulting  $R^2$  values for the three alternative model formulations tested.

Model Formulation	Halifax	Jeavons	NIG	Pearl	Combined
$V * E$	0.60	0.66	0.78	0.45	0.68
$V + E$	<b>0.63</b>	<b>0.72</b>	0.76	0.45	<b>0.73</b>
$V^2 * E$	0.53	0.56	<b>0.81</b>	0.50	0.62
$V^2 + E$	0.59	0.64	0.78	<b>0.53</b>	0.70

Figure 44:  $R^2$  values for Alternative Formulations of the Expectancy Model

Figure 44 shows that for two of the organisations, NIG and Pearl, effort was better predicted by a non-linear valence term.



### 6.3.2 CORRELATIONS BETWEEN ACTUAL AND PREDICTED VALUES

The five regression equations discussed in Section 6.3.1 produce predicted values of intrinsic and extrinsic satisfaction, intrinsic motivation, effort and performance. The model also produces a predicted level of total motivation (using the equation shown in Appendix III). This section examines the level of correlation between the predicted and actual values for each organisation and for the combined dataset in order to provide a measure of the model's accuracy.

	Intrinsic Satisfaction	Extrinsic Satisfaction	Intrinsic Motivation	Total Motivation	Effort	Performance
<b>Halifax</b>	0.97	0.95	0.81	0.85	0.79	0.81
<b>Jeavons</b>	0.81	0.85	0.62	0.73	0.85	0.85
<b>NIG</b>	0.86	0.77	0.76	0.38***	0.87	0.52**
<b>Pearl</b>	0.91	0.88	0.56**	0.88	0.67*	0.66*
<b>Combined</b>	0.88	0.89	0.79	0.82	0.85	0.85

Note: All values are significant at the 1% level except: \* significant at 5% level \*\* significant at 10% level

\*\*\* not significant

Figure 45: Correlations between Model Predicted Values and Actual Values

Figure 45 shows that the level of correlation between the models predicted values and the actual values is generally very high. All correlations are significant at the 1% level except for effort and performance for Pearl, which were found to be significant at the 5% level and intrinsic motivation for Pearl and performance for NIG, which were found to be significant at the 10% level. The only variable for which the model did not achieve a significant correlation was total motivation for Pearl.

Figure A10 - 1 through to Figure A10 - 30 in Appendix X show the graphs of the actual and predicted values for each of the variables shown in Figure 45.

## **6.4 CONCLUSION**

This Chapter discussed the questionnaire used to collect the data for this study and the organisations that participated. The data collected was analysed and the results were presented in Section 6.2 and in Appendix VIII.

Moderately high correlation was found between the perceived job characteristics from The Halifax, NIG and Pearl with only low levels of correlation between NIG and Pearl with Jeavons. Surprisingly, however, the highest level of correlation was between Jeavons and the Halifax. In terms of reward importance, there was less association between the four organisations with only the results from Jeavons and NIG being significantly correlated at the 1% level. The correlation between the satisfaction data followed a similar pattern to the perception of job characteristics with Jeavons only being significantly correlated with The Halifax and generally moderately high correlations between The Halifax, NIG and Pearl.

The analysis also found higher levels of correlation between perception of job characteristics and satisfaction with job characteristics than either perception with importance or importance with satisfaction, as would be expected.

The original model proposed that both weighted reward satisfaction and performance would be determinants of intrinsic and extrinsic satisfaction. The results, however, did not show performance to have a significant effect on this regression model. The model was revised,

therefore, to test whether the level of performance would have a significant effect on the levels of satisfaction with the individual rewards. The results of the regression analysis shown in Figure 41 confirmed that performance was a significant variable for all but three of the job characteristics and the model was revised accordingly.

A generally high level of correlation was found between the model predicted levels of satisfaction, motivation, effort and performance and the values recorded by the questionnaires.

# CHAPTER SEVEN

## 7 USING THE MODEL IN A BUSINESS CONTEXT

### 7.1 THE PROCESS OF JOB REDESIGN

Hackman and Oldham, in their study of work redesign (Hackman & Oldham, [1980]), state that “problems stemming from unsatisfactory relationships between people and their jobs can, in many circumstances, be remedied by restructuring the jobs that are performed, rather than by continued efforts to select, train, direct, and motivate people so that they fit better with the requirements of fixed jobs”.

They also emphasise the importance of collecting diagnostic data about the work system before it is redesigned, pointing out “there are few universals regarding work redesign” (Hackman & Oldham [1980]). The changes to a work system necessary to get the best out of one set of workers may be quite different from the changes necessary to improve the performance of another. The changes necessary may also not be obvious and the changes that “intuitively seem right when one first looks at a work system often turn out later to be wrong or irrelevant” (Hackman & Oldham [1980]). Hackman & Oldham conclude that “for these reasons, pre-change diagnostic work seems to us critical to competent work redesign, and our change models explicitly incorporate diagnostic activities” (Hackman & Oldham [1980]). It is this stage of pre-change diagnostic work that the motivation model developed in this thesis is designed to aid, allowing organisations to make more informed decisions as to which job aspects to change and what the likely effects to such changes would be.

Hackman and Oldham propose six questions to ask in diagnosing work systems prior to work redesign. These are summarised in Figure 46 below.

***Assessing the need for work redesign***

***1. Is there a problem or an exploitable opportunity?***

What is the problem being addressed or, alternatively, what kinds of improvements might be achieved?

***2. Does the problem or opportunity centrally involve employee motivation, satisfaction, or work effectiveness?***

Poor performance may not be a result of low satisfaction or motivation. Where poor performance is the result of a computer error or faulty equipment, for example, work redesign may not be appropriate.

***3. Might the design of work be responsible for the observed problems?***

Low satisfaction and motivation may not be the fault of the work itself. If the MPS of a job is high but low motivation persists then the problem may lie in other areas of the work situation (such as supervision, compensation, or co-worker relations).

***4. What aspects of the job most need improvement?***

What are the worst aspects of the job that need changing?

***Determining the feasibility of work redesign***

***5. How ready are the employees for change?***

How will employees react to job changes?

***6. How hospitable are organisational systems to needed changes?***

Are the changes to the job design feasible? What effects will it have in the rest of the organisation?

Figure 46: Questions to Ask in Diagnosing Work Systems (Adapted from Hackman & Oldham [1980])

It is important to note that question three of Hackman and Oldham's list is largely redundant if one is to use the motivation model developed here. If one refers to Section 4.2 it can be seen that the motivating potential score (MPS) of a job is determined based on the five job dimensions used in the Job Characteristics Model (i.e. Skill Variety, Task Identity, Task Significance, Autonomy and Feedback from the Job). Question three asks whether factors other than these five job characteristics may be responsible for the low motivation of the

workforce. If other factors, such as poor pay or co-worker relationships, are found to be the primary cause then the Job Characteristics Model is not a valid tool for analysis of the situation. However, as explained in Section 5.2.2, the new motivation model developed in this paper has been expanded to include factors such as pay and social relations and is therefore able to analyse the effect of changes in such factors.

The model developed here would primarily be used in answering questions four and five in Hackman and Oldham's list. Hackman and Oldham propose that the Job Diagnostic Survey (shown in Appendix I) be used to investigate which aspects of the job most need improvement. The respondents are asked to rate the various aspects of their job and the results are used to produce a graph similar to that shown in Figure 16 in Section 4.2. Looking at Job B in Figure 16, Hackman and Oldham would maintain that the job characteristics that need attention are autonomy and feedback as these received the lowest perception ratings. However, the new model differs from the Hackman and Oldham and Porter and Lawler models in that it proposes that it is not only the perceived level of job characteristics that will determine motivation but also the level of importance of those characteristics. Examining Figure 16 and concluding that autonomy and feedback are the characteristics that require attention may not produce the desired results if it turns out that the workforce in question do not desire more autonomy or feedback.

It is proposed here that the best answer to the question "Which aspects of the job need changing?" is "Those aspects that will lead to the greatest overall improvement in motivation and performance". Those aspects may not necessarily be the ones that received the lowest

rating scores and may even include the highest rated characteristics if they are also the most important characteristics to the workforce. It therefore follows that questions four and five should be answered simultaneously and the model developed in this Chapter allows a more detailed analysis of the situation in order to provide a better answer.

## **7.2 ADAPTATION OF THE MODEL INTO AN INTERACTIVE MANAGEMENT TOOL**

When the management of an organisation is considering a job redesign program they need to know which aspect of the job should be redesigned, by how much, and what the likely effects will be. The previous Chapter showed that the model was able to predict to a fairly high level of accuracy the levels of certain key variables, such as satisfaction, effort and performance. As the model stands, however, it does not allow the effects of changes to the job characteristics to be easily calculated. This section examines how the model may be used to build an interactive spreadsheet based program that allows changes to job characteristics to be easily investigated in order to help answer questions four and five discussed above.

### **7.2.1 THE 'INTERFACE' SCREEN**

Figure 47 and Appendix XI shows the spreadsheet program that has been developed to allow changes in job design to be investigated. Figure 47 shows the 'Interface' screen where the user 'tunes' the model to the data collected from the questionnaires. Average values are entered for the perception and importance of job characteristics and the model then uses the regression equations discussed in 6.3.1.1 to calculate the estimated levels of satisfaction with the individual rewards. The user must also enter the average values for intrinsic and extrinsic

importance and growth need strength and the model then calculates the estimated levels of satisfaction, motivation, effort and performance using equations discussed in Appendix III and the regression equations shown in Figure 43 and in Appendix IX.

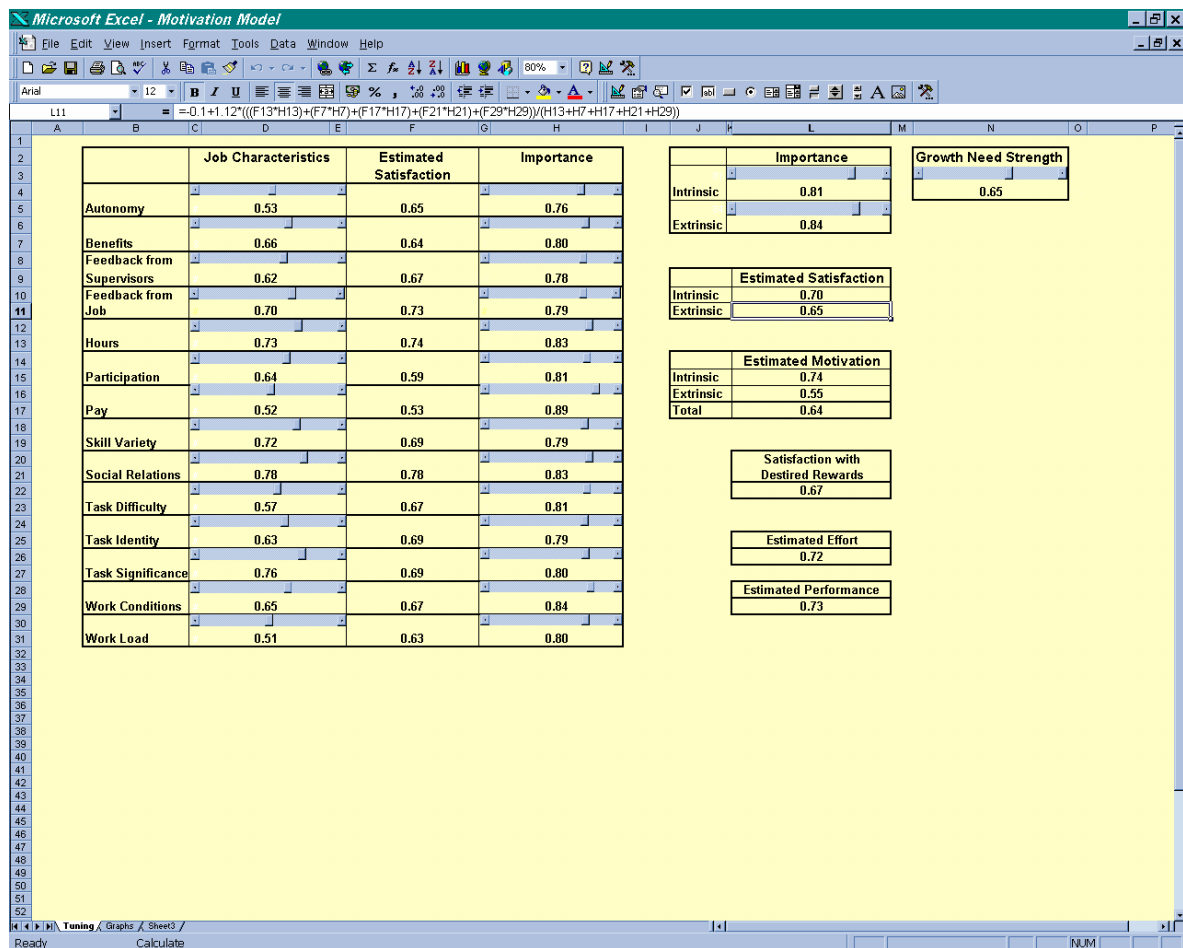


Figure 47: Management Tool – ‘Interface’ Screen

The user is then able to investigate the likely effects of a change in one or many of the values for perceived job characteristics simply by moving the scroll bars shown in Figure 47.



### 7.2.2 THE 'ANALYSIS' SCREENS

If a more detailed analysis is required the user may move to the 'Analysis' screen, shown in Figure A11 - 1. Here the user may select the job characteristics he or she wishes to investigate using the check boxes in the top left of the screen and the percentage by which to increase those characteristics. In Figure A11 - 1 the effects of increasing autonomy, feedback from supervisors and from doing the job, participation, skill variety, social relations and task identity are shown. The table in the middle of the screen shows the new levels of the job characteristics and the estimated levels of satisfaction with those characteristics as well as the percentage increase.

The table on the right of the screen shows the estimated increases in intrinsic and extrinsic satisfaction and motivation, total motivation, satisfaction with desired rewards, effort and performance. It can be seen that a 20% increase in the selected job characteristics is estimated to produce a 5.6% increase in effort and a 5.1% increase in performance. These increases are also shown in the two graphs in the lower half of the screen.

The buttons in the top right corner of the screen may be used to view graphs of satisfaction with job characteristics, the percentage increases in satisfaction with job characteristics and intrinsic and extrinsic satisfaction and motivation (shown in Figure A11 - 2 through to Figure A11 - 4).

### 7.3 USE OF THE MANAGEMENT TOOL

As an illustration of how the model may be used, examination of Figure A8 - 5 or Figure 47 reveals that autonomy, pay and work load are the three job characteristics perceived by the combined workforce as being most lacking from their jobs. Hackman and Oldham would therefore conclude that any work redesign project should focus on these three elements. The estimated effects of increasing these three job characteristics by a certain percentage, say 20%, may easily be investigated using the model.

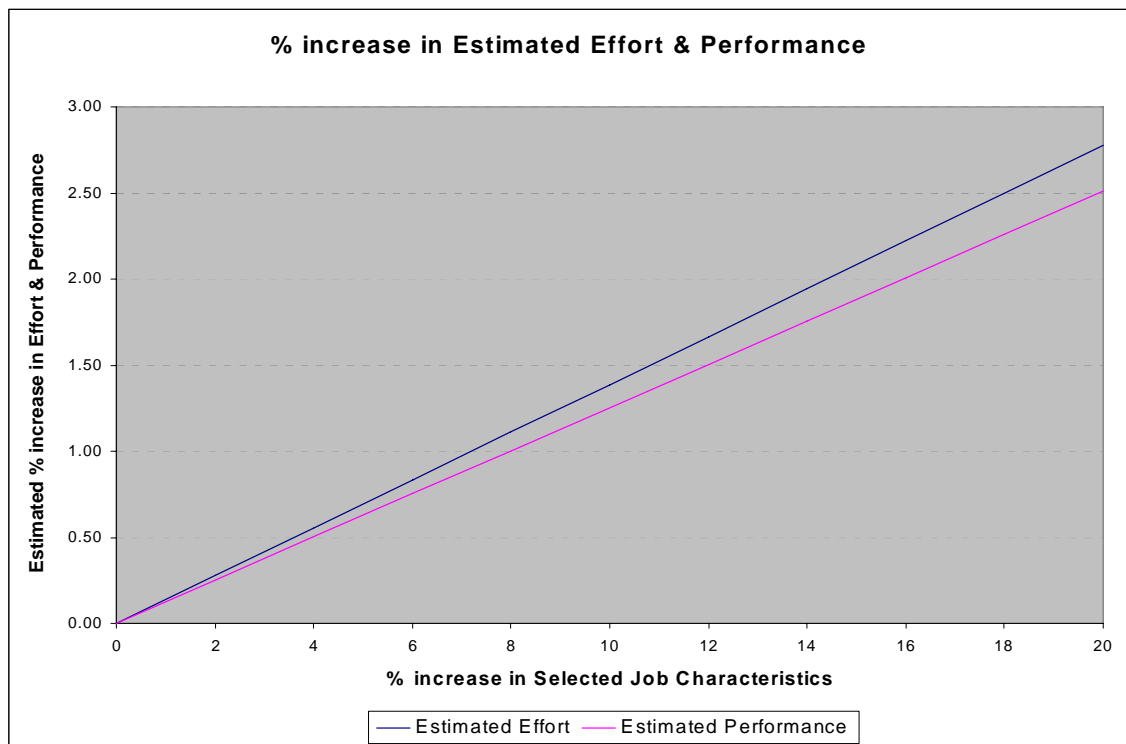


Figure 48: Estimated Increase in Effort and Performance following 20% Increase in Autonomy, Pay and Work Load

Figure 48 shows that a 20% increase in these three job characteristics is estimated to produce only a 2.75% increase in effort and a 2.5% increase in performance. The reason for this

relatively small increase in effort and performance may be explained by the levels of importance of the three characteristics. Figure A8 - 10 shows that, although pay is rated as the most important job characteristic, autonomy is rated as the least important and work load is also fairly low in the importance rating. Increasing these job characteristics does not therefore lead to large increases in effort or performance.

If, instead of concentrating on the job characteristics that were perceived as being most lacking from people's jobs, the organisation concentrated on those job characteristics that were most important to the workforce, bigger improvements in effort and performance may be expected.

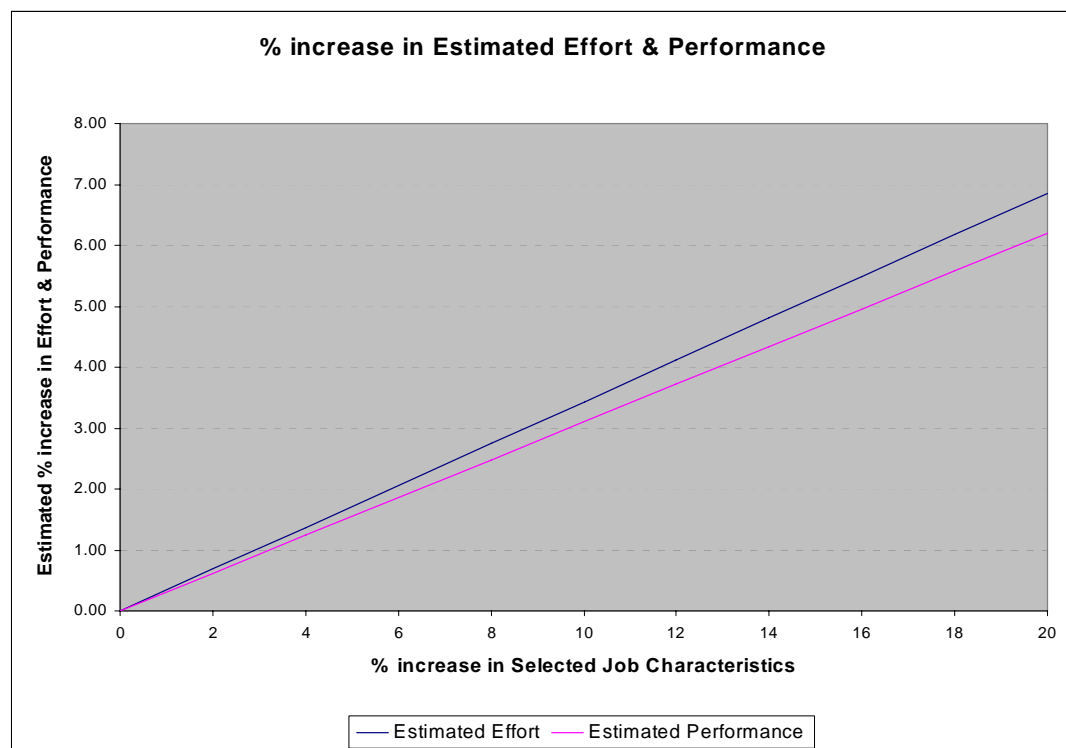


Figure 49: Estimated Increase in Effort and Performance following 20% Increase in Pay, Work Conditions and Social Relations

Figure 49 shows the estimated increase in effort and performance following a 20% increase in pay, work conditions and social relations. It can be seen that effort and performance are increased by approximately 7% and 6% respectively, more than double the increase produced by increasing the three job characteristics recommended by Hackman and Oldham's methodology.

#### **7.4 ALTERNATIVE MANAGEMENT TOOL**

It can be seen from Figure 41 that some of the regression equations linking perception of job characteristics and performance with satisfaction with job characteristics achieved relatively low  $R^2$  values. With the data collected it is not possible to accurately predict respondents satisfaction with certain job characteristics. It is possible to overcome this problem by altering the management tool to allow the user to control the levels of satisfaction with job characteristics directly and then using the regression equations to produce an estimated level of perception that would result in that satisfaction level.

The user, therefore, rather than asking "What would be the estimated effects of increasing the selected job characteristics by  $x$  amount?", is asking two questions. Firstly, "If I were able to increase workers' satisfaction with the selected job characteristics by  $x$  amount, what would be the estimated effects on motivation and performance?" and secondly, "What increase in the perception of the selected job characteristics is likely to result in the required increase in satisfaction?".

The alternative management tool is shown in Figure 50 below.

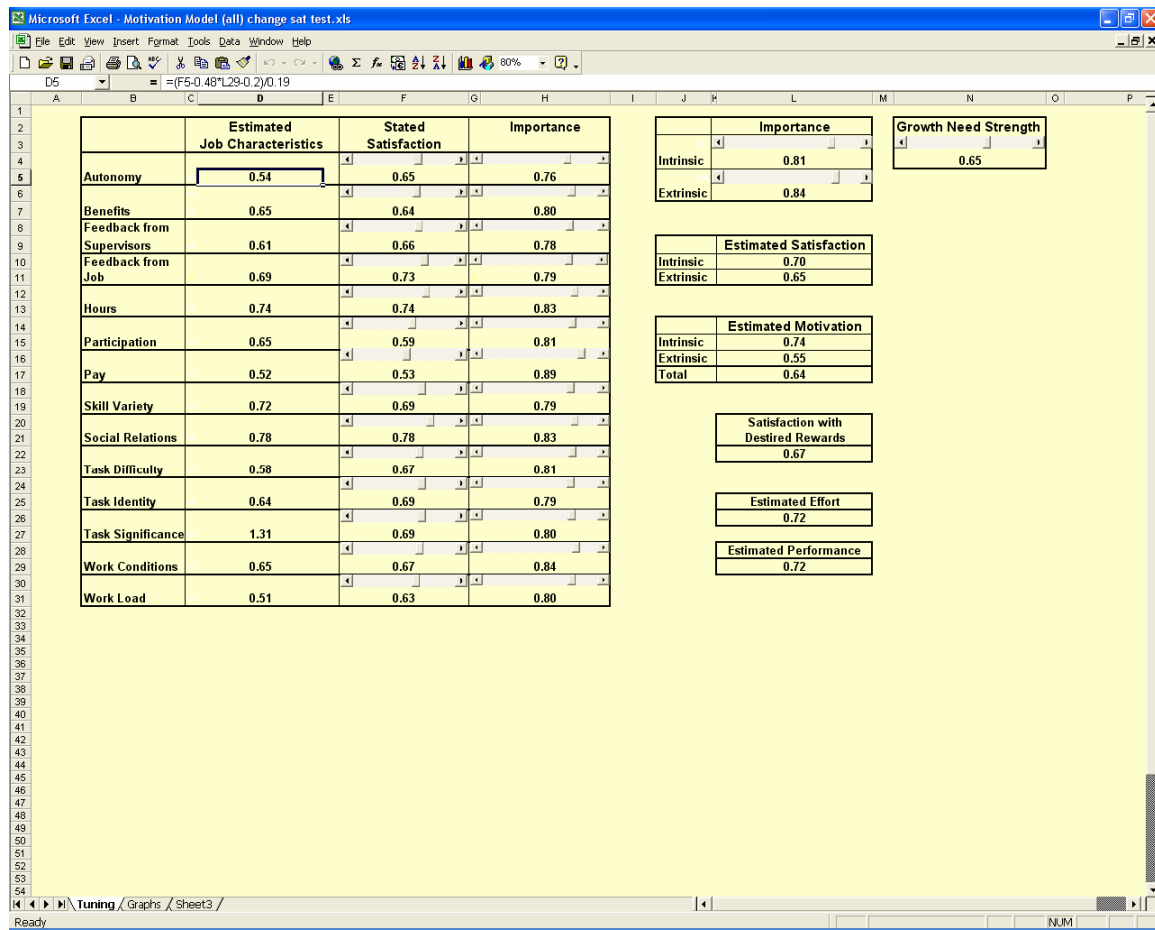


Figure 50: Alternative Management Tool

# CHAPTER EIGHT

## 8 SUMMARY OF CONCLUSIONS AND FURTHER RESEARCH

### 8.1 SUMMARY OF CONCLUSIONS

The aims of the research were the following:

1. To produce a more complete model of employee motivation and performance that incorporates both cognitive and social-cognitive elements (as characterised by Bong [1996]) as well as the three sets of variables identified by Steers [1987] as being essential to a comprehensive model of motivation; the characteristics of the individual, the characteristics of the job and the characteristics of the work environment.
2. To produce an integrated model of employee motivation and performance that incorporates a variety of theories and models of individual dimensions of motivation.
3. To produce a management tool that is of practical use and allows the management of an organisation to easily investigate the likely results of work re-design policies upon the motivation and performance of the workforce.

As its foundation, the new model uses Porter and Lawler's cognitive Expectancy Model and Hackman and Oldham's social-cognitive Job Characteristics Model. Each model is critiqued and amended before being integrated into the new model, thus incorporating the cognitive and social-cognitive approaches proposed by Bong. Each of Steers' three sets of variables are also clearly contained in the new model; the 'Importance' variables represent the characteristics of the individual, the 'Intrinsic and Extrinsic Rewards' represent the job characteristics and the

‘Organisational Structure’ variables represent the work environment characteristics. Section 5.6.2.3 also details how the model incorporates many of the motivational theories discussed in this paper.

The model was validated using questionnaire data collected from four organisations. The data collected measured the respondent’s levels of satisfaction and importance with various aspects of their job as well as their overall levels of motivation and performance. This data was used to form the regression equations used in the model and generally high levels of significance were found for all variables. The only variable that did not reach a satisfactory level of significance was ‘Performance’ when use as a predictor of intrinsic or extrinsic satisfaction. The model was therefore redesigned with the proposed link between performance and intrinsic and extrinsic satisfaction removed. Performance was then tested as a predictor of the levels of satisfaction with the individual job characteristics. It was found that performance was significant in predicting the level of satisfaction with all individual job characteristics except ‘Feedback from Supervisors’, ‘Social Relations’ and ‘Workload’.

Examining the table in Figure 43 it can be seen that, excluding the results for Intrinsic Motivation, the regression equations for the predicted variables achieved  $R^2$  values between 0.67 and 0.86 for the combined dataset.

The proposed new model of motivation extends significantly the existing models but as a theoretical model is still of limited use to the management of an organisation. Chapter Seven describes how the model may be adapted into a management tool to assist in job redesign

projects. The tool should be clear and simple to use and provide the user with a quick way of investigating the likely effects of redesigning certain job characteristics upon the motivation of the workforce. Figure 50 shows the interface that was developed for this purpose. The user may experiment with altering the levels of certain job characteristics and the model calculates the effect on the key output variables, such as motivation and performance. The use of the tool allows the management of an organisation to identify those elements of the job that require attention and to have greater confidence that the job redesign project will achieve the desired results.

## **8.2 FURTHER RESEARCH**

In Section 6.3 it was noted that the regression equation used to predict the intrinsic motivation variable achieved a considerably lower goodness of fit than the other regression equations. It was hypothesised that this may be due to the difficulty in measuring intrinsic motivation or due to a tendency for workers to over-emphasise their intrinsic motivation over their extrinsic motivation. The reasons for the relatively poor performance of the regression model for intrinsic motivation needs more investigation. Perhaps the questions used to measure the respondents' level of intrinsic motivation need re-evaluating and adjusting?

Alternative formulations of the interaction between the Valence and Expectancy terms were briefly examined in Section 6.3.1.2. It was found that for two of the datasets the simple additive formulation did not achieve the best fit. Further work may be necessary to find if there are certain circumstances when an alternative formulation tends to give better results.



For example, do certain types of people better match a multiplicative formulation or do certain types of jobs better match a non-linear model?

Finally, the model needs to be tested on a larger dataset. Although dozens of letters were sent out to companies asking whether they would be willing to take part in this research, only four organisations agreed to do so. Perhaps many felt that the motivation of their workforce (or perhaps lack of it) was a sensitive area and believed that it would reflect poorly on the organisation.

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## **Appendix I      The Job Diagnostic Survey**

Use the scales below to indicate whether each statement is an accurate or inadequate description of your present or most recent job. After completing the instrument, use the scoring key to compute a total score for each of the core job characteristics.

5 = Very descriptive

2 = Mostly non-descriptive

4 = Mostly descriptive

1 = Very non-descriptive

3 = Somewhat descriptive

1. I have almost complete responsibility for deciding how and when the work is to be done.
2. I have a chance to do a number of different tasks, using a wide variety of different skills and talents.
3. I do a complete task from start to finish. The results of my efforts are clearly visible and identifiable.
4. What I do affects the well-being of other people in very important ways.
5. My manager provides me with information about how well I am doing.
6. The work itself provides me with constant feedback about how well I am doing.
7. I make insignificant contributions to the final product or service.
8. I get to use a number of complex skills on this job.
9. I have very little freedom in deciding how the work is to be done.

10. Just doing the work provides me with opportunities to figure out how well I am doing.
11. The job is quite simple and repetitive.
12. My supervisors or co-workers rarely give me feedback on how well I am doing the job.
13. What I do is of little consequence to anyone else.
14. My job involves doing a number of different tasks.
15. Supervisors let us know how well they think we are doing.
16. My job is arranged so that I do not have a chance to do an entire piece of work from beginning to end.
17. My job does not allow me an opportunity to use discretion or participate in decision-making.
18. The demands of my job are highly routine and predictable.
19. My job provides few clues about whether I'm performing adequately.
20. My job is not very important to the company's survival.
21. My job gives me considerable freedom in doing the work.
22. My job provides me with the chance to finish completely any work I start.
23. Many people are affected by the job I do.

Scoring Key:

Skill Variety (SV) (questions 2, 8, 11\*, 14, 18\*) = \_\_\_\_ / 5 = \_\_\_\_

Task Identity (TI) (questions 3, 7\*, 16\*, 22) = \_\_\_\_ / 4 = \_\_\_\_

Task Significance (TS) (questions 4, 13\*, 20\*, 23) = \_\_\_\_ / 4 = \_\_\_\_



Autonomy (AU) (questions 1, 9\*, 17\*, 21) = \_\_\_\_ / 4 = \_\_\_\_

Feedback (FB) (questions 5, 6, 10, 12\*, 15, 19\*) = \_\_\_\_ / 6 = \_\_\_\_

(Note: for the items with asterisks, subtract your score from 6)

Total the numbers for each characteristic and divide by the number of questions to get an average score.

Calculate the Motivating Potential Score (MPS) using the following formula:

$$\text{Motivating Potential Score (MPS)} = \frac{SV + TI + TS}{3} \times AU \times FB$$

MPS scores range from 1 to 125.

## Appendix II Hackman and Oldham's Empirical Support for The Job Characteristics Model

The following is a summary of the results of Hackman and Oldham's test of the Job Characteristics Model (Hackman and Oldham [1976]). The data was collected on 658 employees working on 62 different jobs in seven organisations using the Job Diagnostic Survey (see Appendix I).

### Relationships of the Job Dimensions and Psychological States with the Outcomes

In general, results are consistent with expectations from the model. Correlations are in the predicted direction and most achieve acceptable levels of statistical significance.

Outcome Measures					
	Internal motivation	General satisfaction	Growth satisfaction	Absenteeism	Rated work effectiveness
<b>Psychological States</b>					
Experienced meaningfulness	.64**	.64**	.64**	-.03	.13*
Experienced responsibility	.65**	.41**	.51**	-.16	.16**
Knowledge of results	.23**	.33**	.33*	-.11	.10
<b>Job Characteristics</b>					
Skill variety	.34**	.32**	.48**	-.15**	.07
Task identity	.25**	.22**	.29**	-.18	.15**
Task significance	.31**	.21**	.35**	.16	.12**
Autonomy	.31**	.38**	.51**	-.24**	.19**
Feedback	.35**	.38**	.45**	-.12	.21**
MPS	.48**	.43**	.58**	-.25*	.24**

\*  $p < .05$

\*\*  $p < .01$

Figure A2 - 1: Median Correlations of Job Dimensions and Psychological States with the Work Outcomes (Hackman and Oldham [1976])

### **Test of the Mediating Function of the Psychological States**

To test whether the three psychological states do indeed mediate between the job characteristics and the outcome measures in the way proposed by the model, Hackman and Oldham asked three questions. Firstly, are predictions of the outcome measures from the psychological states maximised when all three of the psychological states are used, or are the relationships equally strong when obtained using the psychological states singly or in pairs? Secondly, are the relationships between the job dimensions and the outcome measures empirically dependent on the psychological states, or do the job dimensions predict the outcome measures just as well if the psychological states are ignored? Thirdly, do specific job dimensions relate to specific psychological states as specified in the model, or are the two sets of variables related more complexly (or less so) than predicted?

Figure A2 - 2 shows the results of the regression analysis to answer the first of the three questions. Although the amount of outcome measure variance controlled by the regression equations does increase as additional psychological states are added to the equations, Hackman and Oldham point out that the biggest increase in  $R^2$  occurs when the number of predictors is increased from one to two. In answer to the first question, “the conclusion that prediction is maximised when all three psychological states are present must be interpreted with considerable caution” (Hackman and Oldham [1976]).

Number of predictors used in regressions	<i>Mean R<sup>2</sup> for Outcome Measures</i>		
	Internal motivation	General satisfaction	Growth satisfaction
One (EM; ER; KR) <sup>a</sup>	.29	.23	.26
Two (EM + ER; EM + KR; ER + KR)	.45	.39	.43
Three (EM + ER + KR)	.51	.46	.50

<sup>a</sup> *n* = 658. EM = experienced meaningfulness; ER = experienced responsibility ; KR = knowledge of results.

Figure A2 - 2: Average Variance Controlled in Regressions Predicting Outcome Measures from One, Two and Three Psychological States (Hackman and Oldham [1976])

To answer the second question, Hackman and Oldham used two complementary methods. First, relationships between each job dimension and the several outcome measures were examined before and after the model specified mediating psychological states were statistically controlled (by partial correlation). The results of this analysis are shown in Figure A2 - 3. For the model to be correct, the partial correlations should approach zero and be substantially lower in magnitude than the zero-order correlations between the job dimensions and the outcome measures. Although there is general support for the proposition that the psychological states mediate between the job dimensions and the outcome measures, the results for feedback and autonomy were less strong than for the other dimensions.

<b>Job Dimension</b>	<b>Zero-order correlation</b>	<b>Partial correlation<sup>a</sup></b>	<b>Difference</b>
<b><i>Internal motivation</i></b>			
Skill variety	.42	.15	.27
Task identity	.22	.08	.14
Task significance	.32	.07	.25
Autonomy	.33	.08	.25
Feedback	.36	.28	.08
<b><i>General satisfaction</i></b>			
Skill variety	.42	.13	.29
Task identity	.22	.07	.15
Task significance	.24	-.06	.30
Autonomy	.43	.29	.14
Feedback	.37	.23	.14
<b><i>Growth satisfaction</i></b>			
Skill variety	.52	.28	.24
Task identity	.31	.19	.12
Task significance	.33	.06	.27
Autonomy	.58	.46	.12
Feedback	.44	.31	.13

<sup>a</sup> For each job dimension, the partial correlation reported controls only for the specific psychological state specified by the model to mediate the effects of that dimension. Thus, for relationships involving skill variety, task identity and task significance, experienced meaningfulness was controlled; for relationships involving autonomy, experienced responsibility was controlled; for relationships involving feedback, knowledge of results was controlled. ( $n = 658$ ).

Figure A2 - 3: Relationships between Job Dimensions and the Outcome Measures Controlling for the Effects of the Psychological States (Hackman and Oldham [1976])

Secondly, a multiple regression analysis was conducted whereby, for each outcome measure, the three psychological states were introduced as primary predictors and the five job dimensions were then added as secondary predictors. If the psychological states do mediate

between the job dimensions and the outcome measures as predicted, (a) the psychological states alone should account for a sizeable portion of the dependent variable variance, and (b) introduction of the five job dimensions into the equation (as additional predictors) should not substantially increase the amount of dependent variable variance controlled.

The results of this analysis is shown in Figure A2 - 4. Again, general support is found for the model. The psychological states account for a substantial variance for each of the dependent measures and the introduction of the five job dimensions adds little to the variance controlled by the model. However, examination of the regression coefficients for the individual variables in the equations reveals a few anomalies. Ideally, the standardised coefficients for the psychological states would all be moderate to high and would all exceed the coefficients for the five job dimensions. Hackman and Oldham found, however, that “experienced responsibility adds little to prediction for two of the outcome measures (general and growth satisfaction). For both of these outcome measures autonomy (the job dimension theoretically mediated by experienced responsibility) has a relatively larger regression coefficient than does experienced responsibility” (Hackman and Oldham [1976]). It was also found that the coefficients for knowledge of results were relatively small. This indicates that the actual relationship between the job dimensions and psychological states may not be as the model predicts. This point is examined further in answering the next question.

	<i>Summary Statistics</i>			
	Multiple correlation ( <i>R</i> ) for the full eight-variable equation	<i>R</i> <sup>2</sup> for the three-variable equation (Psychological states only)	<i>R</i> <sup>2</sup> for the full eight-variable equation	Increase in <i>R</i> <sup>2</sup> by adding the five job dimensions to the regression
Internal	.72	.51	.52	.01
General	.69	.46	.48	.02
Growth	.77	.50	.59	.09

	<i>Standardised regression weights (for the full equation)</i>							
	EM	ER	KR	SV	TI	TS	A	F
Internal motivation	.31	.43	-.03	.09	-.01	.02	-.05	.08
General satisfaction	.52	.05	.12	.07	-.00	-.07	.10	.03
Growth satisfaction	.38	.07	.09	.13	.03	.02	.24	.07

<sup>a</sup> (*n* = 658). EM = experienced meaningfulness; ER = experienced responsibility; KR = knowledge of results; SV = Skill variety; TI = Task identity; TS = Task significance; A = Autonomy; F = Feedback.

Figure A2 - 4: Multiple Regressions Predicting the Outcome Measures from all Prior Variables Compared to Predictions from the Psychological States Only (Hackman and Oldham [1976])

The final question of whether the job dimensions relate to the psychological states as specified by the model was tested by computing regressions for each of the psychological states, in which the predictors were the job dimensions specified by the model as directly causal of that psychological state. Thus, experienced responsibility was predicted from skill variety, task identity and task significance; experienced responsibility was predicted from autonomy; and knowledge of results was predicted from feedback. The remaining job dimensions (i.e. those *not* expected to influence the psychological state) were added to the regression equation. If the model is correct, the remaining job dimensions should not substantially increase the amount of variance controlled by the theory-specified job dimensions, which should

themselves account for substantial variance in the psychological states. Figure A2 - 5 shows the results of this analysis.

<i>Summary Statistics</i>				
	Multiple correlation ( <i>R</i> ) for the full equation (All five Job Dimensions)	<i>R</i> <sup>2</sup> for the model-specified Job Dimensions only <sup>a</sup>	<i>R</i> <sup>2</sup> for the full equation (All five Job Dimensions)	Increase in <i>R</i> <sup>2</sup> by adding to the regression those Job Dimensions <i>not</i> specified by the model
Experienced meaningfulness	.66	.38	.43	.05
Experienced responsibility	.57	.17	.33	.16
Knowledge of results	.56	.29	.31	.02

<i>Standardised regression weights</i>					
	Skill Variety	Task Identity	Task Significance	Autonomy	Feedback
Experienced meaningfulness	[.30]	[.05]	[.27]	.17	.17
Experienced responsibility	.21	.17	.19	[.14]	.16
Knowledge of results	-.13	.04	.07	.11	[.51]

<sup>a</sup> The model-specified job dimensions used in computing these regressions are: skill variety, task identity and task significance to predict experienced responsibility; autonomy to predict experienced responsibility; and feedback to predict knowledge of results. Regression coefficients for the model-specified job dimensions are bracketed in the lower half of the table. (*n* = 658).

Figure A2 - 5: Multiple Regressions Predicting the Psychological States from all Job Dimensions Compared to Predictions from the Model-Specified Job Dimensions Only (Hackman and Oldham [1976])

Hackman and Oldham found only a moderate amount variance in the psychological states controlled by the model-specified job dimensions. Although the job dimensions were found to predict experienced meaningfulness and knowledge of results generally as predicted by the model, experienced responsibility was found to be almost equally affected by all of the job dimensions.



### **Test of the Moderating Effect of Growth Need Strength**

The Job Characteristics model predicts that high GNS individuals will be both better able to experience the psychological effects of an objectively enriched job, and more disposed to respond favourably to that experience. The top group of Figure A2 - 6 shows the result of the correlations between the product of the three psychological states and each outcome measure for subjects high and low in measured GNS. Except for the measure of absenteeism, differences in the magnitude of the correlations for high verses low GNS employees are all in the predicted direction and statistically significant. The relationships between the core job dimensions and the psychological states for high verses low GNS employees are shown in the middle group of Figure A2 - 6. All differences between correlations are again in the predicted direction and (except for task identity) are statistically significant.

The final group at the bottom of Figure A2 - 6 shows results for correlations computed directly between the overall motivating potential of the job and the outcome measures, in effect, bridging the mediating function of the psychological states. In this case, although all differences in correlations for high verses low GNS employees are in the predicted direction, the differences are less substantial than the others reported in the table and statistical significance is only achieved for the measure of internal motivation.

	Median correlations		<i>Z (for difference between rs)</i>
	Low GNS	High GNS	
Product of the three psychological states with:			
Internal motivation	.48	.66	1.75*
General satisfaction	.36	.69	3.66**
Growth satisfaction	.42	.69	2.68**
Absenteeism	-.16	-.13	-0.21
Rated work effectiveness	.12	.44	2.06*
Job dimensions with corresponding psychological states			
MPS with product of the psychological states	.59	.70	2.02*
Skill variety with experienced meaningfulness	.23	.57	3.37**
Task identity with experienced meaningfulness	.17	.30	1.08
Task significance with experienced meaningfulness	.15	.52	2.18*
Autonomy with experienced responsibility	.11	.59	2.99**
Feedback with knowledge of results	.42	.63	2.54**
Motivating potential score with:			
Internal motivation	.27	.52	1.64*
General satisfaction	.32	.49	0.93
Growth satisfaction	.55	.65	0.52
Absenteeism	-.23	-.25	0.00
Rated work effectiveness	.20	.44	0.53

\*  $p < .05$

\*\*  $p < .01$

Figure A2 - 6: Relationships among Job Dimensions, Psychological States and Outcome Measures for Employees High and Low in GNS

## Appendix III Mathematical Relationships in the Modified Expectancy Model of Motivation

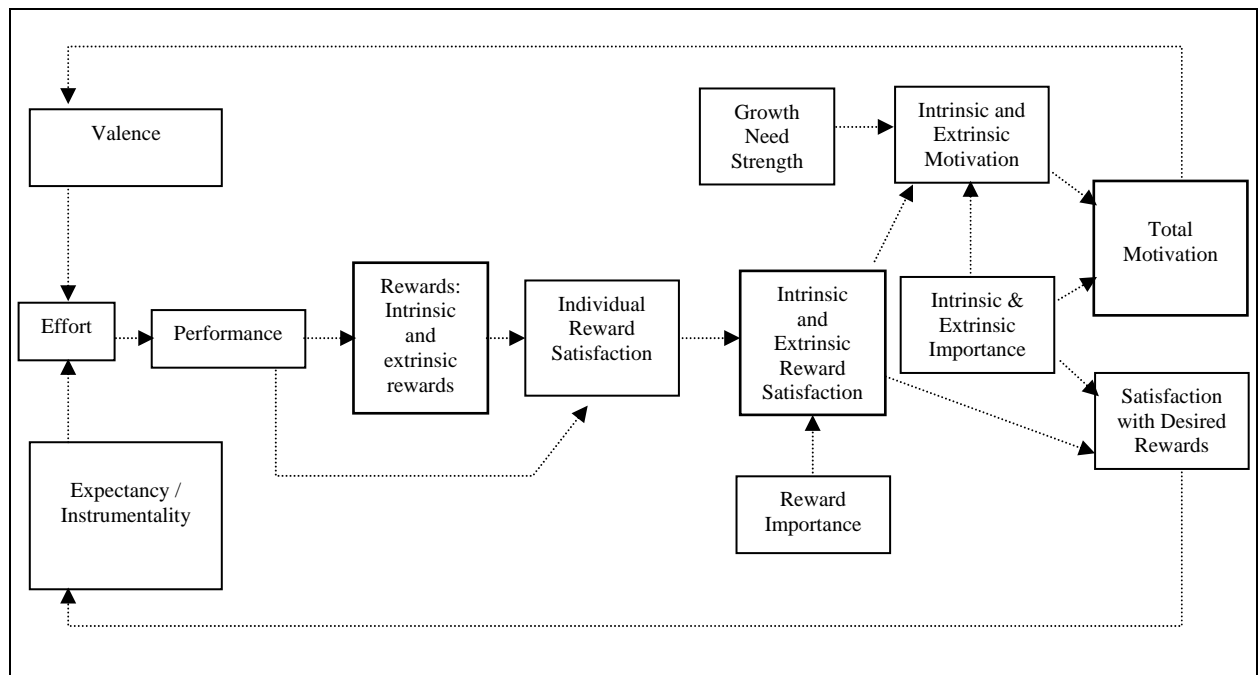


Figure A3 - 1: The Modified Expectancy Model of Motivation

The mathematical relationships between the variables in the modified expectancy model of motivation are explained in points 1 to 4 below.

1. The individual intrinsic and extrinsic rewards produce a level of satisfaction for each reward in the mind of the worker. The worker will desire these individual rewards to differing degrees. Each reward satisfaction is therefore weighted by its level of importance (from the 'Individual Reward Importance' variable) to form levels of 'Intrinsic reward satisfaction' and 'Extrinsic reward satisfaction'.

$$IRS = \frac{(a_{sat} \times a_{imp}) + (b_{sat} \times b_{imp}) \dots (n_{sat} \times n_{imp})}{a_{imp} + b_{imp} \dots + n_{imp}} \quad (1)$$

where:

IRS	=	Intrinsic reward satisfaction
$a_{sat}, b_{sat} \dots n_{sat}$	=	Satisfaction with intrinsic rewards a to n
$a_{imp}, b_{imp} \dots n_{imp}$	=	Importance of intrinsic rewards a to n

and,

$$ERS = \frac{(x_{sat} \times x_{imp}) + (y_{sat} \times y_{imp}) \dots (n_{sat} \times n_{imp})}{x_{imp} + y_{imp} \dots + n_{imp}} \quad (2)$$

where:

ERS	=	Extrinsic reward satisfaction
$x_{sat}, y_{sat} \dots n_{sat}$	=	Satisfaction with extrinsic rewards x to n
$x_{imp}, y_{imp} \dots n_{imp}$	=	Importance of extrinsic rewards x to n

2. The intrinsic and extrinsic reward satisfaction variables (IRS and ERS) are then weighted by the levels of importance of intrinsic and extrinsic rewards *per se* (from the ‘Intrinsic and Extrinsic Importance’ variable) to form a level of ‘Satisfaction with desired rewards’. Note that where the Intrinsic and Extrinsic Reward Satisfaction variables require

individuals to rate the importance of the individual rewards (such as autonomy and feedback), the Satisfaction with Desired Rewards variable requires them to rate the importance of the intrinsic rewards taken together and the extrinsic rewards taken together.

$$SDR = \frac{(IRS \times IR_{imp}) + (ERS \times ER_{imp})}{IR_{imp} + ER_{imp}} \quad (3)$$

where:

SDR	=	Satisfaction with desired rewards
$IR_{imp}$	=	Importance of intrinsic rewards
$ER_{imp}$	=	Importance of extrinsic rewards

3. The intrinsic and extrinsic reward satisfaction variables (IRS and ERS) are multiplied by the levels of importance of intrinsic and extrinsic rewards ( $IR_{imp}$  and  $ER_{imp}$ ) to form levels of intrinsic and extrinsic motivation.

$$IM = IRS \times IR_{imp} \quad (4)$$

where:

IM	=	Intrinsic motivation
----	---	----------------------

and,

$$EM = ERS \times ER_{imp} \quad (5)$$

where:

$$EM = \text{Extrinsic motivation}$$

4. The two levels of intrinsic and extrinsic motivation are then weighted by the levels of intrinsic and extrinsic importance to form a level of ‘Total motivation’.

$$TM = \frac{(IM \times IR_{imp}) + (EM \times ER_{imp})}{IR_{imp} + ER_{imp}} \quad (6)$$

where:

$$TM = \text{Total motivation}$$

It can be seen from equations 4 and 5 that IM and EM are equal to  $IRS \times IR_{imp}$  and  $ERS \times ER_{imp}$ , respectively. Equation 6 may therefore be written as:

$$TM = \frac{(IRS \times (IR_{imp})^2) + (ERS \times (ER_{imp})^2)}{IR_{imp} + ER_{imp}} \quad (7)$$

If equation 7 is then compared to equation 3, it can be seen that the ‘Total motivation’ variable is equal to the ‘Satisfaction with desired rewards’ variable multiplied by the

importance of the intrinsic and extrinsic rewards. While 'Satisfaction with desired rewards' is a measure of satisfaction with the rewards that are most important to the worker, it does not reflect the exact level of importance for those rewards. 'Total motivation' takes the level of importance into account. 'Total motivation' may therefore be thought of as 'Satisfaction with desired rewards' scaled by the level of desire for those rewards. For example, in an extreme case where a worker has very little desire for any of the rewards of the job, but a slightly higher level of desire (although still low) for the pay reward, then their 'Satisfaction with desired rewards' will be determined primarily by their level of satisfaction with the pay reward. If they are satisfied with their level of pay, this variable will be fairly high. The 'Total motivation' variable, on the other hand, will be fairly low, reflecting the fact that both intrinsic and extrinsic needs are low.

## **Appendix IV    Comparison of the Original and Modified Expectancy Model of Motivation**

This section provides an example of how the original and modified models behave to a given scenario, described below. The table highlights the differing behaviour of the two models.

### Worker ‘A’ Scenario

Worker ‘A’ does not work out of necessity. He or she is financially stable and therefore works part-time only to avoid becoming bored and to meet new people. The job provides fairly high levels of intrinsic rewards, such as autonomy and variety, and a fairly high salary. These rewards, although highly satisfactory to Worker ‘A’, are of little importance. Worker ‘A’ gets on very well with his or her work colleagues and, as this is the only reward that interests him or her, is therefore very satisfied with his or her job. Worker ‘A’ is concerned more with chatting to colleagues than with doing a good job and demonstrates little motivation or effort. The table below shows how the two models would behave to the above data.



Original Model	Modified Model
<p>Starting at the 'Outcomes' variable, the intrinsic and extrinsic rewards are said to be fairly high. This would lead to the 'Perception of the probability that expended effort leads to desired outcomes' variable being fairly high.</p>	<p>Starting at the 'Outcomes' variable, the fairly high levels of intrinsic and extrinsic rewards lead to fairly high levels of intrinsic and extrinsic reward satisfaction. As Worker 'A' desires only the reward of 'Social relationships' and is satisfied with this reward, the 'Satisfaction with desired rewards' variable will be fairly high. This would lead to the 'Perception of the probability that expended effort leads to desired outcomes' variable being fairly high.</p>
<p>The fairly high level of rewards, coupled with the high level of satisfaction with those rewards ('Perceived equity'), would lead to a high level of job satisfaction. This, in turn, would lead to a fairly high level of 'Perceived value of outcomes'.</p>	<p>Despite being satisfied with the level of intrinsic and extrinsic rewards, Worker 'A' has little need for the rewards. This would result in the levels of intrinsic and extrinsic motivation (and therefore 'Total motivation') being fairly low. This, in contrast to the original model, would lead to a fairly low level of 'Perceived value of outcomes'.</p>
<p>The high levels of 'Perceived value of outcomes' and 'Perception of the probability that expended effort leads to desired outcomes' would lead to high levels of 'Effort' and 'Performance'. However, it was stated in the text that Worker 'A' displays only low levels of effort. The original model is therefore a poor predictor of effort in this case.</p>	<p>Despite the fairly high level of 'Perception of the probability that expended effort leads to desired outcomes', the fairly low level of 'Perceived value of outcomes' would have a negative effect on the levels of 'Effort' and 'Performance'. This gives a truer reflection of the situation described in the text.</p>

## Appendix V The Job Characteristics and Expectancy Models with Standardised Terms

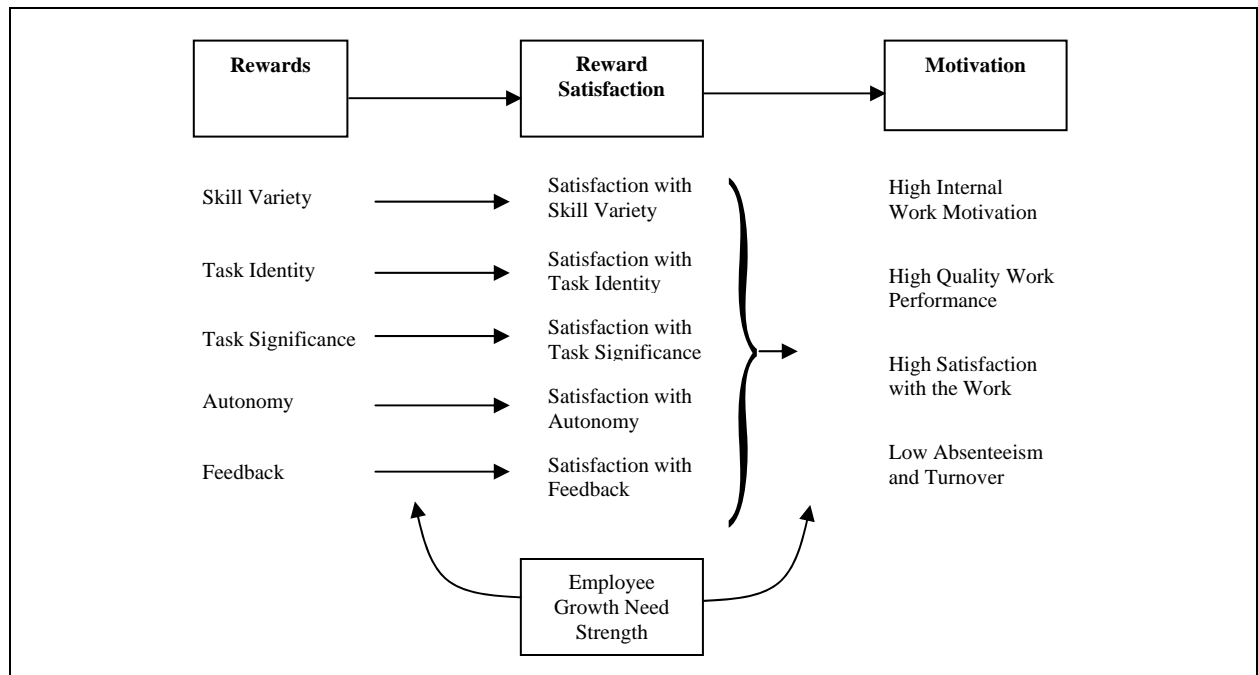


Figure A5 - 1: The Job Characteristics Model with Standardised Terms

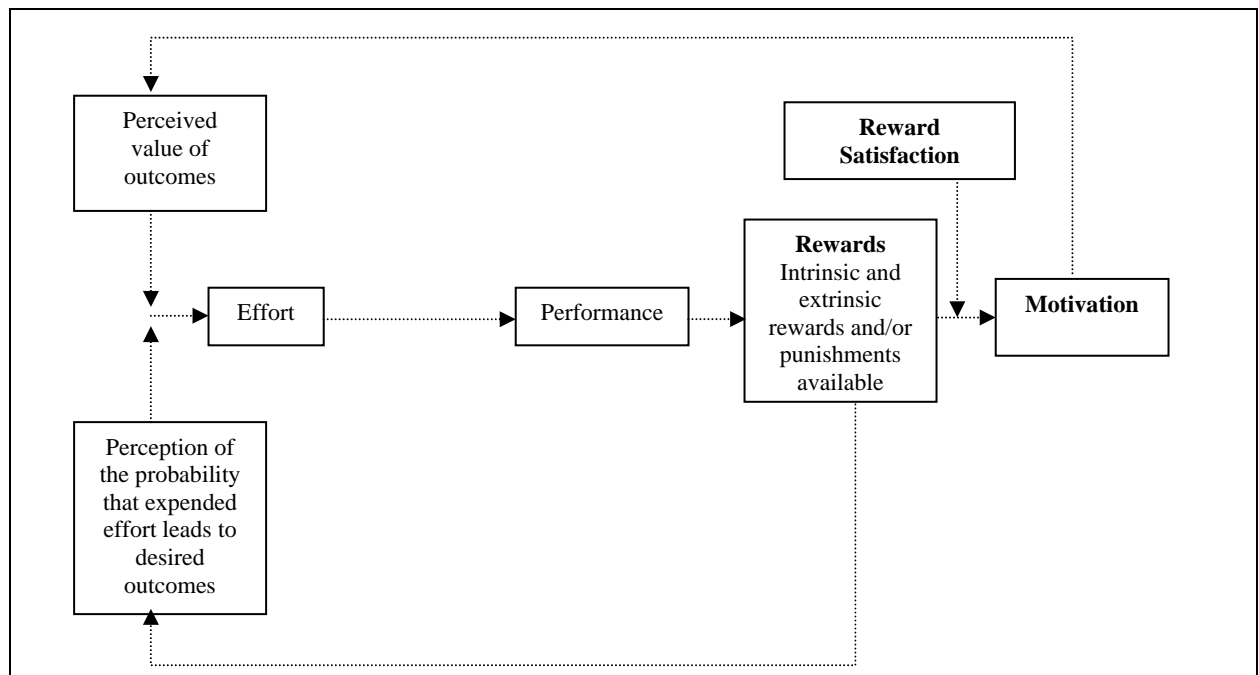


Figure A5 - 2: The Expectancy Model of Motivation with Standardised Terms

## **Appendix VI    Feedback Loops**

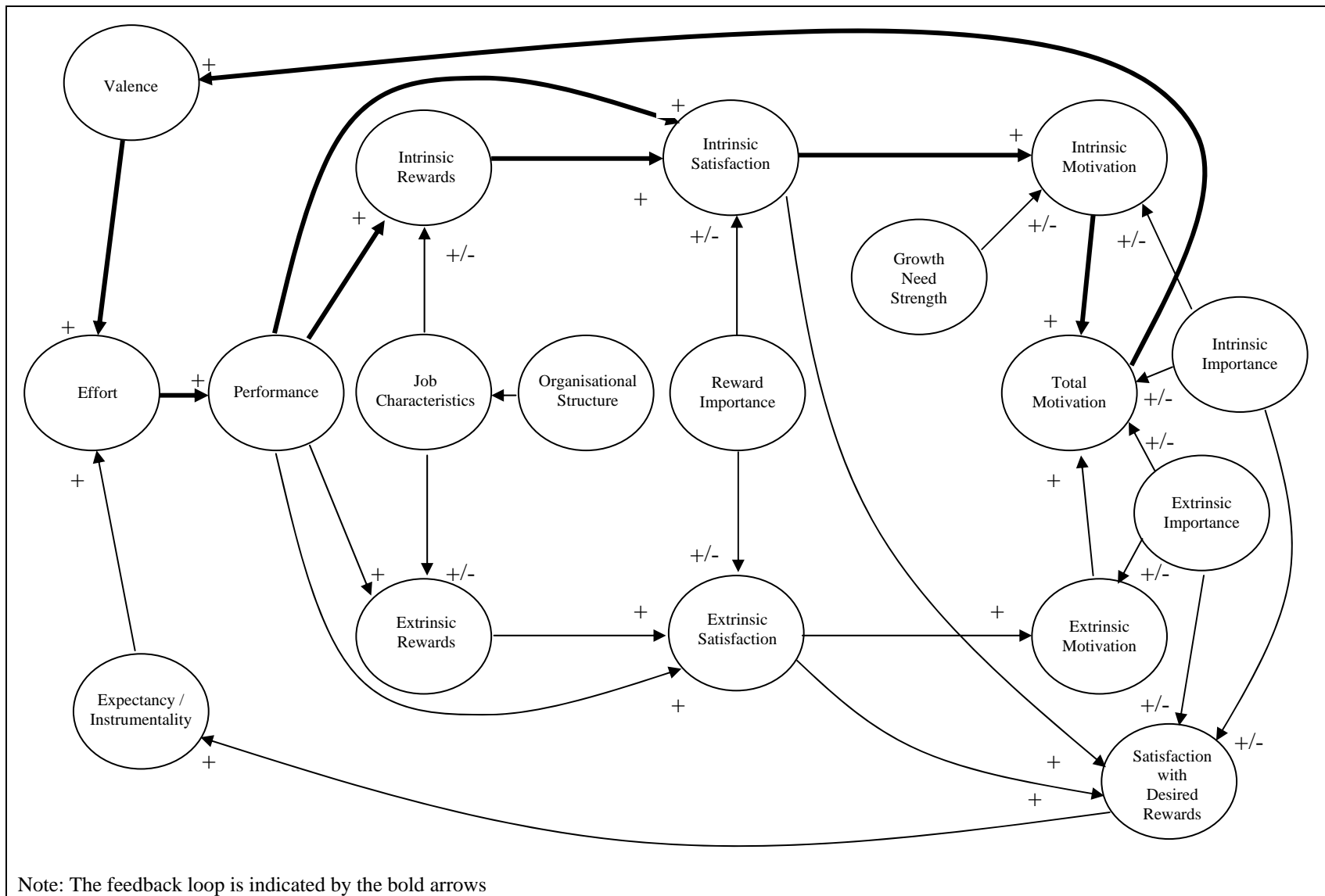


Figure A6 - 1: The Intrinsic Motivation Feedback Loop

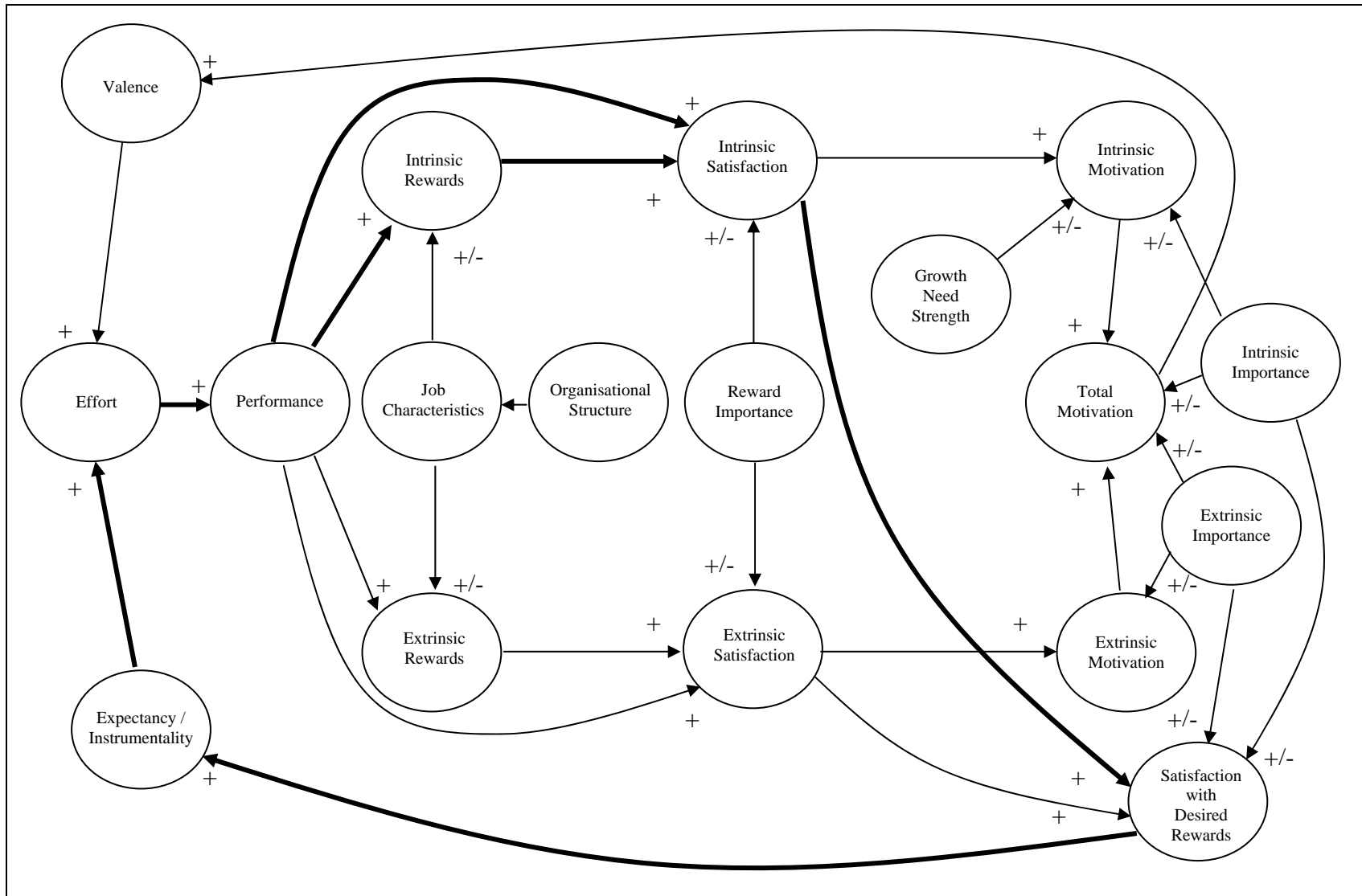


Figure A6 - 2: The Intrinsic Satisfaction Feedback Loop

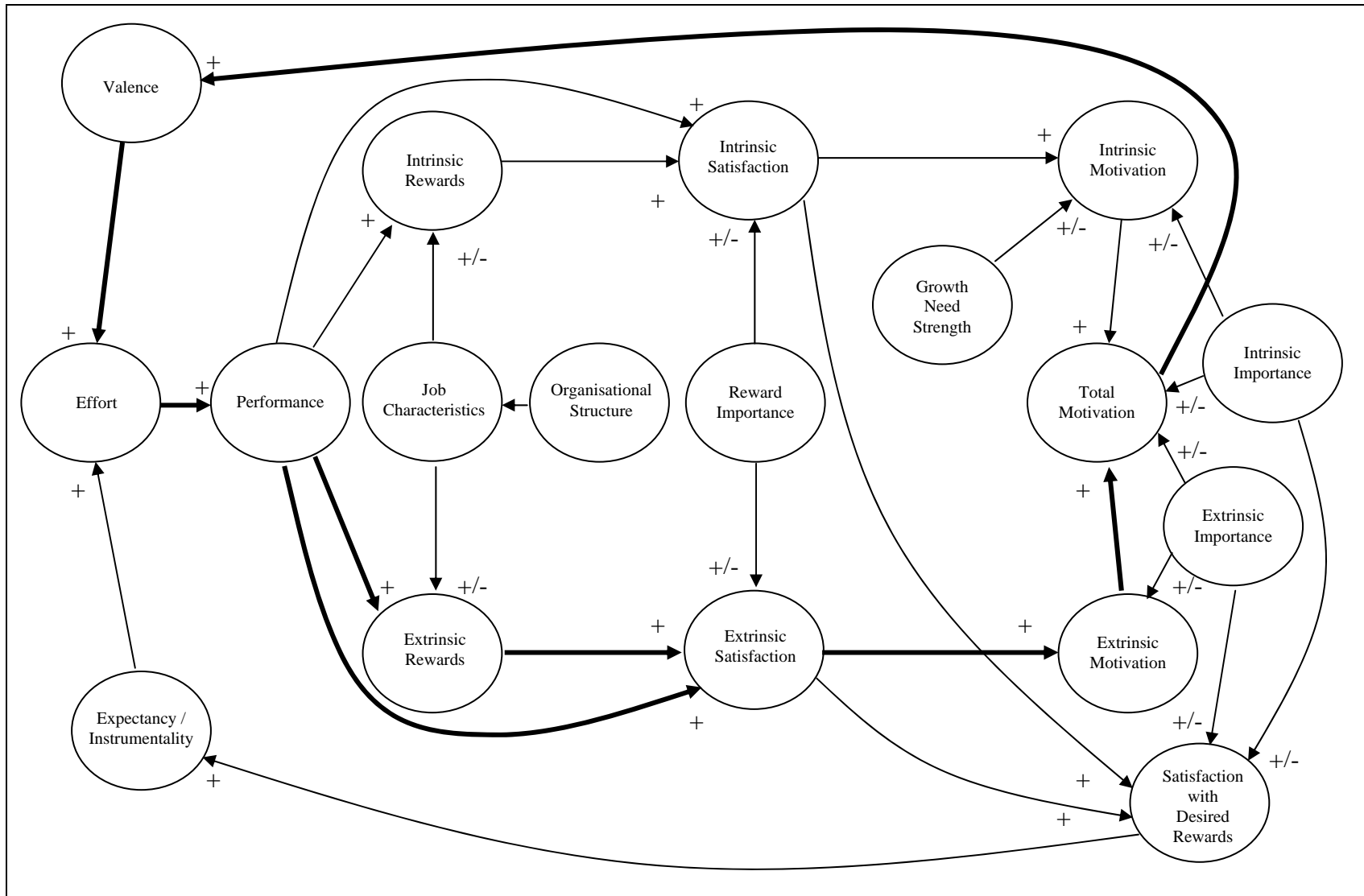


Figure A6 - 3: The Extrinsic Motivation Feedback Loop

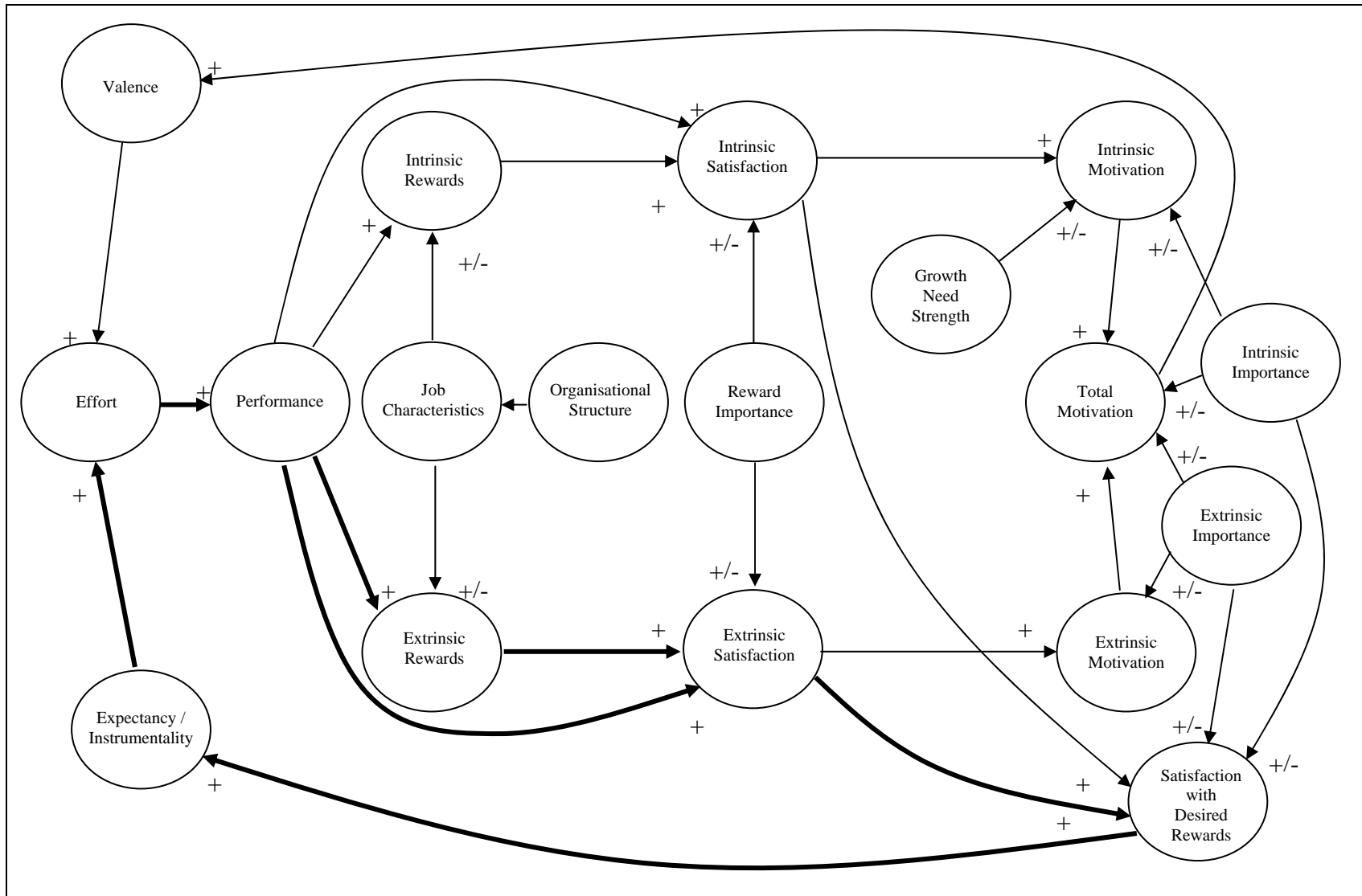


Figure A6 - 4: The Extrinsic Satisfaction Feedback Loop



## **Appendix VII   The Survey Questionnaire**

<p>Please mark on the scale provided (by circling the appropriate tick mark) how strongly you agree or disagree with each statement.</p>	<p>Very strongly disagree      Slightly disagree      Slightly agree      Very strongly agree</p> <p>1      2      3      4      5      6      7      8      9      10</p>
<p>1. Even if I won a lot of money on the lottery I would continue to work somewhere.</p>	<p> _ _ _ _ _ _ _ _ _ </p>
<p>2. Having a job is important to me.</p>	<p> _ _ _ _ _ _ _ _ _ </p>
<p>3. I would hate to be on the dole.</p>	<p> _ _ _ _ _ _ _ _ _ </p>
<p>4. I would get very bored if I had no work to do.</p>	<p> _ _ _ _ _ _ _ _ _ </p>
<p>5. The most important things that happen to me involve work.</p>	<p> _ _ _ _ _ _ _ _ _ </p>
<p>6. If unemployment benefit were really high, I would still prefer to work.</p>	<p> _ _ _ _ _ _ _ _ _ </p>

Please mark on the scale provided how strongly you agree or disagree with each statement.

1. My job is important and it has an effect on other people.
2. My job allows me to complete a whole piece of work from beginning to end and I can identify the results of my work.
3. My job requires me to do different tasks that use different skills.
4. I have the freedom to decide how to do my job.
5. I am told by my supervisor or other workers how well I am performing.
6. I am able to tell how well I am performing whilst I am doing the job.
7. My job is difficult enough to challenge my skills and abilities.
8. My job provides the right amount of work for me to do, not too much and not too little.
9. I have good relationships with other workers and supervisors.
10. My job provides other desirable benefits and perks.
11. I am able to participate in decisions that affect me.
12. My job provides satisfactory working conditions.
13. My job provides satisfactory pay.
14. My hours of work are satisfactory.

Very strongly  
disagree

Slightly  
disagree

Slightly  
agree

Very strongly  
agree

1 2 3 4 5 6 7 8 9 10

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Please mark on the scale provided how <i>important</i> the following things are to you in your job?	Extremely unimportant				Slightly unimportant		Slightly important				Extremely important
	1	2	3	4	5	6	7	8	9	10	
1. The amount of control and responsibility I am given.											
2. My relationship with other workers.											
3. The feedback I get from other workers and supervisors letting me know how well I am performing.											
4. Being able to tell how well I am performing whilst doing the job.											
5. The amount of variety in my job.											
6. The amount of involvement I have in making decisions that affect me.											
7. The feeling that I am doing something important, something that really matters.											
8. Being able to complete a whole piece of work.											
9. Having a satisfactory level of challenge in the job.											
10. Having the right amount of work to do, not too much and not too little.											
11. Getting a sense of pride, satisfaction and achievement from doing the job.											
12. All of the above (1 to 11) taken together.											

Please mark on the scale provided how <i>satisfied</i> you are with the following things in your job?	Extremely unsatisfied					Slightly unsatisfied		Slightly satisfied					Extremely satisfied
	1	2	3	4	5	6	7	8	9	10			
1. The amount of control and responsibility I am given.													
2. My relationship with other workers.													
3. The feedback I get from other workers and supervisors letting me know how well I am performing.													
4. Being able to tell how well I am performing whilst doing the job.													
5. The amount of variety in my job.													
6. The amount of involvement I have in making decisions that affect me.													
7. The feeling that I am doing something important, something that really matters.													
8. Being able to complete a whole piece of work.													
9. Having a satisfactory level of challenge in the job.													
10. Having the right amount of work to do, not too much and not too little.													
11. Getting a sense of pride, satisfaction and achievement from doing the job.													
12. All of the above (1 to 11) taken together.													

Please mark on the scale provided how <i>important</i> the following things are to you in your job?	<div>Extremely unimportant</div> <div>Slightly unimportant      Slightly important      Extremely important</div>									
	1	2	3	4	5	6	7	8	9	10
1. The working conditions.	_ _ _ _ _ _ _ _ _ _									
2. My rate of pay.	_ _ _ _ _ _ _ _ _ _									
3. Any other benefits I receive from my job.	_ _ _ _ _ _ _ _ _ _									
4. My hours of work.	_ _ _ _ _ _ _ _ _ _									
5. All of the above (1 to 4) taken together.	_ _ _ _ _ _ _ _ _ _									

Please mark on the scale provided how *satisfied* you are with the following things in your job?

1. The working conditions.

2. My rate of pay.

3. Any other benefits I receive from my job.

4. My hours of work.

5. All of the above (1 to 4) taken together.

Extremely  
unsatisfied

Slightly  
unsatisfied

Slightly  
satisfied

Extremely  
satisfied

1 2 3 4 5 6 7 8 9 10

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Please mark on the scale provided your overall levels of ...

1. satisfaction with your job.

2. motivation in your job.

3. effort in your job.

4. performance in your job.

Please mark on the scale provided how strongly you agree or disagree with each statement.

5. I sometimes work harder than I really need to because I enjoy doing a good job.

6. I feel unhappy when my work is not up to my usual standard.

7. I often try to think of ways of doing my job more effectively.

8. I feel a sense of pride and satisfaction when I do a good job.

Very Low

Very High

1 2 3 4 5 6 7 8 9 10

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Very strongly  
disagree

Slightly  
disagree

Slightly  
agree

Very strongly  
agree

1 2 3 4 5 6 7 8 9 10

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## **Appendix VIII      Summary of Questionnaire Results**

Figures A8 – 1 to A8 –15 below show the mean perception, importance and satisfaction levels for each measured job characteristic. The results are shown for each of the four organisations separately and then for the combined dataset.

The coefficient of variation for each set of results is also shown. One interesting point to note is that the job characteristics that have a higher mean importance value also tend to have a lower coefficient of variation than the less important characteristics. This would suggest that respondents were in more agreement over which were the most important characteristics than they were over which were the least important. To illustrate this point, the trendlines for both the mean value (perception, importance or satisfaction) and the coefficient of variation are shown with the  $R^2$  value denoting the goodness of fit of the trendline to the actual data.

## The Perception of Job Characteristics

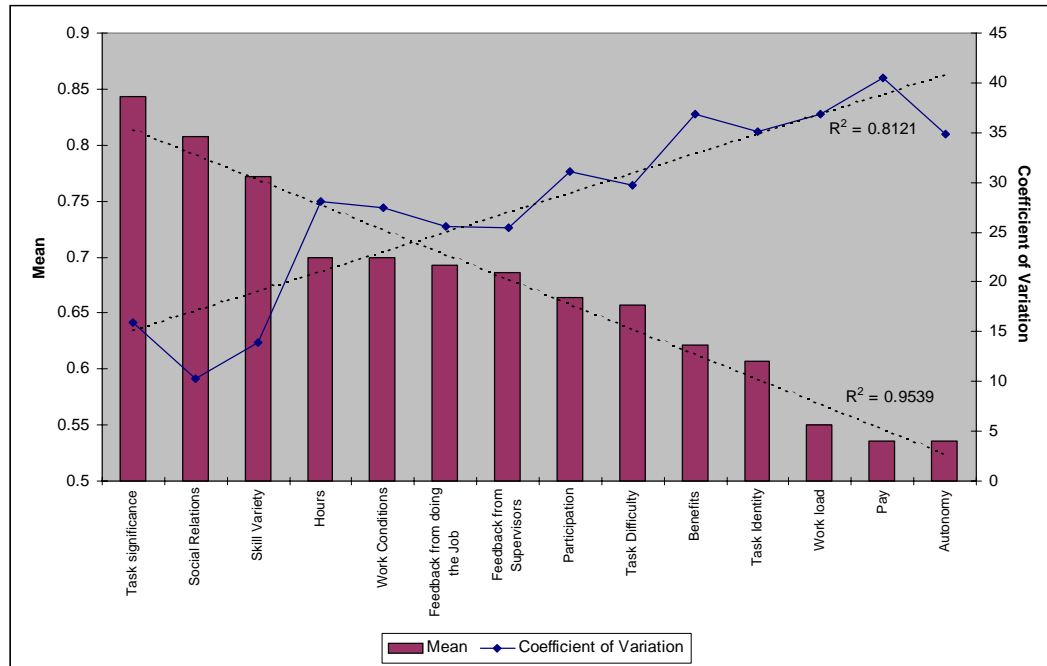


Figure A8 - 1: Mean Perception values for The Halifax

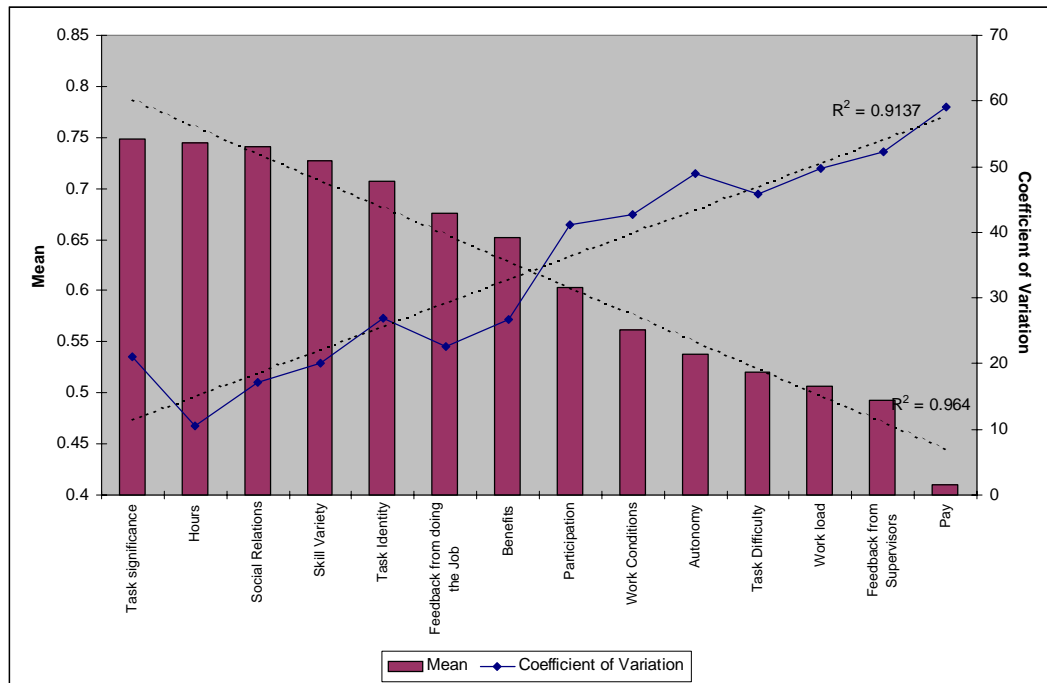


Figure A8 - 2: Mean Perception values for Jeavons

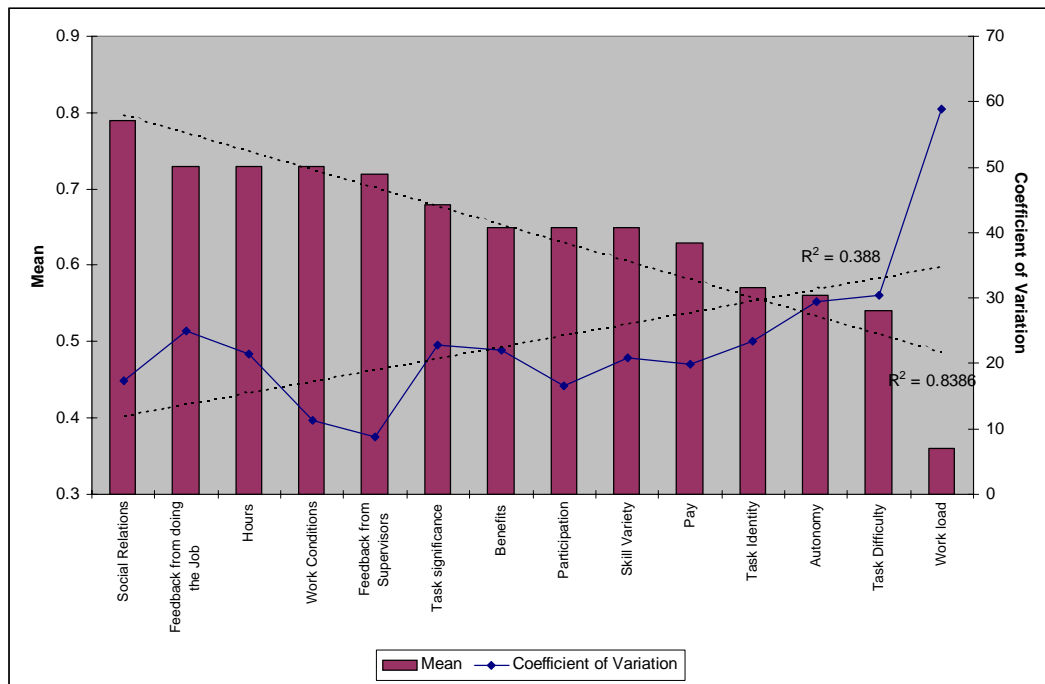


Figure A8 - 3: Mean Perception values for NIG

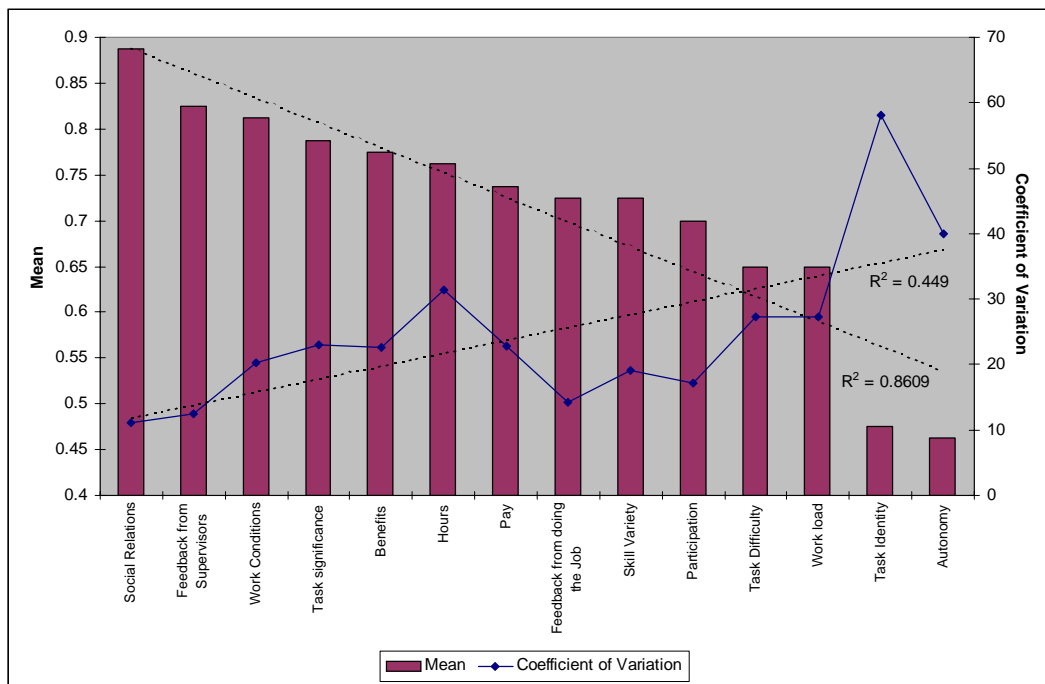


Figure A8 - 4: Mean Perception values for Pearl

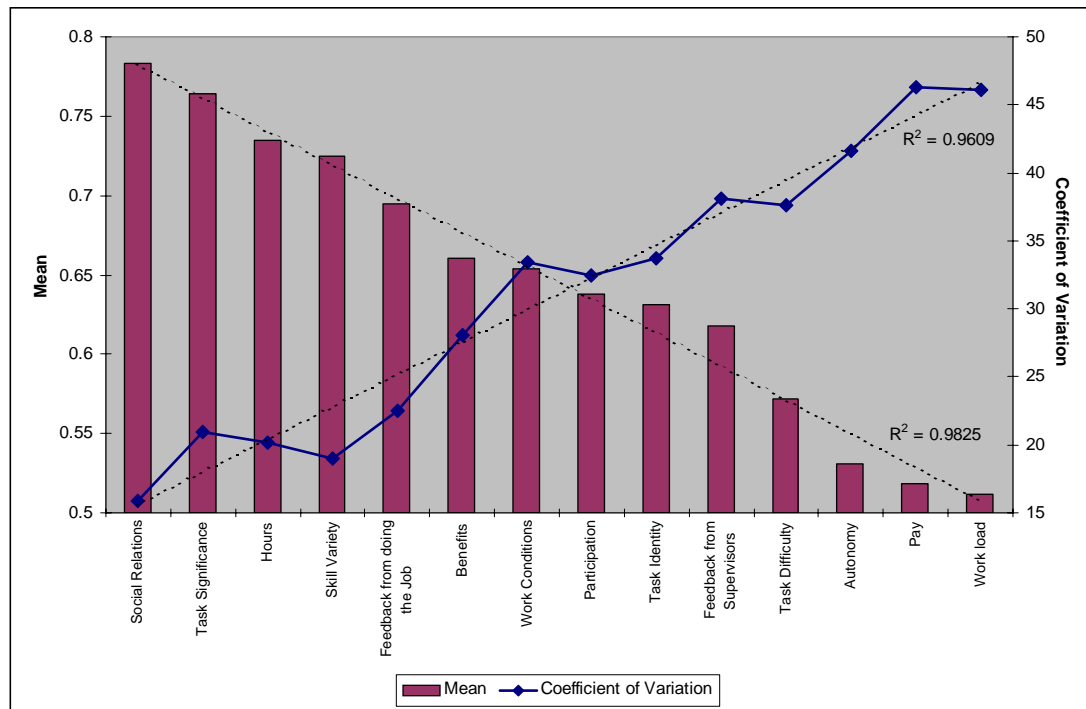


Figure A8 - 5: Mean Perception values for the Combined Dataset

## The Importance of Job Characteristics

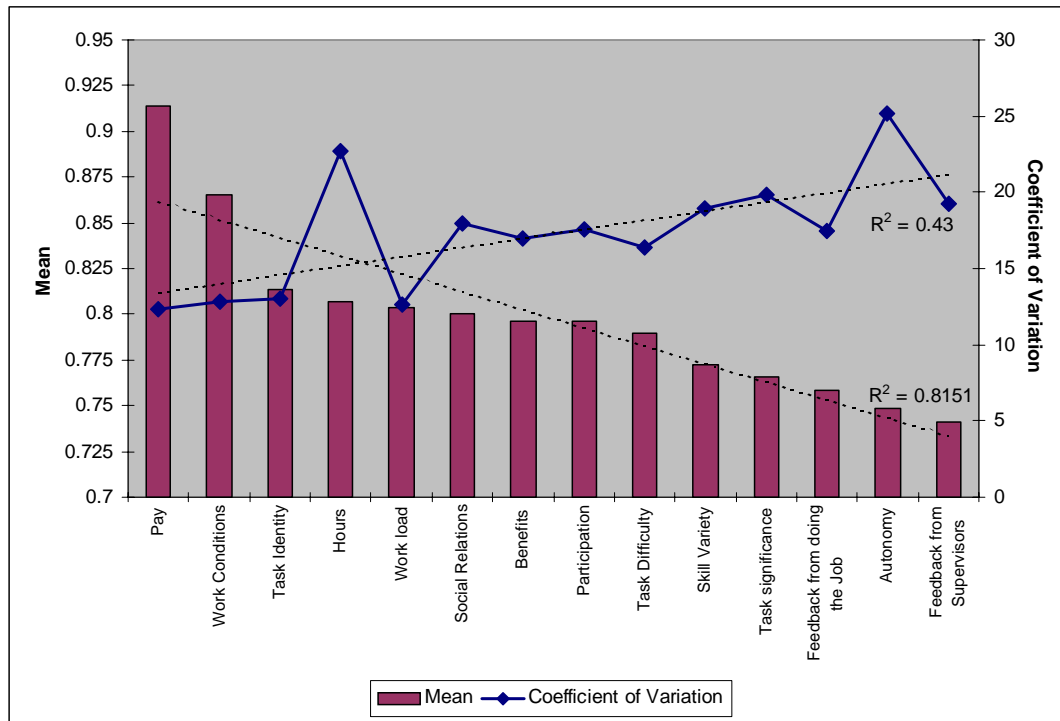


Figure A8 - 6: Graph of Importance results from Jeavons

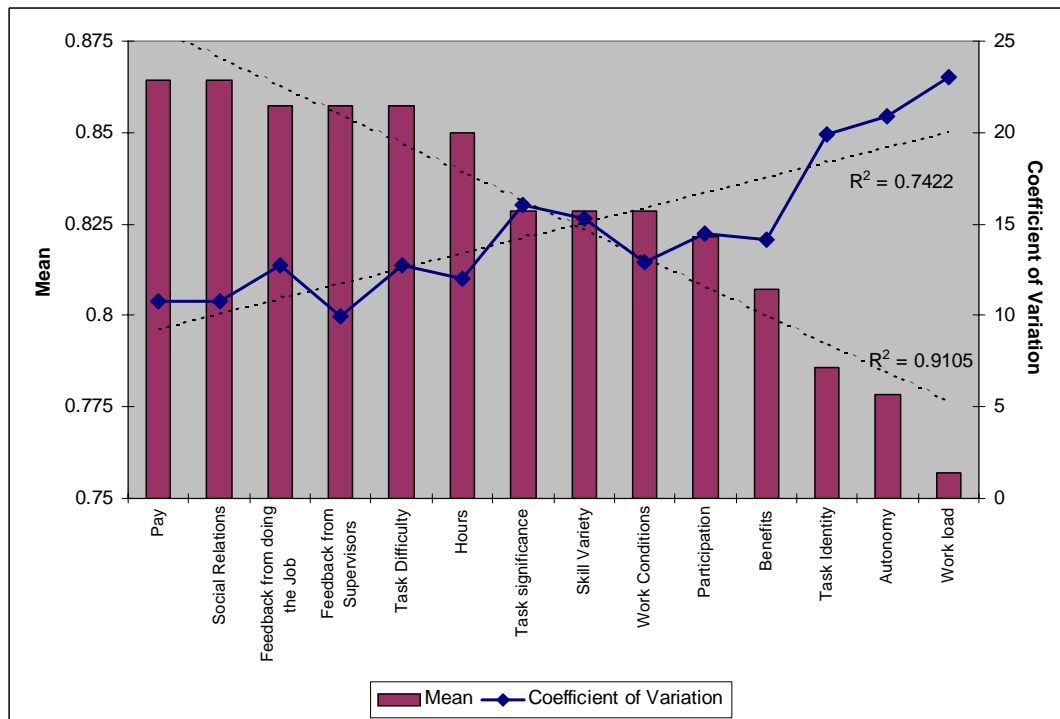


Figure A8 - 7: Graph of Importance results from Halifax Plc

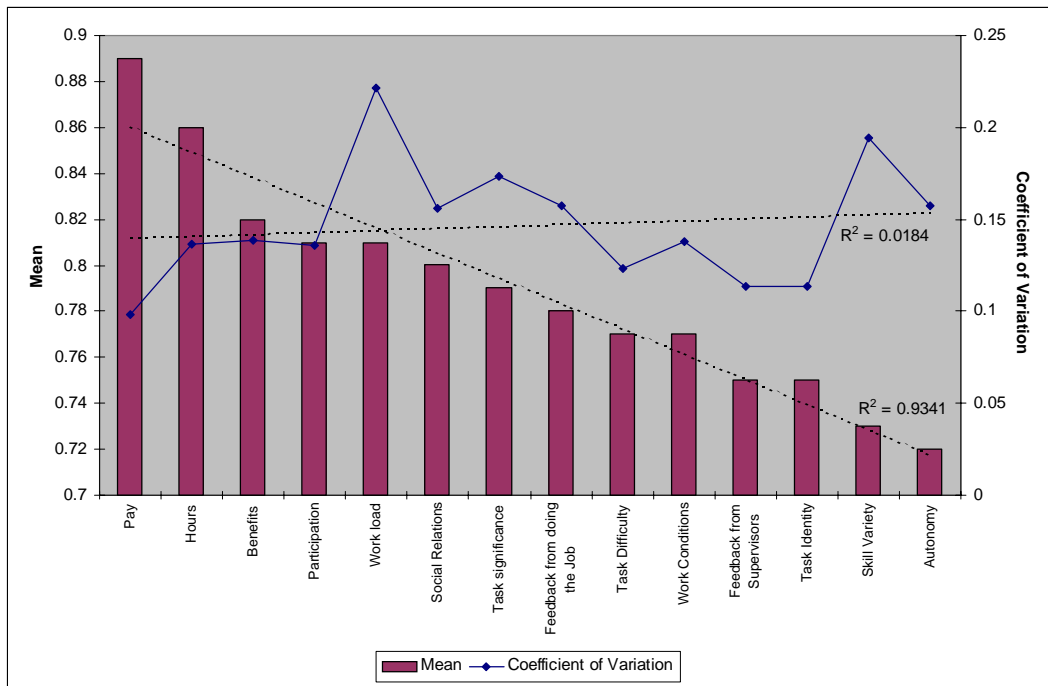


Figure A8 - 8: Graph of Importance results from NIG

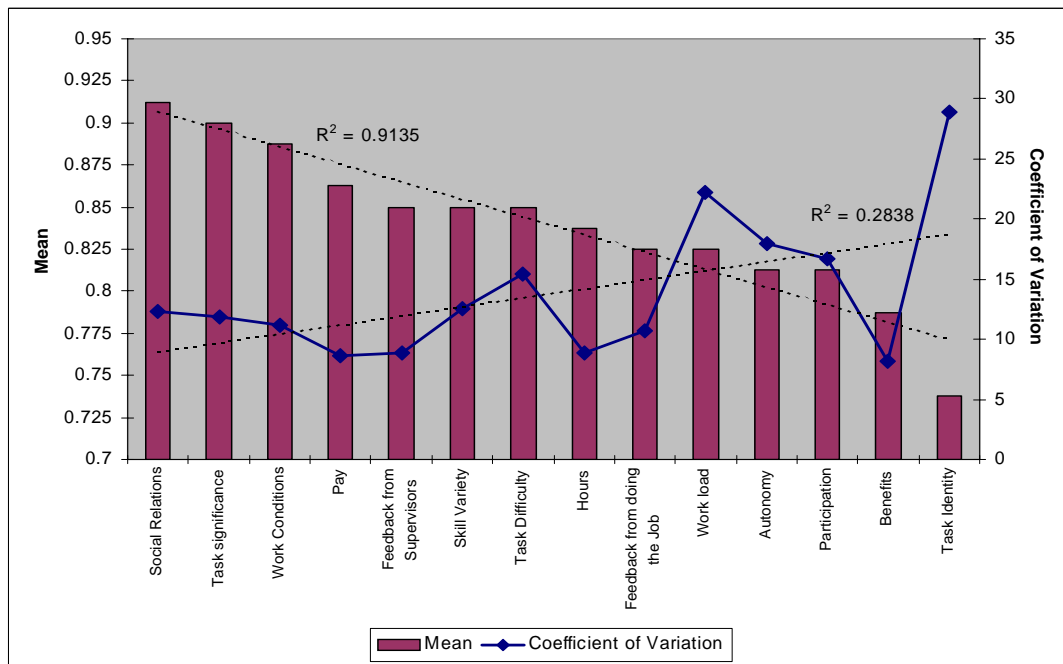


Figure A8 - 9: Graph of Importance results from Pearl

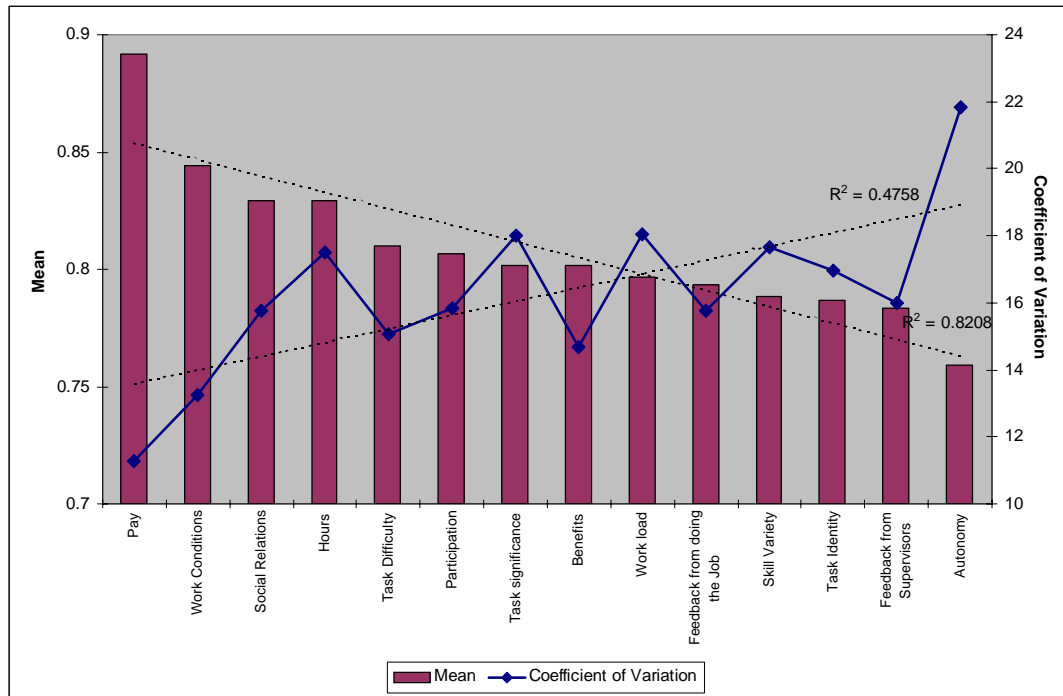


Figure A8 - 10: Graph of Importance results from the Combined Dataset

## Satisfaction with Job Characteristics

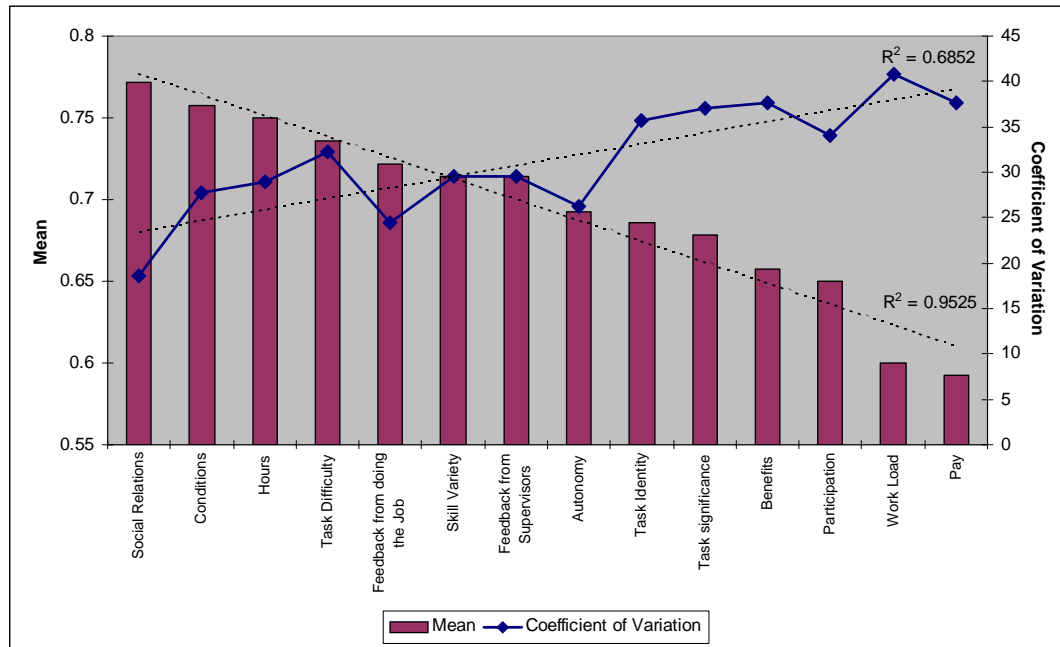


Figure A8 - 11: Graph of Satisfaction results from Halifax

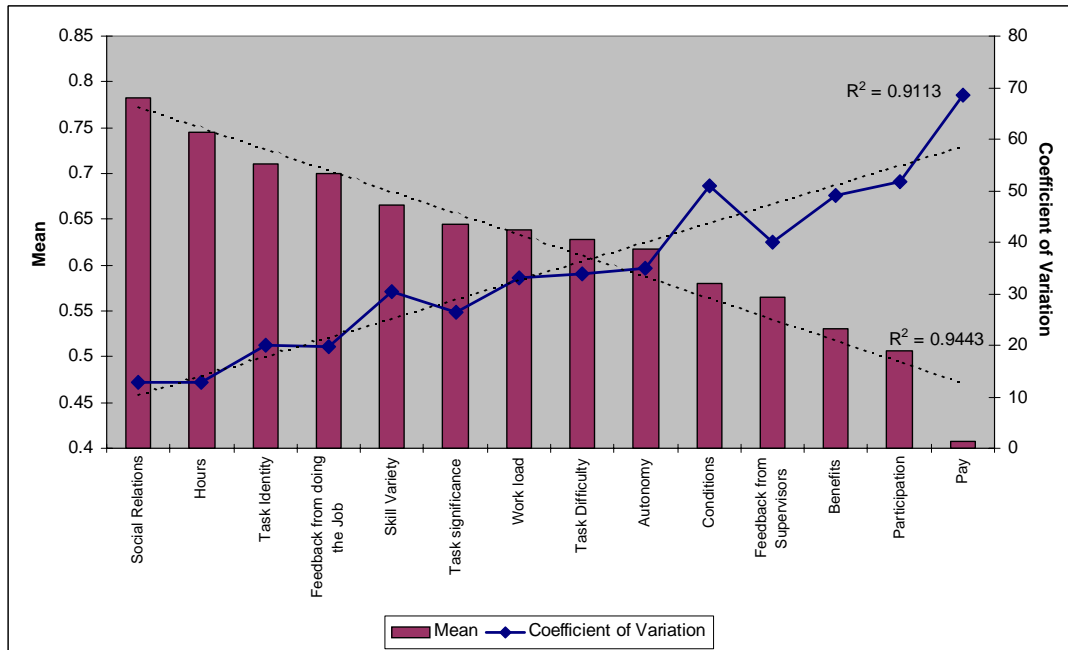


Figure A8 - 12: Graph of Satisfaction results from Jeavons



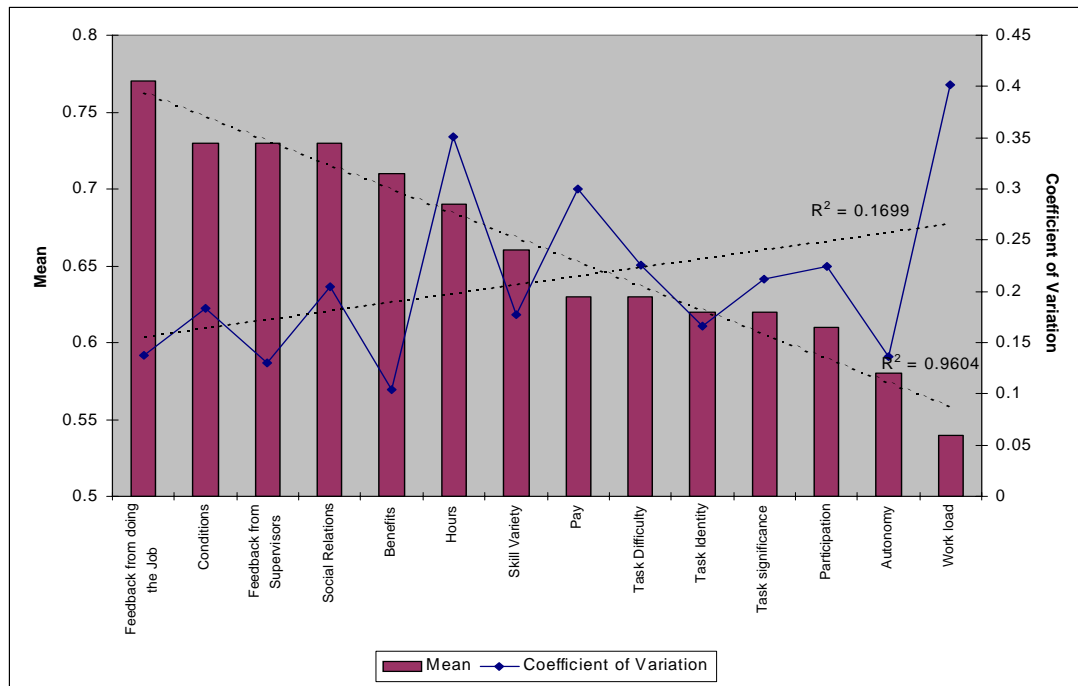


Figure A8 - 13: Graph of Satisfaction results from NIG

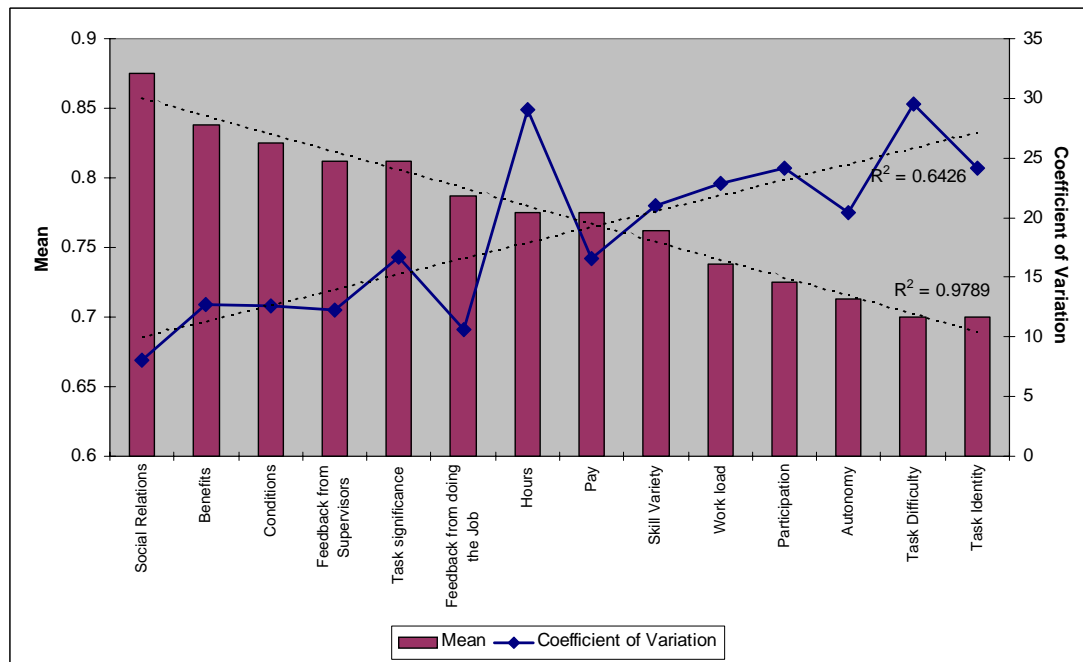


Figure A8 - 14: Graph of Satisfaction results from Pearl

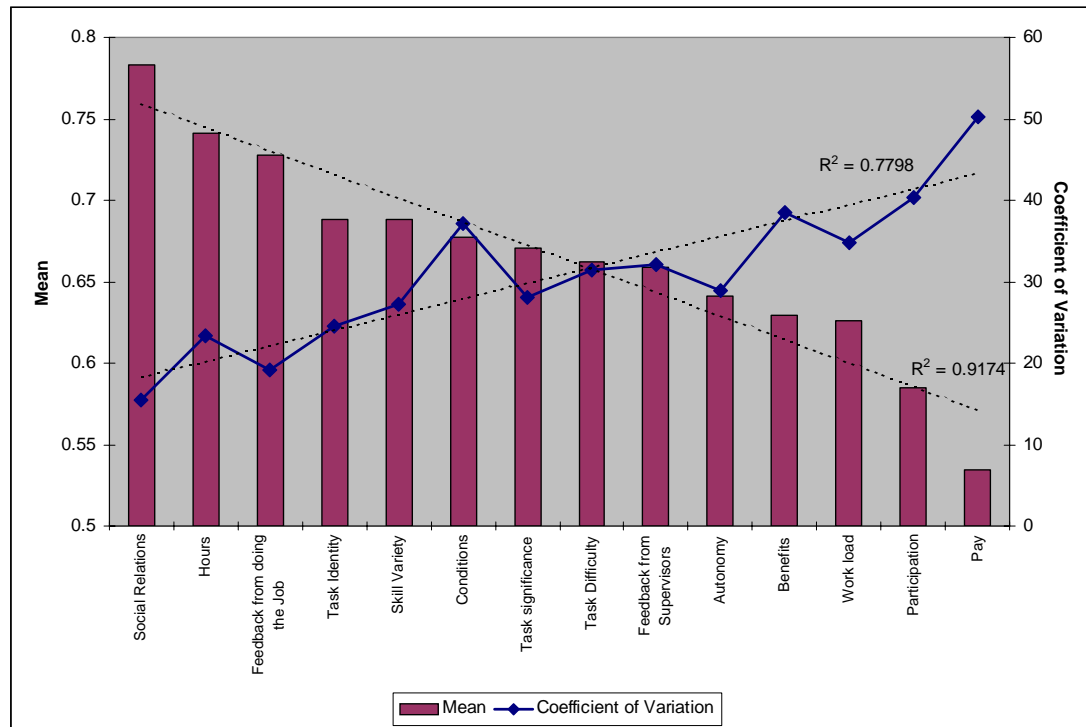


Figure A8 - 15: Graph of Satisfaction results from the Combined Dataset

### The Relationship between Perception, Importance and Satisfaction

Figure A8 - 16 shows the mean values for the perception of job characteristics, importance of job characteristics and satisfaction with job characteristics from Jeavons. As one would expect, there is a stronger correlation between perception and satisfaction than between importance and satisfaction or between importance and perception. The levels of correlation between perception, importance and satisfaction are discussed in Section 6.2.2.

Figure A8 - 16 identifies a potential problem for Jeavons in that the two job characteristics identified as the most important (Pay and Work Conditions) were rated very low in terms of satisfaction.

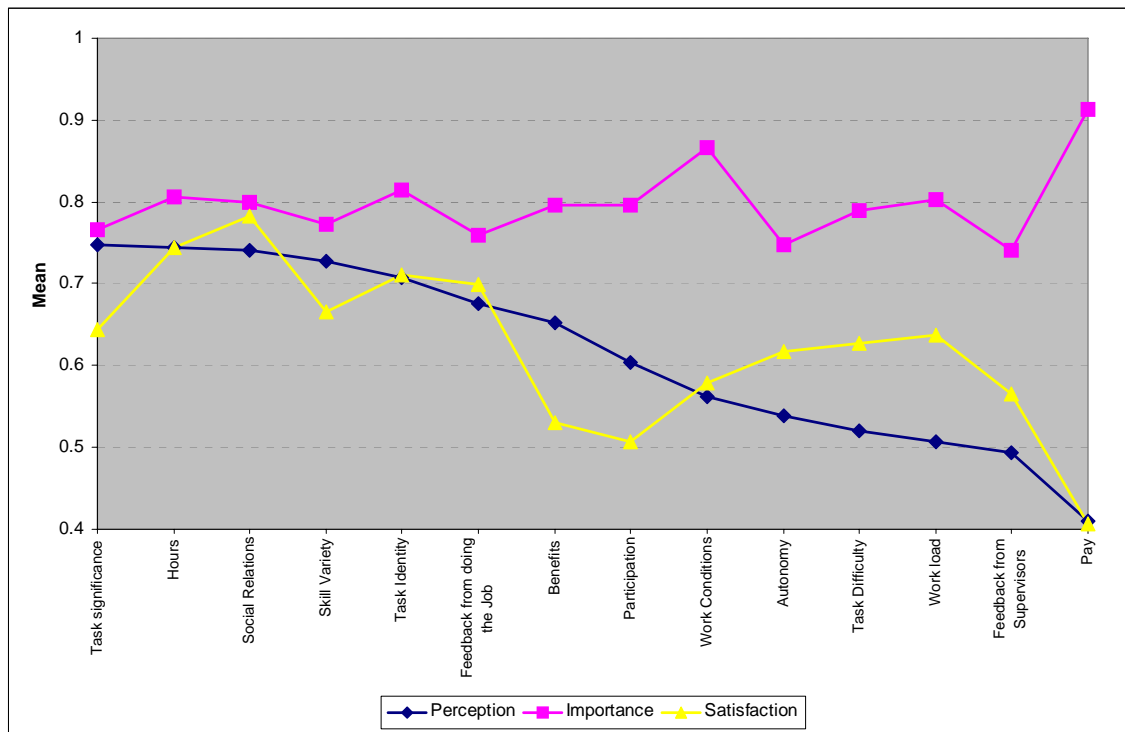


Figure A8 - 16: Graph of Mean Perception, Importance and Satisfaction with Job Characteristics from Jeavons

Figure A8 - 17 through to Figure A8 - 19 show the mean values for perception, importance and satisfaction for The Halifax, NIG and Pearl. The graphs show that, for each organisation, there are higher levels of correlation between the perceived level of a job characteristics and the level of satisfaction than between the levels of importance and satisfaction or importance and perception. Figure 38 summarises the degree of correlation between the variables for each organisation.

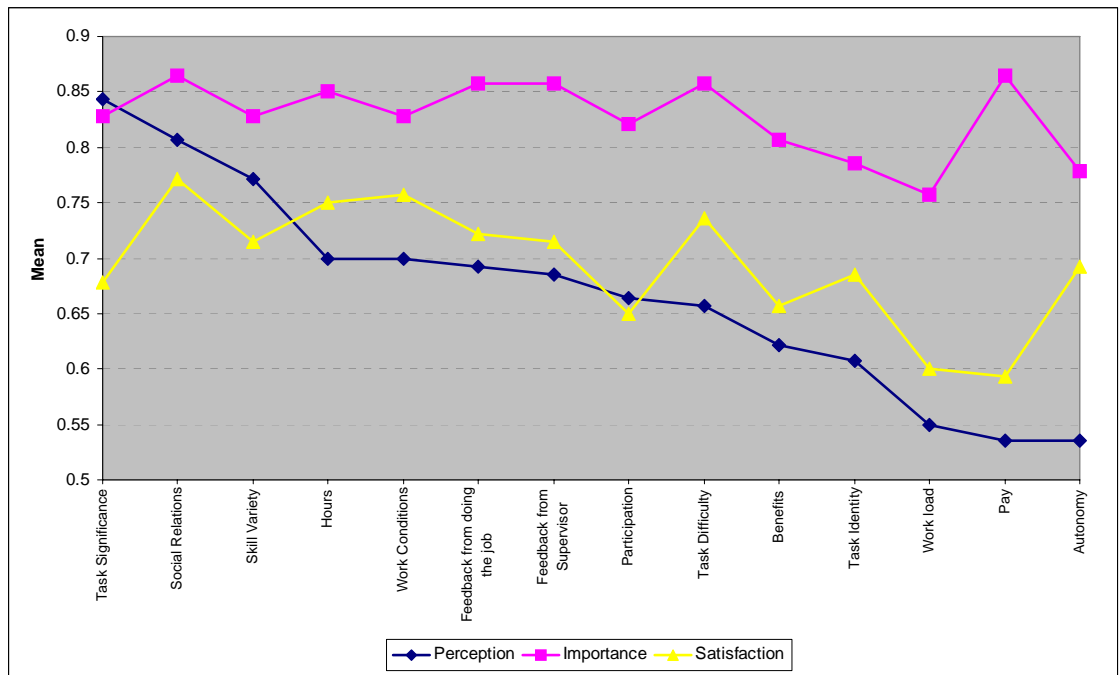


Figure A8 - 17: Graph of Mean Perception, Importance and Satisfaction with Job Characteristics from Halifax

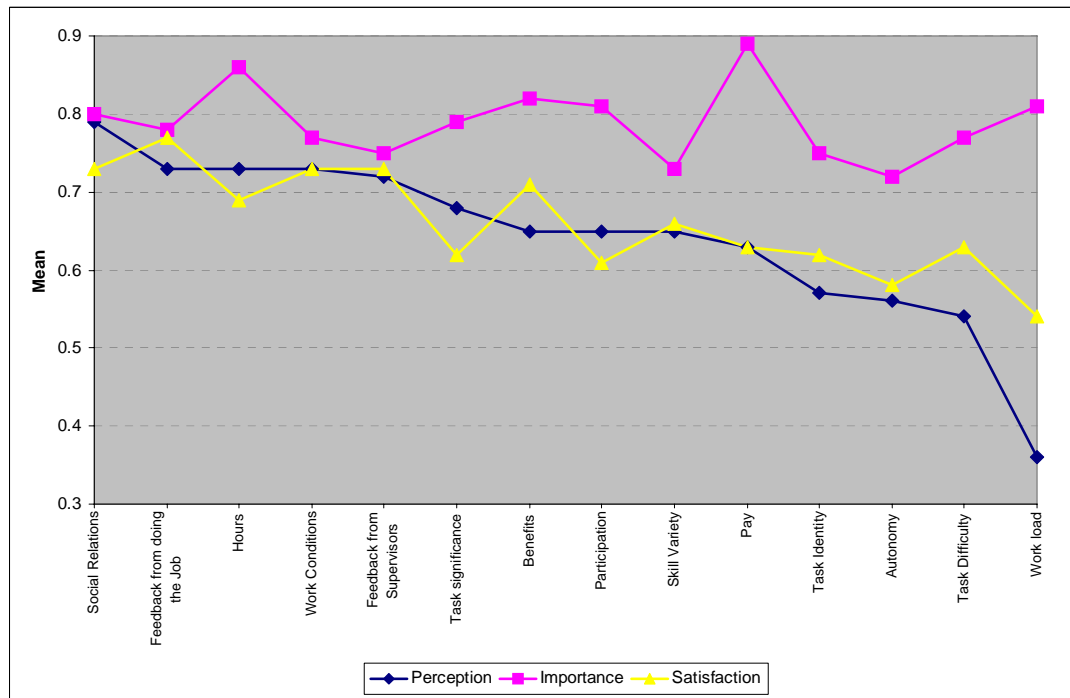


Figure A8 - 18: Graph of Mean Perception, Importance and Satisfaction with Job Characteristics from NIG

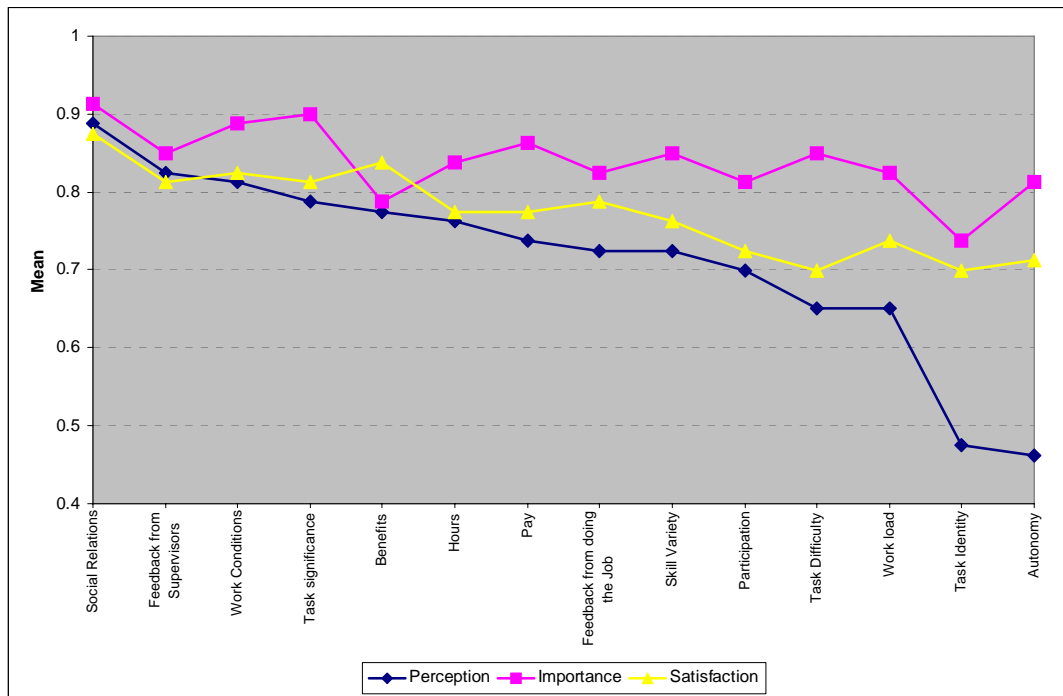


Figure A8 - 19: Graph of Mean Perception, Importance and Satisfaction with Job Characteristics from Pearl

## Appendix IX Regression Equations

### Combined Dataset

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.875379							
R Square	0.766288							
Adjusted R Square	0.762327							
Standard Error	0.080042							
Observations	61							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	1.239376	1.239376	193.4473	2.8E-20			
Residual	59	0.378001	0.006407					
Total	60	1.617377						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.053891	0.047111	1.14391	0.257281	-0.040378	0.148159	-0.040378	0.148159
Weighted Int Sat	0.969508	0.069706	13.90853	2.8E-20	0.830027	1.10899	0.830027	1.10899

Figure A9 - 1: Regression Analysis of Intrinsic Satisfaction for the Combined Dataset

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.666191							
R Square	0.44381							
Adjusted R Square	0.424631							
Standard Error	0.113171							
Observations	61							
ANOVA								
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	2	0.59275	0.296375	23.14048	4.09E-08			
Residual	58	0.742844	0.012808					
Total	60	1.335594						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.293046	0.069052	4.243842	8.02E-05	0.154823	0.431269	0.154823	0.431269
Work Ethic	0.298651	0.102136	2.924053	0.004922	0.094204	0.503098	0.094204	0.503098
Int Sat (calc) * Int Imp	0.462034	0.111006	4.162231	0.000106	0.239831	0.684237	0.239831	0.684237

Figure A9 - 2: Regression Analysis of Intrinsic Motivation for the Combined Dataset

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.890736							
R Square	0.79341							
Adjusted R Square	0.789909							
Standard Error	0.098883							
Observations	61							
ANOVA								
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	2.215565	2.215565	226.5901	7.22E-22			
Residual	59	0.576894	0.009778					
Total	60	2.792459						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-0.102249	0.0515	-1.985424	0.051751	-0.2053	0.000802	-0.2053	0.000802
Weighted Ext Sat	1.121475	0.074502	15.05291	7.22E-22	0.972396	1.270553	0.972396	1.270553

Figure A9 - 3: Regression Analysis of Extrinsic Satisfaction for the Combined Dataset

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.819696							
R Square	0.671902							
Adjusted R Square	0.666341							
Standard Error	0.126322							
Observations	61							
ANOVA								
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	1.928029	1.928029	120.8245	6.6E-16			
Residual	59	0.941479	0.015957					
Total	60	2.869508						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-0.114449	0.077005	-1.486246	0.142539	-0.268537	0.039639	-0.268537	0.039639
Total Mot. + Sat. with Des. Rewards	0.630362	0.057347	10.99202	6.6E-16	0.515611	0.745114	0.515611	0.745114

Figure A9 - 4: Regression Analysis of Effort for the Combined Dataset

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.9272042							
R Square	0.8597076							
Adjusted R Square	0.8573297							
Standard Error	0.0807462							
Observations	61							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	2.35729	2.35729	361.5502	7.65E-27			
Residual	59	0.384677	0.00652					
Total	60	2.741967						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.0651337	0.03553	1.833227	0.071815	-0.005961	0.136228	-0.005961	0.136228
Effort	0.9063643	0.047667	19.01447	7.65E-27	0.810983	1.001746	0.810983	1.001746

Figure A9 - 5: Regression Analysis of Performance for the Combined Dataset



## Appendix X Graphs of Model Predicted and Actual Values

### Intrinsic Satisfaction

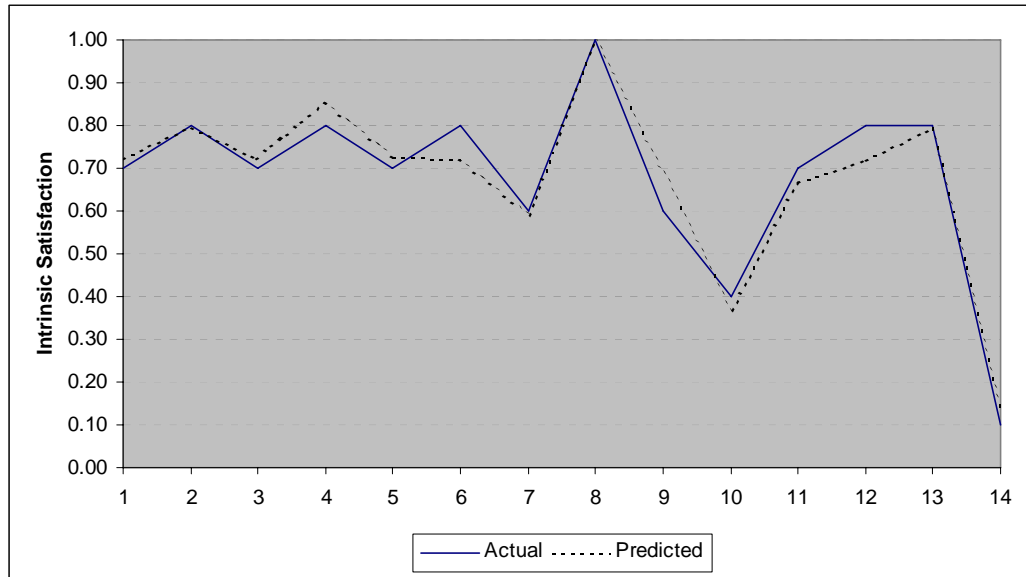


Figure A10 - 1: Graph of Actual and Predicted Intrinsic Satisfaction from The Halifax

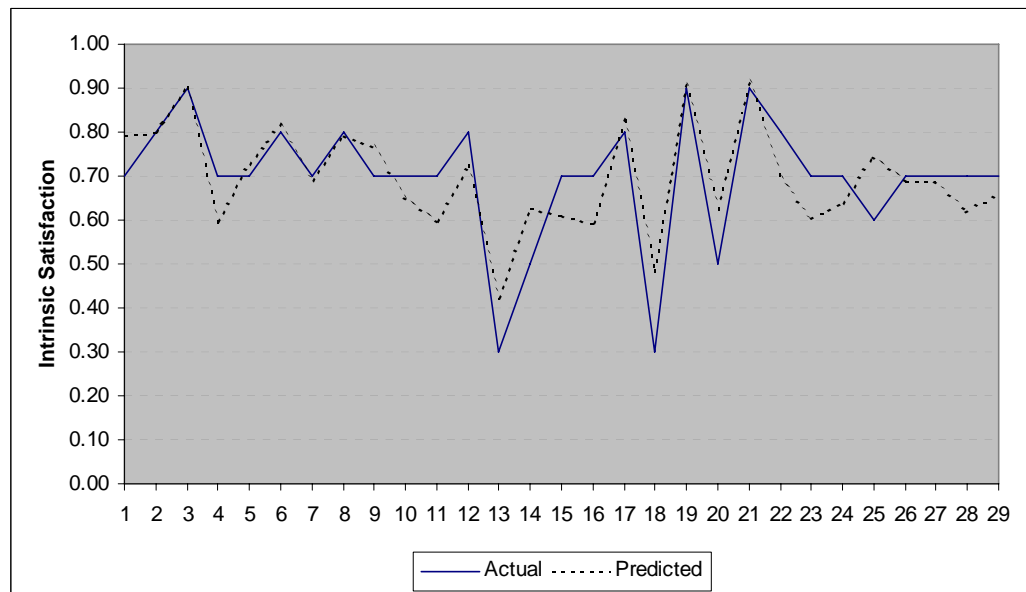


Figure A10 - 2: Graph of Actual and Predicted Intrinsic Satisfaction from Jeavons

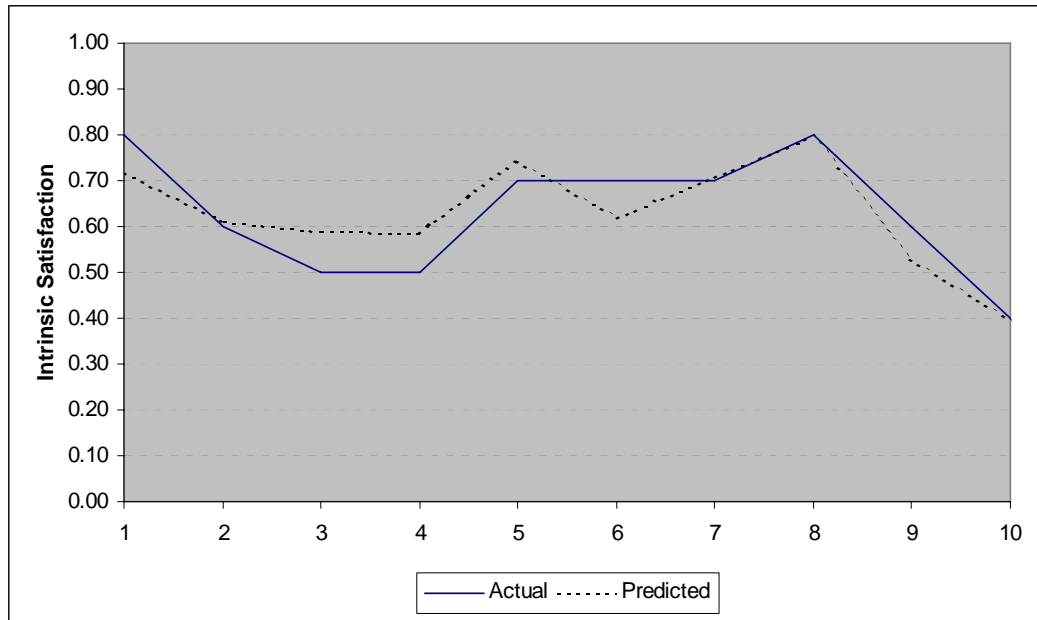


Figure A10 - 3: Graph of Actual and Predicted Intrinsic Satisfaction from NIG

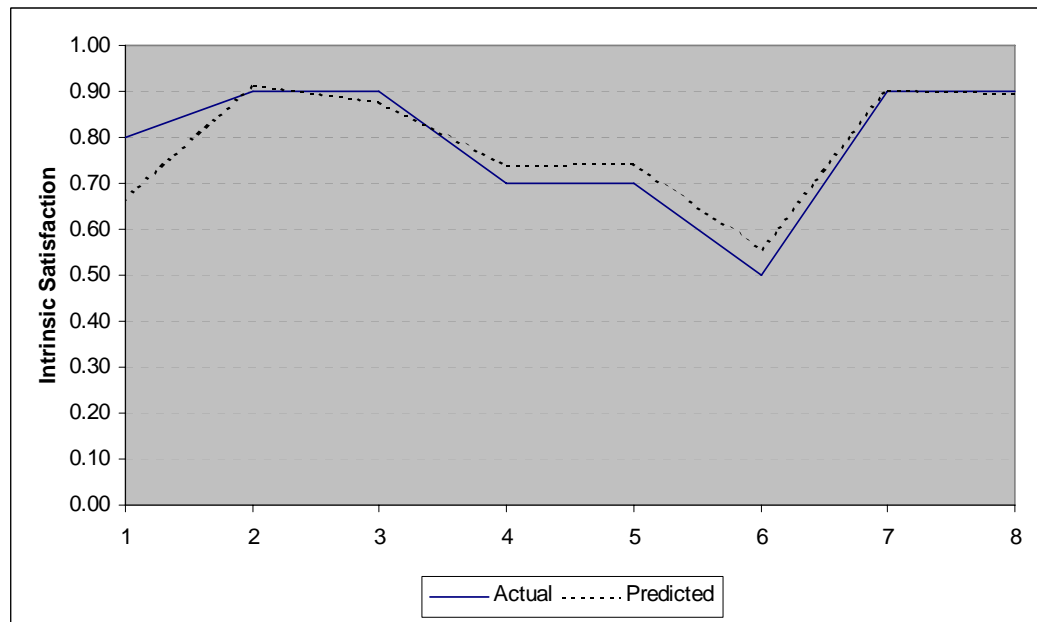


Figure A10 - 4: Graph of Actual and Predicted Intrinsic Satisfaction from Pearl

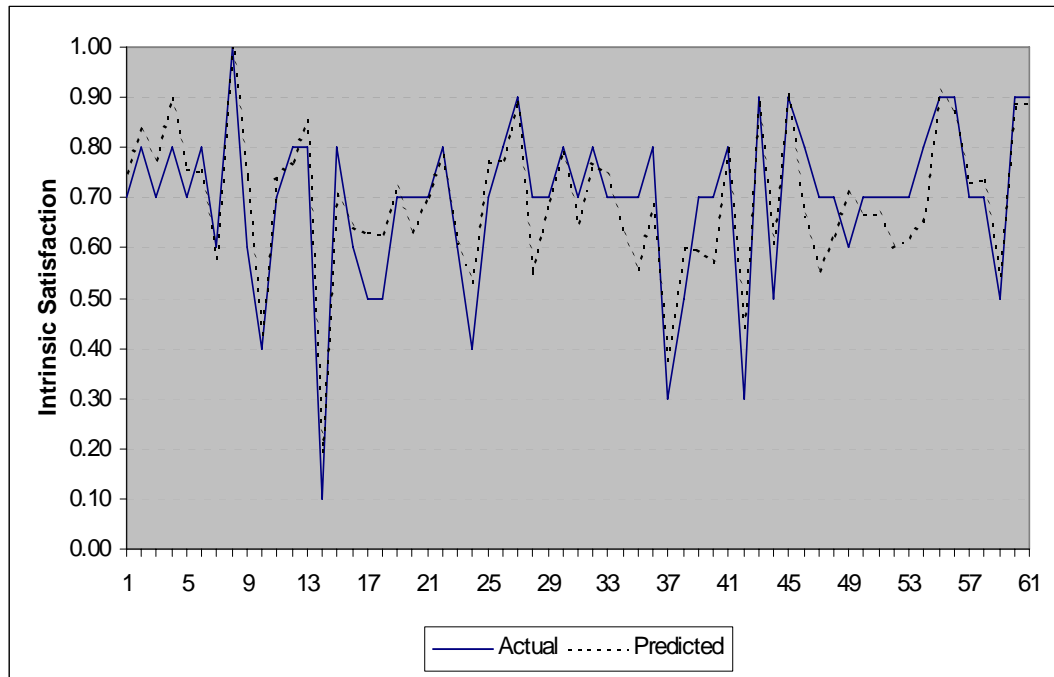


Figure A10 - 5: Graph of Actual and Predicted Intrinsic Satisfaction from the Combined Dataset

## Intrinsic Motivation

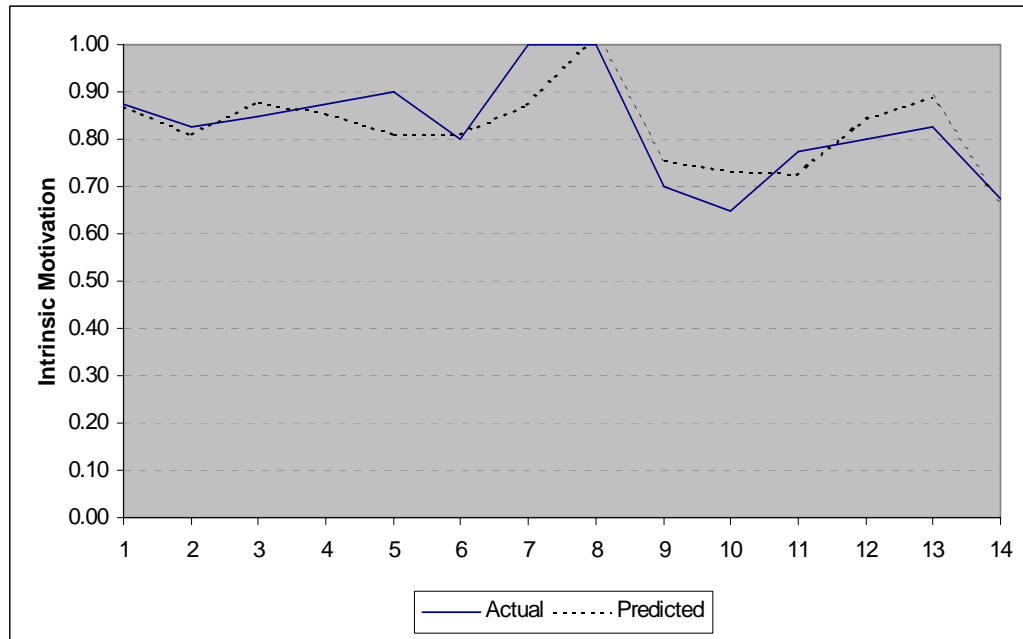


Figure A10 - 6: Graph of Actual and Predicted Intrinsic Motivation from The Halifax

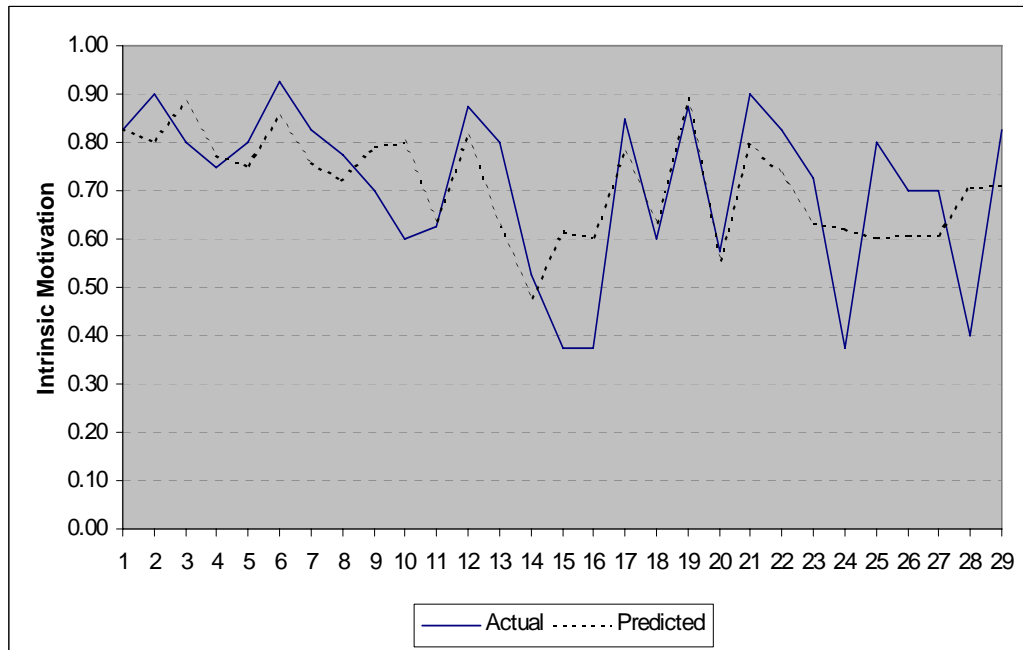


Figure A10 - 7: Graph of Actual and Predicted Intrinsic Motivation from Jeavons

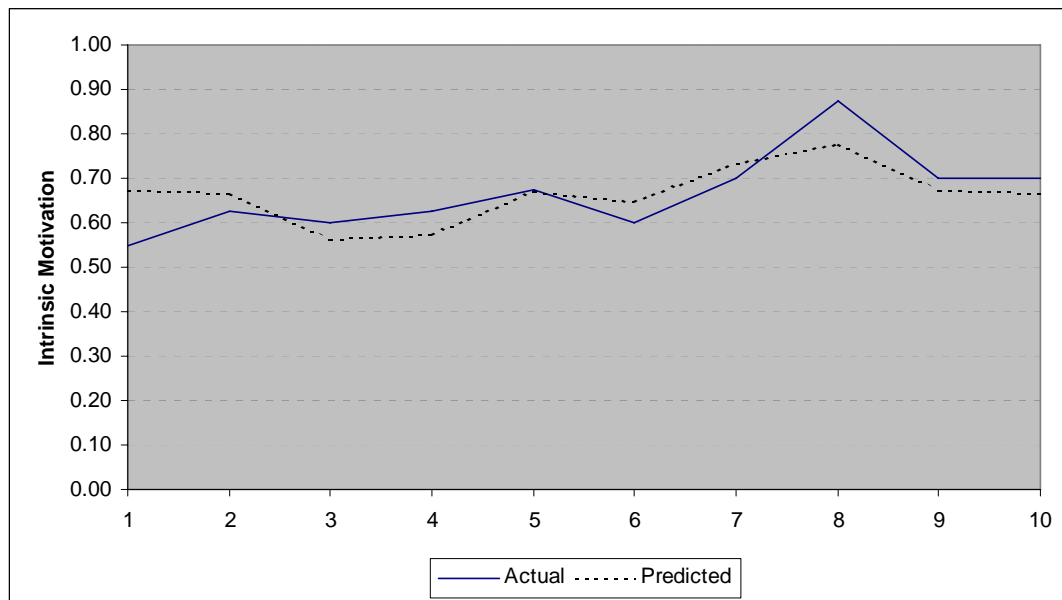


Figure A10 - 8: Graph of Actual and Predicted Intrinsic Motivation from NIG

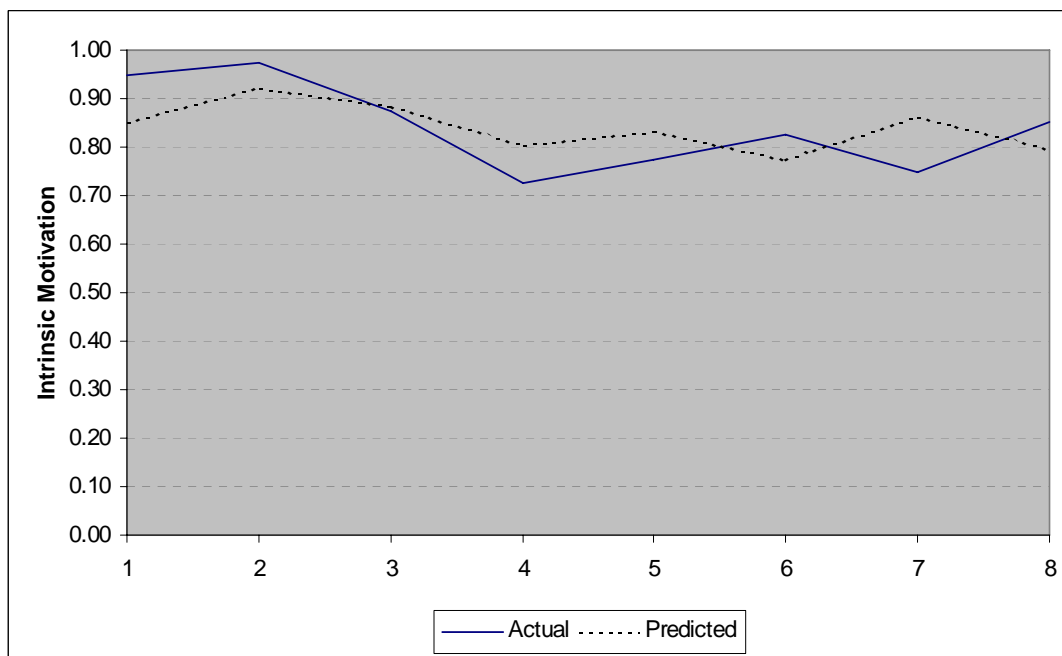


Figure A10 - 9: Graph of Actual and Predicted Intrinsic Motivation from Pearl

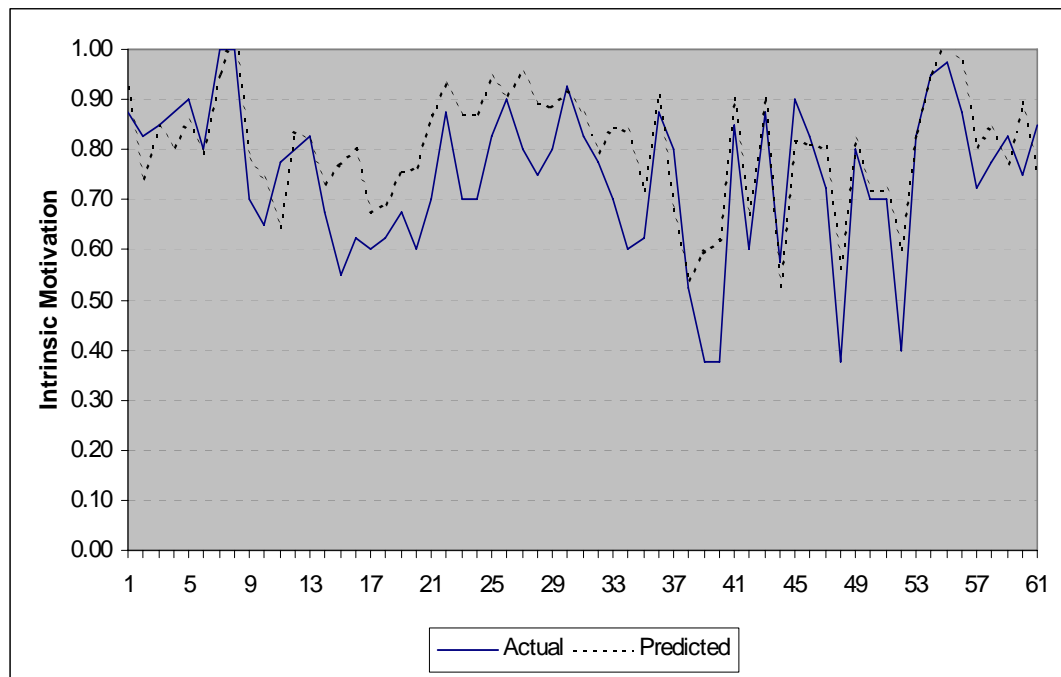


Figure A10 - 10: Graph of Actual and Predicted Intrinsic Motivation from the Combined Dataset

## Extrinsic Satisfaction

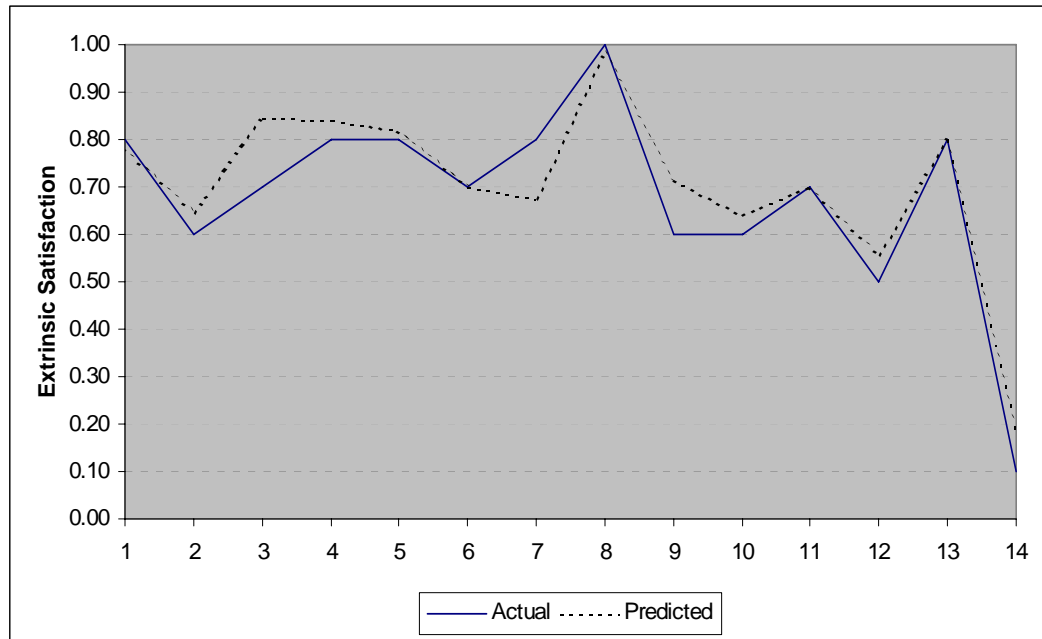


Figure A10 - 11: Graph of Actual and Predicted Extrinsic Satisfaction from The Halifax

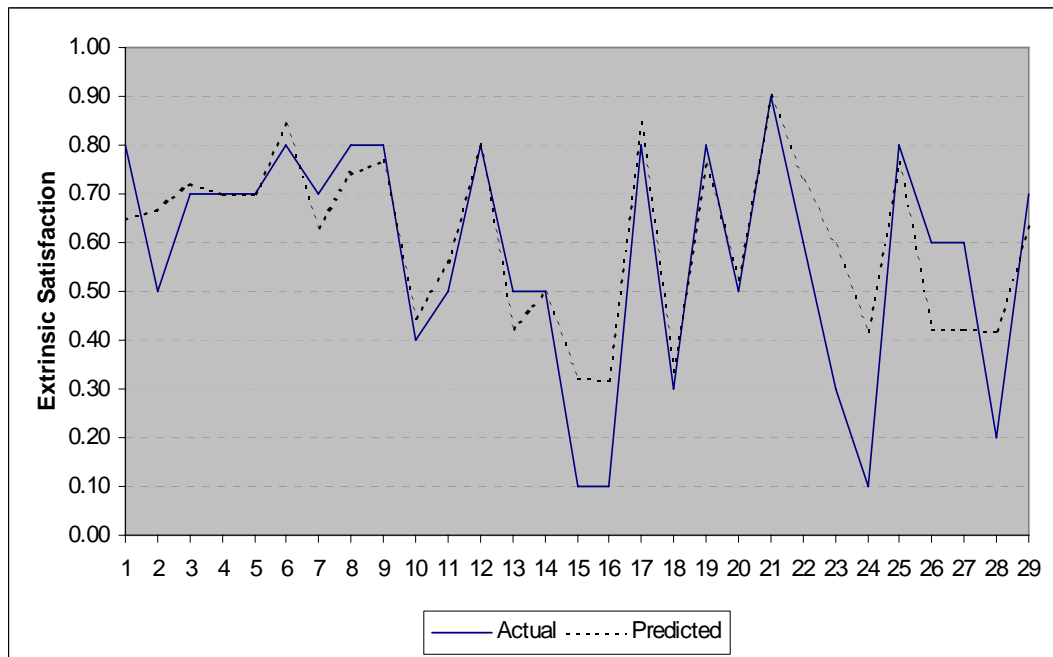


Figure A10 - 12: Graph of Actual and Predicted Extrinsic Satisfaction from Jeavons

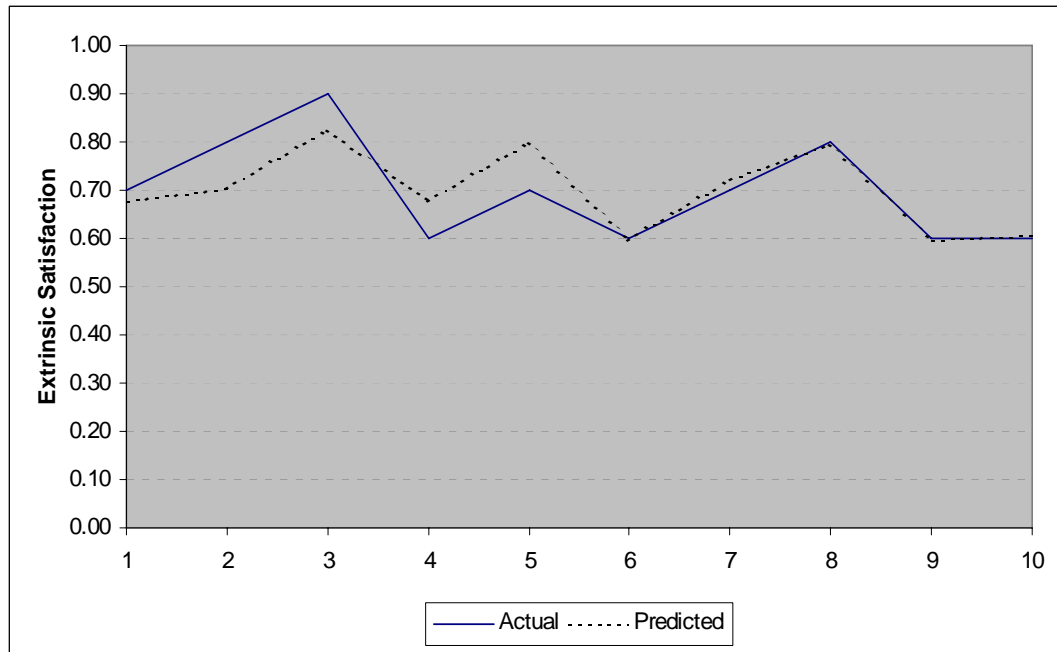


Figure A10 - 13: Graph of Actual and Predicted Extrinsic Satisfaction from NIG

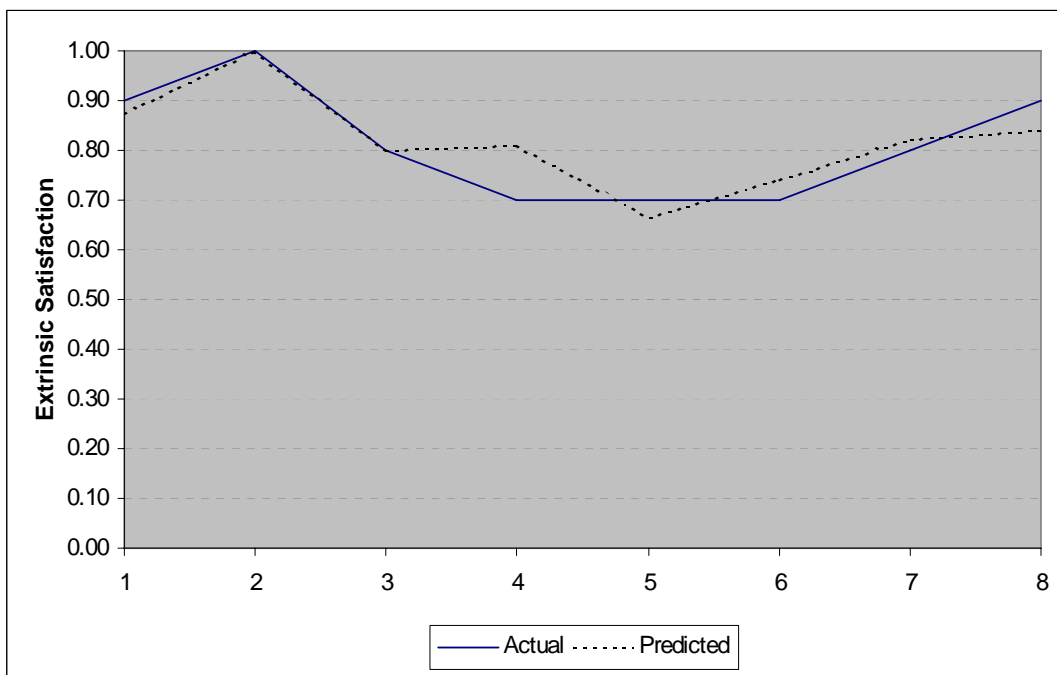


Figure A10 - 14: Graph of Actual and Predicted Extrinsic Satisfaction from Pearl



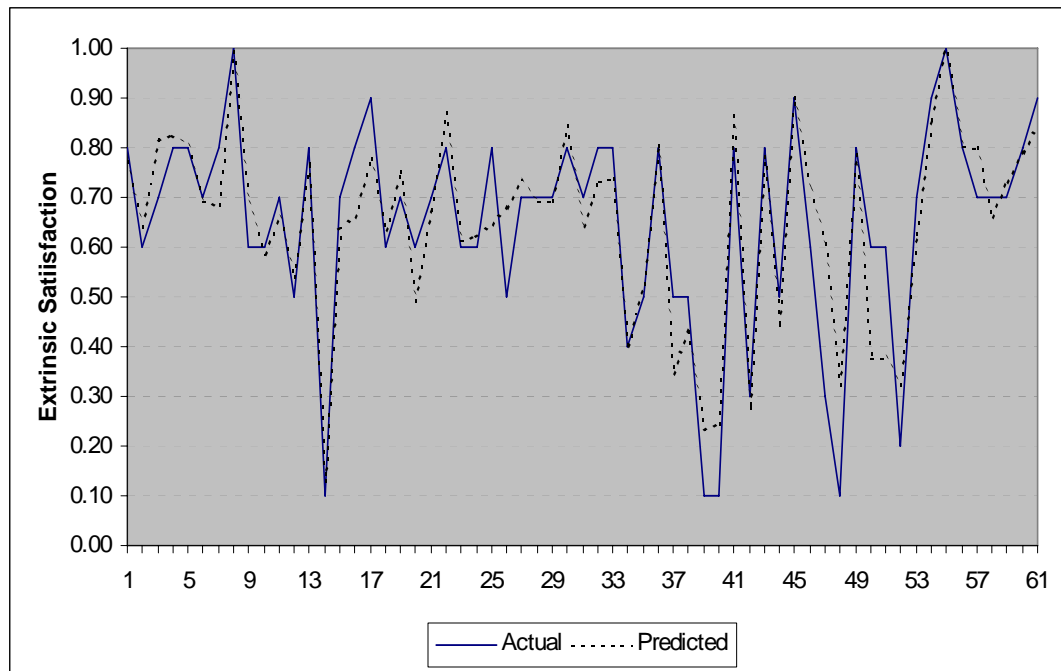


Figure A10 - 15: Graph of Actual and Predicted Extrinsic Satisfaction from the Combined Dataset

## Total Motivation

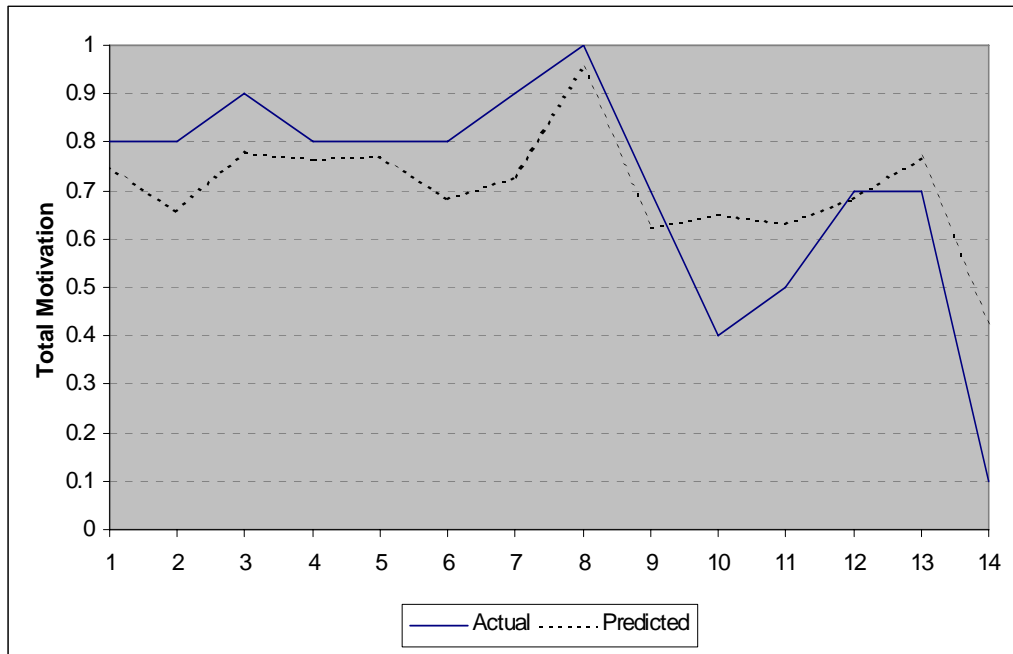


Figure A10 - 16: Graph of Actual and Predicted Total Motivation from The Halifax

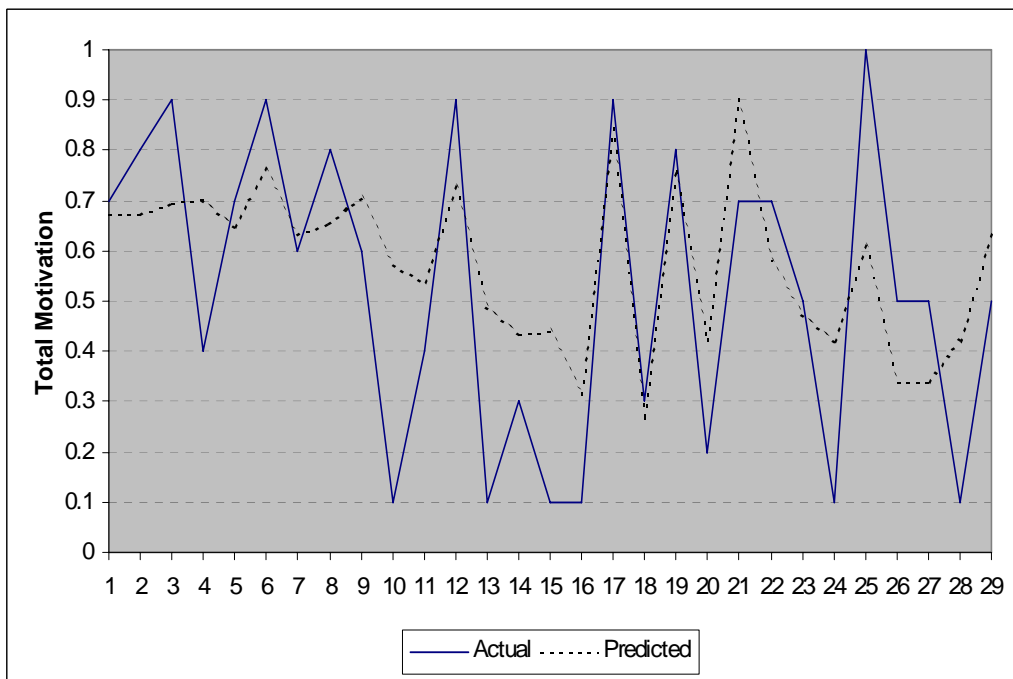


Figure A10 - 17: Graph of Actual and Predicted Total Motivation from Jeavons

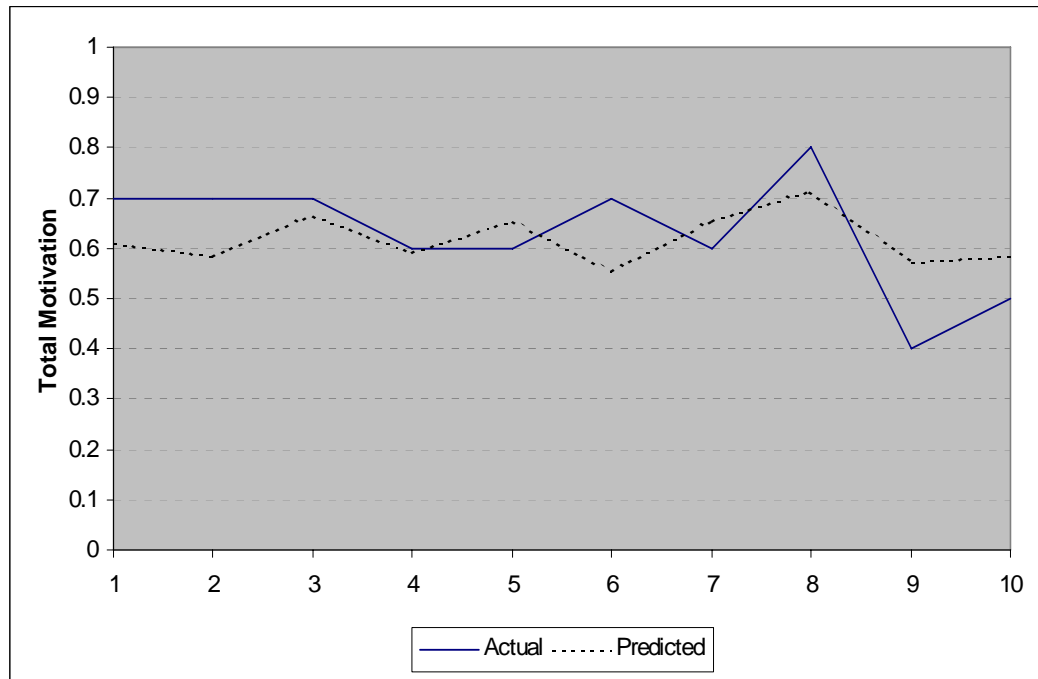


Figure A10 - 18: Graph of Actual and Predicted Total Motivation from NIG

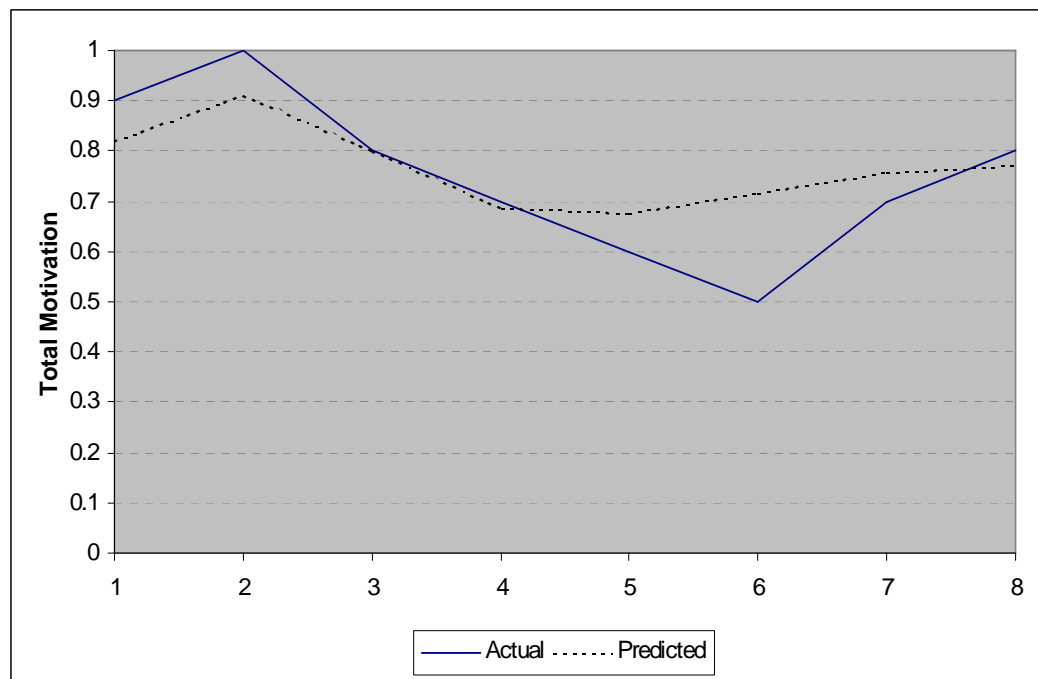


Figure A10 - 19: Graph of Actual and Predicted Total Motivation from Pearl

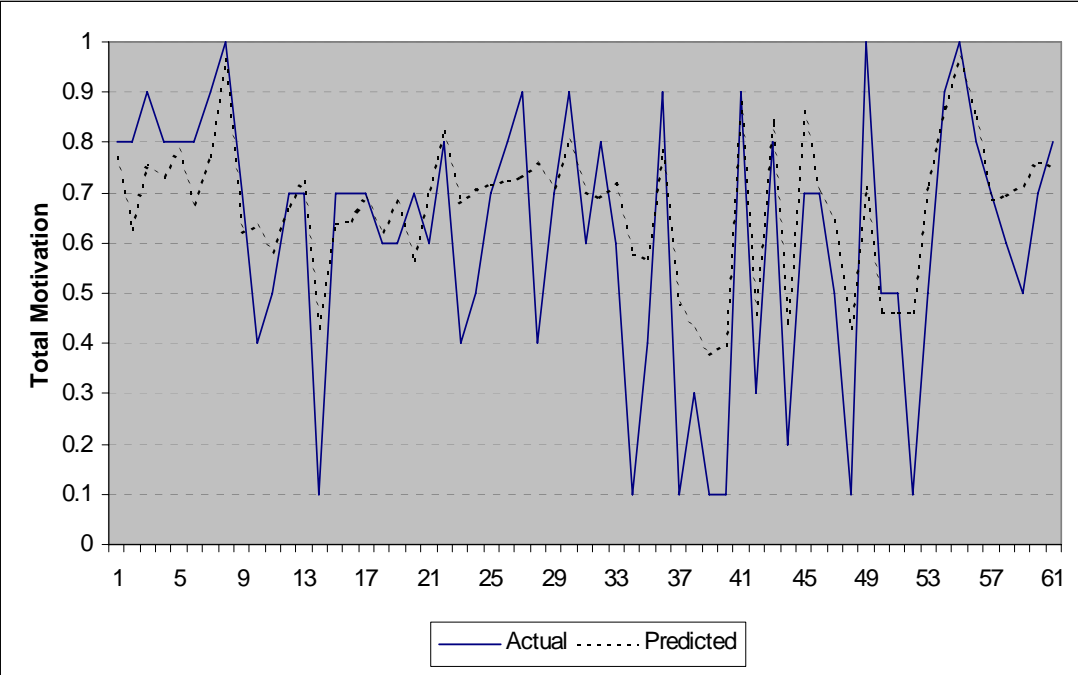


Figure A10 - 20: Graph of Actual and Predicted Total Motivation from the Combined Dataset

## Effort

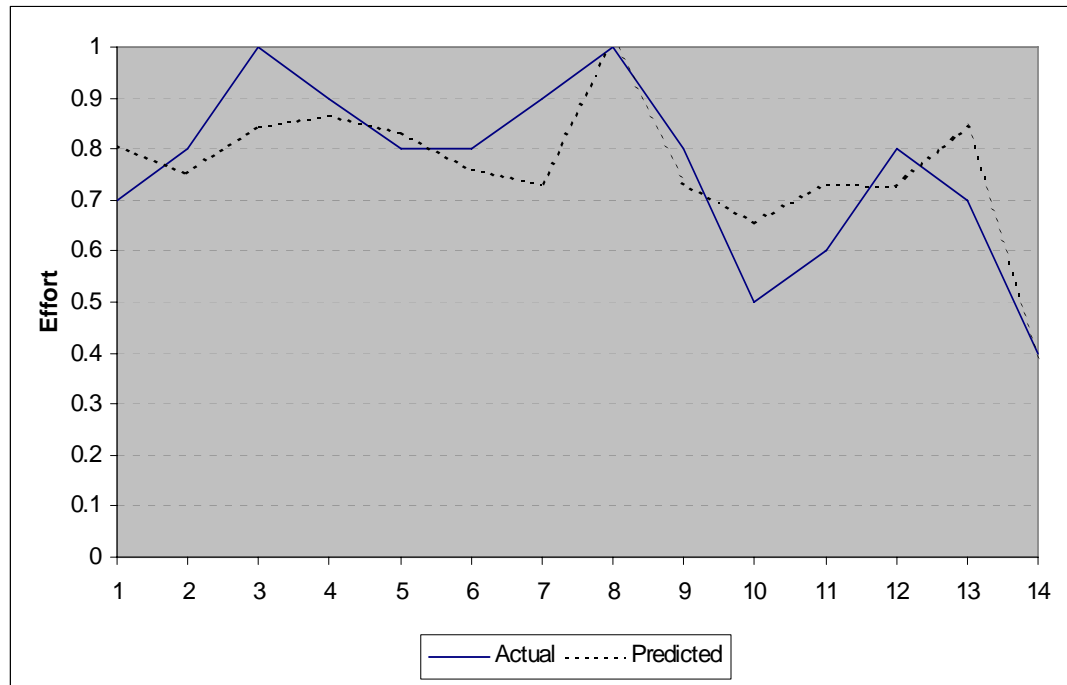


Figure A10 - 21: Graph of Actual and Predicted Effort from The Halifax

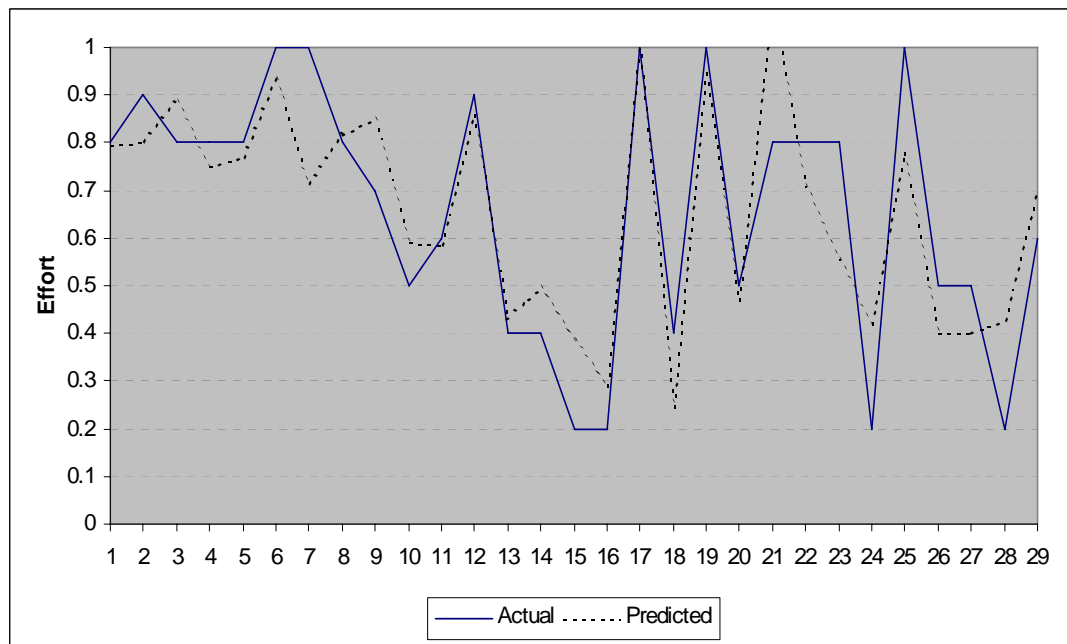


Figure A10 - 22: Graph of Actual and Predicted Effort from Jeavons

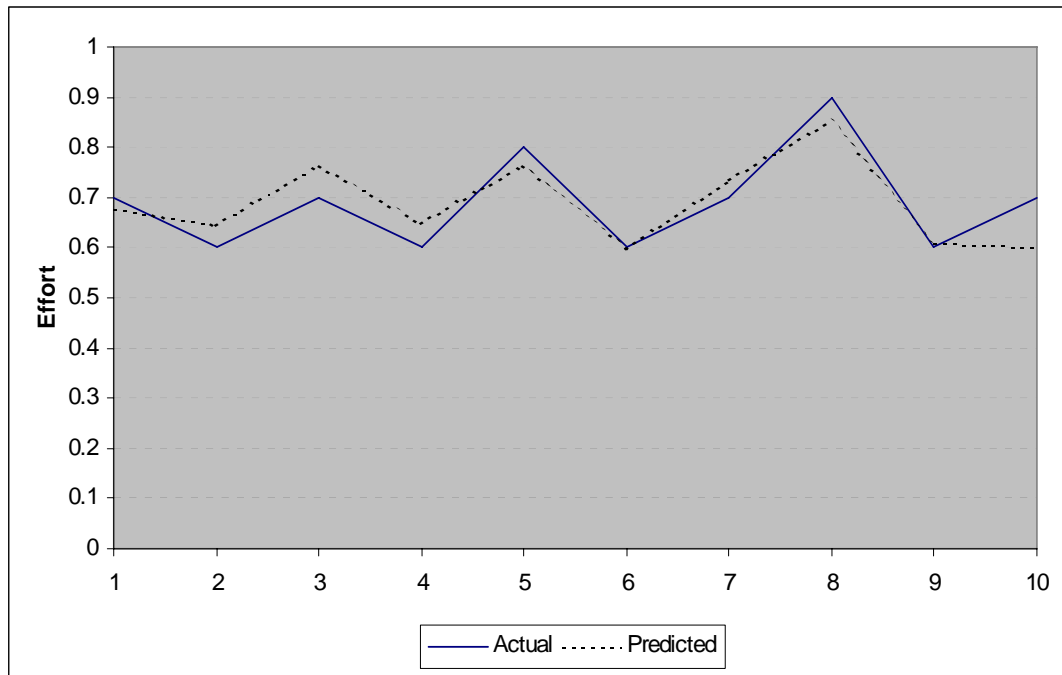


Figure A10 - 23: Graph of Actual and Predicted Effort from NIG

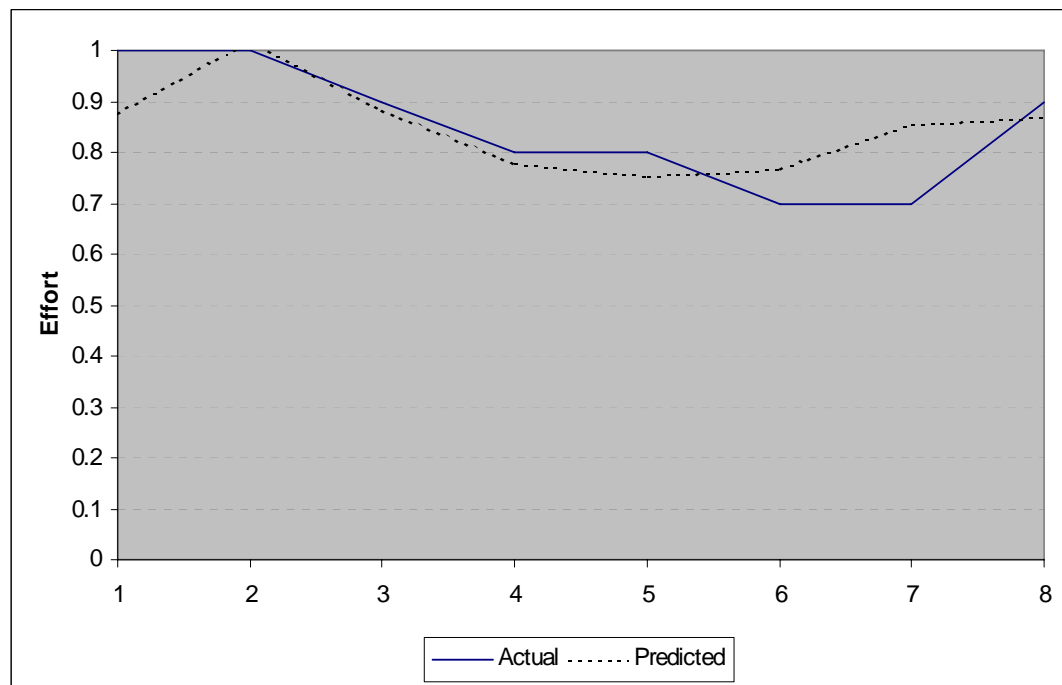


Figure A10 - 24: Graph of Actual and Predicted Effort from Pearl

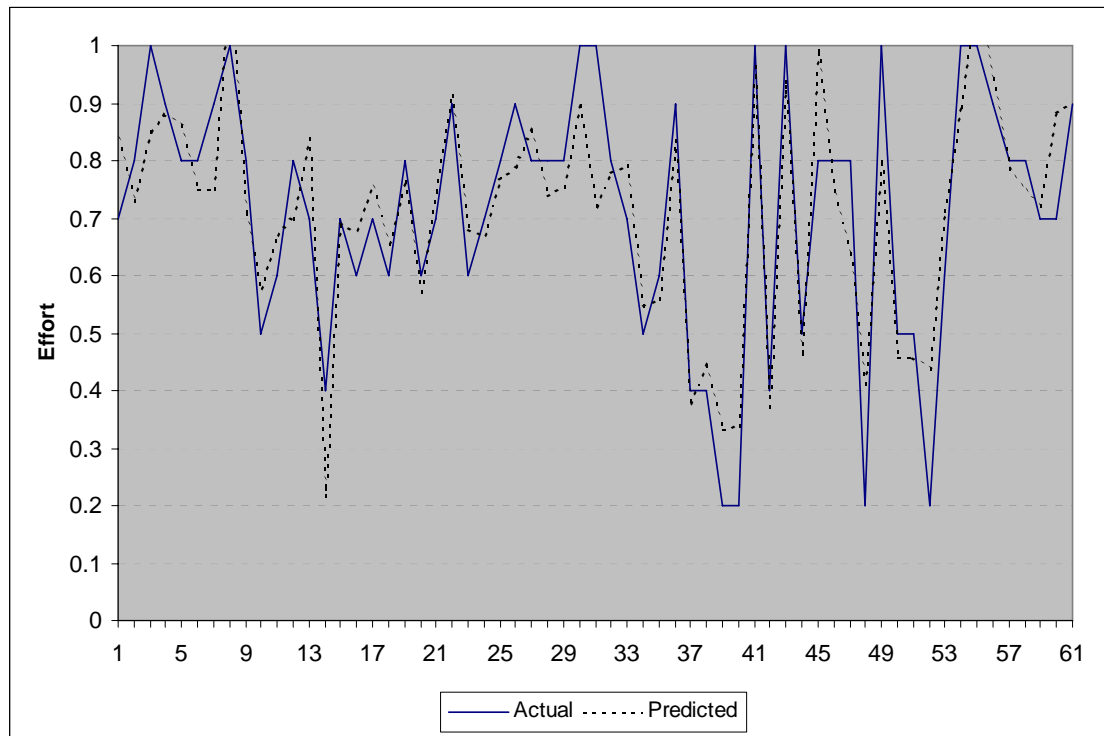


Figure A10 - 25: Graph of Actual and Predicted Effort from the Combined Dataset

## Performance

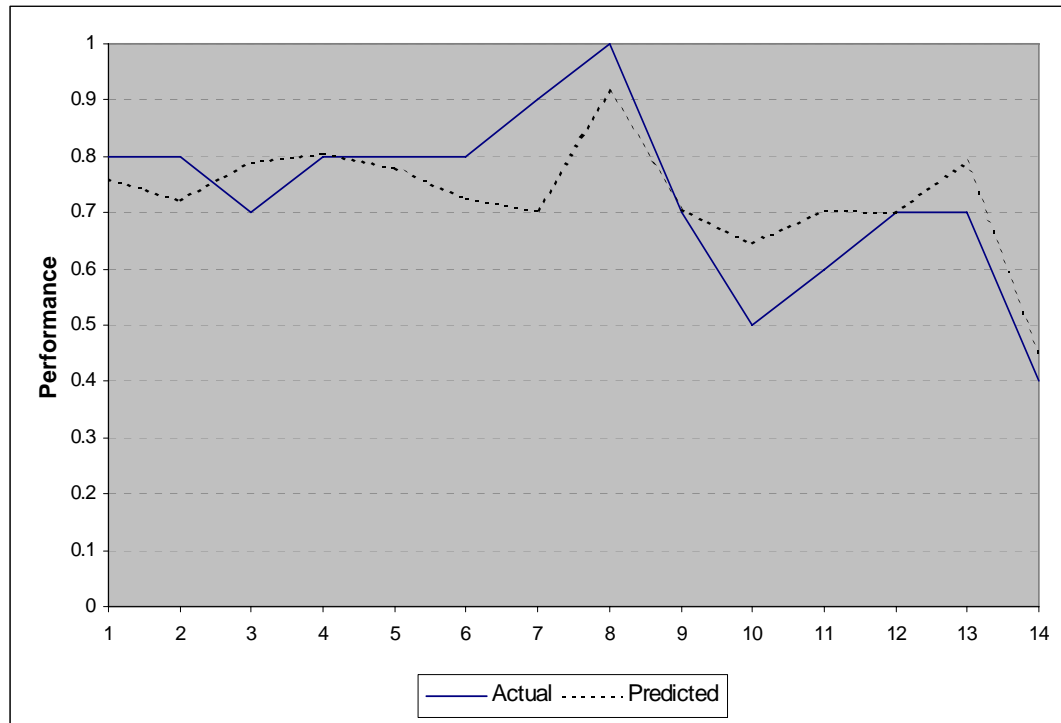


Figure A10 - 26: Graph of Actual and Predicted Performance from The Halifax

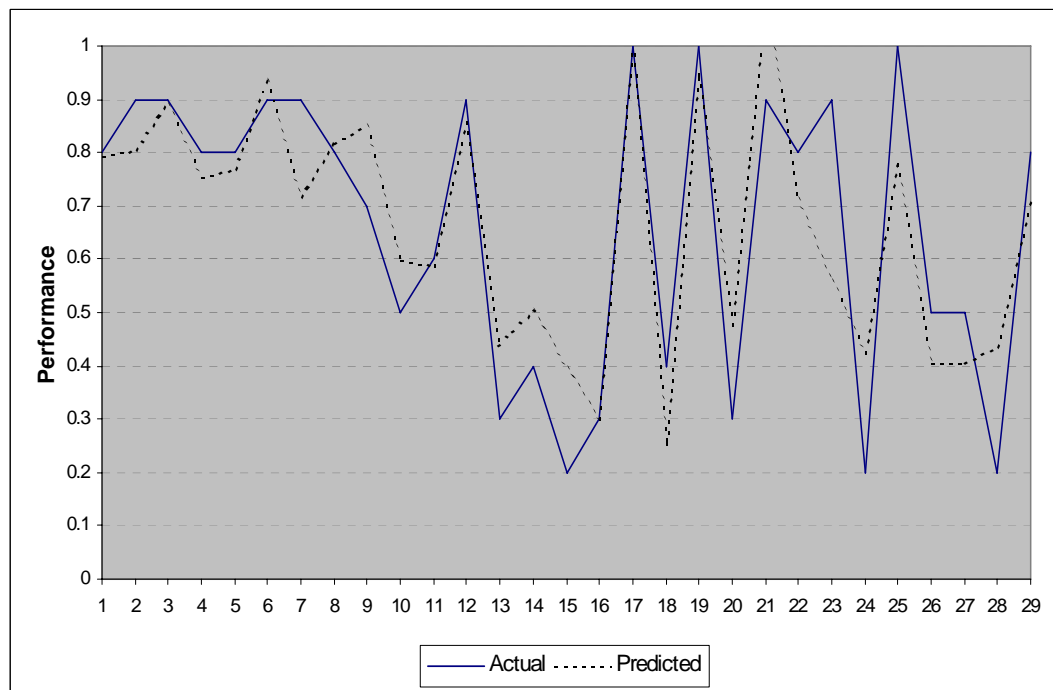


Figure A10 - 27: Graph of Actual and Predicted Performance from Jeavons



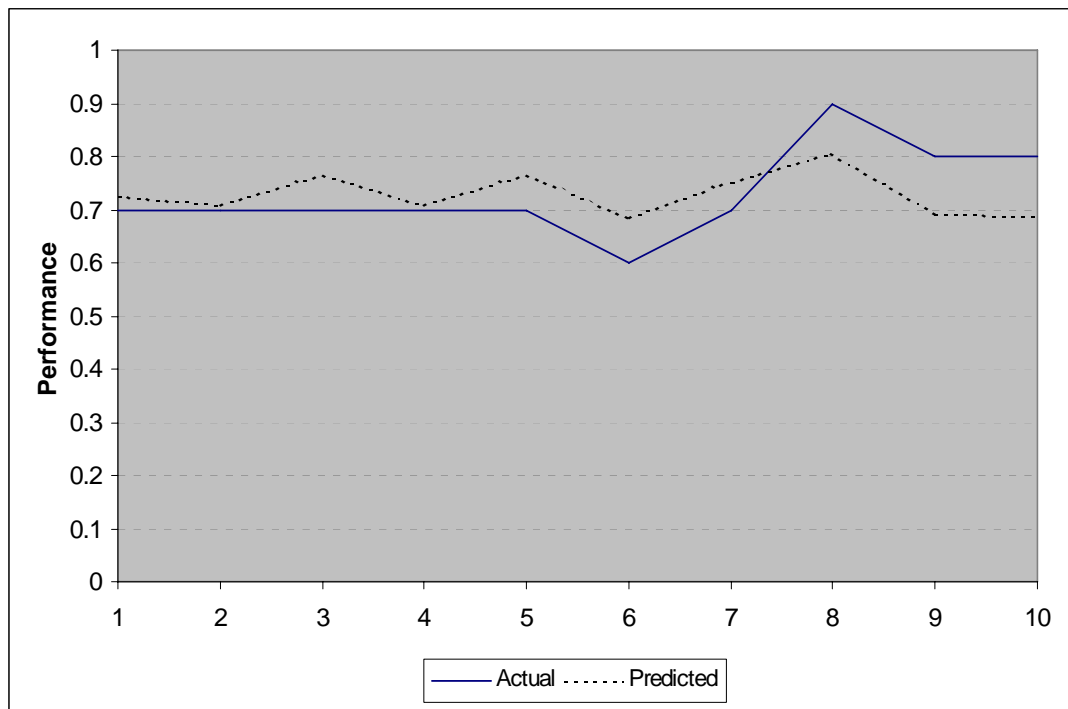


Figure A10 - 28: Graph of Actual and Predicted Performance from NIG

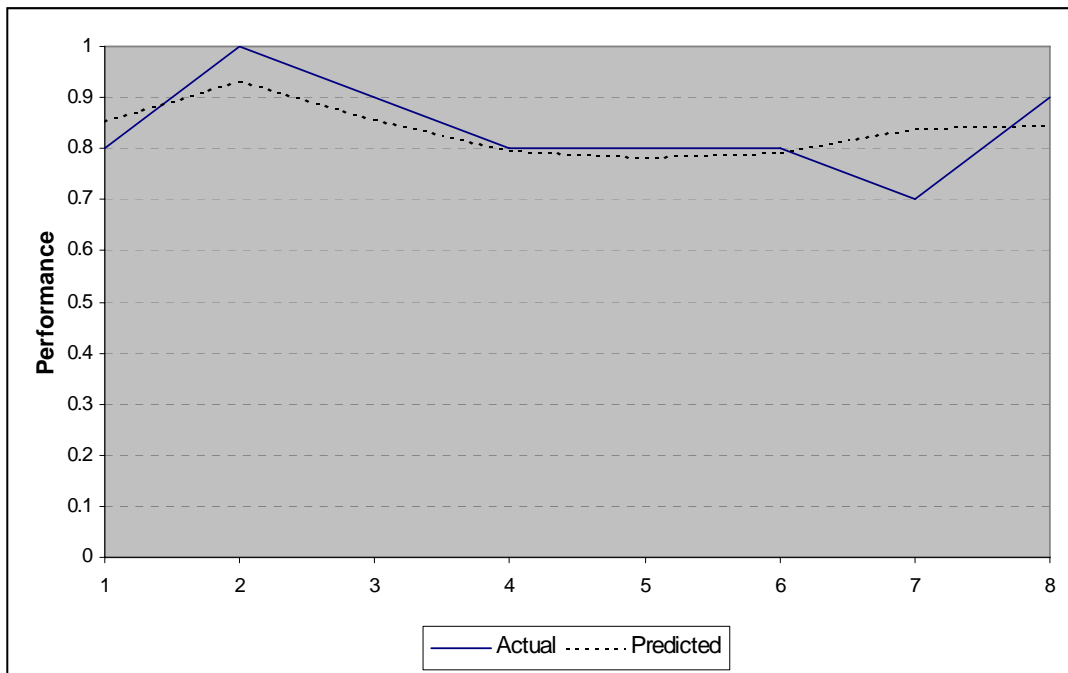


Figure A10 - 29: Graph of Actual and Predicted Performance from Pearl

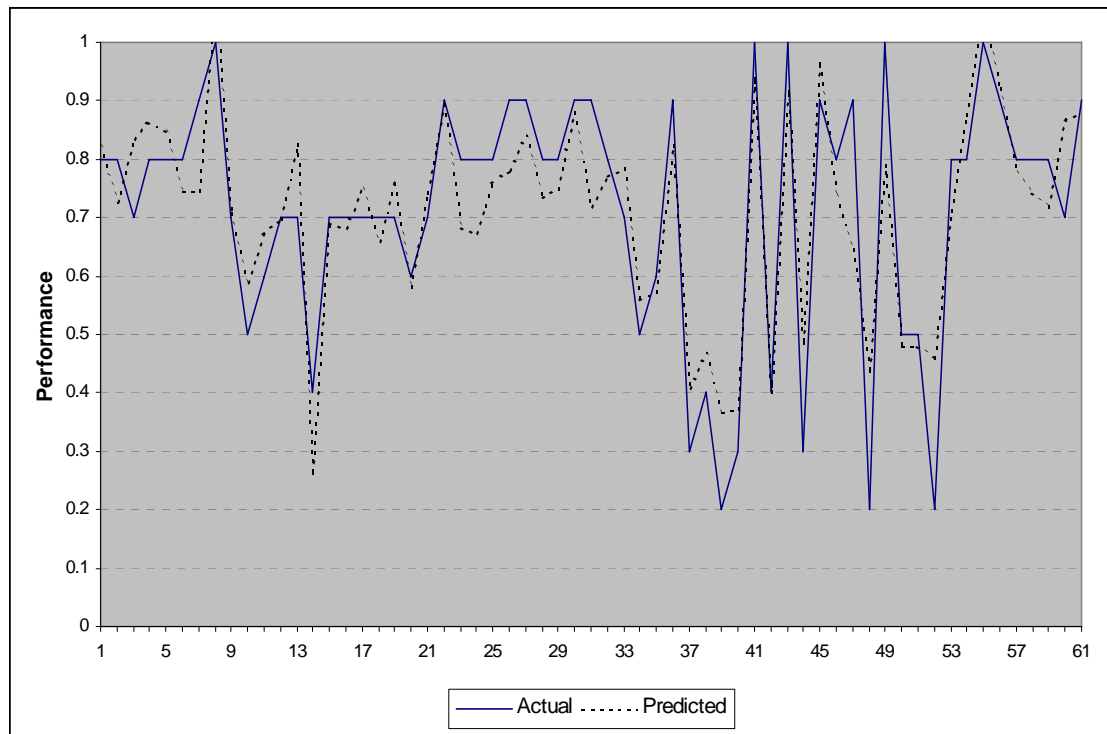
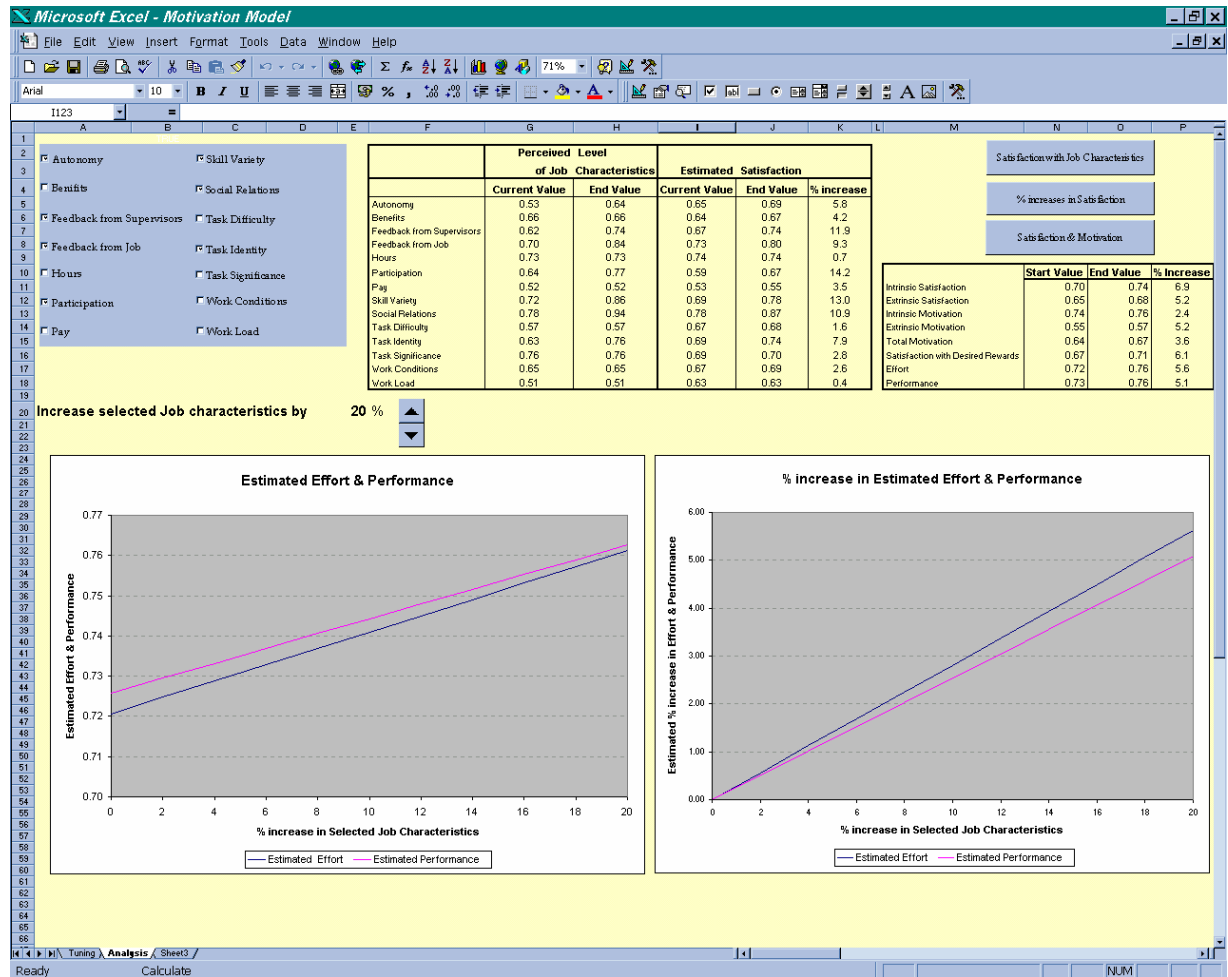


Figure A10 - 30: Graph of Actual and Predicted Performance from the Combined Dataset

## Appendix XI The Management Tool



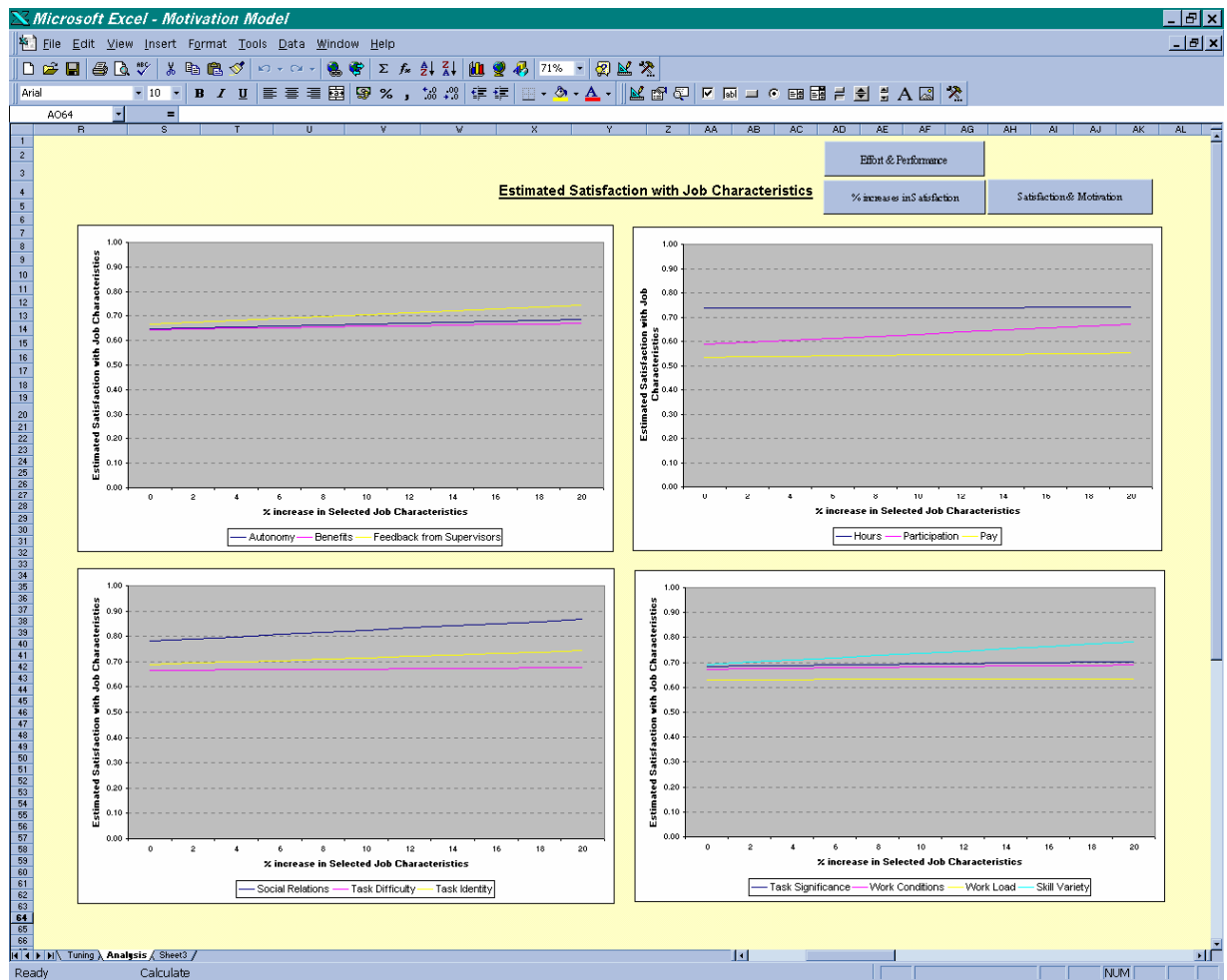
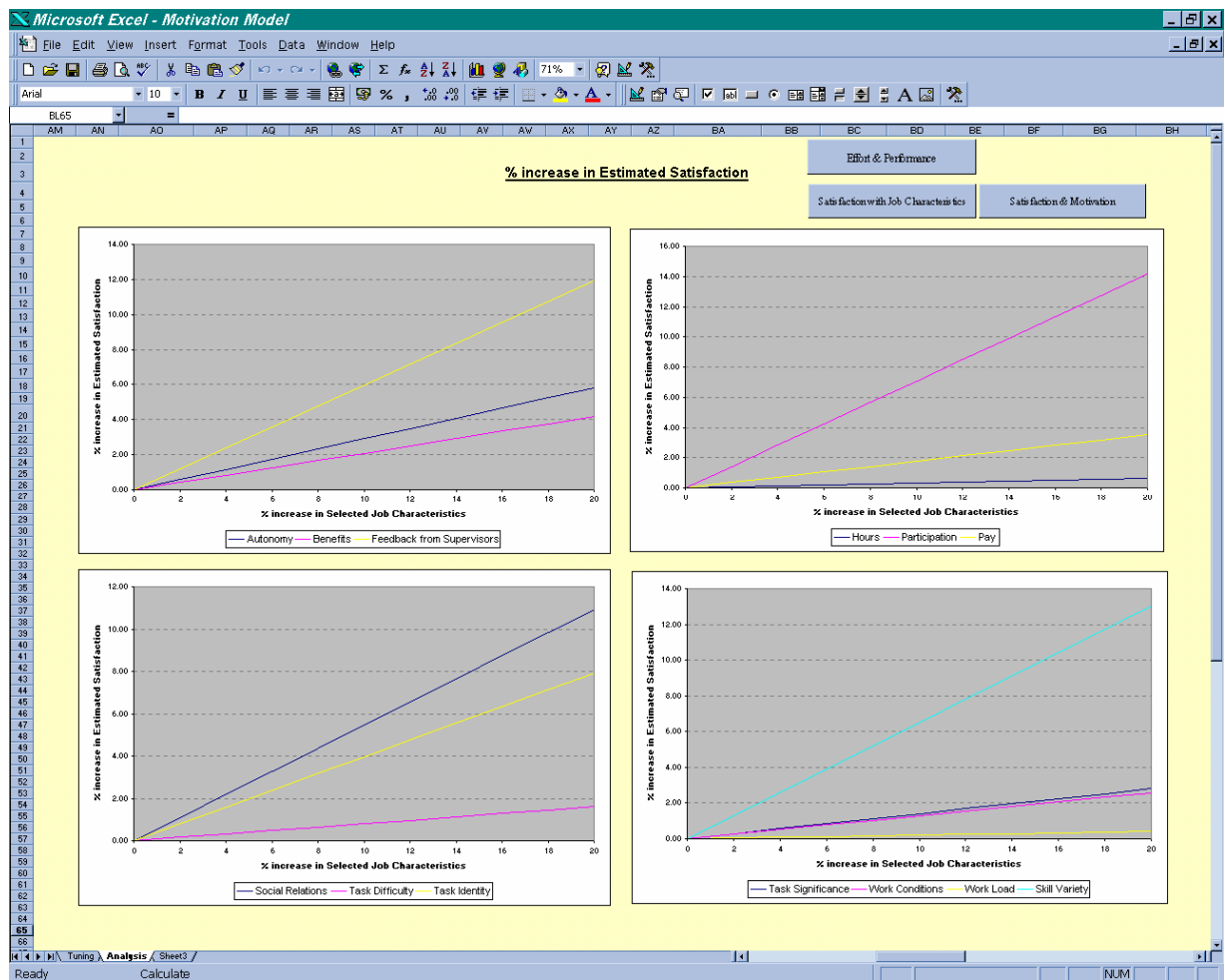


Figure A11 - 2: Management Tool – 'Analysis' Screen 2



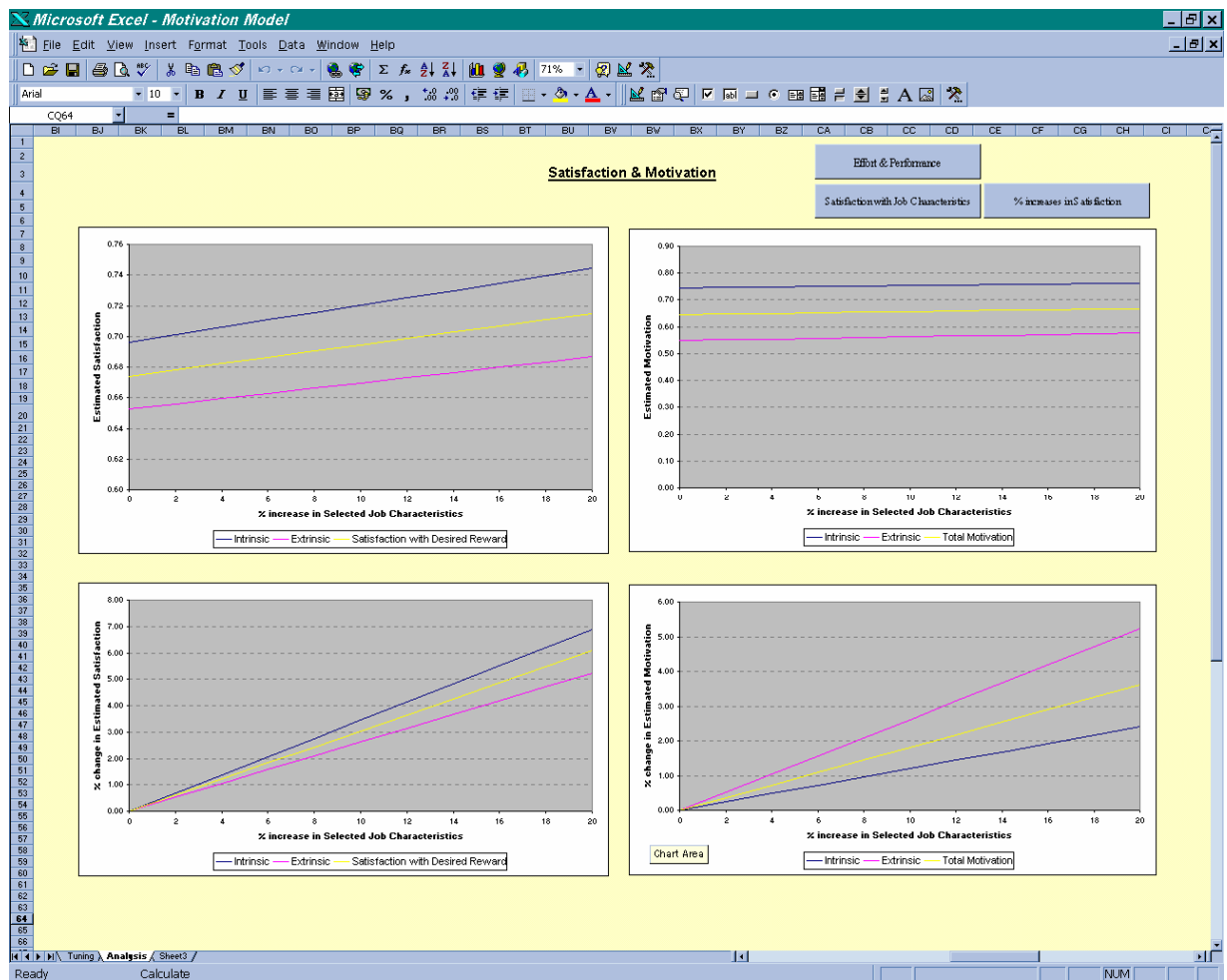


Figure A11 - 4: Management Tool – ‘Analysis’ Screen 4