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# THE CONSTRUCT VALIDITY OF THE JOB DIAGNOSTIC SURVEY WITHIN THE SOUTH AFRICAN CONTEXT

by

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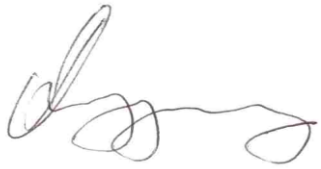
# DECLARATION OF ORIGINAL AUTHORSHIP

I Ilse v Loggerenberg declare that the construct validity of the Job Diagnostic Survey within the South African context, is my own work. All the resources used are cited and referred to in the reference list by means of a comprehensive reference system. I declare that the content of this dissertation has never been used for any other qualification at a tertiary institute or performance body.



Ilse van Loggerenberg
4 April 2012

# ABSTRACT

In many studies it was found that although loyal and trustworthy employees are the backbone of a company, often workers feel bored and underutilised. In fact very few people really feel energised by and interested in their jobs. There is thus a need for managers to understand the conditions under which workers tend to display motivation, satisfaction and productivity.

The Job Design Survey (JDS) is a questionnaire that was designed to measure how jobs could be enriched to create these conditions in the workplace. The Job Characteristic Model (JCM) and the accompanying JDS questionnaire to measure and thus improve job motivation and satisfaction were designed by Hackman and Oldman (1975) and revised by Idaszak and Drasgow in 1987. The JDS was standardised in the international context but also in the South African context on a certain population. The South African context and culture, however, is very unique and diverse and there was a need to standardise this measure further in order to apply it with greater surety in different settings in the South African context.

The main purpose of this study was to validate the Revised JDS within the South African context by using the Confirmatory Factor Analysis (CFA) following the Structured Equation Modelling (SEM) approach. A proper literature review was conducted on the JCM focusing on the theories from which the JCM were derived and expanding on the JCM itself. The background regarding the construct validity of the JDS as well as Revised JDS was studied.

The construct validity study of the Revised JDS was conducted on a new sample. Evidence was found that the Revised JDS reliability is acceptable and that the model does fit the data to a reasonable or acceptable degree. It could therefore be concluded that the Revised JDS can be used by managers in SA with greater confidence as an instrument to redesign work.

# OPSOMMING

In verskeie studies is gevind dat, alhoewel lojale en betroubare werknemers die ruggraat van maatskappye is, hulle dikwels verveeld en onbenut voel. Om die waarheid te sê, baie min mense voel in werkikheid geïnteresseerd en bemagtig deur hulle werk. Daar is dus ‘n behoefte by bestuurders om te verstaan onder watter omstandighede werknemers geneig is om gemotiveerd, tevrede en produktief te wees.

Die Werksontwerpvraelys (Job Design Survey) is ‘n vraelys wat juis ontwerp is om te meet hoe ‘n pos se inhoud verryk kan word, om sodoende hierdie omstandighede te skep vir werknemers. Die Werkskaraktermodel (Job Characteristic Model) asook die Werksontwerpvraelys wat daarop gefokus is om werksinhoud te verbeter en sodoende werksmotivering asook werksbevrediging by werknemers te skep, is deur Hackman en Oldman (1975) ontwikkel en aangepas deur Idaszak en Drasgow in 1987. Die Werksontwerpvraelys is reeds gestandardiseer op internasionale vlak asook in Suid Afrikaanse konteks deur gebruik te maak van ‘n sekere populasiegroep. Die Suid Afrikaanse konteks en kultuur is egter baie uniek en divers en daar was ‘n behoefte om die instrument verder te standardiseer, sodat dit met meer sekerheid gebruik kan word in verskillende areas van die Suid Afkikaanse konteks.

Die hoofdoel van hierdie studie was om die die aangepaste Werksontwerpvraelys binne die Suid Afrikaanse konteks te valideer deur gebruik te maak van die Bevestigende faktoranalise (Confirmatory Factor Analysis) en die Gestruktureerde vergelykende modellering (Structured Equation Modelling) benadering. ‘n In-diepte literatuurstudie is gedoen deur te fokus op die teorieë waarop die Werkskaraktermodel gebaseer is, asook op die Werkskaraktermodel self. Die konstrukgeldigheid van beide die Werksontwerpvraelys asook die aangepaste Werksontwerpvraelys is ook albei in diepte ondersoek.

Die konstrukgeldigheid van die aangepaste Werksontwerpvraelys is getoets op ‘n nuwe steekproef. Daar is bewyse gevind dat die aangepaste Werksontwerpvraelys se betroubaarheid aanvaarbaar is en dat die model die data tot ‘n redelike mate gepas het. Die afleiding kon dus gemaak word dat bestuurders in Suid-Afrika die aangepaste Werksontwerpvraelys met groter vertroue kan gebruik wanneer hulle werk of poste wil herontwerp.

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# CHAPTER 1

# INTRODUCTION

## 1.1 BACKGROUND

“They make up more than half of the workforce. They work long hours and are the loyal and trustworthy employees in the company, the backbone. They are not happy, in fact they feel bored and underutilised”. In a study done by Harvard Business Review, only 33% of the 7700 employees surveyed, felt energised by and interested in their jobs (Morison, Erickson & Dychtwald, 2008, p.55).

Rothmann (2003) highlights two facts that most people are familiar with: 1) jobs are different and 2) some are more interesting than others. Over the years researchers intended and still aspire to understand how job characteristics are associated with the employee’s feeling of motivation, satisfaction and drive to perform (Johns, 2010).

By the 1960s Hertzberg developed a new and revolutionary approach to job design when he introduced the two-factor theory of job satisfaction (Rothmann, 2003). Hackman and Oldman (1975) used Hertzberg’s theory to design the Job Characteristic Model (JCM) that defines task characteristics and leads to the understanding of the relationship to the motivation, performance and satisfaction of employees. Hackman and Oldman (1975) also developed the Job Diagnostic Survey (JDS) to measure five core job characteristics described in the JCM. Idaszak and Drasgow revised the JDS in 1987 thereafter called the Revised JDS. Various studies were conducted over the years to test the factor structures of the JDS in order to increase its usefulness in job design research (Taber & Tayler, 1990). In South Africa limited research has been conducted and further research is needed to ensure that the instrument could be used to the advantage of managers in the South African context (Buys, Olckers & Schaap., 2007).

It seems evident that job design is and will still become a more pressing issue. To use the Revised JDS within the South African context, further refinement of the validation of the

instrument is needed, as South Africa has a unique culture and the needs of the South African people and organisations are obviously different from the international context.

## 1.2 PROBLEM STATEMENT

There is a need for managers to understand the conditions under which workers tend to display motivation, satisfaction and productivity (Voster, Olckers, Buys & Schaap 2005). There is thus also a need to have survey measures to measure how jobs could be enriched to create these conditions in the workplace, especially in the South African context. The JDS originally developed by Hackman and Oldman (1975) and revised by Idaszak and Drasgow (1987) was standardised in the international context but also in the South African context on a certain population. The South African context and culture however is very unique and diverse. Buys *et al.* (2007) state that it is necessary to conduct further standardisation tests on this measure in order to apply it with greater surety in different settings in the South African context. The reason to conduct further studies on the validity of the JDS model in the South African context is to enable managers across South Africa to use the JDS with increased confidence. It can assist managers to design jobs that positively affect employee motivation (Rothmann, 2003).

## 1.3 PURPOSE STATEMENT

The main purpose of this study is to validate the Revised JDS within the South African context by using the Confirmatory Factor Analysis (CFA) following the Structured Equation Modelling (SEM) approach.

## 1.4 RESEARCH OBJECTIVES

The study is guided by the following specific research objectives:

- To review the literature with regard to the Job Characteristics Model (JCM).

- To review the most recent literature with regard to the Revised Job Diagnostic Survey (JDS).
- To evaluate the construct validity of the Revised JDS within the South African context by performing a CFA using the SEM analysis.

## 1.5 IMPORTANCE AND BENEFITS OF THE PROPOSED STUDY

Campion, Mumford, Morgenson and Nahrgang (2005) argue that work design research and the impact thereof on employee motivation pose a remarkable opportunity to enhance the contribution of Human Resource (HR) research to the business. Continued research on work design is particularly critical because it impacts a large number of significant job results such as job satisfaction, effectiveness and performance. Rothmann (2003) researched the JCM and the JDS as a support measurement to ensure job fit between employees and their jobs. He proposes that further research is necessary on the validation of Western management practices in the South African context.

In South Africa, Buys *et al*. (2007) note that despite the positive results obtained during the Revised JDS's construct validity study in the South African context, the instrument needs to be further validated before final conclusions could be reached for the South African context. It is thus advisable to use a new sample to further investigate the validation of the Revised JDS questionnaire. On a practical level the further validation of the Revised JDS, could enable managers in SA to further enhance job satisfaction and employee productivity through the use of the Revised JDS to measure job fit (Wiesner & Vermeulen, 1997). Oldman and Hackman (2005) also feel that there is a great deal more to be known and researched regarding job motivation and that it will remain a key issue.

The content of this document provides an overview of the assumptions, common abbreviations and definitions that were used in this study. Emphasis is placed on the literature in order to further investigate the JCM as well as JDS and Revised JDS instrument based on this theory. More attention is given to the previous validity studies done for both these questionnaires. The data gathering, analysis methods, ethical and quality considerations for this study are also discussed.

## 1.6 DELIMITATIONS AND ASSUMPTIONS

There are some delimitations regarding the context, constructs, theoretical perspectives and the target population of the proposed study. Every study is guided by a set of beliefs or assumptions. Assumptions can be defined as a statement that is assumed to be true and from which a conclusion can be drawn. Without assumptions it will be impossible for a study to exist (Leedy & Ormrod, 2010).

### *1.6.1 DELIMITATIONS*

Firstly, the study is limited by only focusing on South African organisations. The results obtained from the proposed study are thus also limited regarding the generalisation of the findings. Secondly, the study only focuses on the validation of the construct design as described by JDS, originally developed by Hackman and Oldman (1975) and revised by Idaszak and Drasgow (1987). The instrument only measures five core dimensions or job characteristics namely skill variety, task identity, task significance, autonomy and feedback.

Thirdly, the study focuses on previous research done on the construct validity of the JDS in both South African and international context, although the emphasis is on the South African context. Lastly the proposed target population is employees (any person working in South Africa) in any organisation, except employees on management level or illiterate workers. The sampling methods that are used have some limitations with regard to the degree of control the researcher has over the sample, as well as the degree to which the sample can be considered as being well-representative of the population.

### *1.6.2 ASSUMPTIONS*

The study makes a number of assumptions regarding the elements under investigation, the approach to the study, the researcher, the organisation, the results and the participants:

- Job design to motivate staff is an important aspect in the work environment (also in the South African context), which influences the productivity and thus the effectiveness of an organisation;
- The elements included in the Revised JDS provide sufficient information to conduct an appropriate study with sufficient findings;
- The researcher did not allow personal bias to effect the results of the study;
- The researcher acted independently at all times;
- The researcher has the necessary skills and ability to ensure that the results are accurately collected and analysed;
- The quantitative data gathering approach to the study is the most appropriate way of obtaining and evaluating the data for this study;
- All the information in the literature review is true and applicable;
- The participants understood the questions as intended and answered them truthfully;
- The relationships between item responses are reasonably consistent across different types of jobs as well as between respondents from different ages, gender and ethnic backgrounds.

## 1.7 DEFINITION OF KEY TERMS

This study involves a number of key concepts. The manner in which these key terms are defined for the purpose of this study is described in table 1:

**Table 1: Description of key terms used in this study**

| Key Terms | Description of Key Terms |
|---|---|
| **Job Design** | "Work arrangement (or rearrangement) aimed at reducing or overcoming job dissatisfaction and employee alienation arising from repetitive and mechanistic tasks. It entails the offering of non-monitory rewards such as a greater sense of achievement in order to raise productivity in organisations" (Mello, 2004, p. 253). |
| **Job Design Survey (JDS)** | This is the survey that forms part of the Job Characteristics Model (JCM) and is also sometimes referred to as the original JDS. Idaszak and Drasdow have revised this questionnaire in 1987 to create the Revised JDS (Boonzaier, Ficker & Rust, 2001). |
| **Revised JDS** | This refers to a new version of the JDS Revised by Idaszak and Drasdow in 1987, where the negatively worded items were replaced with positively worded ones (Boonzaier *et al.* 2001). See Annexure A for an example of this, the Revised JDS questionnaire. |
| **Construct Validity** | "The extent to which an instrument measures a characteristic that cannot directly be observed but is assumed to exist based on patterns in people's behaviour (such a characteristic is a construct)" (Leedy & Ormrod, 2010, p. 92). |
| **Skill Variety** | "The degree to which a job requires variety of different activities so the employee can use a number of different skills and talents" (Rothmann, 2003, p. 333). |
| **Task Identity** | "The degree to which the job requires a completion of a whole and identifiable piece of work" (Hackman & Oldman, 1975, p. 18). |

| | |
|---|---|
| **Task significance** | "The degree to which the job has substantial impact on the lives or work of other people" (Hackman & Oldman, 1980, p. 8). |
| **Autonomy** | "The extent to which the employee is able to work and determine work procedures at his/her own discretion, free from supervision" (Mello, 2004, p. 254). |
| **Feedback** | "The degree to which carrying out the work activities required by the job results in the individual obtaining direct and clear information about the effectiveness of his/her performance" (Rothmann, 2003, p. 333). |

This study also uses various abbreviations and table 2 provides a list of these abbreviations used in this study and the meaning thereof.

**Table 2: Abbreviations used in this document**

| Abbreviations | Meaning |
|---|---|
| JDS | Job Diagnostic Survey |
| Revised JDS | Revised Job Diagnostic Survey |
| JCM | Job Characteristics Model |
| MPS | Motivational Potential Score |
| SEM | Structural equation modelling |
| EFA | Exploratory factor analysis |
| CFA | Confirmatory factor analysis |
| HR | Human Resources |
| SA | South Africa |

## 1.8 CONCLUSION

Work design has a strong impact on employee motivation (Campion *et al*. 2005). Hackman and Oldman (1975) developed the JDS, revised by Idaszak and Drasgow in 1987, to

measure five core job characteristics associated with job design and motivation. Although the factor structure of the Revised JDS was tested both internationally and in South Africa to increase its usefulness, it is suggested by Buys *et al*. in 2007 that further validation studies need to be conducted in the South African landscape due to the complexity and uniqueness of the country.

Chapter 2 gives a more in-depth overview of the theoretical background of the study. It focuses on the context and theory of the JCM as well as the validation of the Revised JDS in international and South African context. Chapter 3 describes the research design and methods of data analysis whilst chapter 4 focuses on the data analysis and findings. Chapter 5 provides a summary of the findings, conclusions and recommendations.

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# CHAPTER 2

# LITERATURE REVIEW

## 2.1 INTRODUCTION

This chapter will aim to review or describe the most important literature with regard to job design and job characteristics. The main focus in this chapter is on the Job Characteristics Model (JCM), the Job Diagnostic Survey (JDS) and construct validity of the JDS. The literature is based on the South African as well as international perspective, but only people employed in South African organisations were approached to complete the questionnaire.

## 2.2 THE IMPORTANCE OF JOB DESIGN

The first question to be asked may be what job satisfaction is? Although various researchers gave their opinions and definitions over decades, Locke (1976, p.1304) provided perhaps the most popular definition of all " ... a pleasurable or positive emotional state resulting from the appraisal one's job or job experiences". Judge, Hellller and Klinger (2008) maintain that the cognitive demands the work poses are the only clear attribute of work itself that consistently plays a role in work satisfaction as shown by empirical evidence.

Job design could be defined as work arrangement or rearrangement focused on overcoming job dissatisfaction and employee unhappiness because of boredom with repetitive tasks, routine or mechanistic tasks (Business Dictionary, 2010). Employee productivity and job satisfaction are important concerns for all organisations. One of the more challenging tasks in organisations is allocating specific tasks and job responsibilities to employees (Mello, 2004). Small things irritate people about their workplace and work content. It was found in a survey done by Harvard Business Review on 7700 employees in the USA, that one out of five employees was seeking alternative employment due to their

need for rearrangement of their job content. Respondents indicated that they would rather work for less in exchange for more challenging work requirements (Morison, Erickson & Dychtwald, 2008). It thus illustrates that employees and employers are still struggling with the negative impact unchallenging work has on most people's motivation, quality of work and productivity.

Job design is an on-going process. The goal is to make adjustments as conditions or tasks change within the workplace. If job enrichment occurs research suggests that one of the consequences could be greater employee loyalty to the company (Miner, 2007). Through analysing and addressing job design, organisations make an effort to raise productivity levels by offering non-material rewards such as greater job challenges and a sense of achievement in meeting these increased challenges (Business Dictionary, 2010).

For those who assign work responsibilities, it is important to ensure that employees are neither overwhelmed by job requirements, nor bored and unchallenged. This implies that a well-balanced approach needs to be found where employees feel optimally utilised with sufficient work to keep them productive and motivated (Parker, Wall & Cordery 2001). A good job design allows for employees to have the option to vary activities according to personal needs, work habits, and the circumstances in the workplace. It should give employees a sense of accomplishment, pride and provide feedback to the employees about their performance (Job design, 2010).

The importance of job design has not gone unnoticed by researchers and they responded by developing a number of task characteristics theories. Rothmann (2003) states that these theories seek to identify the characteristics of jobs and how these characteristics could be combined to form different jobs. It also focuses on how employees' motivation, satisfaction and performance are related to the task characteristics of the job.

The two-factor theory developed by Herzberg (1966) is seen as the starting point. It was however, Turner and Lawrence's requisite task attributes theory which was developed in 1965 that formed the basis for the most dominant job design theory used worldwide today, namely the Hackman and Lawler's job characteristics theory (Rothmann, 2003). The Job

Characteristics Model (JCM) was based on this theory and it is thus important to expand on the theories behind the JCM before investigating the model further (Miner, 2007).

## 2.3 THEORETICAL APPROACHES TO WORK DESIGN AS A BASIS FOR THE JCM

Hackman and Oldman's JCM is one of the most influential theories ever presented in the field of organisational psychology. It is therefore important to explore the most prominent theories to contribute to this model further. The two most prominent theories that form the basis for the JCM is the two-factor theory developed by Herzberg (1960) and Turner and Lawrence's requisite task attributes theory developed in 1965 (Voster *et al.,* 2005).

### *2.3.1 HERTZBERG'S TWO-FACTOR THEORY*

Herzberg developed the first theory which focused on the motivational elements of work and jobs, in the 1950's (Herzberg, 1987). This theory is also called the motivation hygiene theory and is based on the belief that employee's relation to work is basic and that a person's attitude can determine accomplishment or failure. Hertzberg (1966, p.45) therefore asked the question "What do people want from their jobs?"

Two distinct sets of factors that influence motivation and job satisfaction were identified in his two-factor motivation theory. The first set is hygiene factors, which he described as not motivational but if inadequately met, they cause dissatisfaction. This will include factors such as pay, psychical work conditions and job security. These factors are seen as extrinsic to the work itself. On the other hand motivators can motivate people. These are factors associated with the work itself (intrinsic to the work) and if they are present are likely to motivate people to perform superiorly. Examples include recognition, personal growth and responsibility (Rothmann, 2003).

Traditional theories indicate that motivation transpires along one continuum between low and high job satisfaction. Hertzberg (1966) however believes differently and suggests that two dimensions are involved. One moves between low and high job satisfaction

(motivating factors) and the other between low job dissatisfaction and no job dissatisfaction (hygiene factors).

Hackman and Oldman (1976) observe that Herzberg contributed greatly but also add that the theory does not allow for differences between people as to how likely they are to respond differently to enriched jobs. They also question the ability of the theory to specify the measurement of the presence or absence of motivating factors. The authors therefore asserted the need to develop an instrument that could diagnose jobs prior to planned change and that could evaluate the effects of work design activities after the change has been carried out.

### *2.3.2 THE REQUISITE TASK THEORY*

Turner and Lawrence (1965) introduced the research on objective characteristics of jobs as related to work design. The observed employees determined what the connection between their responses to their work and the attributes of tasks were. They then created measures of six requisite task attributes: variety, autonomy, required interaction, optional interaction, knowledge and skill required, and responsibility. Turner and Lawrence anticipated that certain attributes would narrate positively to employee satisfaction, effectiveness, and attendance. To test relationships between the core of jobs and workers' reactions to them, a summary measure, the Requisite Task Attributes Index (RTA Index) was generated from the six measures. The job holders would experience more job satisfaction the higher a job's standing was on these attributes.

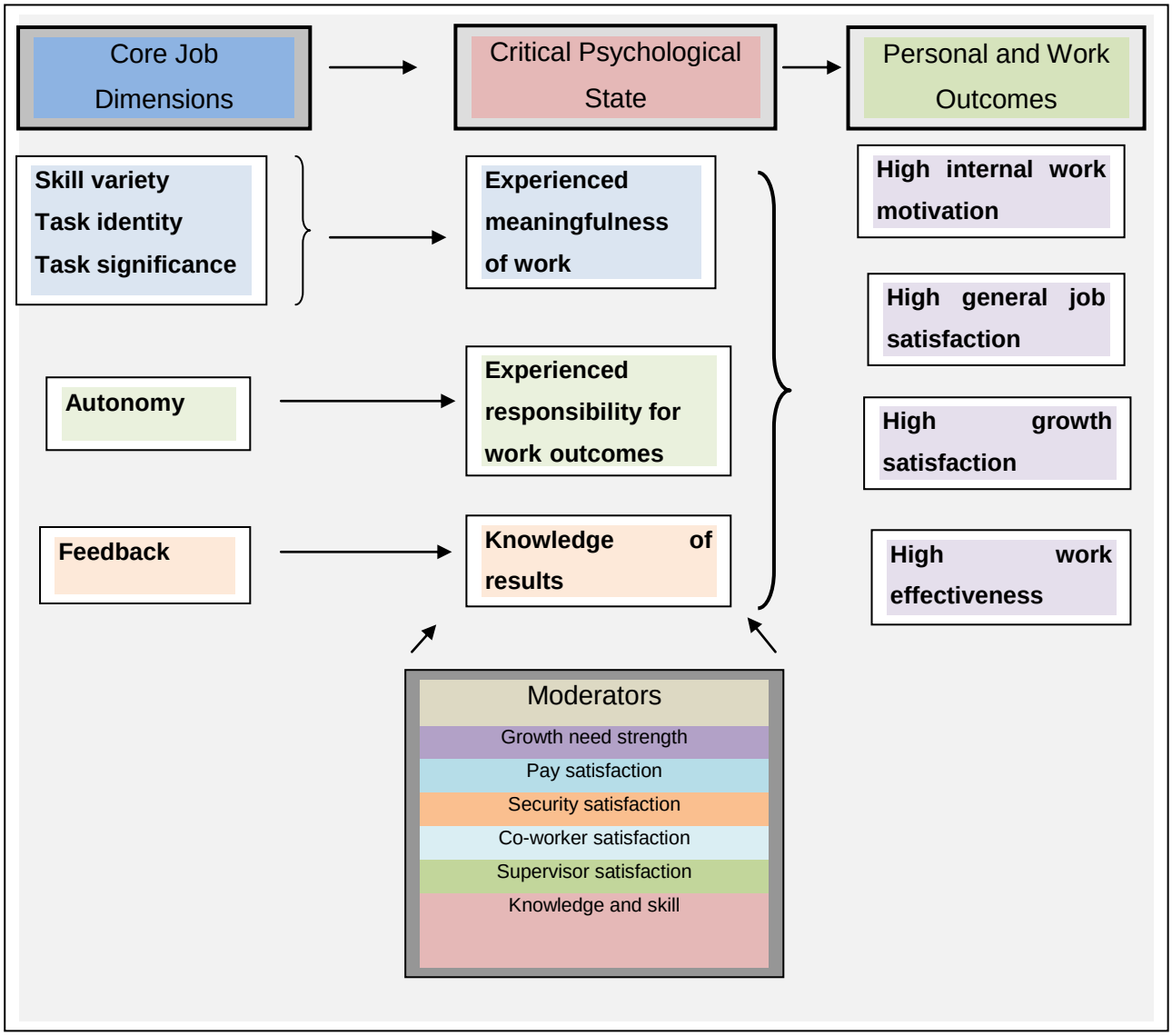
Turner and Lawrence (1965) also found that there was a positive relation between the RTA Index and the motivation levels of employees from factories in small towns. Although the results were limited, Hackman and Lawler (1971) could use this information as a basis to conduct a study that provided further evidence that job characteristics can directly affect employee attitudes and behaviour at work. The four core dimensions used, adapted from the work of Turner and Lawrence, were job variety, task identity, autonomy and feedback. Results from Hackman and Lawler's study supported Turner and Lawrence's work in that employees who have a stronger need for growth respond more positively to complex jobs

than employees with a low need for growth. The JCM was developed from the need to refine and extend the Hertzberg two-factor and task requisite theories described here.

## 2.4 THE JOB CHARACTERISTIC MODEL

The JCM model taps into the motivating factors as described in the Hertzberg theory developed in 1966 and the task requisite factors as declared by Turner and Lawrence in 1965, in other words intrinsic factors that focus on motivating the employee and that could lead to greater job satisfaction (Rothmann, 2003). The JCM model describes the relationships among core job dimensions, critical psychological states and on-the-job outcomes as depicted in figure 1 (Hackman & Oldman, 1980):

**Figure 1: The Job Characteristics Model (JCM)**




Source: Hackman and Oldman (1980, p.90).

The model suggests that employees will realise a high internal work motivation, general job satisfaction, growth satisfaction and work effectiveness, if they experience the following factors in their work:

- the work as meaningful
- responsibility for the outcomes of work
- knowledge of the results or outcomes of work

According to Kulik, Oldman and Hackman (1987), it could be reasoned that these three factors are established and improved by five factors inherent in the design of the job itself namely: skill variety, task identity, task significance, autonomy, and feedback. Meaningfulness of work (the dependent variable) is thus caused by task identity, skill variety, and task significance (independent variables). In order to experience responsibility for work results it will depend on the autonomy the employee experiences in performing his/her job. The same applies for knowledge of results. This will depend on the variable of feedback, which means that the employee could only gain knowledge of his/her own results if provided with feedback in the job environment (Pierce, Jussila, & Cummings, 2009). The most important dimensions as summarised in figure 1, will be discussed in short in the subsequent sections.

### *2.4.1 CORE JOB DIMENSIONS*

The core job dimensions are based on five characteristics that are seen as essential to engage the higher order needs of an individual. The highest order need is viewed as self-actualisation according to Maslow's hierarchy of psychological needs. Maslow introduced the motivation theory in 1943. He suggested that there are five independent levels of basic human needs (motivators or growth needs), which must be satisfied in sequence. The sequence starts at the lowest, namely physiological needs (e.g. air, food, water), then follows safety (e.g. employment, property, health), affiliation (e.g. love, friendship, closeness), esteem (e.g. confidence, respect, achievement) and self-actualisation (potential achievement). The lower order needs, namely physiological, safety and affiliation need to be satisfied before the higher order needs of esteem and self-actualisation could influence behaviour (Judge, Heller & Klinger, 2008).

The higher order need namely self-actualisation could be described as "…the desire for self-fulfilment, namely the tendency for him (the individual) to become actualised in what he is potentially…" (Gleitman, Fridlund, & Reisberg, 2004, p. 76). Hackman and Lawler's job characteristics theory links to Maslow's motivational theory in that the core dimensions need to be introduced into a person's job in order to make the job meaningful, enriched

and motivational for employees with higher order needs (Miner, 2007). The five core job dimensions will now be briefly discussed:

- **Skill variety**

Skill variety is described as the way in which the job requires the incumbent to perform a variety of different tasks or activities and where the person has to use a number of different skills and talents in order to perform the task effectively (Mello, 2004). Hackman and Oldman (1976) postulate that a task that requires a person to engage in activities, which challenge or contest his/her skills and abilities, will almost invariably, be experienced as meaningful by the individual.

- **Task identity**

Task identity is seen as the degree in which the job requires the employee to complete the work, thus including a distinct sense of beginning and ending of the task, as well as including a high visibility of the transformation of the process into a final or identifiable product (Hackman & Oldman, 1980). An example of high task identity could be that of a cabinetmaker who designs a piece of furniture, selects the wood, builds the piece of furniture and rounds it off. An example of low task identity would then be a worker that only designs the legs of the chair (Rothmann, 2003).

- **Task significance**

Rothmann (2003), views task significance as the degree to which the job has a considerable impact on the lives or work of other people. This is therefore based on the perception of the employee on how important he/she views his/her job to be to those inside or outside the organisation. He explains that an example of a job scoring high on task significance would be a nurse who has to care for patients and take care of their diverse needs in the intensive care unit of a hospital. An example of low task significance would be the person, responsible for sweeping the floors of the hospital.

- **Autonomy**

Autonomy is the extent to which jobs are designed in such a way as to allow employees to enjoy more freedom and independence, with regard to the work that they do and the procedures that they use (Hackman & Oldman, 1980). An example of a person with high autonomy in his/her job is that of a sales person, who could manage his/her own diary and follow his/her own sales approach. An example of a job with low autonomy would be a sales person, who has specific appointments that he/she has to attend to on a daily basis, with the same specific sales pitch to deliver (Rothmann, 2003).

- **Feedback**

Mellow (2004) postulates that feedback is the extent to which the employee is allowed by the job to gain a sense of how well he/she met the requirements and responsibilities posed by the job. The employee obtains clear and direct information regarding his/her effectiveness in the job (Hackman & Oldman, 1980). An example of a job with high feedback is the job of a factory worker who assembles a product and also tests that product to determine the quality. An example of low feedback is that of a factory worker who assembles a product but the product is sent to the quality control department in order to perform the quality control (Rothmann, 2003).

### *2.4.2 CRITICAL PSYCHOLOGICAL STATE*

Hackman and Oldman (1976) indicate that there are three psychological states that will follow should the employee experience that the five core job dimensions are present in his/her job. A psychological state could be defined as a mental condition in which the qualities of a state are relatively constant even though the state itself may be dynamic (Learning theories, 2010). Kulik *et.al.* (1987) describe this as the core of the model. The three psychological states are:

- **Meaningfulness of work**

The skill variety, task identity and task significance are combined to create meaningful work for an employee. It implies that if these three characteristics exist in a job the prediction could be made that the employee in the job will view the job as important, valuable and sensible (Kulik *et al*., 1987).

- **Experienced responsibility for outcomes**

Should the incumbent experience autonomy in his/her work, he/she should also take personal accountability for the results of his/her job (Kulik *et al*., 1987).

- **Knowledge of the actual results of the work**

If an employee receives feedback and if a job is designed to provide feedback, the individual will know exactly how effective he/she is performing in the position. This should happen on a continuous basis (Kulik *et al*., 1987).

Some of the literature however questions the value of these psychological states. All are in agreement regarding the association between the job characteristics and the outcomes. However, it is suggested that the three psychological states cannot be viewed as mediators (Boonzaier *et al*., 2001). Although they admit that these states make sense on an intuitive level, they also postulate that the mediators have not been well researched. Fried and Ferris (1987, p.312) remark that: “It appears, however, that the results fail to support the mediating effect of the core psychological states on the job characteristics – work performance relationships. This might suggest that there are possibly other psychological states unspecified by the model that mediate the relationship between job characteristics and performance. Another possibility is that work performance is affected mainly by organizational motivators associated with the job.”

### *2.4.3 PERSONAL AND WORK OUTCOMES*

Judge *et al.* (2008) explain that the employee obtains internal rewards (experienced meaningfulness) when the individual learns (knowledge and results) that he/she has performed well on a task (experienced responsibility) that he/she cares about. Miner (2007) suggests that the more these three psychological states are present the greater the incumbent's motivation, performance and satisfaction will be and the less the employee will be absent or the lower the staff turnover will be. The incumbent thus experiences both personal and work outcomes.

#### 2.4.3.1 Personal outcomes

- **Internal work motivation** – the degree to which a person is committed within himself/herself to achieve in his/her job. This implies that the employee will feel optimistic and positive when performing well in the job, and negative or troubled when performing badly (Hackman & Oldman, 1980).
- **General job satisfaction –** is an overall measure of the degree to which the employee feels content and fulfilled with the job (Hackman & Oldman, 1980).
- **Growth satisfaction** – suggests the degree to which a person in a job is satisfied with chances for growth in the job. Boonzaier *et al.* (2001) indicate this as an elaboration on the original model by Hackman and Oldman in 1978.

#### 2.4.3.2 Work outcomes

- **Work effectiveness –** this factor is exclusive to specific work environments and therefore the model does not offer a description of work effectiveness. It should be understood that work effectiveness is not measured in the Revised JDS as shown in annexure A.

### *2.4.4 MODERATORS*

Boonzaier *et al.* (2001) explain (figure 1) that the moderator variables mediate to affect both the relationships between the job characteristics and the psychological states, as well as between the psychological states and the personal and work outcomes. In other words, depending on how relevant certain moderators are to certain employees, they will experience different levels of fulfilment and motivation for a job with a given motivating potential.

Moderators appear to be the least researched aspect and area of the model. For instance in 1976 Hackman and Oldham only defined employee growth need strength. In 1980 they identified three moderating variables namely: knowledge and skill, growth need strength and context satisfaction. The moderator variables are currently defined as:

- **Knowledge and skill**

As a moderator the variable knowledge and skill are not particularly defined, as it is unique to particular work settings. Miner (2007) explains the working of the moderators at the hand of the growth need variable. An employee's need to grow will include the desire to increase his/her self-esteem and self-actualisation. If the employee has a high growth need, he /she is likely to experience the psychological states when the job is enriched. On the other hand an employee with a low growth need will experience the opposite. A person with a high growth need will thus respond more positively to the psychological states when he/she is presented with job enrichment than a person with a low growth need (Pierce *et al.*, 2009).

- **Growth need strength**

This refers to an employee's desire to personally accomplish, to learn and to develop himself/herself further than his current state of development (Hackman & Oldham, 1976).

- **Pay satisfaction**

Makes reference to the employee's contentment with his/her basic compensation and benefits. It also refers to the degree to which the organisation's compensation relates to the employee's input in the organisation (Hackman & Oldham, 1980).

- **Security satisfaction**

Refers to the extent to which the incumbent experiences security in his/her job as well as the feeling he/she has that the job will provide future security (Hackman & Oldham, 1980).

- **Co-worker satisfaction**

Reflects the extent to which the employee feels satisfied with the co-workers he/she works with or makes contact with the person in the work environment. It also refers to the degree to which the employee gets an opportunity to assist co-workers and make contact with them (Hackman & Oldham, 1980).

- **Supervision satisfaction**

Indicates the degree of satisfaction that the employee feels with the way he/she is treated, supported and guided by the supervisors. It also includes the extent to which the employee perceives the supervision that he/she receives as being of good quality and satisfactory (Hackman & Oldham, 1980).

Hackman and Oldman (1976) created a measuring instrument in order to validate the model. This measurement instrument, the Job Diagnostic Survey (JDS), will subsequently be investigated.

## 2.5 THE JOB DIAGNOSTIC SURVEY (JDS) INSTRUMENT

In 1975 Hackman and Oldman developed a measuring instrument in order to validate the model for job redesign, namely the Job Diagnostic Survey (JDS), which was revised in conjunction with the refinements of the model by Idaszak and Drasgow in 1987. The JDS is used to collect data in an organisational context regarding job design. The JCM has served as the basis for scores of studies and job restructure interventions over the past three decades (Voster *et al*., 2005). The original research has been extensively reviewed and is subsequently discussed.

### *2.5.1 THE PURPOSE OF THE JDS*

According to Voster *et al*. (2005), the JCM provides an explanation for the circumstances under which employees tend to show motivation, satisfaction and productive behaviour. The JDS provides a direct measure of all the variables in the JCM as depicted in figure 1 (excluding the work effectiveness as well as knowledge and skill). The JDS could be used as a multi-method diagnosis and is a data compilation instrument. The JDS measures the constructs as described in the JCM theory. The key uses for the JDS are to:

- Identify jobs that are considered for reshaping in order to improve motivation and satisfaction;
- Discover the specific job characteristics that are most in need of improvement;
- Measure the readiness of employees to respond positively to enhanced jobs (Pierce *et al*., 2009)

The JDS signifies a complete set of measurements by means of which dissimilar components of the JCM can be tested or measured empirically. The theory can thus be implemented and used in actual job enrichment programmes in the organisational context, including in South African organisations (Boonzaier *et al*, 2001). The JDS is the most widely used instrument in job redesign research and possesses known and acceptable psychometric properties (Miner, 2007).

### *2.5.2 MEASURING WITH THE JDS*

With the exception of some moderators and the variables introduced when the theory was extended to group tasks, the JDS provides a comprehensive coverage of the variables of the theory. These variables will now be further described:

- Miner (2007) indicates that the JDS contains measures of **job dimensions** which include the five core job dimensions (skill variety, task identity, task significance, autonomy and feedback). It is also on these dimensions that the validity study is focused (Buys *et al.* 2007);
- Hackman and Oldman (1980) also include the **psychological states** stated by the theory and affective reactions to the job (general satisfaction, internal work motivation, and specific satisfaction in relation to security, pay, co-workers, supervision and growth opportunity);
- It further includes the index of **feedback from external agents** (not the job itself). This indicates the degree in which the employee receives feedback on his/her performance from others, for instance from co-workers or supervisors. It supplements the information on **feedback** (Hackman & Oldman, 1980).
- Another additional measurement included in the JDS is the element of **dealing with others.** This refers to the extent in which the job requires the employee to work closely with other people. This could be both inside and outside the organisation during the execution of work activities by the employee. This element is specifically included to ensure job designers of the possibility of an interrelated group of jobs that needs attention, rather than concentrating on a single job (Boonzaier *et al*., 2001).
- The last element included in the questionnaire is the **growth need strength**. This provides an index of what the employee would like from the job and one in which choices are made between different jobs (Hackman & Oldman, 1980).

Hackman and Oldman (1980) also created a Motivational Potential Score (MPS). Based on this model the JDS computes a score showing the overall motivating potential of a job regarding the five job characteristics. The objective of the MPS is to provide a single

indicator of the degree to which the five job characteristics are present in a job and is calculated as follows:

$$MPS = \left[\frac{\text{Skill variety+Task identity + Task significance}}{3}\right] X \text{ Autonomy X Feedback}$$

For a job to have high motivational potential, it must be high on at least one of the three factors that lead to experience meaningfulness (skill variety, task identity or task significance) and must be high on both autonomy and feedback. If a job measures high on motivational potential, the model expects that motivation, performance and satisfaction should be positively affected, while absence and turnover is likely to decline (Rothmann, 2003).

### *2.5.3 RESEARCHING THE JDS*

In order to perform human resource planning it is essential to understand that work systems need to be continuously measured and evaluated. This should be done to ensure that the organisation assigns tasks and responsibilities to employees that would keep them engaged as well as assist in achieving the organisational objectives. In order to achieve this goal the JDS could be used as a tool (Mello, 2004). Research has continuously shown positive results when testing the direct relationship between workers' reports of job characteristics and job satisfaction (Judge *et al*., 2008). As Fried and Ferris (1987) indicate there might be other psychological states unspecified by the model that mediate the relationship between job characteristics and performance. The questionnaire therefore does not encompass questions or results of the psychological states as seen in annexure A. This does not affect the usefulness of this research which seeks to study the validation of the Revised JDS questionnaire as altered by Idaszak and Drasdow (1987).

Humphrey, Nahrgang and Morgenson (2007) meta-analysed the results of over 250 studies of characteristics and job outcome relationships. They found that all five intrinsic job characteristics were strong predictors of job satisfaction. It could be asked if this is also true for the South African context. It is thus also important to research the factor structure

of the JDS focusing specifically on the South African context in order to ensure the validity of the instrument in South Africa.

## 2.6 BACKGROUND OF THE CONSTRUCT VALIDITY OF THE JDS

Several international studies have been conducted in order to determine the construct validity of the JDS (Boonzaier *et al*., 2001).Hackman and Oldman (1980) suggested that five job characteristics should be included in the model (earlier there was only four) and task significance was also incorporated. The JDS then offered the individual indicators of the extent to which each job characteristic is presented in a job. Boonzaier *et.al.,* (2001) mention that the question arises as to which particular combination of job characteristics provide optimum representation of the complexity of the job.

Various studies were conducted that supported the a priori dimensionality of the five characteristics depicted by Hackman and Oldman (1980). Pokorney, Gilmore and Beehr (1980) performed a study in an insurance company and Johns, Xie and Fang (1992) also executed a study in a utility company, both studies confirming the validity of the JDS questionnaire.

There have, however, been several inconsistencies identified in the JDS factor structure. Dunham (1976), for instance, proposed that a single factor accounted for 83% of the explicated discrepancy in the study of 2610 employees of a large merchandising company. Lee and Klein (1982) established that employees who function on diverse levels in the organisation comprehend the multifaceted format of some of the JDS items differently. They systematically compared the factor structure across occupational groups and discovered that the JDS structure was invariant across different job-related groups. Fried and Ferries (1986) also described inconsistencies and reported the likely influence of the respondents' age, level of education and position level. It was thus important to improve the construct validity of the JDS. The answer seemed to be found in the Revised JDS.

## 2.7 BACKGROUND OF THE CONSTRUCT VALIDITY OF THE REVISED JDS

Hackman and Oldman (1975) included a few negatively stated items to minimise response bias. Harvey, Billings and Nilan (1985) however, recommended that the items should be rewritten and stated in a positive manner. Idaszak and Drasgow (1987) also pointed out that the reverse-score items of the JDS were a major source of inconsistencies in determining the number of factors operating as job characteristics. They rewrote these items and this resulted in the Revised JDS. The new Revised JDS improved the measurement properties and was recommended by the researchers (Boonzaier *et al*., 2001). Kulik, Oldman and Langer (1988) though, found some inconsistencies in the Revised JDS and recommended that research should be performed to develop new items, rather than researching the Revised JDS further.

Codery and Sevastos (1993) did a comparative study between the original JDS and Revised JDS. The results indicated that the revised version of the JDS in which only *positive statements are used, better fits the five-factor structure underlying the instrument.* Kulik *et al*., (1988) also contrasted the original JDS (Hackman and Oldman, 1980) with the revised version altered by Idaszak and Drasdow (1987). The results of the confirmatory factor analysis showed that job characteristics of the Revised JDS adapted more closely to the five characteristics structure than the original JDS did.

Idaszak and Drasdow (1987) found that there were some limitations in that the JDS's factors were not compared with each other and it was unknown what impact the revision had on the criterion validity of the Revised JDS. Other critics such as Burke (1999) also declared that the practicability of screening the invalid responses are a concern rather than the positive or negative statements used in the JDS. Renn and Swiercz (1993) came to the conclusion that revised scales provided adequate measures of the five characteristic model but also affirmed that more construct valid items would add to the stability of the structure of the JDS. Kulik *et al.* (1988) established that the revised items afforded unmodified measures of variety, significance and identity but at the same time showed that the measurements for feedback and autonomy were not really significantly improved.

According to Boonzaier *et al.* (2001) there are various problems in comparing research results:

- Dissimilar instruments are used to measure the job characteristics;
- The nature of the samples differs in level of jobs, types of businesses and types of occupations;
- Studies make use of different data collection methods for instance as reported by external individuals versus those reported by the occupants of the jobs.

Taking into consideration the positive evidence, the criticism and the problems stated, it is obvious that for the purpose of this study, the application of the JDS in the South African setting should be further explored.

## 2.8 APPLICATION OF THE JDS IN SOUTH AFRICAN CONTEXT

The JDS, which is based on the JCM, has been widely used in South Africa as a revised job design practice in order to assist line and HR managers to deal with some essential people management issues (Rothmann, 2003). Voster *et al*., (2005) mention that understanding the JCM and the accompanying JDS, could greatly assist in understanding the workforce in South Africa as the model specifies and the survey measures the conditions under which workers tend to display motivation, satisfaction and productivity.

In the South African context, however, very little has been done to determine the construct validity. Boonzaier and Boonzaier (1994) performed a study which found that the JDS is applicable for the South African context and that it satisfies the basic requirements of reliability and validity for use. Unfortunately they only focused on the link between the job characteristics, motivation and job satisfaction.

Voster *et al.* (2005) performed a study in South African organisations with a sample of 677 Black and White respondents to determine whether the JDS is useful if it is used for groups with highly dissimilar backgrounds. The equivalence of the structural model of the JDS in respect to black and white cultural groups was confirmed. Thus there were no

specific differences between black and white groups who completed this study. It could be stated that the JDS measure could be used with confidence for job enrichment programmes in SA across different cultural groups.

Buys *et al.* (2007) stated that in essence the JCM and the Revised JDS were used in the South African context for many years, yet there was no sound evidence of the construct validity of this instrument in this context. They then performed a study in 2007 to determine the construct validity of the Revised JDS in the South African context. A confirmatory factor analysis (CFA) was done to determine whether the validity of the instrument is acceptable. A total of 677 respondents from different organisations across South Africa completed the Revised JDS.

The findings offered interesting information. According to the results of the validity analysis the validity of the instrument was satisfactory and fitted the data to an acceptable degree. The only item which seemed not to function at an acceptable level was item 3 which forms part of the Skill Variety scale. They suggest that it could be considered that this item may not fit the South African setting and could in future perhaps be revised. They further concluded that the Revised JDS could, based on the evidence, be utilised by HR managers in South Africa as an instrument to redesign and address critical human resources problems facing these managers and HR practitioners. They, nonetheless, suggest that additional studies need to be conducted in the South African context before final conclusions could be reached on the construct validity of the Revised JDS (Buys *et al.,* 2007).

## 2.9 CONCLUSION

The next decade is believed to be an exciting time for research regarding people doing work in organisational settings. Work design nevertheless, is everywhere in organisations which demonstrate the importance of this topic (Oldman & Hackman, 2010). It is clear that HR professionals could greatly grow from all the newly gained knowledge through research and practice of work design (Michaels, Handfield & Axelrod, 2001).

Hackman and Oldman (2010) further suggest that it will remain important for managers to understand the impact of work design on job satisfaction, morale, absenteeism and staff turnover. Employee turnover is very expensive and therefore it is important to retain talent. Studies show that variables affecting job satisfaction amongst employees include factors such as the need to work autonomously, a need to have challenging jobs and self-determination. The JCM and accompanying JDS as well as the proposed action steps for improving motivation, satisfaction and performance have been functionally used in SA as a revised job design practice (Boonzaier, 2001).

Over the years a great deal of research was done on the psychometric properties of the JDS and in general the results were favourable. Whilst researchers such as Fried and Ferris (1987) suggested that the scales measuring the core job dimensions and other variables in the theory proved to be reliable, others made it clear that evidence of the validity of the JDS was mixed and needed further investigation (Jex, 2002).

In the South African context Boonzaier *et al.* (2001) pointed out that despite the fact that job design is recognised as an important aspect of any organisation's success, there is still ambiguity and inconsistencies throughout the research, making further research and knowledge creation, especially on the variables of the JDS, a necessity, especially in a South African context.

The importance thereof remains undisputable and further research needs to be performed in order to eliminate the inconsistencies throughout the research. There is a need for the Revised JDS to be further validated so that it could be used with greater confidence in South African organisations. One of the objectives of this study is to evaluate the construct validity of the Revised JDS within the South African context (on a new sample) using the CFA and following the SEM approach.

# CHAPTER 3

# RESEARCH DESIGN AND METHODS

## 3.1 INTRODUCTION

According to Leedy and Ormrod (2010, p.2), “Research is a systematic process of collecting, analyzing, and interpreting information (data) in order to increase our understanding of the phenomenon about which we are interested or concerned”. They describe eight characteristics of research. Clarke and Dawson (1999) as well as Babbie and Mouton (2001) explain that a research design is a research strategy, which can be used as the blueprint of the research study. Research:

- Initiates from a problem or question;
- Requires a clear statement of the goal;
- Requires a plan for events;
- Divides the main problem into controllable sub problems;
- Is directed by a specific problem, question or hypothesis;
- Gives consent to certain critical assumptions;
- Entails the gathering and interpretation of data to resolve the question that introduced the problem;
- Is scientific by nature.

In this section the main research design and methods used during the study are discussed. It includes topics such as the research paradigm, inquiry strategy or broad method design, sampling techniques, data collection methods, data analysis, the quality and rigour of the study and the ethical considerations with regard to the study.

## 3.2 RESEARCH PARADIGM/PHILOSPHY

According to Saunders, Lewis and Thornhill (2009, p.597), a paradigm is a "…way of examining social phenomena from which particular understandings of these phenomena can be gained and explanation attempted…". It could also be seen as the basic set of beliefs that guide the actions of the researcher. This implies that the researcher has some critical suppositions about what is real, how information is shaped and what the most suitable ways are of examining the phenomenon in question. The way in which the data is collected and interpreted is therefore influenced by these suppositions or assumptions. It could be reasoned that the researcher's paradigm to some extent might influence the results of a study (Creswell, 2009).

### *3.2.1 THE MAIN RESEARCH PARADIGM FOR THIS STUDY*

This study is guided by the Positivist paradigm, which is strongly rooted in the natural sciences. The core idea is to work with observable and social reality focusing on an end product to be generalised (could be compared to the physical and natural sciences) (Saunders *et al*., 2009). Positivistic research is thus aimed at obtaining objective knowledge that can pave the way to establishing a cause-effect relationship (Kotze, 2009). The research is undertaken in an assessment-free way and the researcher stays removed from the data collected (Saunders *et al,* 2009). The language and structure used in Positivistic research studies should be scientific and objective, without the researcher becoming attached or emotionally involved (Kotze, 2009).

The Positivist uses highly structured methodology to facilitate replication and will result in quantifiable observations that lend themselves to statistical analysis (Saunders *et al*., 2009). Therefore only quantitative methods can be used to attain data, where the researcher is in control of the process and the variables can be controlled. The researcher's role is to collect data, analyse data and deliver results while keeping an objective and impartial view (Kotze, 2009).

### *3.2.2 THE ONTOLOGICAL, EPISTEMOLOGICAL AND AXILOGICAL ASSUMPTIONS BEHIND THE PARADIGM*

The main assumptions behind the Positivist paradigm can be seen as:

- **Ontology:** Ontology has to do with the nature of reality (Saunders *et al*., 2009). It relates to a person's belief regarding what is real and what is true. In the positivistic approach there is only one true reality that can be captured and identified. Pre-existing patterns that can be discovered and measured are reality. Reality is not viewed as being bound to a time or context and the results can be generalised (Kotze, 2009).

- **Epistemology:** Epistemology relates to a person's beliefs regarding knowledge and knowledge creation. It could be seen as the philosophy of knowledge, nature and scope of knowledge. In the positivistic approach the researcher and participants are not linked and the participants studied do not influence the researcher. The researcher stays objective by following standardised procedures. The values and opinions of the researcher should not influence the results of the study in any way, and knowledge is created by verifying the hypotheses or facts (Saunders *et al*., 2009).

  The study can be considered as true if it can be replicated and the theory is regarded as verifiable (Kotze, 2009). The researcher will therefore reason that the information obtained is objective and unbiased. The researcher embraces the realist and interprevist philosophies.

- **Axiology:** Axiology is about a person's beliefs regarding the role that values play in research. It is studying the judgement about value (Saunders *et al*., 2009). There is however no place in research for the values of the researcher according to the positivistic approach. The researcher must control his/her own emotions and opinions in order not to influence the study or the participants and to stay objective (Kotze, 2009).

### 3.2.3 *THE MAIN REASON FOR BASING THIS RESEARCH ON THE POSITIVISM*

The Positivism focuses on working with observable data in the context of reality. It is also possible to generalise the results obtained in this approach. This approach suits the requirements of this research approach well in that it is a validation of a questionnaire. The Positivist approach implied that the researcher used a highly structured methodology and quantifiable observations that facilitated statistical analysis. The Epistemology assumptions behind this philosophy allowed the researcher to provide credible facts that could be generalised. Assumptions of Axiology suggest the objectivity of the researcher and that there was an unbiased stance. Lastly the assumptions behind Ontology ensured independency from the role-players in the study (Saunders *et al*. 2009).

## 3.3 DESCRIPTION OF INQUIRY STRATEGY AND THE BROAD RESEARCH DESIGN

The general characteristics and strategy of inquiry of this study are discussed in this section. An inquiry strategy refers to the type of research used to solve the research problem (Kotze, 2009). The major research design for this study is a quantitative research method and is further discussed.

### *3.3.1 THE BASIC CHARACTERISTICS OF QUANTITATIVE RESEARCH*

Leedy and Ormrod (2010) describe quantitative research methods as focusing on numbers or quantities of one or more variables of interest. Saunders *et al. (*2009) agree and define quantitative research as research in which the meaning of the study is derived from numbers. It implies that objective theories are tested by examining relationships amongst variables (Creswell, 2009). The basic characteristics of quantitative research include (Welman, Kruger, & Mitchell, 2005):

- Evaluating numerical objective data;
- Analysis based on complex structured methods limiting flexibility;

- Dealing with an abstraction, rather than working with everyday life;
- Investigating from an outsider's perspective to understand the facts, and remaining detached and objective;
- Focusing on causal aspects and the collection of facts whilst keeping the research process as stable as possible;
- Isolating the variables by controlling the structure and investigation;
- Focusing on consistent and stable measurements;
- Usability and suitability for research studies with large populations.

Leedy and Ormrod (2010), state that quantitative research's:

- Purpose is to predict or confirm and validate information;
- Nature is focused and deals with known variables;
- Data is statistically analysed and focused on being objective;
- Sample used is large;
- Findings are communicated in numbers, statistics and aggregated numbers;
- Data is analysed by using deductive reasoning.

### *3.3.2 THE STRATEGY OF ENQUIRY*

In this study a quantitative research approach was used in which empirical data was collected and analysed. "Quantitative research is a process that is systematic and objective in its ways of using numerical data from only a selected subgroup of a universe to generalise the finding to the universe that is being studied" (Maree, 2010, p. 145). According to Leedy and Ormrod (2010, p. 94), "Quantitative research involves looking at amounts or quantities, of one or more variable of interest. It seeks explanations and predictions that will generalise to other persons and places".

Construct validity refers to the extent to which the measurement questions actually measure the presence of the constructs they intended to measure. This term is usually used when referring to constructs such as attitude and personality tests (Saunders *et al*., 2009). One of the objectives of this study was to evaluate the construct validity of the Revised JDS within the South African context by performing a CFA with an SEM approach. In order to determine the construct validity of the Revised JDS, it was necessary to use a quantitative method of inquiry, the only method with which construct validity can be established (Mouton, 2001).

### *3.3.3 SURVEY RESEARCH AS A FORM OF QUANTITATIVE RESEARCH*

Survey research is an effective way of gathering empirical, numerical or primary data and provides an overview of a representative sample of a large population. Survey research is also an effective approach for studies rooted in the positivist paradigm such as this study. Descriptive and inferential statistics are used to analyse the data collected by means of surveys or questionnaires. In order to analyse the data statistically, techniques include correlations, regression analysis, factor analysis (used in this study) and the use of tabulations and graphics (Mouton, 2001).

Survey research refers to almost any form of descriptive and quantitative research. However, for the purposes of this study it is defined as the gathering of information about certain characteristics, opinions or attributes of individuals or groups by analysing and tabulating their responses to a set of predetermined questions (Leedy & Ormrod, 2010). The design classification is empirical by nature (Mouton, 2001).

High measurement reliability, construct validity, and the generalisation of results are some of the strengths of survey research. Survey research is also a very versatile method and information can be gathered with accuracy. This is a very effective method to use in order to make comparisons and develop explanations (Saunders *et al*., 2009). Creswell (2009) adds to this by mentioning that survey research holds the advantage of economic viability,

rapid turnaround in data collection and the ability to identify the attributes of large populations from a small sample group of people.

A limitation of survey research is the lack of insiders-perspective. The researcher does not know what the underlying reasons are for the participants' responses. Data is also very simple and context specific. The main errors that occur during survey research include errors with regard to sampling, data capturing, fieldwork and the use of inappropriate techniques (Mouton, 2001). Leedy and Ormod (2010) remind that survey research is relying on self-report and people tell what they perceive to be true. There are also high refusal rates from people who are unwilling to participate in the study and the gathering of incomplete data.

A structured questionnaire namely the Revised JDS that contains only close-ended questions, were used to collect the data for this study. Survey research was therefore the relevant and chosen quantitative research method.

### *3.3.4 A CLASSIFICATION OF THE OVERALL RESEARCH DESIGN*

The research design is described by Creswell (2009) as the general plan of how the researcher will go about answering the research question. The following research descriptors best describe the research design of this study:

- **Empirical research**: Due to the fact that the researcher mainly collected and analysed data, the study can be seen as an empirical study (Mouton, 2001).

- **Basic research:** Saunders *et al*. (2009) see basic research as research that is conducted in order to clarify processes and the outcomes thereof in order to explain results to the academic community. In this study the research results were used to evaluate the construct validity of the Revised JDS within the South African context in order to assist managers to determine job redesign needs. The main aim of the research study was to increase scientific knowledge.

- **Descriptive research:** This is viewed as, “Research for which the purpose is to produce an accurate representation of persons, events or situations” (Saunders *et al*, 2009, p. 590). This study provided an in-depth description of job characteristics based on quantitative diagnostic techniques.

- **Cross-sectional research**: Is described by Leedy and Ormrod (2010) as a particular phenomenon studied at a particular time. In other words a snapshot is taken at a specific point in time. During the study the respondents were asked to fill in the questionnaire only once, and it thus only represents a single point in time.

- **Primary data:** Is described as the data collected for a specific research project (Saunders *et al*., 2009). Data was collected for this specific study (in order to evaluate the construct validity of the Revised JDS within the South African context) and could therefore be seen as primary data.

- **Quantitative data:** This is defined as data that has been quantified or as numerical data (Saunders *et al*., 2009). The data for this study was collected by means of a standardised questionnaire. During the study numerical and empirical data was analysed statistically.

## 3.4 SAMPLING

This section of the research proposal describes how the respondents were chosen to participate in the study as well as the method that was used to select the participants.
Ideally the participants in a research study should be representative of the population of which conclusions need to be drawn. In no other type of study is sampling as important as with survey research. The sample has to be representative of the population in order to draw purposeful conclusions (Leedy & Ormrod, 2010).

The population for this study was the entire South African workforce (between the ages of 18 ad 65), excluding senior managers or above and illiterate employees. The job design and job characteristics are specifically associated with the working environment. The study only concentrated on the South African context, as this is the focus of the study. The sampling units were South African organisations, and the elements of analysis were therefore the individuals working in these organisations. The sample included males, females, in different positions and from ages between 18-65 years (working population).

Time and resource constraints made it impossible to include the entire population which is the reason for choosing a sample representative of the population. Participants working in different organisations and industries were requested to complete the Revised JDS as the researcher had access to employees working for various organisations. The researcher made an effort to choose a sample to represent the population, which was very challenging.

The statistical technique used for this study was a confirmatory factor analysis (CFA) using the structural equation modelling (SEM) approach. According to Pallant (2007), between five to ten cases for each item is needed to conduct a factor analysis. Pallant further suggests that the overall sample size should be 150 plus. The Revised JDS has 30 items of which only the first 15 items were actually used to perform the validation study. Ten cases per item were selected which brought the total sample size to a minimum of 150 respondents.

In order to perform a construct validation study by using a minimum of 150 respondents, two non-probability sampling procedures were used to acquire data. In non-probability sampling it is not possible to specify the probability that each case will be included in the sample. Non-probability sampling is also called non-random sampling and is based on subjective judgement of the researcher (Saunders *et al*., 2009). The non-probability sampling techniques used in this study were convenience sampling and snowball sampling. **Convenience sampling** is also called accidental sampling and does not intend to select units of study by preplanning this. It rather focuses on selecting people that are readily available (Leedy & Ormrod, 2010). During this study participants working in

organisations that were easily accessible to the researcher, were selected to be involved in the study and to complete the survey questionnaire. For the convenience sampling process a minimum of 125 people were selected. The second method that was used is the **snowball sampling** method, where the first respondents in the study assisted to identify additional respondents (Saunders *et al*., 2009). Another 52 cases were identified in this manner, which resulted in a total sample of 177 respondents. It was however only possible to use 166 responses as 11 questionnaires were spoilt and could not be used.

There are some limitations when using non-probability sampling methods (including the convenience and snowball sampling techniques). According to Saunders *et al*. (2009), this technique of sampling is prone to bias and influences outside the researcher's control. It may be difficult for the researcher to make initial contact with the sample cases. During this study the researcher had easy access to the respondents but limited time availability made it slightly more challenging for respondents to complete the questionnaire. Saunders *et al*. (2009) also mention that with this method and these techniques a likelihood exists that the sample will not be representative of the population and that generalisations might be at best flawed. Specifically with snowball sampling the chance for bias is vast, as the respondents are likely to identify respondents who are similar to themselves, resulting in a homogenous sample. In this study these problems were also prevailing and are discussed in Chapters 4 and 5.

Welman *et al.* (2005) on the other hand state that there are also advantages when using these sampling techniques. These are low cost methods and useful when there is little variation between the units of analysis in the population. The assumption is made that the relationship between people who differ with regard to age, gender and race or covariance between item responses will be reasonably consistent across different types of jobs and departments. All these advantages were experienced during this study. The chosen sampling methods can therefore be considered to be relevant for the proposed study.

## 3.5 DATA COLLECTION

This section defines the method for gathering data as well as the process that was followed including the administration of the questionnaire. The obstacles, advantages and disadvantages of this method are also discussed in depth.

### *3.5.1 THE METHOD FOR COLLECTING DATA*

A questionnaire was used as a structured method to collect data for this study. Saunders *et al*. (2009) stipulate that questionnaire data collection refers to a process in which each person is asked to answer the same set of questions in a predetermined order. An advantage of this data collection method and the reason for many researchers using this technique, is that a questionnaire completed by respondents (asked to respond to the same set of questions), provides an efficient way to collect responses from a large sample prior to quantitative analysis.

The structured questionnaire used for this study to collect the data was the Revised JDS. Hackman and Oldman, developed the JDS in 1975 (sometimes refers to in text as the original JDS). The JDS is based on the five core dimensions of the JCM theory namely 1) task variety, 2) task identity 3) task significance 4) feedback and 5) autonomy (discussed in section 2.4 of the literature review). Idaszak and Drasgow (1987) however revised the JDS in 1987 to change the negatively worded items to positively worded ones.

The researcher used only a paper copy of the questionnaire as this was the easiest way to gather the responses. Respondents were handed the questionnaire and the survey administrators explained to respondents how to complete the questionnaire. An instruction page clearly stating the purpose and format, as well as the instructions, accompanied the questionnaire (see Annexure A). The respondents were requested to answer all the questions as honestly and as frankly as possible.

A trial test session was conducted in which five respondents on different levels in an organisation were asked to complete the questionnaire (pen-and-paper). The researcher

found that it took approximately 7 minutes to complete the questionnaire and that the respondents had no difficulty understanding the questions. The researcher also established that it would be beneficial to supplement the study by adding biographical information to the questionnaire. The questionnaire was completed anonymously but the assessor included a biographical information page, requesting information such as gender, age and position in the company. Race group was excluded as this could have negatively influenced the perception of the participants regarding the purpose of the questionnaire, especially in some politically sensitive industries. The biographical information was valuable to establish how inclusive/exclusive the sample was of the general population.

The researcher trained four survey administrators who also had access to the sample respondents on administering the questionnaire. The questionnaire was administered and the data collected by the researcher and survey administrators which ensured more control, accuracy and consistency during the process. The main source of data that was collected is primary data, received first hand from the participants for the purpose of this specific study. The data was in numeric form as the data was collected by means of a standardised questionnaire. The data was collected over a period of five months. A copy of the questionnaire, including the informed consent form, can be viewed as Appendix A.

#### 3.5.1.1 A description of the Revised JDS questionnaire

The Revised JDS questionnaire consists of five sections and rating questions are used. Rating questions are often used to collect opinion data and frequently use the Likert-style rating scale. A respondent is requested to indicate how strongly he/she agrees or disagrees with a statement or series of statements (Saunders *et al*., 2009). The Likert scale is described by Maree (2010) as a scale that provides an ordinal measure of a respondent's attitude. Four to seven categories on the Likert scale are most commonly used in surveys. The Revised JDS questionnaire also makes use of closed questions, providing a set of responses from which the respondent has to choose on a 7-point Likert scale.

In **section one** of the Revised JDS questionnaire five questions were stated and a 7-point Likert scale was used as a response format. Three descriptions were provided for the scale, describing the least, moderate and most statements on the 7-point scale. A respondent had to complete the questions by circling the number (one to seven) closest to the three statements that describe his/her work. An example would be "How much autonomy is there in your job?" (Idaszak & Drasgow, 1987, p.34).

In **section two** ten statements were given to describe the job. The respondents were requested to indicate the accuracy of the statements to describe the person's own job. A 7-point Likert scale was again used as a response format. An example would be "The job requires me to use a number of complex or high-level skills" (Idaszak & Drasgow, 1987, p.36). The scale descriptions were as follows:

- 1: Very inaccurate;
- 2: Mostly inaccurate;
- 3: Slightly inaccurate;
- 4: Uncertain
- 5: Slightly accurate
- 6: Mostly accurate
- 7: Very accurate.

The confirmatory factor analysis (CFA) was only done on the 15 items gathered in section one and two, as these two sections hold the relevant items with which to perform the validation study on (Buys *et.al*., 2007). The respondents were asked to indicate how they feel about their job in **section three** in which they had to rate seven statements; in **section four** how satisfied they were with their jobs, rating four statements; and in **section five** how they thought other people in the organisation perceived the same job (also four statements to rate). In all three of these sections the respondents were requested to use the same 7-point Likert scale. Descriptions for the seven points on the scale were provided at the beginning of each section.

The questionnaire was developed to include people from all organisational levels (excluding illiterate people) and the language usage in the questionnaire is very straightforward. According to Hackman and Oldman (1980) it may however be less appropriate for senior management levels. This is not elaborated on in their research but it is mentioned that it stems from the fact that manager's jobs are defined by role relationships rather than by the tasks they perform.

#### 3.5.1.2 Description of the scale used on the Revised JDS

A scale is described as a collection of items in measurement instruments, combined into a composite score and intended to show levels of theoretical variables that is not easy to observe directly. The most commonly used scale is the Likert scale. This implies that items are presented as declarative sentences, followed by response options that are indicative of various degrees of agreement or disagreement of the statement. In the Revised JDS questionnaire equal intervals are used in a 7-point Likert scale with respect to agreement. Likert scales are often used in cases where a scale will measure opinions, beliefs and attitudes (DeVellis, 2003).

#### 3.5.1.3 Administering the questionnaire

According to Saunders *et.al* (2009) the stages of pen-and-paper based administration of questionnaires are to:

- Ensure that cover letters accompany each questionnaire. A cover letter was included in the questionnaire, explaining the purpose of the study clearly (see Annexure A).
- Contact the respondents to attend the session via post, electronically or telephonically. For this study the respondents were asked to attend assessment sessions as part of an HR initiative. The researcher had access to these assessment sessions at different companies and in various industries and requested the respondents at these sessions to complete the questionnaire.

- Hand out the questionnaire to each respondent, including the cover letter. For this study the researcher had survey administrators to assist in this regard.
- Give the instructions to respondents and emphasise the anonymous or confidential nature of the questionnaire. During this study the researcher and survey administrators asked the respondents' permission as well as cooperation, before giving the instructions. The fact that the questionnaire was anonymous, confidential and that the respondents had access to the results were also accentuated.
- Ensure respondents' questionnaires are collected. During the data collection process in this study, the researcher and administrators also made sure the respondents completely filled in the questionnaire. The researcher collected the questionnaires personally or requested other questionnaire administrators to do so.

#### 3.5.1.4 Obstacles

There were several factors, which hindered or slowed down the collection of data. Firstly the researcher made an effort to inform and obtain consent from gatekeepers in organisations in advance in order to gain access to the sample groups. This ensured accessibility to the respondents and addressed a possible first obstacle of respondent availability fairly effectively.

A second more prevailing problem however was the willingness and time availability of the respondents to complete the questionnaire. The fact that a paper-and-pen data gathering method was used during assessment group sessions led by the researcher/administrators assisted to overcome this issue. The researcher and administrators emphasised the importance of the study on a personal basis after the assessment group sessions were concluded. They then requested the respondents to make time available to complete the questionnaire, highlighting the fact that the average time to complete a questionnaire was limited to approximately 7 minutes. The researcher also made an effort to collect questionnaires at a later stage at the offices of respondents who indicated willingness to complete the questionnaire but had limited time available to do so after the assessment sessions.

In the third place the researcher had to take time to capture the results of the paper-and-pen questionnaire which would not have been the case if it were done on-line. The questionnaire however is fairly short and was easy to capture on a spread sheet. To address the problem of possible human error during the capturing process, the assessor requested an independent party to monitor the process.

Fourthly it was challenging to reach the minimum target of 150 respondents to complete the questionnaire. To address this issue, survey administrators were trained to assist the researcher to gather questionnaires. The snowball sampling method in addition to the convenience sampling method, were used to enhance the number of respondents. The researcher used references from the convenience sample to increase the number of respondents and this enabled the researcher to gain access to more respondents.

The last issue was that some questionnaires were incomplete. The fact that respondents were anonymous and could not be contacted at a later stage to correct the incomplete data made this a more serious problem. The issue was addressed by checking the responses for correctness and completeness directly after completion. The researcher however still found 11 questionnaires that could not be used in the study. It was not a serious issue as the researcher still obtained 16 questionnaires more than the minimum 150 required.

### *3.5.2 THE ADVANTAGES AND LIMITATIONS OF THE METHODS USED FOR DATA COLLECTION*

Some advantages of using a paper and pen questionnaire:

- Within a short space of time many respondents are able to complete the questionnaire (Maree, 2010).
- Completion and collection take place on the same day at the same time and eliminates the need for follow-up processes (Saunders *et.al,* 2009).

- Respondents are likely to answer it more truthfully due to the fact that it is anonymous as opposed to an interview (Leedy & Ormrod, 2010).
- The primary researcher has relative control over what happens in the field (Maree, 2010).
- It enables the researcher to include respondents who are not computer literate or who do not have access to computers (Leedy & Ormrod, 2010).
- It also allows the researcher to explain the instructions face-to-face and to assist should respondents not understand the instructions.
- Correctness, completeness and accuracy could be checked by the researcher/administrator as he/she is on site.
- The data collection process is not exposed to technological glitches, viruses and power outages as is the case with web-based questionnaires (Saunders *et al*., 2009).
- It is easy to maintain and uphold ethical standards as the researcher has control over the completion of the questionnaires.
- Most people requested to complete the questionnaire partake as the researcher is physically present at the time of request. The researcher could also offer to make the results available to the participants in order to motivate them to participate (Leedy & Ormrod, 2010). The response rate is therefore optimal.
- Pen-and-paper administered questionnaires are less prone to content bias and have higher response rates than web-based questionnaires (Saunders *et al.*, 2009).

There are however also disadvantages of using a paper-and-pen questionnaire:

- Different administrators of the questionnaire provide more opportunity for mistakes and may lead to different responses from respondents (Maree, 2010).
- The results are not immediately available, as the researcher first has to capture it on a database. This also implies possible human error during the capturing process and additional procedures to counter the consequences (Saunders *et* al., 2009).
- Paper-and-pen questionnaires, especially large volumes, are less cost effective to distribute than web-based questionnaires (Leedy & Ormrod, 2010).

- Although the questionnaires are completed anonymously, the respondents may still feel exposed due to the fact that the researcher collects the questionnaires from them personally. This may also have a negative impact on the honesty with which the participant completes the questionnaire.
- Incomplete questionnaires cannot be retuned to a respondent to be corrected as the respondent completes the questionnaire anonymously (Leedy & Ormrod, 2010). This also implies that the researcher has to find new respondents to complete the questionnaire which is associated with increased costs, effort and time.
- Time and geographical constraints are limiting factors in such a study (Saunders *et al*., 2009). In this study only participants to whom the assessor had physical access in certain regions in South Africa were able to partake in the study (Leedy & Ormrod, 2010).

## 3.6 DATA ANALYSIS

In this section the main methods used to analyse the obtained data for this study are discussed. The focus is on the reliability and validity measures, the use of a confirmatory factor analysis and structured equation modelling, the fit indices and software programs that were used during this study.

### *3.6.1 RELIABILITY*

For a questionnaire to be valid it must be reliable. DeVellis (2003) postulates that reliability is a fundamental issue in psychological measurement. Researchers need to prove that the instruments they use are reliable, as a reliable instrument should be replicable, and replicability is fundamental to the scientific method (Garson, 2011). Scale reliability is stated as "…the proportion of variance attributable to the true score of the latent variable." (DeVellis, 2003, p.23). Field (2009, p. 788) defines a latent variable as "A variable that cannot be directly measured, but is assumed to be related to several variables that can be

measured". Garson (2011, p.13) posits that "…reliability is the correlation of an item, scale or instrument with a hypothetical one which truly measures what it is supposed to…". Leedy and Ormrod (2010) indicate that the reliability of an instrument supposes consistent results when the characteristics being measured have not changed. Saunders *et al.* (2009) support this and mention that reliability is concerned with the robustness of the questionnaire, in particular whether it could deliver comparable results at a different time and under different circumstances (e.g. other participants).

The reliability that is of interest for this study is the internal consistency or reliability which indicates the homogeneity of the items within the scale. Scales based on classical measurement models are meant to measure a single phenomenon or construct. When a number of items are created to measure a certain construct there should be a high degree of resemblance among them since they need to measure the shared construct (Engelbrecht, 2009). A measure of this degree of similarity is a suggestion of internal consistency of the instrument. If the items of a scale are strongly related to the latent variable, they will also have a strong relationship to each other. It could therefore be said that a scale is internally consistent to the extent that its items are highly inter-correlated. The Cronbach's alpha coefficient is usually used to measure the internal reliability of an instrument (Maree, 2010).

The Cronbach's alpha coefficient usually varies between 0 and 1.00. A rule of thumb is that indicators should have a Cronbach alpha of 0.7 or more to be seen as reliable. The closer the score is to 1.00 the more strongly the items are correlated with each other, which imply high internal consistency. If the Cronbach's alpha coefficient is close to 0.00 it means that the items are not strongly correlated and that the internal consistency is low (Garson, 2011). The interpretations of Cronbach's alpha coefficient is summarised in table 3.

**Table 3: Interpreting Cronbach's alpha coefficient**

| Cronbach's alpha | Interpretation |
|---|---|
| < 0.70 | Low reliability |
| 0.70 - 0.80 | Moderate reliability |
| > 0.90 | High reliability |

Source: Maree (2010, p.145).

### *3.6.2 VALIDITY*

The validity refers to the degree to which the questionnaire (in this case the Revised JDS) measures what it is supposed to measure, namely job design (Maree, 2010). Leedy and Ormrod (2010) mention that a questionnaire may be called a measure of certain characteristics but it does not essentially mean that this questionnaire measures the characteristics its designers suggest that it does. Validity studies can provide an indication of the degree to which an instrument may have error. DeVellis (2003) states simply that validity focuses on whether the variable is the underlying cause of item covariance. The type of validity measured in this study is construct validity, which is also the purpose of the study (to measure the construct validity of the Revised JDS in the South African context).

Construct validity is the type of validity that is needed for standardisation. It focuses on how well the construct covered by the instrument is measured by various groups of related items (Maree, 2010). Leedy and Ormrod (2010) stipulate that it is the degree to which an instrument measures characteristics that cannot be directly detected but is assumed to exist based on the patterns in people's behaviour. DeVellis (2003) adds to this by mentioning that construct validity is concentrated on the theoretical relationships of a variable to other variables.

The JCM provides an explanation for the circumstances under which employees tend to show motivation, satisfaction and productive behaviour. The Revised JDS offers a direct measure of all the variables in the JCM. For example if the questionnaire wants to measure autonomy, some items will load onto this factor. It is therefore important to assess the construct validity before the assumption could be made that the instrument is

standardised. The two statistical techniques to measure validity are usually the **factor analysis and item analysis** (Maree, 2010).

Several international studies have been conducted in order to determine the construct validity of the Revised JDS (Boonzaier *et al.*, 2001). In the South African context however, limited research has been done to establish the construct validity. Buys *et al.* (2007) performed a study to determine the construct validity of the Revised JDS in the South African context. A confirmatory factor analysis (CFA) was performed to determine whether the validity of the instrument is acceptable. According to the results the validity analysis of the instrument is satisfactory and fits the data to an acceptable degree. Buys *et al.* (2007) however suggest that additional studies need to be conducted in the complex South African context before final conclusions could be reached on the construct validity of the Revised JDS. This suggestion was further investigated in this study by using the CFA following the SEM approach on a new sample of the population.

### *3.6.3 ITEM ANALYSIS*

An item analysis is used to determine items that should not be included in the questionnaire because they are not proven to be appropriate (Maree, 2010). Leedy and Ormrod (2010, p.115) support this by stating that "…item analysis is a process of evaluating single test items by any of several methods". This usually involves the determination of how well an individual item distinguishes itself from other items and its relationship to some criterion of measurement. Item analysis is very valuable in refining items to be used again in later tests, but it can also be used to remove ambiguous items in a test. Maree (2010) suggests that an item analysis should be done so that irrelevant items could be identified and removed or replaced. Inappropriate items should be eliminated so that only the suitable items are included in the questionnaire and are able to influence the results.

Although one of the statistical techniques to measure validity is item analysis, item analysis data is not synonymous with item validity. An external criterion is essential to correctly judge the validity of test items. "By using the internal criterion of total test score,

item analyses reflect internal consistency of items rather than validity" (Leedy & Ormrod, 2010, p. 119).

### *3.6.4 FACTOR ANALYSIS*

Factor analysis basically determines a way to decrease or condense large sets of data by using a smaller set of factor components. Factor analysis tries to find clusters or groups among the inter-correlations of a set of variables. This technique is widely utilised by researchers to develop and evaluate tests and scales as is the case with this study (Pallant, 2007). Field (2009) supports this by mentioning that factor analysis has three main uses:

- To recognise the structure of a set of variables;
- To compile a questionnaire to determine an underlying variable;
- To reduce a dataset to a controllable size while holding as much of the original information as possible.

Garson (2011) describes factor analysis as a technique utilised to discover the hidden structure or dimensions of a set of variables. He however also suggests that it is a non-dependent procedure as it does not assume that a dependent variable is specified. Garson captures the core of this study by indicating that one of the purposes of factor analysis is to validate a scale or index by indicating that its core items load on the same factor, and to reject scale items which cross-load on more than one factor. Maree (2010) stipulates that items measured on a 5 to 7 point Likert scale are well suited for this type of analysis, which was also the case in this study.

There are two main approaches to factor analysis namely **exploratory factor analysis (EFA) and confirmatory factor analysis (CFA)**. The EFA is more often used in the initial stages of research to discover the interrelationships amongst a set of variables. Confirmatory factor analysis (CFA) intends to establish if a pre-set theory is validated by a certain number of factors and the loading of measured (indicator) variables. In other words it is often used at a later phase in the research to confirm the theory or hypothesis relating

to the structure underlying the set of variables (Nasser & Takahashi, 2003). In this study a theory already existed and had to be validated which made the CFA approach more appropriate than the EFA approach. There are two approaches to confirmatory factor analysis (CFA) namely the traditional method and **the structural equation modelling (SEM)** (Engelbrecht, 2009)**.** For this study to determine which items loaded onto the same factor and which items could be disregarded for loading onto more than one factor, the CFA was used with the SEM approach which will be further discussed. Firstly, however, the EFA will be highlighted.

#### 3.6.4.1 Exploratory factor analysis (EFA)

This is the most common form of factor analysis. No previous theory exists and factor loadings are utilised to discern the factor structure of the data. The main purpose of an EFA is to uncover the underlying structure of a large set of variables. During EFA the factor loadings are used so that consciousness of the factor structure of the data could be created. It is therefore used to determine the number of factors underlying the set of measurements and the factors to be included or eliminated. The researcher thus presumes that any indicator may be connected to any factor (Garson, 2011). Suhr (2011) confirms this by stating that the EFA is a variable reduction technique, which allows the researcher to designate and identify the number of dormant constructs (factors) and conventionally has been used to search the possible underlying factor structure of a set of measured variables.

The EFA is best used in a study design which includes cross-validation. The greatest difficulty in using the exploratory factor analysis is choosing the appropriate principal dimensionality (Harvey *et al.*, 1985). As this study had a previous theory as a basis to work from, it was decided to rather use the CFA following the SEM.

### 3.6.4.2 Confirmatory factor analysis (CFA)

Confirmatory factor analysis (CFA) is suitable in situations where previous research exists and therefore the dimensionality of a set of variables for a given population is already identified (Buys *et al*., 2007). Garson (2011) endorses that the CFA sets out to determine if a pre-established theory is confirmed by determining the conformation of a number of factors and the loadings of measured (indicator) variables to what is expected. It implies that the researcher makes use of either knowledge of the theory or empirical research, or both, states the relationship pattern a priori and then tests the hypothesis statistically (Suhr, 2011). In other words the researcher's supposition is that each factor (the number and labels of which may be specified) is related to a specified subset of indicator variables (Kim & Mueller, 1978).

Confirmatory Factor Analysis (CFA) necessitates clear predictions regarding the existing factors and the way these factors relate to each other as well as the way they relate to the variables. The CFA may be used to examine whether the established dimensionality and factor-loading pattern fits a new sample from the same population as was relevant in this study (Suhr, 2011).

In chapter 2 the theoretical model of the Revised JDS was discussed and the various constructs, factors and dimensions were explained. The Revised JDS is based on the JCM and therefore clear predictions exist on how these factors relate to one another and also how they relate to the different job dimensions. The CFA was consequently used to conclude whether the measures created, really belong together and load onto the right job dimensions in the JDS model. The goodness of fit between the hypothesised model and the observed data could therefore be determined. The fact that previous research was conducted provided an additional reason for using this study. When researches refer to CFA techniques they are often talking about methods based on structured equation modelling (SEM) (DeVellis, 2003).

### 3.6.4.3 Structured Equation Modelling

One of the approaches to the CFA is **the structural equation modelling (SEM).** Alternative words for SEM are covariance structure analysis, covariance structure modelling, and analysis of covariance structures (Field, 2009). SEM has been described as a combination of exploratory factor analysis and multiple regression analysis (Schreiber, Nora, Stage, Barlow & King, 2006). Engelbrecht (2009) describes SEM as a statistical technique for testing and estimating causal relations using a mixture of statistical data and qualitative causal assumptions. Structured equation modelling (SEM) is seen as a confirmatory rather than exploratory procedure, using one of three possible approaches:

- **Strictly confirmatory approach** - It is determined if a structural model specified by the researcher is matched with the pattern of variances and covariance in the data by using SEM goodness-of-fit tests as was the case with this research.
- **Alternative models approach** – This is used if the researcher wants to test two or more casual models to establish which has the best fit.
- **Model development approach** – When a model is tested using SEM procedures, errors are identified and changes made to improve the model. The alternative model is then tested based on the changes indicated by the SEM modification indexes (Garson, 2011).

According to Garson (2011, p.18) the SEM approach is done to determine whether the pattern of variances and co-variances in the data is consistent with a structural model. Structural equation modelling (SEM) "…takes into account the modelling of interaction, non-linearity, correlated independents, measurement error, correlated error terms, multiple latent independents (each measured by multiple indicators), and one or more latent dependents (also each with multiple indicators)". Garson further explains that SEM may in fact be used as a more influential substitute to multiple regression, path analysis, factor analysis, time series analysis and analysis of covariance. These procedures may be seen as special cases of SEM.

The SEM's purpose is, where a large number of variables averts modelling all the measures individually, to decrease a large number of variables to a smaller number of

factors for modelling purposes. It could therefore be stated that factor analysis is integrated in structural equation modelling (SEM), to assist in the confirmation of the latent variables modelled by SEM (Suhr 2011). One of the strengths of SEM is the capacity to create latent variables. Latent variables are expected in the model from several other measured variables each of which is predicted to load onto the latent variables. Latent variables are not measured directly. This implies that the structural relations between latent variables could be correctly projected (Schreiber *et al*., 2006).

The SEM process revolves around two steps: validating the measurement model and fitting the structural model. Validation of the measurement model is basically accomplished through CFA. While SEM is typically used to model causal relationships among latent variables (factors), it is equally possible to use SEM to explore CFA measurement models (DeVilles, 2003). In fitting the structural model it is important to take note that this measurement model also uses goodness of fit measures generated by the SEM package to determine the goodness of fit (Garson, 2011). Goodness-of-fit is an index which gives an indication of how well a model fits the data from which it was created, and is usually based on how well the data forecasted by the model corresponds with the data that was actually gathered (Field, 2010).

According to Garson (2011) there are a few steps in performing the SEM analysis:

- The first step is to do the model specification which implies that the model must be defined acceptably, based on the type of analysis that the researcher is making an effort to confirm. It therefore entails describing the theoretical factor model and explaining the nature of the factors and variables.
- The second step is usually the estimation of free parameters. This is done by comparing the actual covariance conditions representing the relationships between variables and the estimated covariance conditions of the best fitting model.
- The assessment of fit is the next step and involves using goodness-of-fit indices to accept or reject the model.
- The fourth step is to do the model modification in order to improve the model fit and thereby estimating the most likely relationships between variables.

- In the fifth place it is to compute the sample size. It has been noted by many researchers that the results from indices are influenced by sample size. This is one of the main reasons why researchers use a variety of fit indices rather than basing results on a single index (Smith & Langfield-Smith, 2004).
- The last step in the SEM analysis is to interpret and report on the findings (Garson, 2011). The interpretation is to make claims about the constructs, based on the best fitting model (Ladesma & Valera-Mora, 2007). The SEM approach was followed in this study and the model was tested by making use of SEM goodness-of-fit measures.

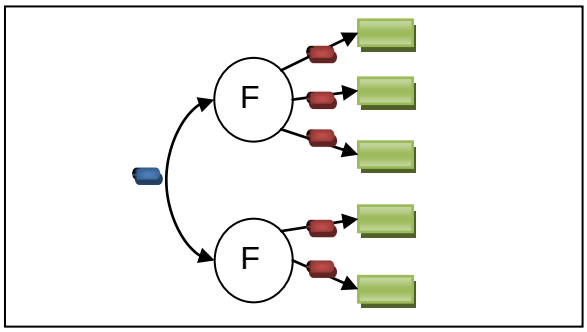
### a. Fitting the model

There are two methods for fitting the model or extracting the factors from a set of data, namely principal axis factoring (PAF) also known as principal factor analysis (PFA) and principal component analysis (PCA). Principal axis factoring (PAF) seeks to replicate the correlations of the variables and accounts for the co-variation among the variables. It is used if the purpose of research is theory confirmation. The PCA on the other hand is used when researchers want to reduce a large number of items to a smaller number of underlying latent dimensions and no causal model exists. (Garson, 2011). The PAF method was used during this study because it is the preferred method to use when a SEM is done. It is also effective for identifying the structure of data and the purpose of this study was to confirm theory (Engelbrecht, 2009).

### b. Exogenous and endogenous variables

When interpreting the results from a correlations matrix (SEM model), the factor loadings between variables should be analysed (Garson, 2011). There are different latent variables (unobserved variables) depicted in a correlation matrix, namely exogenous variables and endogenous variables. Exogenous variables are the independent variables with no a priori variable and are also known as the predictor variables. Endogenous variables are also called mediating variables and the dependent or outcome variables (Garson, 2011). An example of a correlation matrix or SEM model is presented in figure 2.

**Figure 2: Example of a SEM model**




Source: Norman & Steiner (2003, p.8).

All variables are represented by rectangles and each path is characterised by a straight line with an arrow head on the one end. The predictor (exogenous) variables are linked by curved lines with arrow heads on both sides. The straight arrows are paths and the bowed ones signify the correlation among variables. In figure 2 the predictor or exogenous variables (F1 and F2) are connected by curved arrows which signify the correlations between them. The exogenous variables are connected to the endogenous or outcome variables (green squares) by means of straight arrows representing the path of the casual relationship. The values next to the curved arrows (signified by the blue oval shape) provide the strength of the correlations between the exogenous or predicator variables. The values next to the straight lines (represented by the red oval shapes) are called the standardised path coefficients. These values have to be positive, alternatively it implies that the casual relationship is moving in the wrong direction (from the predictor variable to the outcome variable) (Norman & Steiner, 2003).

The strength of the correlations between variables will indicate how well the model fits the data. The percentage of variance in all the variables accounted for by each factor can be calculated by dividing the number of variables into the sum of the standardised path coefficients for the factor. The correlations should be 0.7 or higher to confirm that the factors are measuring the same construct (Garson, 2011).

### *3.6.5 SPSS AND EQS FOR WINDOWS AS THE MAIN METHODS OF DATA ANALYSIS*

Once the respondents had completed the questionnaire, the responses were captured on a spread sheet. The researcher could also keep track of the number of responses by using this method. The data on the spread sheet was cleaned up, organised and exported for analysis. All the information on the questionnaires was converted to numbers for the data analysis process. The data was thus in electronic format and could be exported to SPSS and EQS worksheets. Only fully completed questionnaires were used. Data will be kept electronically for a ten year time period after completion of this study.

The most important techniques that were used to analyse the data are reliability and validity measures and factor analysis. All of these statistical methods were conducted by making use of SPSS and EQS statistical calculation packages for Windows. The goodness-of-fit indices were calculated on the EQS6 for Windows programme. The reliability statistical data analysis was done on the SPSS programme.

### *3.6.6 FIT INDICES*

Goodness-of-fit indices give an indication of how well a model fits the data from which it was generated. A goodness-of-fit index is typically based on how well the data projected by the model correspond with the data that were in fact collected (Field, 2010). It could also be said that this provides the basis to either accept or reject models. It also gives a basis for accepting one competing model over another (Schumacker & Lomax, 2004). The output of SEM programmes includes matrices of the estimated relationships between variables in the model. In SEM the fit indices determine whether the model is generally acceptable. If the model is acceptable it becomes necessary to establish whether specific paths are significant (Moss, 2009).

Kenny (2011) mentions that researchers should not only rely on one fit index but should rather make use of various different ones. Jaccard and Wan (1996) recommend the use of at least three goodness-of-fit measures. Kline (1998) proposes at least four tests. A pitfall

to be avoided is not to only select the fit indices that are most supportive of the researcher's model. It is interesting to note that acceptable fit indices do not always suggest that the relationships are strong. In fact the reverse might be true due to the fact that the power to spot inconsistencies from forecasts is often amplified in this procedure.

Goodness-of-fit indices can be categorised into two broad categories namely absolute and incremental (comparative) fit indices and it is suggested that it should be reported on indices from both categories (Hox, 2008). Absolute indices are calculated using formulae that include discrepancies. It is called absolute for the reason of not comparing this model to any other. The incremental model includes discrepancies from a null model. It therefore has the label of relative or comparative (Kenny, 2011). The different fit indices used during this study are now elaborated on.

- **Chi-square value**

It is recommended reporting on the chi-square, an absolute fit index. The chi-square for the model is also called the discrepancy function, likelihood ratio chi-square, or chi-square goodness-of-fit (Moss, 2009). If the chi-square is not significant, the model is viewed as acceptable, in that the observed covariance matrix is similar to the predicted covariance matrix (the matrix predicted by the model). If the chi-square is significant, the model is looked upon as unacceptable. If the model chi-square is < 0.05 the researchers' model is rejected. It should however be noted that because the model chi-square is so conservative (prone to Type II error), researchers may well debate or ignore negative model chi-square results if other model fit measures support the model. This may especially be true for large sample sizes (Hox, 2008).

- **Normed Fit Index (NFI)**

It is suggested reporting on two of the baseline fit indices for example the normed fit index (NFI) and the comparative fit index (CFI) which are both incremental fit indices (Garson, 2011). The NFI is also known as the Bentler-Bonett normed fit index. The fit index varies from 0 to 1 where 1 is seen as ideal. It is noted that the NFI equals the variance between

the chi-square of the null model and the chi-square of target model, divided by the chi-square of the null model (Byrne, 2006). The NFI was developed as a substitute for CFI, but does not require making chi-square assumptions (Garson, 2011). The NFI replicates the quantity by which the researcher's model improves fit compared to the null model (uncorrelated measured variables). An example would be if the NFI = 0.50 it implies that the researcher's model improves fit by 50% compared to the null model.

It is generally accepted that the NFI values above 0.95 are a good fit, between 0.90 and 0.95 acceptable, and below 0.90 indicates a need to revisit the model (Schumacker & Lomax, 2004). Ullman (2001) infers that small samples may influence the effectiveness of the NFI. It is therefore good to compare the results from the NFI with the results from the NNFI. Hox (2008) proposes that the sample size should be more than 100 to regard it as satisfactory for a confirmatory factor analysis. This study's sample size is more than 100 and would therefore be applicable for the CFA.

- **Non-normed fit index (NNFI)**

Moss (2009) explains that the NNFI is also similar to the NFI but unlike normed indices it does not always have a value between zero and one. If the NNFI index is lower, the model is viewed as less acceptable. It is however advantageous that the model is fairly independent of sample size (Garson, 2011). A NNFI value of between 0.95 and 1.00 is indicative of a very good fit and a value between 0.90 and 0.94 is considered as acceptable. Less than 0.90 is seen as a poor fit (Schumacker & Lomax, 2004).

- **Comparative Fit Index (CFI)**

The CFI is also known as the Bentler Comparative Fit Index. It compares the existing model fit with a null model which assumes that the latent variables in the model are uncorrelated (therefore called the independence model). The CFI and the normed fit index (NFI) are very much alike but the CFI is not really affected by sample size, whilst the NFI is known to undervalue the fit for small samples (Garson, 2011). Hox (2008) states that the

CFI varies from 0 to 1 and that CFI close to 1 indicates a very good fit. CFI should be equal to or greater than 0.90 to accept the model. Less than 0.90 is regarded as a poor fit.

- **Root mean square error of approximation (RMSEA)**

The RMSEA was developed to determine how well a given model approximates the true model. If the approximation is good the RMSEA should be small (Hox, 2008). RMSEA is a modern and popular measure of fit, as it does not require comparison with a null model. Sample size does not affect this fit index as compared to other fit indices (e.g. the CFI). A concern however is that for smallest sample sizes, it overestimates goodness-of-fit (Garson, 2011). Schumacker and Lomax (2004) explain that there is good model fit if the RMSEA value is less than or equal to .05, adequate fit if the RMSEA value is between or equal to 0.06 and 0.08 and 0.10 or higher is a poor fit.

- **Bollen's Incremental fit index (IFI)**

This fit index is, like NFI, part of the relative or incremental fit indices, which compares the chi-square of the model tested with the chi-square of a null model or baseline model (Bollen, 1990). The incremental fit index, also known as Bollen's IFI, is also less focused on sample size. It is indicated that values that exceed 0.90 are acceptable, although this index can exceed 1.0.

- **McDonald Fit Index (MFI)**

The McDonald Fit Index (MFI) belongs to the category of absolute fit indices. With absolute fit indices, there is no reliance on comparison to a reference model to determine the measure of improvement in the model. It rather concentrates on how well the theorised model fits the sample data. The MFI is comparable to RMSEA in that it does not provide for a fit-per-degree-of-freedom interpretation (Byrne, 2006). Hu and Bentler (1999) specify a cut-off point of 0.90 for the MFI. A good fit will therefore be >0.90.

Table 4 contains a summary of the cut-off values for each of the fit indices that were discussed.

**Table 4: Summary of the cut-off values for the fit indices**

| Fit Index | Model fit | Value |
|---|---|---|
| 1. Chi-Square value | Poor fit | </= 0.05 |
| | Reasonable fit | 0.06 – 0.08 |
| | Good fit | > 0.08 |
| 2. Bentler-Bonett - Normed Fit Index (NFI)<br>3. Bentler-Bonett – Non-normed Fit Index (NNFI)<br>4. Comparative Fit Index (CFI) | Perfect fit | = 1 |
| | Good fit | >0.95 |
| | Reasonable fit | 0.90-0.95 |
| | Poor fit | <0.90 |
| 5. Bollen's Incremental Fit Index (IFI) | Acceptable | >0.90 |
| 6. McDonald Fit Index (MFI) | Acceptable | >0.90 |
| 7. RMSEA | Good fit | </= 0.05 |
| | Reasonable fit | 0.06 - 0.08 |
| | Poor fit | > 0.08 |
| The '<' stands for 'smaller than' | The '>' stands for 'greater than' | The '=' stands for 'equal to' |

Source: Garson (2011); Byrne (2006), Schumacker & Lomax (2004); Hu and Bentler (1999); Bollen (1990).

## 3.7 ASSESSING AND DEMONSTRATING THE QUALITY AND RIGOUR OF THE RESEARCH DESIGN

The main purpose of this section is to describe the relevant factors that influenced the quality and rigour of the study. It is also to provide an indication of the guidelines that were used to uphold the quality of the obtained results.

### *3.7.1 BIAS*

Bias can be defined as an influence that may distort the data (Leedy & Ormrod, 2010). In this study, sample bias was identified as a possible influence, as the researcher used convenience sampling. This may cause some groups of people of the population to be excluded. Those sampled were people who were available and most certainly did not include a sample of the overall population. Special attention was given to make sure all levels in the organisation (except senior management level); ages and positions were included in this study. Access to respondents however was restricted to the companies and industries the researcher had access to. There was also a possibility of participant bias, where the participants in the study could feel that their answers might upset management in the organisation. In this study however special care was taken to keep the responses received anonymous to conquer this bias (Saunders *et al*., 2009).

### *3.7.2 ERROR*

The first error that influenced the results in the proposed study is non-response error. Non-response error occurs when not all of the respondents complete the questionnaire (Saunders *et al*., 2009). More respondents were requested to complete the questionnaire than responses needed in order to overcome this problem. It was also decreased by making use of snowball sampling and by doing this inviting more people to partake in the study.

The second error was a participant error. Respondents were asked to complete the questionnaire after assessment sessions and what happened during the sessions could have impacted on the respondent's feelings and motivation whilst completing the questionnaire. Ensuring that participation was voluntary, partially addressed this problem. Lastly, observer, and in this case administrator bias also came into play. Different test administrators could possibly have different ways of conducting the questionnaire completion sessions. The test administrators, however, were thoroughly trained in the questionnaire administration procedures to overcome this error.

### *3.7.3 VALIDITY*

In this study the validity of the Revised JDS was measured and therefore was ensured. Validity could be defined as the extent to which the instrument measures what it is supposed to measure (Cresswell, 2009). There are a number of aspects that can negatively influence validity measures:

- **History:** Refers to how the respondent candidate may feel about the topic due to some incidents that occurred over time. The respondent may have had a history of bad experiences in the company he/she was working for, which could influence his/her responses on some of the questions in the questionnaire (Saunders *et al*., 2009). During this study it was emphasised in both the written and verbal instructions that the respondents should think of the job when answering the questions, not the company.
- **Testing:** Implies that the results may be contaminated should the respondents believe that the outcome may disadvantage them in any way (Saunders *et al*., 2009). It was addressed in this study by highlighting that the responses were anonymous and confidential.
- **Social desirability:** Is an issue when the respondents answer the way they think they are expected to answer (Maree, 2010). The completion of the Revised JDS however, was anonymous and therefore the occurrence of social desirability is likely to be low.
- **Agreeableness:** Refers to the fact that some of the respondents may tend to answer too agreeably to the questions (Maree, 2010). This may have been a problem in this study but was possibly also conquered by the fact that the questionnaire was completed anonymously and thus there was no pressure to portray a more positive image than necessary.
- **Item bias:** Comes into play when external factors such as language differences influence the item scoring among groups (Maree, 2010). In an attempt to decrease item bias, the researcher and administrators were available to interpret certain words or sentences when required.

- **Generalising:** There is also the problem of possible bias in the process of generalising conclusions of the proposed study (Maree, 2010). This study was only performed on a specific sample, in a few different settings, at a specific time. This may have had a negative influence on the generalisation of results.

## 3.8 RESEARCH ETHICS

Research ethics refer to the appropriateness of the behaviour in relation to the rights of the participants or those affected by this study (Cresswell, 2009). A number of ethical issues were considered during this study which is discussed in this section. Some of the main ethical considerations considered for this study included privacy, confidentiality of data collected, behaviour and objectivity of the researcher, access and consent, ethical data collection procedures, copyright, informed consent, reporting as well as ethical clearance.

### *3.8.1 ACCESS AND PERMISSION*

Gatekeepers in organisations were approached and access to participants in specific organisations was requested and obtained. The permission of each candidate participating in the study was acquired and individuals were not forced or pressured to participate in the study or to perform any task that may have put them in distress.

The researcher could confidently make use of the Revised JDS in South Africa for the proposed study, as it is a questionnaire that is readily available and no special permission is needed for it to be obtained. Only employees over the age of 18 were used as subjects for the study and there was thus no need for parental permission. Participants were in no way psychologically upset or harassed.

### *3.8.2 COPYRIGHT*

A signed plagiarism form is included in this study (p. i) as undertaking that the author only handed in her own original work. Where someone else's work was used due acknowledgement was given.

### *3.8.3 INFORMED CONSENT*

People who are purposely recruited to participate in a study should be informed about the nature of the study and given the choice to participate or not (Leedy & Ormrod, 2010). The participants in this study were allowed to withdraw at any point, without suffering any negative consequences as it was voluntary. A consent form was included in the paper and pencil questionnaire and the respondents were requested to complete this before completing the questionnaire. The consent form contained printed information on the participants' rights. This included the right to stop participating at any time and emphasised the fact that participation was voluntary. It also accentuated the fact that the participant could have access to the final results should the individual wish to do so.

### *3.8.4 ANONYMITY*

It is important to ensure anonymity and confidentiality when gaining access to organisations in which the questionnaire will be completed (Saunders *et al.,* 2009). In this study the names of respondents were not requested when completing the questionnaire. The consent form as part of the questionnaire also suggested that the study involved an anonymous survey, that the respondents' names would not appear on the questionnaire and that their answers would be treated as strictly confidential. Although some personal data was requested from candidates such as age and position in the company, the fact that it was anonymous ensured that participants were not identifiable.

### *3.8.5 ETHICAL REPORT WRITING AND STORAGE*

Researchers should report their findings in a complete and honest fashion (Leedy & Ormrod 2010). The findings of this research were analysed and presented as fair and exact as possible, without any efforts to mislead the audience. The benefits of the study were not exaggerated for the participating parties. It was clearly indicated in the consent form respondents signed, that the results were only to be used for academic purposes and could be published in an academic journal. The information obtained during the study was stored in a safe place, will be stored for 10 years and only authorised people have access to results. Questionnaires that were not completed correctly were discarded and additional participants were requested to participate in the study.

### *3.8.6 THE PROCESS USED FOR OBTAINING ETHICAL APPROVAL*

The necessary approval to conduct the study and to make use of human data was obtained from the Research Ethics Committee. The data collection procedure was only initiated after final approval was obtained from the Committee in question.

## 3.9 CONCLUSION

In this chapter the research philosophy of this study was established as the positivist paradigm. Thereafter the inquiry strategy and research design were discussed in more depth. The sampling and data collection methods used in this study were also further explored. Factor analysis, reliability and validity were focus points in the discussion on data analysis. The chapter concluded by concentrating on the rigour and quality of the study as well as the ethical considerations that were important during the process.

# CHAPTER 4

# RESEARCH FINDINGS

## 4.1 INTRODUCTION

In this chapter the results acquired in the research study are discussed and visually presented according to the main data analysis methods discussed in the previous chapter. This will include the reliability or internal consistency measures using the Cronbach's alpha coefficient, the validity data analysis methods namely the structural equation modelling (SEM) and related fit indices. The aim was to determine whether there is a good or poor fit between the theorised model and the observed data. A CFA was conducted on the five-factor model to determine if this fitted the data. According to the theory there are three items loading onto each factor (see table 5). The results of the confirmatory factor analysis assisted to determine which of the items in the Revised JDS could be regarded as good indicators and which as poor indicators of the five different factors.

Only the items in section one and two of the Revised JDS were used to perform the CFA analysis as these are indicated as the relevant items to determine the validity of the instrument. There are three items per factor, and five job design factors measured in the Revised JDS. Fifteen (15) items were therefore analysed and table 5 provides a description of these items per factor of the Revised JDS (Buys *et al.*, 2007).

**Table 5**: **Items per factor for the Revised JDS**

| **Factors** | Skill Variety | Task Identity | Task Significance | Autonomy | Feedback |
|---|---|---|---|---|---|
| **Items** | Item 3 | Item 2 | Item 4 | Item 1 | Item 5 |
| | Item 6 | Item 7 | Item 10 | Item 11 | Item 8 |
| | Item 9 | Item 12 | Item 15 | Item 14 | Item 13 |

Source: Buys *et al.* (2007)

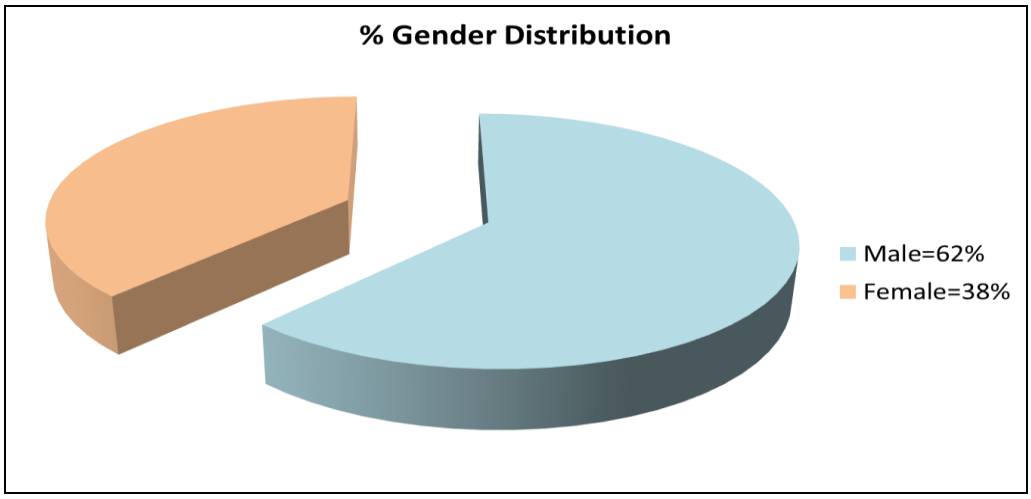
## 4.2 BIOGRAPHICAL INFORMATION

As part of the questionnaire the respondents were requested to complete biographical information. This provided the researcher with more information about the sample and enhanced the opportunity to make the study as representative as possible of the general population. The biographical information was collated and is presented in different graphical formats in order to highlight important facts and differences about the sample that was selected.

- **Gender distribution**

Figure 3 is indicative of the gender distribution of respondents during the study. The majority of the respondents namely 62% of the sample were male (n=103) as opposed to 38 % female respondents (n = 63).

**Figure 3: The percentage gender distribution of respondents during this study**

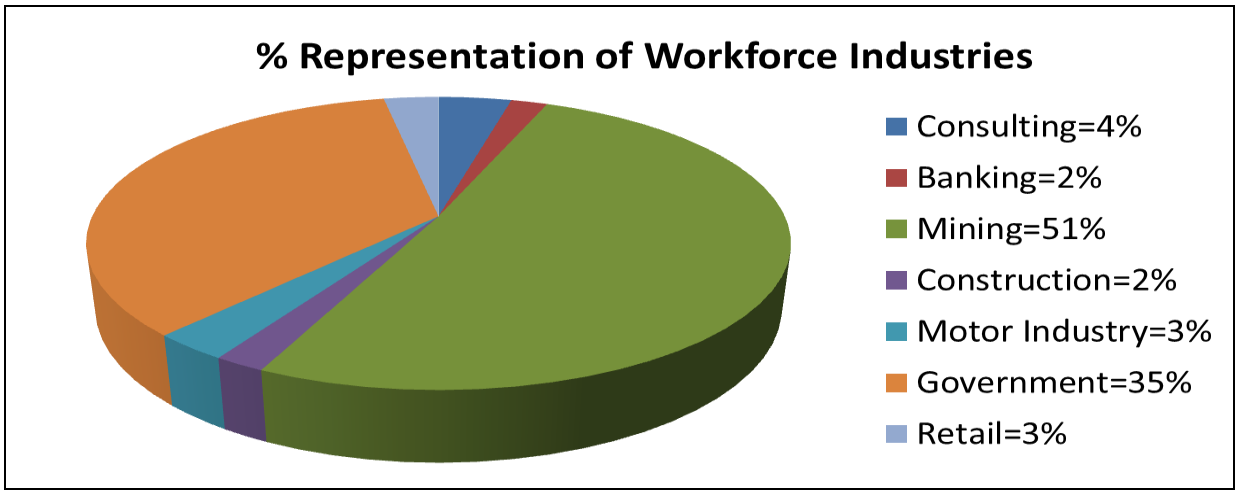



- **Representation of workforce industries**

The researcher had easier access to some workforce industries than others. Figure 4 provides an indication of the percentage of respondents from the different workforce industries. It should be noted that most respondents are representative of the mining

(n=85) and government (n=58) industries as these were the industries the researcher had most access to.

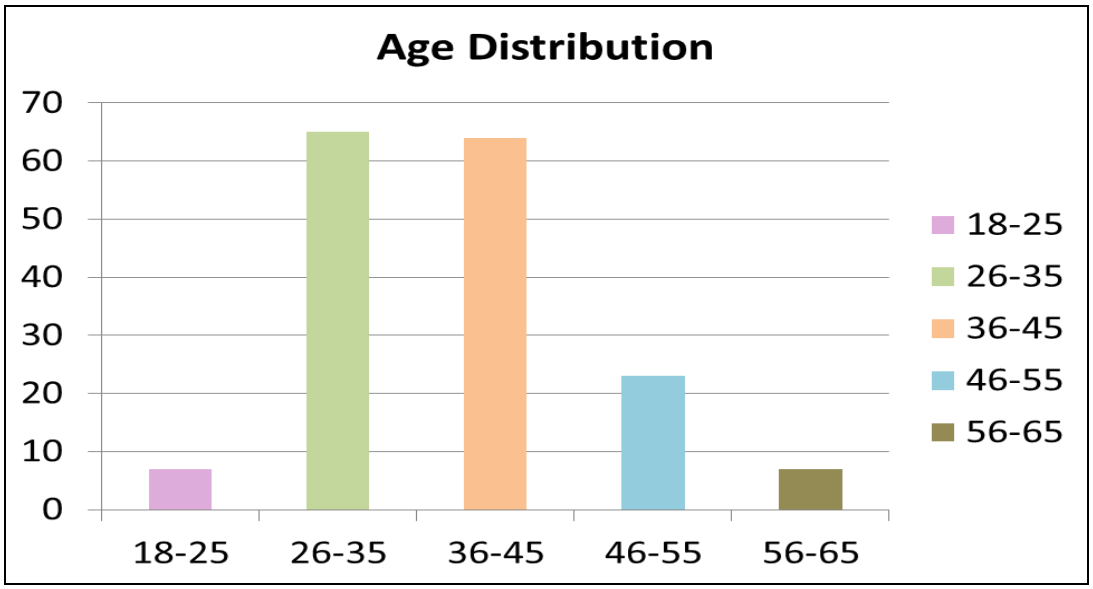
**Figure 4: The percentage representation of the workforce industries during this study**




- **Age distribution of respondents**

Figure 5 depicts the different age groups of respondents that were included in this study. It was important to involve all age groups between the ages of 18 and 65 as this is representative of the general working population in South Africa. Most of the respondents were from the age grouping 26-35 (39%) and 36-45 (38%). There was 4% representation for the age grouping 18-25, 15% representation for the age grouping 46-55 and 4% representation for the age grouping 56-65.

**Figure 5: The age distribution of respondents during this study**




## 4.3 RELIABILITY

As discussed in chapter 3, reliability is concerned with the robustness of the questionnaire in particular whether it could deliver comparable results at a different time and under different circumstances (Saunders *et al.* 2009). The reliability relevant to this study is the internal consistency or reliability which indicates the similarity of the items within the scale. It is said that if items of a scale are strongly related to the latent variable, the scale is internally consistent to the extent that its items are highly inter-correlated. One of the most commonly used methods for determining internal consistency is Cronbach's alpha coefficient (Maree, 2010).

### *4.3.1 THE CRONBACH ALPHA*

The Cronbach's alpha coefficient for the five factors was calculated using SPSS and the results are presented in table 6.

**Table 6**: **Reliability statistics as a summary for the Cronbach alpha results**

| Factor | Item no | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted | Cronbach's Alpha Coefficient |
|---|---|---|---|---|---|---|
| 1.Skill Variety | 3 | 11.1687 | 5.329 | .545 | .852 | .808 |
| | 6 | 10.9277 | 4.892 | .699 | .691 | |
| | 9 | 10.9398 | 4.869 | .734 | .656 | |
| 2.Task Identity | 2 | 10.7771 | 6.295 | .526 | .701 | .741 |
| | 7 | 10.7048 | 5.652 | .548 | .681 | |
| | 12 | 10.5422 | 5.632 | .629 | .581 | |
| 3.Task Significance | 4 | 11.8434 | 4.909 | .479 | .714 | .723 |
| | 10 | 11.9036 | 4.379 | .626 | .533 | |
| | 15 | 11.7108 | 4.886 | .533 | .648 | |
| 4. Autonomy | 1 | 11.0542 | 5.542 | .535 | .761 | .765 |
| | 11 | 10.5422 | 5.341 | .635 | .642 | |
| | 14 | 10.5482 | 5.776 | .632 | .652 | |
| 5. Feedback | 5 | 11.0241 | 5.224 | .573 | .691 | .757 |
| | 8 | 10.9337 | 4.814 | .566 | .704 | |
| | 13 | 10.5120 | 5.076 | .627 | .633 | |

The **Corrected Item-Total Correlation** values as specified in Table 6 are indicative of the degree to which each individual item correlates with the total score of the factor it loads onto. If the score is smaller than 0.3 it is stated that this item is measuring something different from the scale as a whole. Such items should be removed (Field, 2010).

All items related to specific factors on the Revised JDS in table 6, have scores bigger than 0.3. The lowest score is 0.47, which is still within the acceptable range. The results thus suggest that the items correlate from a high to moderate degree with the total score of the particular factor it is loading onto. It was not necessary to remove any of the items.

The column headed **Alpha if Item Deleted** gives an indication of the impact should each item be removed from the scale. The values of each item in this column should be compared to the overall alpha value obtained for each factor (table 7). If the final alpha value is less than 0.7 and any of the values in the **Alpha if Item Deleted** column is higher than the overall alpha value for each factor it is loading onto, it should be considered to remove this item (Pallant, 2007).

The results in table 6 show that only item 3 loading onto skill variety has a greater value in the **Alpha if Item Deleted** column (0.852) than the final alpha value for skill variety (0.808). It is however not necessary to delete this item as the final alpha value was not smaller than 0.7. All the other scores were in line with the suggested standards and it was therefore not necessary to do remove any of the items.

To interpret the results of the **Cronbach Alpha Coefficient** it is important to take note (as explained in Chapter 3) that it usually varies between 0 and 1.00. Values of 0.80 and higher is indicative of a very good internal consistency or high reliability. Values between 0.70 and 0.80 imply that the internal consistency is acceptable or reliability moderate and below 0.70 low internal consistency or reliability (Pallant, 2007). It thus infers that the closer the score is to 1.00 the more strongly the items are correlated with each other, which suggests high internal consistency. The opposite is also true. If the Cronbach's alpha coefficient is close to 0.00 it proposes that the items are not strongly correlated and that the internal consistency is low (Garson, 2011).

From table 7 it could be deducted that task variety (factor 1), has high reliability or internal consistency with a value of 0.808. The other factors namely task identity, task significance, autonomy and feedback, have values ranging between 0.70 and 0.80 which is indicative of an acceptable or moderate reliability.

### *4.3.2 THE FINAL CONCLUSION ON THE SCALE RELIABILITY*

With correlations ranging between acceptable and high internal consistency or moderate and high reliability, it could be concluded that the items of the Revised JDS all measure the same construct as underlying factors or characteristics important in job design.

## 4.4 CONFIRMATORY FACTOR ANALYSIS

As discussed in the previous chapter the EQS software was used to conduct a confirmatory factor analysis following the SEM approach. To evaluate the coefficients, the maximum likelihood estimation method was used in the SEM. To measure model fit several goodness-of-fit indices were used namely the chi-square with its probability value, the NFI, the NNFI, the CFI, the IFI, the MFI and the RMSEA. The rejection or acceptance of the model is determined by the results of the fit indices.

### *4.4.1 CHI-SQUARE VALUE*

Table 8 provides a summary of the results obtained from the chi-square goodness-of-fit analysis.

**Table 7: Summary of chi-square results for the Revised JDS factors**

| Chi-Square Output | Residual-Based Test Statistics |
|---|---|
| Probability value for the chi-square statistic | 0.00000 |

The results of the chi-square test are indicative of the fit between the observed data and theoretical model (Garson, 2011). Chi-square values of 0.05 and lower are significant and suggest a poor fit. The chi-square however has to have a value of 0.06 and more to have a reasonable or good fit. The results have to be insignificant for a good model fit (Field, 2010). From table 8 it is evident that the chi-square value is 0.00000 which infers that the test is significant and the model fit is unsatisfactory or that the model has a poor fit. It is

however stated by Field (2010) that with large samples the test is almost always significant and the model rejected. It is therefore important to give more attention to the other fit indices (Garson, 2011).

### *4.4.2 THE BASELINE FIT INDICES*

Table 9 gives the results of the baseline fit indices for the items and factors of the Revised JDS.

**Table 8: The baseline fit indices for the Revised JDS**

| Baseline Fit Indices | Values |
|---|---|
| Bentler-Bonett – Normed Fit Index (NFI) | 0.943 |
| Bentler-Bonett – Non-normed Fit Index (NNFI) | 0.924 |
| Comparative Fit Index (CFI) | 0.942 |
| Bollen Fit Index (IFI) | 0.944 |
| McDonnald Fit Index (MFI) | 0.894 |

For the NFI, NNFI and CFI values between 0.95 and 1.00 indicate a good fit, whilst values between 0.90 and 0.94 are a reasonable fit (Schumacker & Lomax, 2004). Bollen (1990) indicates that values that are higher than 0.90 are acceptable for the IFI, although this index can exceed 1. Hu and Bentler (1999) specify a cut-off point of 0.90 for the MFI. The MFI value in this study was 0.894 which could be rounded to 0.90 and is a reasonable fit.

From table 9 it is evident that the NFI, NNFI and the CFI values are between 0.90 and 0.95 which show a reasonable fit and a satisfactory model. The IFI value exceeds 0.90 and is also indicative of an acceptable model fit. The MFI is on the borderline of the cut-off point but still falls under the description of an acceptable fitting model.

### *4.4.3 THE RMSEA VALUES*

The RMSEA was developed to determine how well a given model approximates the true model. Table 10 provides results for the RMSEA values of the Revised JDS.

**Table 9: The RMSEA values for the Revised JDS**

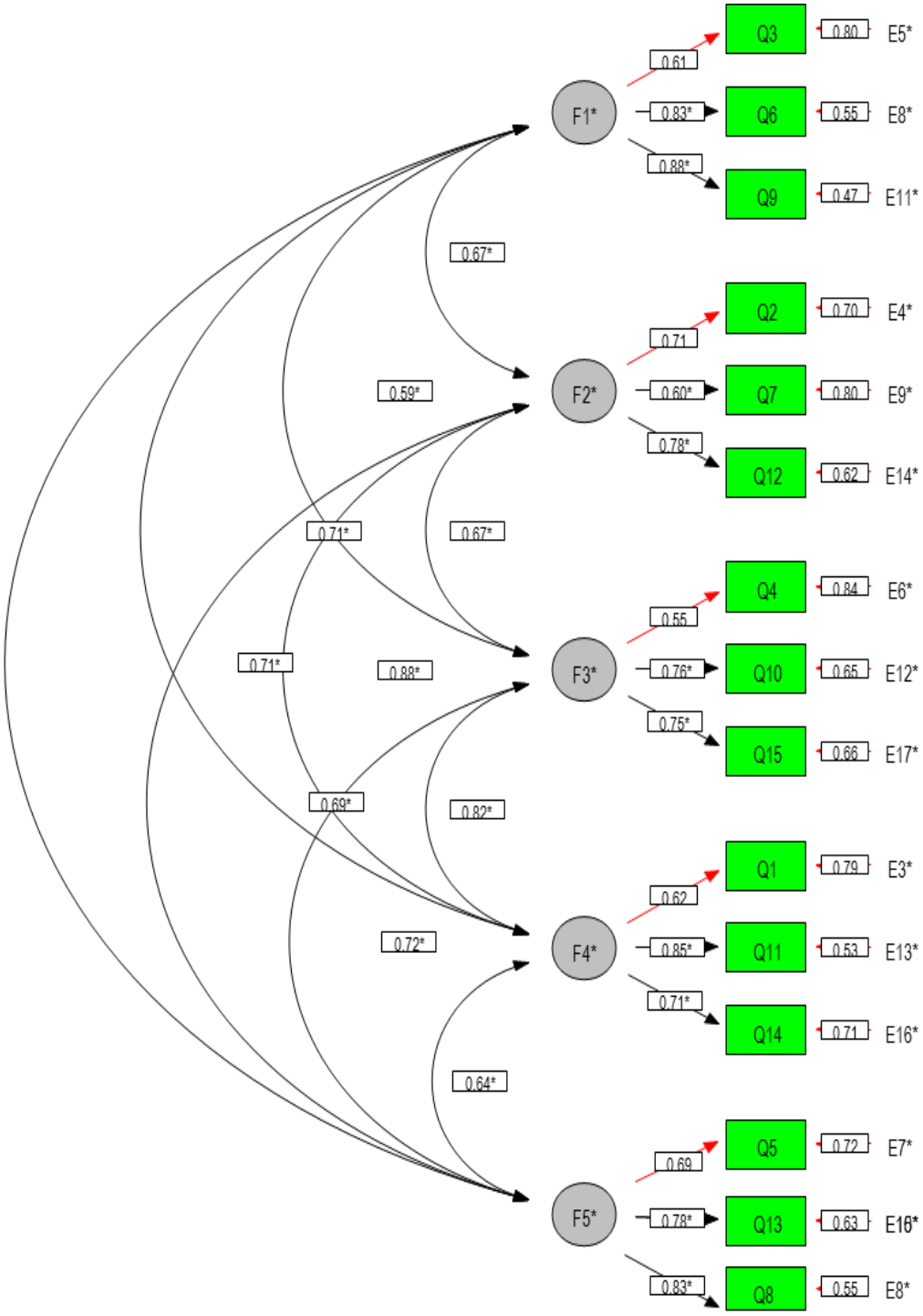
| Output | Values |
|---|---|
| Root Mean-Square Error of Approximation (RMSEA) | 0.053 |
| 90% Confidence Interval of RMSEA | (0.030, 0.073) |

RMSEA values of 0.05 or less are indicative of a good model fit while values between 0.06 and 0.08 are still seen as a reasonable fit (Schumacker & Lomax, 2004). The RMSEA value is 0.053 and could be rounded to 0.05 which suggests a good fit and satisfactory model. With regard to the confidence intervals the lower limit should be close to 0.00 and the upper limit less than 0.08 to indicate a good fit (Garson, 2011). In table 10 the results of the RMSEA show the lower limit as 0.03 and the upper limit as 0.073 which falls within the boundaries of a good model fit.

### *4.4.4 THE FACTOR LOADINGS*

The estimate parameters of the JDS diagram are depicted in figure 6.

**Figure 6: The standardised estimate parameters of the JDS diagram**



The factor loading or correlations between variables should be considered to interpret the model's results (Garson, 2011). For this study the standardised estimate parameters of the JDS diagram were chosen and are presented in the figure 6. Factors one to five (the grey circles) represent the exogenous variables and the variables in the green squared boxes are the endogenous variables. The exogenous and endogenous variables or items are depicted in table 11.

**Table 10: Exogenous and endogenous variables as depicted in**

| **Exogenous Variables** | **Factor 1 Skill Variety** | **Factor 2 Task Identity** | **Factor 3 Task Significance** | **Factor 4 Autonomy** | **Factor 5 Feedback** |
|---|---|---|---|---|---|
| **Endogenous Variables** | Q3 = Item 3 | Q2 = Item 2 | Q4 = Item 4 | Q1 = Item 1 | Q5 = Item 5 |
| | Q6 = Item 6 | Q7 = Item 7 | Q10 = Item 10 | Q11 = Item 11 | Q8 = Item 8 |
| | Q9 = Item 9 | Q12 = Item 12 | Q15 = Item 15 | Q14 = Item 14 | Q13 = Item 13 |

All of the signs of the standardised path coefficients are in the right direction and therefore positive. The values next to the curved arrows give an indication of the strength of the correlations between the Revised JDS factors. The correlations should be 0.7 or higher to confirm that the factors are indeed measuring the same construct (Schreiber *et al.*, 2006).

Item 3 loading onto skill variety (factor 1), item 7 loading onto task identity (factor 2), item 4 loading onto task significance (factor 3), item 1 loading onto autonomy factor 4 and item 5 loading onto feedback (factor 5) all have values lower than 0.70. Garson (2011) however states that the percentage of variance in all the variables accounted for by each factor can be calculated by dividing the number of variables by the sum of the standardised path coefficients for that factor.

The sum of the standardised path coefficients for skill variety (factor 1) is 0.77, for task identity (factor 2) is 0.70, for autonomy (factor 4) it is 0.73 and for feedback (factor 5) is 0.76 which is above 0.70 and still acceptable. The sum of the standardised path

coefficients for task significance is however 0.69 which is below the 0.70 acceptable level. Although it could be rounded to 0.70, the covariance structure suggests that item 4 has a relatively low correlation (0.55) with latent variable task significance and is likely to be the cause of the lower score on the standardised path coefficients for task significance. There is therefore a concern that item 4 may not be suitable for the South African context and should possibly be revised.

## 4.5 CONCLUSION

In this chapter of the research study all the important results were presented in table and figure format. It is simpler to identify patterns and draw conclusions when results are presented in this format. The main results discussed in this chapter were the internal consistency measures and the fit indices. The SEM model of the standardised estimate parameters of the JDS diagram was also presented. In the following chapter the findings will be discussed in more detail.

# CHAPTER 5

# DISCUSSIONS AND RECOMMENDATIONS

## 5.1 INTRODUCTION

The main purpose of this study was to validate the Revised JDS within the South African context by using the confirmatory factor analysis (CFA) following the structured equation modelling (SEM) approach. This chapter contains more detail on the results presented in the previous chapter. This chapter concludes by relating the research results back to the research objectives as pronounced in chapter 1.

## 5.2 BIOGRAPHICAL INFORMATION

From the background information gathered during the study it was evident that more males completed the questionnaire than females. This may be due to the fact that most questionnaires were completed by respondents in the mining industry, which is generally male dominant. According to the South African Mining Charter only 9% of the Mining workforce is female (Case study, 2007). Although respondents from seven different workforce industries were included in the study, the Mining and Government sectors were most representative. The researcher, however, had easy access to these sectors. It is not clear what the impact of the uneven representation of the population was on the results of this study.

Most respondents who completed the questionnaire were part of the age groups 26-35 and 36-45. It is, however, indicative of the normal distribution of the working population in South Africa (Trading economics, 2011). It is undisclosed whether the respondents were representative of the different race groups in South Africa as questions regarding ethnicity were excluded from the biographical information. The researcher decided to omit race group questions as this could have influenced the perception of the respondents in some of the more politically sensitive industries negatively regarding the purpose of the questionnaire. One of the assumptions for this study was, therefore, that relationships

between item responses are reasonably consistent across different types of jobs as well as among participants from different age groups, gender and ethnic backgrounds.

## 5.3 RESEARCH FINDINGS

A discussion follows in this section on the Cronbach's alpha coefficient results, the various fit indices and the correlations matrixes, as presented in the previous chapter.

### *5.3.1 INTERNAL CONSISTENCY*

In order to establish the internal reliability of the instrument, the Cronbach's alpha coefficient was computed for each item loading onto each of the five factors of the Revised JDS as well as the overall coefficient for each factor. An alpha coefficient score close to 1.00 implies high internal consistency and to 0.00 a low internal consistency (Garson, 2011).

The results indicated that task variety (factor 1) had a high internal consistency with a value of 0.808. The other factors, namely task identity, task significance, autonomy and feedback had an acceptable or moderate reliability with scores ranging between 0.70 and 0.80 (Pallant 2007). It can thus be concluded that there is a moderate degree of resemblance among the items that were created in the Revised JDS to measure a shared construct. The Revised JDS measurement instrument's internal consistency can be regarded as acceptable and moderately reliable.

### *5.3.2 CONFIRMATORY FACTOR ANALYSIS*

The CFA following the SEM approach was done on the data to determine whether the five-factor model of the Revised JDS fitted the data. To measure model fit, several goodness-of-fit indices were computed, namely the chi-square with its probability value, the NFI, NNFI, CFI, IFI, MFI and the RMSEA.

The chi-square value for the five factors of the Revised JDS was significant and indicates a poor model fit. Field (2010) however, suggests that the chi-square test is very conservative and influenced by sample size and model complexity. Pallant (2007) states that to conduct a factor analysis preferably five to ten cases should be used for each item. For this study the maximum of ten cases were included per item (15 items) which amounted to 150 respondents. Hundred and sixty six respondents were, however, eventually included which resulted in a rather large sample size. Garson (2011) agrees that large samples almost always have a significant chi-square value and the model rejected. Due to the vulnerability of the chi-square value, which is known to be sensitive to the Type 2 error, researchers suggest that the negative findings of the chi-square should be disregarded if other model fit measures support the model.

The NFI, NNFI and CFI values were between 0.90 and 0.94 which is indicative of a reasonable or acceptable model fit (Shumacker & Lomax, 2004). The IFI value was 0.944 which is greater than 0.90 and shows an acceptable fit. The MFI was 0.894 which rounds off to 0.90 and is on the borderline of an acceptable model fit. According to these baseline indices the model can be accepted. It also implies that the chi-square results could be disregarded (Hox, 2008).

The RMSEA value was 0.053 which could be rounded to 0.05 and is indicative of a good fit model according to the parameters (Schumacker & Lomax, 2004). The lower limit of the confidence interval should be close to 0.00 and the upper limit less than 0.08 to be a good fit. In this study the RMSEA confidence intervals were 0.030 and 0.073. The RMSEA results of this study could therefore be regarded as satisfactory and indicate a good fit model fit.

Table 12 provides a summary of the results for all the fit indices for the sample of the Revised JDS:

**Table 11: Summary of results of fit indices for the sample**

| Model Fit Indices | Chi-Square | NFI | NNFI | CFI | IFI | MFI | RMSEA |
|---|---|---|---|---|---|---|---|
| **Meet the parameters** | No | Yes | Yes | Yes | Yes | Yes | Yes |

From table 12 it is evident that the chi-square test was dissatisfactory and indicated a poor model fit. As discussed the chi-square test is very susceptible to sample size and model complexity. Researchers indicate that if the chi-square value is significant but the other fit indices are positive the chi-square test can be ignored (Garson, 2011). All of the baseline indices (NFI, NNFI, CFI, IFI and MFI) indicated a reasonable model fit. The RMSEA value was acceptable and indicative of a good model fit. In general it could therefore be concluded that the results from the fit indices for the five factors of the Revised JDS indicate an acceptable or satisfactory model fit.

### *5.3.3 CORRELATIONS MATRIX*

A correlation was conducted between the endogenous and exogenous variables. Values of 0.70 and higher indicate a good correlation between items and factors and confirm that the items are indeed measuring the same construct (Schreiber *et al*., 2006).

It could be deducted from figure 6 that item 3 loading onto skill variety (factor 1), item 7 loading onto task identity (factor 2), item 4 loading onto task significance (factor 3), item 1 loading onto autonomy (factor 4) and item 5 loading onto feedback (factor 5) all had values lower than 0.70. Garson (2011) however, states that the percentage of variance in all the variables accounted for by each factor can be calculated by dividing the number of variables by the sum of the standardised path coefficients for the factor.

The sum of the standardised path coefficients for skill variety (factor 1) was 0.77, for task identity (factor 2) it was 0.70, for autonomy (factor 4) 0.73 and for feedback (factor 5) 0.74 which were above 0.70 and still acceptable. The sum of the standardised path coefficients for task significance is however 0.69 which is below the 0.70 acceptable level. It is

possible to round 0.69 to 0.70 which is acceptable. The covariance structure however suggests that item 4 has a relatively low correlation (0.55) with the latent variable task significance and is likely to be the cause of the lower score on the standardised path coefficients for task significance.

It could thus be concluded that the factor loadings between the variables indicate that the items (endogenous variables) on the Revised JDS correlate well with the factors that it is measuring (exogenous variables). It is however highlighted that item 4 loading onto task significance may not be suitable for the South African context and should possibly be revised due to its low correlation levels.

## 5.4 LIMITATIONS AND RECOMMENDATIONS

It should be emphasised that there are some limitations with regard to the generalisation of results, as is with most studies. To lessen the limitations of this study, recommendations for future studies are made. Some of the main limitations and recommendations with regard to the Revised JDS are discussed in this section.

It should be noted that the researcher was not always present when respondents completed the survey and made use of trained survey administrators to conduct some of the survey sessions. This could have influenced the results regarding the consistency with which instructions were given as well as questions answered by the different administrators (Saunders *et al*., 2009). To ensure consistent results, it is recommended that the researcher or one administrator facilitate all questionnaire completion sessions.

The Revised JDS consists of 30 items but only 15 are relevant to compute the construct validity (Buys *et al*., 2007). This is a short survey with only five underlying constructs. Idaszak and Drasgow (1987), point out that the true underlying structure would be more clearly reflected, if four to six items per factor are used. An expansion of the questionnaire is recommended.

The sample in a research study should be representative of the population of which conclusions need to be drawn (Leedy & Ormrod, 2010). In this study, the entire workforce of the South African population was targeted. It is impossible to include all members of the workforce and the researcher therefore made an effort to include as many workforce industries as possible. There was, however, an uneven representation of the different workforce industries. Some industries and sectors were over-represented such as Mining and Government, and others underrepresented such as Banking and Construction. This could have impacted negatively on the results. It is suggested in future, that snowball sampling is used more effectively to ensure that the sample is better representative of the population and thus improve the generalisation of results.

This study was limited to the South African context and thus context-bound which also limits the generalisation of the results. In a diverse country such as South Africa it is important to ensure that all race groups are represented in the study. Ethnicity, however, was excluded from this study due to the political sensitivity in some industries and organisations the researcher had access to. Voster *et al*. (2005) confirmed the equivalence of the structural model of the JDS in respect to black and white cultural groups. It was also stated as one of the assumptions of his study that the relationships between item responses are reasonably consistent across different types of jobs as well as among participants of different ages, gender and ethnic backgrounds. It is, however, still important to include other ethnic groups such as Indian and coloured in future studies to improve the generalisation of the study's findings specifically for the South African context.

## 5.5 CONCLUSION

It seems that people generally have a lack of interest and passion for their jobs (Morison, Erickson & Dychtwald, 2008). Researchers and managers have made many efforts over the years to understand more clearly under which conditions workers will show motivation, dedication and have a drive to deliver results (Johns, 2010; Voster *et al.* 2005). It is therefore important to understand and measure the job characteristics impacting on job satisfaction. The JCM and the accompanying JDS questionnaire to measure and thus improve job motivation and satisfaction were designed by Hackman and Oldman (1975)

and revised by Idaszak and Drasgow in 1987. The JDS and Revised JDS have been used over the years in South Africa to redesign jobs and to address HR problems facing managers (Wiesner & Vermeulen, 1997).

The JDS was standardised in the international but also in the South African (using a certain population) context (Buys *et al.* 2007). The South African context and culture, however, is very unique and diverse. Buys *et al.* (2007) suggested that further standardisation tests had to be conducted on the Revised JDS for managers to apply it with greater confidence in the South African context. The main purpose of this study was to validate the Revised JDS within the South African context by using the confirmatory factor analysis (CFA) following the structured equation modelling (SEM) approach. The main research objectives were as follows:

- To review the literature with regard to the Job Characteristics Model (JCM).
- To review the most recent literature with regard to the Revised Job Diagnostic Survey (JDS).
- To evaluate the construct validity of the Revised JDS within the South African context by performing a CFA using the SEM analysis.

A proper literature review was conducted on the JCM focusing on the theories from which the JCM were derived and expanding on the JCM itself. The two most prominent theories that form the basis for the JCM is the two-factor theory developed by Herzberg (1960) and Turner and Lawrence's requisite task attributes theory (Voster *et al.,* 2005). According to Hackman and Oldman (1987) there are five factors inherent in the design namely: skill variety, task identity, task significance, autonomy, and feedback. The JCM model describes the relationships among core job dimensions, critical psychological states and on-the-job outcomes. The JDS was designed to measure the job dimensions linked to job motivation and job design.

The recent literature with regard to the Revised JDS was also reviewed. The background regarding the construct validity of the JDS as well as Revised JDS was studied. An in-depth review was, however, also done of the use of the JDS in the South African context,

focusing specifically on construct validity studies conducted by researchers such as Voster *et al.* (2005) and Buys *et al.* (2007).

The construct validity study of the Revised JDS was conducted on a new sample. Evidence was found that the Revised JDS reliability is acceptable and the model does fit the data to a reasonable or acceptable degree. The results of the study therefore confirm the results obtained in previous studies such as Buys *et al.* (2007). It could therefore be concluded that the Revised JDS can be used by managers in SA with greater confidence as an instrument to redesign work.

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# APPENDIX A

# REVISED JDS QUESTIONNAIRE

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

**Faculty of Economic and Management Sciences**

Letter of Introduction and Informed Consent for participation in academic research

**Dept. of Human Resource Management**

**Title of the study**

**"The Construct Validity of the Job Diagnostic Survey within the South African context"**

Research conducted by:

Ms I van Loggerenberg (86309171)

Cell: 0824460428

Dear Respondent

You are invited to participate in an academic research study conducted by Ilse van Loggerenberg, a Masters student from the Department Human Resources at the University of Pretoria.

The purpose of the study is to validate the Revised JDS within the South African context by using the ESEM method. The literature will be based on the South African as well as international perspective, but only people employed in South African organisations will be approached to complete the questionnaire.

Please note the following:

- This study involves an anonymous survey. Your name will not appear on the questionnaire and the answers you give will be treated as strictly confidential. You cannot be identified in person based on the answers you give. [Kindly note that consent cannot be withdrawn once the questionnaire is submitted as there is no way to trace the particular questionnaire that has been filled in.]
- Your participation in this study is very important to us. You may, however, choose not to participate and you may also stop participating at any time without any negative consequences.
- Please answer the questions in the attached questionnaire as completely and honestly as possible. This should not take more than 7 minutes of your time.
- The results of the study will be used for academic purposes only and may be published in an academic journal. We will provide you with a summary of our findings on request.
- Please contact my study leader Mr M Buys at Michiel.Buys@up.ac.za, if you have any questions or comments regarding the study.

Please sign the form to indicate that:

- You have read and understand the information provided above.
- You give your consent to participate in the study on a voluntary basis.

_____ _____

***Respondent's signature*** ***Date***

Please complete the following biographical information, before commencing with the questionnaire. Please note that the biographical information is only for research purposes and you are not asked to make your identity known:

| **BIOGRAPHICAL INFORMATION** | |
|---|---|
| **DATE:** | |
| **POSITION IN YOUR CURRENT ORGANISATION:**<br>**(e.g. HR assistant, IT manager)** | |
| **SECTOR YOU WORK IN: (e.g. mining, banking, government)** | |
| **AGE:** | |
| **GENDER: (Male, Female)** | |

## THE REVISED JOB DIAGNOSTIC

The Job Diagnostic Survey is used to diagnose jobs and how people react to them. The questionnaire is useful in determining how jobs can be better designed, by obtaining information about how people react to different kinds of jobs (Job Diagnostic Survey, 2010). On the following pages you will find several different questions relating to your job. Specific instructions are given at the start of each section. The questions are designed to obtain *your* perceptions of your job and *your* reactions to it. There are no trick questions. Your individual answers will be kept completely confidential. Please answer each item as honestly and frankly as possible.

Thank you for your co-operation.

## SECTION ONE

This part of the questionnaire asks you to describe your job, as *objectively* as you can. Please do *not* use this part of the questionnaire to show how much you like or dislike your job. Questions about that will come later. Instead, try to make your descriptions as accurate and as objective as you possibly can. A sample question is given below:

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

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

| | | |
|---|---|---|
| Very little; the job requires almost no contact with mechanical equipment of any kind | Moderately | Very much; the job requires almost constant work with mechanical equipment |

If, for example, your job requires you to work with mechanical equipment a good deal of the time - but also requires some paperwork - you might indicate a number 6. If you do not understand these instructions, please ask for assistance.

**Please start here:**

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

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

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

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

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

| | | |
|---|---|---|
| My job is a small-sized "chunk" of the overall piece of work; my own contribution can almost never be seen in the final outcome. | My job is a moderate-sized "chunk" of the overall piece of work; my own contribution can be seen in the final outcome. | Very much; the job gives me almost complete responsibility for deciding how and when the work is done. |

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

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

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

4 In general, *how significant or important* is your job? That is, are the results of your work likely to significantly affect the lives or well-being of other people?

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

| | | |
|---|---|---|
| Not very significant; the outcomes of my work are *not* likely to have important effects on other people | Moderately significant. | Highly significant; the outcomes of my work can affect other people in very important ways |

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

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

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

## SECTION TWO

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

Please indicate whether each statement is an *accurate* or an *inaccurate* description of *your* job. Once again, please try to be as objective as you can in deciding how accurately each statement describes your job – regardless of whether you like or dislike your job. Write a number on the right next to each statement in the table:

***How accurate* is *the statement in describing your job?***

| 1<br>Very<br>Inaccurate | 2<br>Mostly<br>Inaccurate | 3<br>Slightly<br>Inaccurate | 4<br>Uncertain | 5<br>Slightly<br>Accurate | 6<br>Mostly<br>Accurate | 7<br>Very<br>Accurate |
|---|---|---|---|---|---|---|

| | ***SCORE*** |
|---|---|
| 1. The job requires me to use a number of complex or high-level skills. | |
| 2. The job is arranged so that I can do an entire piece of work from beginning to end | |
| 3. Just doing the work required by the job provides many chances for me to find out how well I am doing. | |
| 4. The job allows me to use a number of complex or high-level skills. | |
| 5. This job is one where a lot of other people can be affected by how well the work gets done. | |
| 6. The job gives me a chance to use my personal initiative and judgment in carrying out the work. | |
| 7. The job provides me with the chance to completely finish the parts of work that I begin. | |
| 8. After I finish a job, I know whether I performed well. | |
| 9. The job gives me considerable opportunity for independence and freedom in how I do the work. | |
| 10.The job itself is very significant and important in the broader scheme of things. | |

## SECTION THREE

Now please indicate *how you personally feel about your job.* Each of the statements below is something that a person might say about his or her job. Please indicate your own personal *feelings* about your job by indicating to what extent you agree with each of the statements.
Write a number on the right next to each statement in the table:

***How much do you agree with the statement?***

| 1<br>Disagree strongly | 2<br>Disagree | 3<br>Disagree slightly | 4<br>Neutral | 5<br>Agree Slightly | 6<br>Agree | 7<br>Agree Strongly |
|---|---|---|---|---|---|---|

| | ***SCORE*** |
|---|---|
| 1. My opinion of myself goes up when I do this job well. | |
| 2. Generally speaking, I am very satisfied with this job. | |
| 3. I feel a great sense of personal satisfaction when I do this job well. | |
| 4. I seldom think of quitting this job | |
| 5. I feel good and happy when I discover that I have performed well on this job. | |
| 6. I am generally satisfied with the kind of work I do in this job. | |
| 7. My own feelings are generally affected by how well I do in this job.. | |

## SECTION FOUR

Now please indicate how *satisfied* you are with each aspect of your job listed below. Write a number on the right next to each statement in the table:

***How satisfied are you with this aspect of your job?***

| 1<br>Extremely Dissatisfied | 2<br>Dissatisfied | 3<br>Slightly Dissatisfied | 4<br>Neutral | 5<br>Slightly Satisfied | 6<br>Satisfied | 7<br>Extremely Satisfied |
|---|---|---|---|---|---|---|

| | ***SCORE*** |
|---|---|
| 1. The amount of personal growth and development I get in doing my job. | |
| 2. The feeling of worthwhile accomplishment I get from doing my job.. | |
| 3. The amount of independent thought and action I can exercise in my job. | |
| 4. The amount of challenge in my job. | |

## SECTION FIVE

Now please think of the other people in your organization who hold the same job that you do. If no one has exactly the same job as you, think of the job, which is most similar to yours.

Please think about how accurately each of the statements describes the feelings of those people about the job. It is quite all right if your answers here are different from when you described your own reactions to the job. Often different people feel quite differently about the same job. Write a number on the right next to each statement in the table:

***How much do you agree with the statement?***

| 1<br>Disagree strongly | 2<br>Disagree | 3<br>Disagree slightly | 4<br>Neutral | 5<br>Agree Slightly | 6<br>Agree | 7<br>Agree Strongly |
|---|---|---|---|---|---|---|

| | ***SCORE*** |
|---|---|
| 1. Most people in this job feel a great sense of personal satisfaction when they do the job well. | |
| 2. Most people in this job are very satisfied with the job. | |
| 3. People in this job seldom think of quitting | |
| 4. Most people in this job feel good or happy when they find that they have performed the work well | |

## THANK YOU FOR COOPERATING