

**WORK ENGAGEMENT OF EMPLOYEES IN THE MINING
ENVIRONMENT**

AD Rathbone, LLB

Mini-dissertation submitted in partial fulfilment of the requirements for the degree
Magister Commercii in Business Administration at the
North-West University, Potchefstroom Campus

Supervisor: Dr K Mostert

November 2006

Potchefstroom

COMMENTS

The reader should keep the following in mind:

The references as well as the editorial style as prescribed by the *Publication Manual (5th edition)* of the American Psychological Association (APA) were followed in this mini-dissertation.

ACKNOWLEDGEMENTS

This year I received a tremendous amount of blessings, all of which were the result of being sensitive to the guidance of the Holy Spirit and the inspiration and motivation of family and friends. Words cannot sufficiently accentuate the benefits that I have received in completing this MBA course. It was the worst and best three years of my life. Special appreciation goes to:

- My Lord, Jesus Christ, for allowing the events of 15 October 2003 to dramatically change my life and for providing me with the ability to persevere in obtaining the ideals that You have given me.
- Dr Karina Mostert, who guided me through all the stages of this study. None of this would have been possible without your insight and willingness to help. You are truly a mentor and never too busy to listen. You have helped me greatly and I thank you very much. Thank you also for the statistical analysis that you conducted in this research.
- My wife Melani, who has always been there to support me during my MBA course, irrespective of the circumstances. Thank you for your unconditional support, love and patience and willingness to invest in me. At last we have some time available for recovery!
- My dear friend Frans, who has been with me since our first year of MBA. Thank you for your guidance and motivation. You have been a great colleague and I appreciate your friendship and support tremendously.
- My “Mamma” and “Daddy”: You have always been there. Thank you for your inspiration and motivation in helping me realise my dreams. None of this would have been possible without your teachings and active participation in the decisions I have made in my life.
- The mining organisations that were willing to assist me in conducting this research. You will undoubtedly benefit from the findings of this research.
- Dr Amanda van der Merwe for the professional manner in which she conducted the language editing.

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ABSTRACT

Title: Work engagement of employees in the mining environment

Key terms: Demographic characteristics, job characteristics, work-home interaction, work engagement, mining environment.

The mining industry is one of the largest employers in South Africa. In an attempt to thrive in a continuously changing environment and in line with the modern organisation's focus on the various dimensions of employee well-being, mining organisations need the services of engaged workers.

The objective of this research was to establish the relationship between work engagement and demographic characteristics, job characteristics and work-home interaction of employees working in the mining industry. A random sample of 320 employees was taken from various mining companies in the Gauteng and North West Provinces. The job characteristics, UWES and SWING questionnaires were used as measuring instruments. Cronbach alpha coefficients, Pearson product-moment correlation coefficients, exploratory factor analysis, structural equation modelling and logistic regression analysis were used to analyse the data.

Exploratory factor analysis with target rotations confirmed the construct validity of the measuring instruments. Chi-square and *t*-tests indicated positive relationships between work engagement and race, autonomy, social support, instrumental support, task characteristics, positive work-home interference and positive home-work interference. Logistic regression analyses revealed that race, autonomy, task characteristics and positive home-work interference were significant predictors of work engagement.

Recommendations were made for further research.

OPSOMMING

Titel: Werksbegeestering van werknemers in die myn omgewing

Sleuteltermes: Demografiese eienskappe, werkseienskappe, werk-huis interaksie, werksbegeestering, myn omgewing.

Die myn industrie is een van die grootste werkgewers in Suid Afrika. In 'n poging om welvaart te behaal in 'n omgewing wat konstant verander en in lyn met die moderne organisasie se fokus op die verskeie dimensies van werknemer welstand, het organisasies die dienste van werksbegeesterde werknemers nodig.

Die doelstelling van hierdie navorsing was om die verhouding tussen werksbegeestering, demografiese eienskappe, werkseienskappe en werk-huis interaksie van werknemers in die myn industrie te ondersoek. 'n Eweskansige steekproef van 320 werknemers van verskeie myn maatskappye in die Gauteng en Noord Wes is geneem. Die werkseienskappe, UWES en SWING vraelyste was as meetinstrumente gebruik. Cronbach-alfakoëffisiënte, Pearson-produkmomentkorrelasies, verkennende faktoranalise en logistiese regressie is gebruik om die data te analiseer.

Eksploratiewe faktoranalise met teikenrotasies en strukturele vergelykingsmodellering het die konstruk geldigheid van die meetinstrumente bevestig. Chi-kwadraat en *t*-toetse het 'n positiewe verhouding tussen werksbegeestering en ras, outonomie, sosiale ondersteuning, instrumentele ondersteuning, positiewe werk-huis inmenging en positiewe huis-werk inmenging aangedui. Logistiese regressie analise het aangedui dat ras, outonomie, taak eienskappe en positiewe huis-werk inmenging betekenisvolle voorspellers van werksbegeestering was.

Aanbevelings vir verdere navorsing is gemaak.

CHAPTER 1

INTRODUCTION

This mini-dissertation deals with the relationship between work engagement and certain constructs in organisational psychology such as demographic characteristics, job characteristics and work-home interaction.

In this chapter the problem statement is presented. The research objectives are set out, which include the general objective and specific objectives. The research method is explained and the division of chapters is given.

1.1 PROBLEM STATEMENT

Since the inception of South Africa's mining industry more than a century ago, it has established itself as the world's leading supplier of high quality mineral products and has played an authoritative role in directing the movement of the South African economy. According to Statistics South Africa (2004), the total number of people employed in the mining industry in 2004 was 415 000 and gross salaries paid during this same year amounted to R39 624 million. Despite these exorbitant figures and prosperity, the mining industry in the South African context is one of the most difficult industries in which to work, characterised by extremely high job demands and unpleasant working conditions (Khulumani Support Group, 2006).

It is generally known that management's most fundamental directive is to increase the wealth of shareholders. The mandate of management, in traditional organisations, has been characterised by a strong emphasis on strict organisational structures and economic principles such as cost reduction, efficiency and cash flow. This mandate, however, fails to address the need of employees to experience long-term well-being, especially considering that the most obvious aspects of mining is that it involves various job demands (and that these job demands require employees to spend an excessive amount of hours working with heavy duty machines, working with explosives, in intense underground temperatures etc.) and insufficient resources (e.g. no participation in decision making, limited task variety) (Calitz, 2004). In view of this

perception, it may be argued that in light of extreme job demands, limited job resources and an absent concern for the well-being of employees can have devastating results not only for the employees, but also the mining environment and the South African economy as a whole. However, Schaufeli and Salanova (in press) indicate that the focus of the modern organisation has recently shifted from a single-minded emphasis on organisational structures and common economic principles to the management of human capital. These authors indicate that the modern organisation of today considers its employees to be its most valuable asset.

Currently, and in line with management's new focus, organisations expect their employees to be proactive, show creativity, cooperate with each other in teams, take responsibility for their own development, and to be committed to performance (Schaufeli & Salanova, in press). Accordingly, Ulrich (1997, p. 125) claims that "employee contribution becomes a critical business issue because in trying to produce more output with less employee input, companies have no choice but to try to engage not only the body but the mind and soul of every employee". It is clear from this argument that management should not restrict its focus to aspects such as financial profit, productivity, and the management of employees, but should also focus on enhancing those aspects of the job that would result in its employees feeling energetic, dedicated, and absorbed by their work (i.e., engaged workers).

According to González-Romá, Schaufeli, Bakker and Lloret (2006), engagement is "a multidimensional construct defined as a positive and fulfilling work-related state of mind that is characterised by high levels of energy, the willingness to invest effort in one's work, and being deeply engrossed in one's work, where time passes quickly and one has difficulty detaching oneself from work" (p. 2). According to Schaufeli and Salanova (in press), today's modern organisation needs engaged employees especially when it strives to survive and prosper in a continuously changing environment. Schaufeli, Salanova, González-Romá and Bakker (2002) describe engaged employees as having a sense of energetic and effective connection with their work activities and seeing themselves as able to deal completely with the demands of their job.

Due to their important contribution to the economy of South Africa, various companies in the mining industry need to maintain a competitive advantage in complying with the demands of change, and as a result, impose various forms of stressors on their employees. Research has

shown that these stressors are characterised by certain job characteristics, including high levels of workload, time pressure and role conflicts, all of which have been shown to be positively related to employee health impairment (Bakker, Demerouti & Schaufeli, 2003; Frone, Russel & Cooper, 1995). The authors indicate that these factors are not only related to negative outcomes for the individual, including depression, a sense of failure, fatigue, and loss of motivation, but also to negative outcomes for the organisation, including absenteeism, turnover rates and lowered productivity.

Recent research indicated that work engagement is positively associated with various constructs in organisational psychology that have positive results for organisation well-being, including a positive attitude towards work and the organisation, job satisfaction, organisational commitment, and low turnover intention (Demerouti, Bakker, De Jonge, Janssen & Schaufeli, 2001; Salanova, Schaufeli, Llorens, Peiro & Grau, 2000; Schaufeli, Taris & Van Rhenen, in press), positive organisational behaviour such as personal initiative and learning motivation (Sonnentag, 2003), proactive behaviour and job performance (Salanova, Llorens, Cifre, Martínez & Schaufeli, 2003). Organisations whose employees are dissatisfied with their jobs, who are not committed to the organisation and who are continuously absent from work in an attempt to recover from extremely high job demands will certainly experience severe financial constraints. This theory was confirmed in a study performed by Goetzel, Guindon, Turshen and Ozminskowski (2001), where it was shown that an organisation's financial health correlates positively with investments in employee well-being.

For an effective study on work engagement in the mining industry, the levels of engagement, based on certain characteristics of employees and their working situations, should be properly investigated. This would allow for a deeper understanding of whether the levels of work engagement can be positively correlated to certain employee characteristics and working conditions. Although research has shown that there are a number of antecedents and correlates of work engagement, this study will focus on the relationship between work engagement and certain demographic characteristics, job characteristics and work-home interaction.

Since 1994, the landscape of the mining industry in South Africa has changed dramatically. One of the major changes in addressing the inequities and discrimination of the apartheid

government was the introduction of a non-sexist and non-racial society which aimed at re-establishing respect for human dignity. In light of this, the mining industry has seen previously disadvantaged groups being introduced to its workforce. As a result, mining companies are now representational of an array of different races and cultures. The different races and cultures could be an important influence on the levels of work engagement, and this aspect needs to be determined. Other demographic characteristics could also play an important role, such as gender, age, race, language, marital status, parental status and education levels of employees (Bakker et al., 2003; Coetzee & Rothmann, in press; Duxbury & Higgins, 2003; Naudé and Rothmann, 2004; Schaufeli & Bakker, 2003). It therefore seems important that the relationship between work engagement and demographic characteristics be investigated.

In literature on stress, characteristics of the job (overload, lack of autonomy and support, payment and benefits, career opportunities etc.) are associated with certain outcomes that could influence the functioning of employees. According to De Jonge and Schaufeli (in press), autonomy on the job is linearly associated with job satisfaction in that the more autonomy an employee experiences at work, the more he/she is satisfied with that job. Likewise, skill variety, task identity, task significance and feedback are associated with high quality work performance, low absenteeism and turnover (Schaufeli & Bakker, 2004). Furthermore, work engagement is considered to be positively associated with job characteristics that might be labelled as resources, motivators or energisers, such as social support from co-workers, performance feedback, coaching, job autonomy, task variety, and training facilities (Demerouti et al., 2001; Schaufeli et al., in press). It has also been found that work engagement plays a mediating role between job resources and proactive behaviour in that the availability of job resources increases work engagement, which in turn fosters proactive organisational behaviour (Salanova & Schaufeli, in press). According to Salanova, Grau, Llorens and Schaufeli (2001) work engagement is also positively correlated with self-efficacy. It therefore seems important to investigate which job characteristics contribute to work engagement.

The strain experienced by employees in their work situation as a result of stressful job characteristics may eventually spill over from the work situation to the home domain, causing these two important spheres in an individuals' life to interfere with each other. Greenhaus and

Beutell (1985, p. 77) defines work-home conflict as “a form of conflict in which the role pressures from work and home domains are mutually incompatible in certain respects”.

Despite various studies performed on work-home interaction, research in this field has been characterised by several limitations (Geurts & Demerouti, 2003). Researchers realised that work does not only interfere with home, but that the reverse effect also takes place. It also became clear that work and home could influence each other in a positive way and that research should start to focus on the positive interaction between work and home and not only exclusively focus on the *negative* interference between these two domains. As a result, four dimensions of work-home interaction are found, namely (1) *negative work-home interference (WHI)*, referring to a situation in which negative load reactions built up at work hamper functioning at home; (2) *negative home-work interference (HWI)*, referring to negative load reactions developed at home that impede functioning at work; (3) *positive WHI*, defined as positive load reactions built up at work that facilitate functioning at home; and (4) *positive HWI*, occurring when positive load reactions developed at home and facilitate functioning at work (Geurts et al., 2005)

For a number of years, a significant amount of research has been dedicated to the effects on business when work and personal demands conflict. Some of the influences identified were that the average employee in America misses more than 11 days per year to handle personal and family related matters (Reynolds, 1999). According to Taylor (2000), employees with a better work-life balance make their organisations much more profitable. A better work-life balance reduces absenteeism and the costs of business and it increases productivity. In a study performed by Duxbury and Higgens (2003) on the impact of work-family conflict (WFC) on organisations in Canada, it was estimated that the costs of absenteeism as a result of WFC amounts to \$3.1 billion when work overload was the reason for it, \$830 million as a result of WFC, \$450 million as a result of conflict from the home to work and \$1.1 billion as a result of caregiver strain. On the other hand, research suggests that an investment in comprehensive work/family programmes results in an increase in productivity, enhanced employee retention, improved recruiting, reduced absenteeism and increased job satisfaction (Reynolds, 1999). In the study of Reynolds, the author provides examples where companies have reaped the benefits of what they had sowed financially in work/family programmes. John Hancock Financial Services estimated a payback of \$4.17 for every dollar it invested in

its work/family program. Wyoming realised productivity improvement of 35% during the five years following the implementation of a compressed workweek programme.

According to Sonnentag (2003), employees who feel that they have sufficiently recovered from a previous working day during their leisure time at home experience enhanced levels of work engagement during the subsequent working day. Work engagement is therefore positively correlated with positive WHI. In a similar vein, it was found that high job demands are related to negative WHI (Peeters, Montgomery, Bakker & Schaufeli, 2005). Within the framework of WHI it is plausible to assume that negative WHI may be negatively related to work engagement (Montgomery, Peeters, Schaufeli & Den Ouden, 2003). Montgomery et al. argue that engaged employees are assumed to have a sense of energetic and effective connection with their work activities and they see themselves as able to deal completely with the demands of work. According to Geurts and Demerouti (2003) it is assumed that home demands, such as care responsibilities towards dependants and household tasks can be associated with negative load effects that hamper a persons functioning in the home and work domain. As a result of home demands and limited home resources such as the help of a spouse, negative load reactions are built up which may spill over from the home domain to the work domain. It is therefore plausible to assume that WHI and HWI is related to work engagement.

In a continuously changing environment it is clear that the modern organisation needs a workforce which is characterised by engaged employees. It is also imperative to determine what stimulates work engagement and what its consequences are. For this reason, work engagement needs to be measured in relation to socio demographics, job characteristics and work-home interaction.

The following research questions arise on the basis of the description of the research problem:

- How is work engagement, job characteristics and work-home interaction conceptualised in the literature?
- What is the relationship between work engagement, demographic characteristics, job characteristics and work-home interaction according to the literature?

- What is the relationship between work engagement, demographic characteristics, job characteristics and work-home interaction in a sample of employees in the mining environment?
- What are the characteristics of employees with low and high work engagement with respect to demographic characteristics (i.e., gender, age, race, language, marital status, parental status and education), job characteristics and work-home interaction?
- What future recommendations can be made for future research and practice?

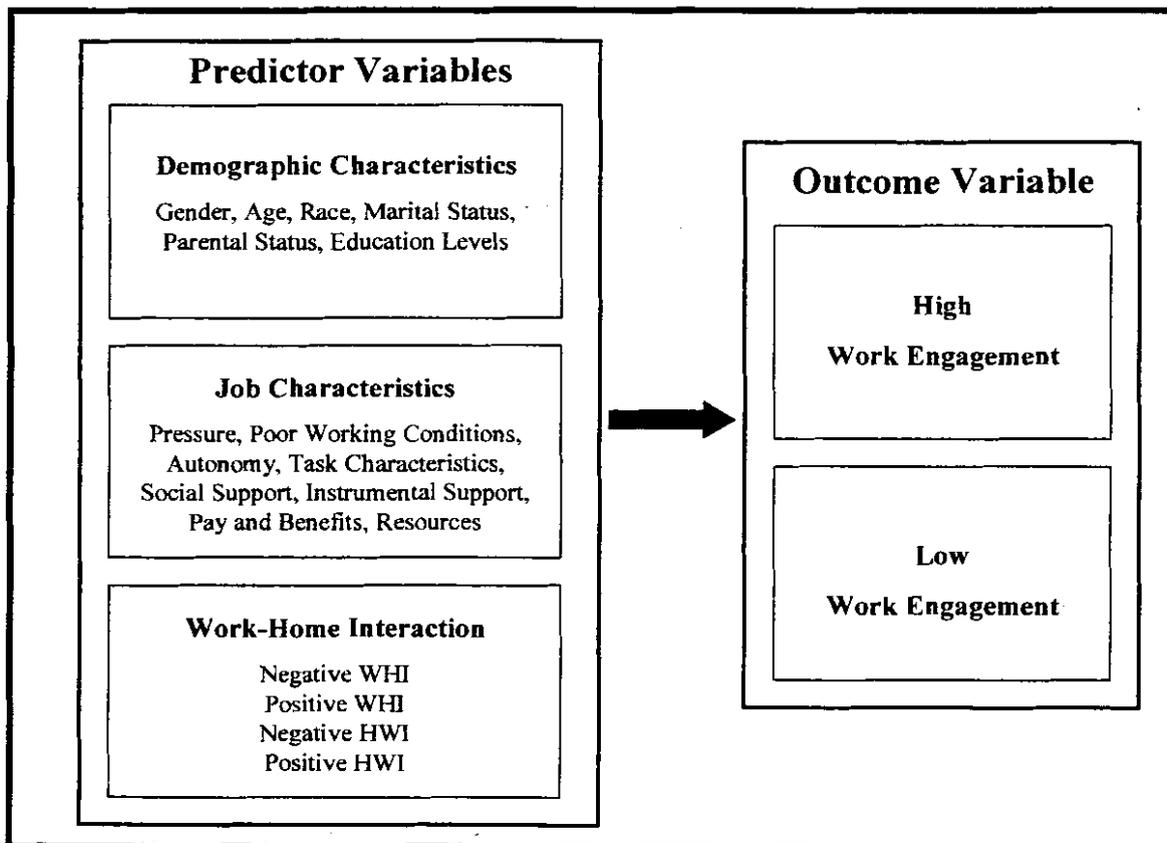


Figure 1. Demographic characteristics, job characteristics, work-home interaction and work engagement.

1.2 RESEARCH OBJECTIVES

The research objectives are divided into a general objective and specific objectives.

1.2.1 General objective

With reference to the above formulation of the problem, the general objective of this research is to establish the relationship between work engagement and demographic characteristics, job characteristics and work-home interaction of employees in the mining industry.

1.2.2 Specific objectives

The specific research objectives are as follows:

The following research follow from the description of the research problem:

- To determine how work engagement, job characteristics and work-home interaction is conceptualised in the literature.
- To establish the relationship between work engagement, demographic characteristics, job characteristics and work-home interaction according the literature.
- To determine the relationship between work engagement, demographic characteristics, job characteristics and work-home interaction in a sample of employees in the mining environment.
- To determine the characteristics of employees with low and high work engagement with respect to demographic characteristics (i.e., gender, age, language, marital status, parental status and education), job characteristics and work-home interaction.
- To make recommendations for future research and practice.

1.3 RESEARCH METHOD

The research method involves a literature review and an empirical study.

1.3.1 Literature review

The literature review focuses on the history and definition of the work engagement construct, as well as its antecedents and correlates. Specific attention is given to the relationship

between work engagement and certain identified demographic characteristics, job characteristics and WHI.

1.3.2 Empirical study

The empirical study involves the research design, participants and procedure, measuring battery and a statistical analysis.

1.3.2.1 Research design

A survey design is used to reach the research objectives. The specific design is the cross-sectional design, by means of which a sample is drawn from a population at one time (Shaughnessy & Zechmeister, 1997). Information collected is used to describe the population at that time. This design can also be used to assess interrelationships among variables within a population. According to Shaughnessy and Zechmeister, this design is ideally suited to the descriptive functions associated with cross-sectional research.

1.3.2.2 Participants and procedure

After approaching various mining companies in the Gauteng, North West and Northern provinces, including gold, platinum and phosphate mines, a random sample ($n = 320$) was taken. The sample comprised of employees from different grade and section levels. The levels ranged from management, to employees working underground. Pre-planned visits with the mining companies were made. After obtaining permission from all the relevant departments concerned, focus group sessions were arranged for the purpose of gathering information on the work environment and factors that might help or hinder employees in doing their job. A selected number of employees participated in the focus groups. After obtaining an idea of what the recurring topics and main concerns of the employees were, the measuring battery was compiled and questionnaires were distributed. A letter was included with the questionnaire explaining the goal and importance of the study. Participants were assured of the confidentiality of the information they provided. Participants were given three weeks to complete the questionnaires, after which they were personally collected or returned by ordinary post.

1.3.2.3 Measuring battery

The following questionnaires are used in this study:

Demographic characteristics. A demographic questionnaire is used to determine the demographical characteristics of the participants working in the mining industry. Characteristics such as gender, ethnicity, age, language, level of qualification, household situation, parental status, as well as the participant's working contract were measured with this questionnaire.

Job characteristics. Focus groups were held in several mining houses to determine the specific job characteristics that employees experience in their work. The responses were analysed and used to develop items for the questionnaire. Principal components extraction was used to determine the number of factors underlying the questionnaire. All items were rated on a four-point scale ranging from 1 (*never*) to 4 (*always*).

Work-home interaction. The *Survey Work-Home Interaction – Nijmegen* (SWING) is used to measure work-home interaction (Geurts et al., 2005). The SWING is a 22-item work-home interference measure and measures four types of work-home interference, namely (1) negative WHI (eight items, e.g. "How often does it happen that you do not have the energy to engage in leisure activities with your spouse/family/friends because of your job?"); (2) positive WHI (five items, e.g. "How often does it happen that you fulfil your domestic obligations better because of the things you have learned on your job?"); (3) negative HWI (four items, e.g. "How often does it happen that you have difficulty concentrating on your work because you are preoccupied with domestic matters"); and (4) positive HWI (five items, e.g. "How often does it happen that you take your responsibilities at work more seriously because you are required to do the same at home?"). All items are scored on a four-point frequency rating scale, ranging from 0 (*never*) to 3 (*always*).

Engagement. The Utrecht Work Engagement Scale (UWES; Schaufeli et al., 2002) is used to measure work engagement and consists of three scales, namely Vigour, Dedication and Absorption. In this study, Vigour and Dedication are the subscales used. Four items are used to measure Vigour (e.g. "I am bursting with energy every day in my work") and five items to measure Dedication ("I am enthusiastic about my job"). The UWES is scored on a seven-

point frequency rating scale, varying from 0 (*never*) to 6 (*always*). Alpha coefficients range from 0,78 to 0,89 (Schaufeli et al., 2002). Storm and Rothmann (2003) obtained acceptable alpha coefficients for the Vigour scale ($\alpha = 0,78$) and Dedication scale ($\alpha = 0,89$) in a sample of 2 396 members of the SAPS.

1.3.2.4 Statistical analysis

The statistical analysis is carried out by means of the SPSS programme (SPSS Inc., 2005) and the AMOS programme (Arbuckle, 2003). Exploratory factor analyses are carried out to determine the construct validity of the job characteristics questionnaire. Confirmatory factor analysis, using the AMOS programme (Arbuckle, 2003), is used to test the construct validity of the SWING and the UWES. The χ^2 statistic and several other goodness-of-fit indices summarise the degree of correspondence between the implied and observed covariance matrices. Descriptive statistics and effect sizes are used to decide on the significance of the findings. Cronbach's coefficient alpha is calculated to assess the internal consistency and reliability of the measuring instruments that have different scoring and response scales (Kerlinger & Lee, 2000). Pearson product-moment correlation coefficients (r) are used to specify the relationship between the relevant variables.

Employees who are respectively low and high in work engagement are compared for demographic characteristics, job characteristics and work-home interaction using χ^2 tests (p values were obtained from Pearson's chi-square tests) en t -tests. Finally, logistic regression analysis is performed to examine if demographic characteristics, job characteristics and work-home interaction are associated with low and high work engagement.

1.4 OVERVIEW OF CHAPTERS

In chapter 2, the history of the work engagement construct and the naissance of its definition are discussed. The antecedents and correlates of work engagement with specific regard to certain identified variables will also be discussed. Chapter 3 deals with the empirical study. The results of the study will be set out in chapter 4 and a discussion and recommendations will follow in chapter 5.

1.5 CHAPTER SUMMARY

This chapter discussed the problem statement and research objectives. The measuring instruments and research method that will be used in this research were explained, followed by a brief overview of the chapters that follow.

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CHAPTER 2

WORK ENGAGEMENT

This chapter focuses on the history of the engagement construct and the naissance of its definition. The antecedents and correlates of work engagement with specific regard to certain identified variables will be discussed. The specific antecedents and correlates used in this study include demographic characteristics, job characteristics and work-home interaction. A brief discussion of certain identified consequences of work engagement will also be given.

2.1 THE HISTORY AND BACKGROUND OF WORK ENGAGEMENT

The focus of research on aspects pertaining to the field of psychology has traditionally predominantly been limited to the study of negative psychological states rather than positive ones. Only recently, researchers started paying attention to the study of the so-called “positive psychology” which focuses on human strengths and optimal functioning (Seligman & Csikszentmihalyi, 2000). According to Seligman and Csikszentmihalyi, the science of positive subjective experiences, positive individual qualities and positive institutions promises to improve the value of life and prevent various pathologies that arise when life is bleak and pointless.

In literature on burnout, research progressed in a similar fashion and started giving meaning to its theoretically-viewed positive antithesis namely work engagement. Two different but related schools of thought assisted in the development of the engagement construct. In the first school, Maslach and Leiter (1997) characterised work engagement by energy, involvement and efficacy which was subsequently labelled as the direct opposites of the dimensions of burnout, namely exhaustion, cynicism and lack of professional efficacy respectively. Their arguments were based on results obtained in a case study on two hospitals, using the Maslach Burnout Inventory (MBI), where low scores on exhaustion and high scores on professional efficacy were obtained.

In 2002, the second school of thought, established by Schaufeli and his colleagues, maintained that even though engagement could still be conceptualised as the positive antithesis of burnout, it cannot be presumed to be the direct opposite through a mere assessment of opposite MBI profile scores (Schaufeli, Salanova, González-Romá & Bakker, 2002). These authors argue that using the same questionnaire to test the concurrent validity of both constructs would have at least two negative consequences. The first is the assumption that when a person is not suffering from burnout he is consequently engaged and, reversibly, when a person is low on engagement he is suffering from burnout (which is factually incorrect). The second is that the relationship between burnout and engagement could not empirically be tested when using the same questionnaire, as it would affect the concurrent validity of both the burnout and engagement constructs. Schaufeli and his colleagues, however, agreed that a part of Maslach and Leiter's (1997) finding was indeed correct when considering that negative correlations are expected between both the burnout and engagement constructs, but argued that burnout and engagement are both distinct concepts that should be assessed independently (Schaufeli & Bakker, 2001).

After conducting a theoretical analysis, Schaufeli and Bakker (2001) found that burnout and engagement are conceptually related, resulting in the identification of two underlying dimensions of work-related well-being namely (1) *activation*, ranging from exhaustion to vigour, and (2) *identification*, ranging from cynicism to dedication. Professional efficacy and absorption, which were also included in the burnout and engagements constructs respectively, could not be considered as direct opposites but rather conceptually distinct aspects that had no antithetical characteristics.

2.2 DEFINITION OF WORK ENGAGEMENT

According to Schaufeli et al. (2002) engaged employees, contrary to those who suffer from burnout, have a sense of energetic and effective connection with their work and see themselves as able to deal with the demands of their job. According to Schaufeli and Bakker (2003), engagement is a positive, fulfilling, work-related state of mind that is characterised by vigour, dedication and absorption. Rather than a momentary and specific state, engagement refers to a more persistent and pervasive affective-cognitive state that is not focused on any particular

object, event, individual, or behaviour. *Vigour* is characterised by high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties. *Dedication* refers to being strongly involved in one's work and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge. *Absorption* is characterised by being fully concentrated and happily engrossed in one's work, in a situation where time passes quickly and one has difficulty detaching oneself from work.

Although engagement is seen as a three-dimensional construct, researchers have recently argued that vigour and dedication are considered the "core dimensions of engagement", while absorption is considered a relevant aspect that plays a less critical role in the engagement concept (Schaufeli et al., 2001; Schaufeli & Bakker, 2001), is considered as a distinct aspect of work engagement (González-Romá, Schaufeli, Bakker & Lloret, in press; Schaufeli, 2005; Schaufeli & Bakker, 2004), rather resembles a state of optimal experience or "flow" (Csikszentmihalyi, 1990) and seems to act as consequence of work engagement. Consequently, researchers are rather inclined to use the core dimensions of engagement (i.e. vigour and dedication) when conducting research on engagement (Montgomery, Peeters, Schaufeli & Den Ouden, 2003).

Maslach, Schaufeli and Leiter (2001) states that engagement should be distinguished from recognised constructs in organisational psychology such as organisational commitment, job satisfaction or job involvement. Whereas organisational commitment refers to an employee's loyalty to the organisation, engagement focuses on the work itself. Job satisfaction similarly, refers to the extent in which work is the source of need fulfilment but does not take into account the employee's relationship with his work. Job involvement is considered to be similar to the aspect of engagement with work, but does not include the energy and effectiveness dimension. Engagement therefore provides a much more intricate and comprehensive perspective on an individuals relationship with his work.

2.3 ANTECEDENTS AND CORRELATES OF WORK ENGAGEMENT

Because the majority of studies performed on the engagement construct have been cross sectional in nature, it should be emphasised that only *possible* causes of work engagement can be

identified (Schaufeli & Bakker, 2003). Although previous studies have identified various antecedents and correlates of work engagement, this study will focus on the relationship of work engagement with demographic characteristics, job characteristics and work-home interaction.

2.3.1 Demographic Characteristics

2.3.1.1 Gender

After conducting Dutch and Flemish studies among different occupational groups, Schaufeli and Bakker (2003) found that men score slightly higher than woman on the dedication and absorption aspects of engagement, but confirmed that no statistical difference in the levels of vigour between the two genders seems to exist. Although the differences with regard to the dedication and absorption element are considered statistically significant, they lacked practical significance because the difference was found to be smaller than one standard deviation. In a South African study performed by Coetzee and Rothmann (in press) to determine differences between the work engagement levels of employees in service of a higher education institution, no statistical significant differences between gender and its relationship with work engagement could be detected. Based on these findings, it is expected that no statistical significant difference regarding the gender of employees would be found in the current study (*Hypothesis 1a*).

2.3.1.2 Age

Schaufeli and Bakker (2003) found that work engagement correlates weakly, but positively with age, where older employees feel slightly more engaged than younger employees. Their finding is confirmed in a study on students, where a weak positive correlation was established between the levels of engagement and age. The older the students, the more they feel engaged. However, the strength of the relationship between engagement and age is very weak and usually does not exceed 0,50 (Schaufeli & Bakker). Research conducted in South Africa between the correlation of engagement levels and age has yielded no statistically significant differences (Coetzee & Rothmann, in press; Barkhuizen & Rothmann, in press). According to Storm (2002), a statistical significant difference exist between age and the three dimensions of engagement, however, none

of these differences are practically significant. It is therefore expected that different age groups will not differ with regards to work engagement (*Hypothesis 1b*).

2.3.1.3 Race

Little international academic attention has been given to the relationship between work engagement and race. International researchers have merely attempted to determine the validity of the UWES as a measuring instrument across different cultures. In a cross-cultural study for students in Spain, Portugal and the Netherlands, it was found that the UWES was factorial valid and that its scales were satisfactorily internally consistent (Schaufeli, Martinez, Pinto, Salanova & Bakker, 2002). However, Naudé and Rothmann (2004) found that the construct equivalence of the scales was not acceptable as a result of the manner in which some of the items on the UWES had been formulated. A study conducted by Storm (2002), on the levels of burnout and engagement amongst police officers in the South African Police Services, found that no practical significant differences were found between race and the three dimensions of work engagement. It could therefore be hypothesised that no differences will exist between different racial groups (*Hypothesis 1c*).

2.3.1.4 Marital status

In a study conducted among 323 working couples in a variety of occupations, it was found that wives' levels of vigour and dedication uniquely contribute to their husbands' levels of vigour and dedication, respectively, even when controlled for several work and home demands (Bakker, Demerouti & Schaufeli, 2005). The same applies to husbands' levels of engagement that are likewise influenced by their wives' levels of engagement. This means that engagement crosses over from one partner to the other, and vice versa. There is currently however, no research available on whether engagement can be correlated positively to an employee's marital status. However, based on the findings of Bakker et al., it is hypothesised that married employees will experience higher engagement, compared to employees who are not married (*Hypothesis 1d*).

2.3.1.5 Parental status

According to Duxbury and Higgins (2003), working parents face a vast amount of challenges in the work place. Their research indicates that employees who take care of dependants are more likely to experience interference between the work and home domain. Their research also indicates that approximately 70% of Canadian woman who have dependant care responsibilities report high levels of work overload, resulting in them being less productive at work. As a result of their dependant care responsibilities these woman are less productive due to an increase in number of days absent, lateness and stress levels. Their findings also indicate that their unproductive levels are compounded further when employees return to work from parental leaves because they struggle to re-adjust to work demands in addition to their family responsibilities.

However, according to Peeters et al. (2005), merely having children does not matter so much in assessing mental or home demands. They submit that it is the extent to which having children contributes to quantitative, emotional, and/or mental home demands that counts. This argument is substantiated when a person considers that certain children demand a substantial amount of attention and time from their parents, which might result in parents having certain time-related conflicts. In a similar vein, certain parents are pre-occupied by worries relating to their children, which might contribute to the experience of increased emotional demands at home. There is however, no research currently available on the relationship between the engagement levels of employees and their parental status. The various positive and negative dimensions of parental status will have to be investigated before such a correlation can be made. Therefore, it is expected that no differences will exist between employees who have children, compared to those who do not have children (*Hypothesis 1e*).

2.3.1.6 Education levels

Little information is available regarding the relationship between the levels of education and work engagement. Storm (2002) found no statistically or practically significant differences between the three work engagement dimensions and levels of education. In contrast, Gilbert

(2001) found that highly educated workers tend to be more absorbed in their work. This viewpoint was confirmed by Barkhuizen and Rothmann (in press), where it was found that academics in possession of a doctoral degree were more absorbed in their jobs than those with a four-year degree or honours. It is therefore predicted that employees with a higher education will experience higher levels of engagement compared to individuals with a lower education (*Hypothesis 1f*).

2.3.2 Job Characteristics

One of the models used to examine the influence of job characteristics on occupational outcomes is the Job Demands-Resources (JD-R) model (Bakker, Demerouti, De Boer & Schaufeli, 2003; Demerouti et al., 2001). The JD-R model proposes that job characteristics are prearranged in two categories, namely job demands and job resources. According to Demerouti et al. (2001), job demands refer to the aspects of the job that require physical and/or mental effort and are therefore associated with certain psychosocial and/or psychological costs. Job resources, on the other hand, refer to those physical, psychological, social or organisational features of the job that (1) are purposeful in achieving work goals; (2) decrease job demands and the associated physiological and psychological costs; or (3) encourage personal growth and development. The task itself may consist of resources (e.g. performance feedback, skill variety, task significance, task identity, autonomy; Hackman & Oldham, 1976), organisational resources (e.g. career opportunities, job security, salary) and social resources (e.g. supervisor and co-worker support and team climate). According to Demerouti et al. adequate resources will cause a reduction in physiological and/or psychological costs and will also stimulate personal growth and development.

According to Bakker, Demerouti and Schaufeli (2003), job demands and job resources have different influences on work-related outcomes. It has been found that job demands may lead to the infringement of health in that it exhausts an individual's mental, emotional and physical resources. This exhaustion of resources may further lead to the depletion of energy and to health-related problems (e.g. Demerouti et al., 2001; Lee & Ashforth, 1996; Leiter, 1993). Job resources, on the other hand, may lead to a motivational process, where the presence of sufficient

job resources reduces job demands, promotes the accomplishment of goals and encourages personal growth and development. In turn, this may result in an individual feeling more committed to the organisation and dedicated to his/her work. Researchers have found that job demands are the main predictors of burnout, while the existence of job resources determines the levels of work engagement (Demerouti et al., 2001; Schaufeli & Bakker, 2004).

Internationally, it has been found that work engagement is positively correlated with positive job characteristics which might be labelled as resources, motivators or energisers. Job resources, according to Schaufeli and Salanova (in press), are those aspects of the job that have the capacity of reducing job demands, are purposeful in achieving goals in the workplace and may stimulate individual development. Various other aspects relating to job characteristics such as social support from co-workers and superiors, performance feedback, training, job autonomy, task variety, and training facilities have all shown to contribute positively to the levels of engagement of employees (Demerouti et al., 2001; Salanova et al., 2003; Schaufeli & Bakker, 2004). More recently Salanova and Schaufeli (in press) found in a Dutch and a Spanish employee sample that work engagement plays a mediating role between job resources and proactive behaviour. It was similarly found that the availability of job resources increases work engagement which in turn fosters proactive organisational behaviour.

In a study conducted amongst employees from a pension fund company, Bakker, Euwema and Van Dieren (in press) confirms that social support from colleagues and job autonomy are positively related to levels of engagement. These researchers also found that engaged employees are able to mobilise and utilise resources more effectively. It is therefore clear that the higher the availability of job resources, the higher the level of work engagement. It is interesting to note that some individuals, regardless of their high job demands and long working hours, seem to find pleasure in hard work and dealing with job demands (Schaufeli & Bakker, 2001).

In a study conducted by Mostert, Cronje and Pienaar (2006), it was found that the availability of job resources may help police officers cope with the demanding aspects of their work and simultaneously stimulate them to learn from, and grow in their job. It was found that the presence of support from the organisation, advancement possibilities, growth opportunities and

socialising with colleagues at work lead police officers to higher energy levels (vigour) and more dedication to the job and organisation. According to Mostert (2006), job control, and especially job support, contributes toward work engagement. Based on these findings, it is expected that job resources will be associated with individuals who experience high work engagement (*Hypothesis 2a*) while job demands will not be associated with work engagement (*Hypothesis 2b*)

2.3.3 Work-Home Interaction

One of the models used to illustrate the fundamental operation of work-home interaction is the Effort-Recovery (E-R) model (Meijman & Mulder, 1998). The E-R model is useful in describing how work and private life may possibly interact with each other and which aspects of these two life domains may affect the well-being of an individual during the interaction process (Geurts et al., 2003). The E-R model suggests that exposure to mental or physical workload requires effort, which is furthermore associated with short-term psycho-physiological reactions such as an accelerated heart rate, increased hormone secretion and mood changes. As a result of the effort utilised in dealing with workload, specific “load reactions” develop within an individual’s physiological, behavioural and subjective levels. In principle, these reactions are reversible when the exposure to workload ceases and the functional systems that were activated become stable again. The E-R model clearly provides a promising perspective on negative work-home interaction in light of the fundamental role of the recovery process. The same perspective may also increase the understanding of positive work-home interaction, since effort expenditure may also be accompanied by positive load reactions. For example, when individuals are able to keep their effort investments within acceptable limits by making the most use of available job resources, energy resources may be reloaded rather than depleted.

The importance of recovery in the home domain is likewise important. According to Geurts et al. (2005), activities that require high effort investment (e.g. household tasks or child care activities) and which are associated with insufficient recovery periods (e.g. relaxing in front of the television set or a lack of sleep) may result in the activation of a downward spiral. Therefore, when an individual has failed to properly recover from previous effort investment, and additional

effort is required to perform in accordance with new demands faced at home, it may increase the accumulation of negative load effects. It is therefore clear that effort investments at home should be used within acceptable limits just as in the case of effort expenditure at work. Job and home settings that enable individuals to self-regulate their effort investment offer the prospect of gaining positive experiences, yielding positive load reactions that spill over to the other domain (home or job) (Bakker & Geurts, 2004; Rothbard, 2001).

Work-family conflict has originally been defined by Greenhaus and Beutell (1985, p.77) as “a form of interrole conflict in which role pressures from the work and family domains are mutually incompatible, such that participation in one role makes it difficult to participate in the other”. Despite various studies performed on WHI, research in this field has been characterised by several limitations (Geurts & Demerouti, 2003). First of all, researchers realised that work does not only interfere with home, but that the reverse effect can also take place (e.g. home interfering with work). Secondly, it became clear that work and home could also influence each other in a positive way and that research should start to focus on the positive interaction between work and home and not only exclusively focus on the *negative* interference between these two domains.

As a result of this new focus, Geurts et al. (2005) formulated a definition based on the E-R model (Meijman & Mulder, 1998) and subsequently define the work-home interface concept as an interactive process in which a worker’s functioning in one domain (e.g. home) is influenced by negative or positive load reactions that have built up in the other domain (e.g. work). Based on this definition, work-home interaction comprises of four dimensions: (1) negative work-home interference (WHI), which refers to a situation in which negative load reactions built up at work, hamper a person’s functioning at home; (2) negative home-work interference (HWI), referring to negative load reactions developed at home that fetters a person’s functioning at work; (3) positive WHI, defined as positive load reactions built up at work that facilitates functioning at home; and (4) positive HWI, occurring when positive load reactions developed at home facilitates functioning at work.

2.3.3.1 Positive WHI

The study of Montgomery et al. (2003) found a statistically significant relationship between positive WHI and the dedication dimension of work engagement. They also found that employees who take positive experiences from work to their home domain show higher levels of work engagement than those who do not carry positive experiences between the two different life domains. According to Geurts and Demerouti (2003), sufficient resources at work facilitate an employee's functioning in the home domain. Therefore, when existing job resources are sufficient to deal with high job demands, individuals may be stimulated to learn from and grow in their jobs and energy will be mobilised rather than depleted, facilitating positive spill-over to the home domain. Bakker and Geurts (2004) have shown that positive work-related states (e.g. intrinsic motivation and work-related happiness) have a positive influence on a person's private life, as employees return home happily after a successful day at work. Therefore, if a husband comes home during a working day in a positive state, for example, he is more enthusiastic to take care of household errands, giving his wife an opportunity for recovery – a prerequisite for her work engagement during the next day (Sonnentag, 2003).

Similarly, in a South African study performed by Mostert (2006), it was found that positive WHI is positively correlated with work engagement. Mostert et al. (2006) also found support for a positive correlation between positive WHI and engagement. Based on these findings, it is expected that positive WHI will be positively correlated with high work engagement (*Hypothesis 3a*).

2.3.3.2 Negative WHI

Geurts and Demerouti (2003) have found that job demands that require too much effort and time to fulfil the job requirements of an employee, and without the accompaniment of sufficient resources, may result in his/her energy and time resources being depleted. A chronic lack of resources may result in a negative interference of work with family life which implies more effort expenditure in the long run (Bakker & Geurts, 2004). Consequently a cumulative process is started that may seriously affect the health and well-being of an individual

(Geurts et al., 2005). An individual with feelings of fatigue and impaired functioning will subsequently experience lower levels of work engagement (Mostert, 2006). Mostert also found that negative WHI is related to lower levels of work engagement. According to Mostert and Oosthuizen (2006) it was found that nurses who experience high time-related demands and too much pressure such as having work left to do when they leave the job, have difficulties in combining their work and home lives and experience a negative interference from work to home. Based on these results, it is expected that negative WHI will be associated with lower levels of work engagement (*Hypothesis 3b*).

2.3.3.3 Positive HWI

In a study on employees of six service organisations, Sonnentag (2003) found support for a positive effect of recovery on work engagement and proactive organisational behaviour. The study furthermore reflects that employees who recover during their leisure time are not only more engaged the following day, but show more personal initiative at work. Geurts et al. (2005) point out that when an individual has sufficient time to recover from demands faced at home such as household tasks and child care responsibilities, the individual is able to invest more time and energy to complete tasks. A home setting that permits an individual to self-regulate effort expenditure offers the possibility of gaining positive experiences that may spill-over in the work domain (Bakker & Geurts, 2004; Rothbard, 2001). According to Mostert (2006), individuals who have sufficient time to recover will feel more revitalised and motivated, leading to an experience of higher levels of engagement during the next working day. It is therefore predicted that positive HWI will be related to higher levels of work engagement (*Hypothesis 3c*).

2.3.3.4 Negative HWI

Research in the work/non-work field consistently shows that negative influence from work (negative WHI) is more ubiquitous than negative influences from home (negative HWI; Burke & Greenglass, 1999; Demerouti, Geurts & Kompier, 2004; Frone, Russell & Cooper, 1992). This is mainly because many employees find it difficult in combining work and domestic obligations. According to Geurts and Demerouti (2003) it is assumed that home demands, such as care

responsibilities towards dependants and household tasks, that require too much effort and time, are associated with negative load effects that hamper a persons functioning in the home domain. When these demands are accompanied by a lack of recovery time, a downward spiral may exist, causing the expenditure of additional effort. When negative load effects experienced at home start building up in an individual's private life, it may result in a spill over at work, causing the home domain to negatively interfere with the work domain which could lead to lower levels of engagement during the subsequent working day.

According to Mostert (2006) and Mostert et al. (2006), a chronic lack of resources at home, accompanied with insufficient recovery time at work may subsequently result in a sub-optimal individual experiencing lower levels of engagement. Consequently it is predicted that negative HWI will lead to lower levels of work engagement (*Hypothesis 3d*).

2.4 CONSEQUENCES OF WORK ENGAGEMENT

Various researchers have concluded that work engagement results in certain specific positive outcomes which is relevant for the optimal functioning of employees in their organisations (Schaufeli & Salanova, in press). These outcomes have been identified as a result of the positive attitudes that employees have towards their work and organisations. A positive correlation between work engagement and various recognised constructs in organisational psychology such as job satisfaction, organisational commitment, and low turnover intention (Demerouti et al., 2001; Salanova, Schaufeli, Llorens, Peiro & Grau, 2000; Schaufeli, Taris & Van Rhenen, in press) has been made. Further positive correlations have also been made with specific regard to positive organisational behaviour such as personal initiative and learning motivation (Demerouti et al., 2001), proactive behaviour (Sonnetag, 2003), low levels of depression and distress (Schaufeli et al., in press) and psychosomatic complaints (Demerouti et al., 2001). Taken together, these results suggest that engaged workers are able and willing to "go the extra mile" (Schaufeli & Salanova, in press).

After some 30 in-depth interviews aimed at shedding more light on the defining characteristics of engaged employees were conducted, Schaufeli et al. (2001) found that engaged workers 1) are

active agents who utilise their own initiative for the purpose of providing direction in their lives, 2) generate their own positive feedback, 3) are also engaged outside their working environments, 4) have the same values than that of the organisation, 5) also feel tired 6) and are not workaholics.

In light of the above it has been shown that work engagement does not only have various causes but also various consequences. It follows logically that work engagement, in particular, is a concept relevant for positive work behaviour and employee well-being.

2.5 CHAPTER SUMMARY

This chapter discussed work engagement. Firstly, the history and the establishment of the definition of the work engagement construct were presented. The antecedents and correlates of work engagement with specific regard to certain demographic characteristics, job characteristics and work-home interaction were also given. Specific positive and negative relationships between work engagement and demographic characteristics were given. A positive relationship between job resources and work engagement was also identified. This was followed by an in-depth discussion into the relationship between engagement and the four dimensions of work-home interaction. Finally, possible consequences of work engagement were discussed.

The first objective has thus been accomplished, namely to determine how the literature conceptualises work engagement, job characteristics and work-home interaction and to establish the relationship between work engagement, demographic characteristics, job characteristics and work-home interaction. Chapter 3 focuses on the empirical study.

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CHAPTER 3

EMPIRICAL STUDY

In this chapter, the method employed for the empirical study will be discussed. The choice and compilation of the study population, measuring battery, administration and scoring of the measuring instruments, as well as relevant statistical analyses will be given.

3.1 PARTICIPANTS

A cross-sectional survey design was used to achieve the objectives of this research. Random samples ($n = 320$) were taken from various gold, platinum and phosphate mining houses in the Gauteng, North West and Limpopo provinces. Participants included employees of different Patterson grade levels (B2-E2), ranging from employees appointed as managers to employees working underground.

Table 1 provides an indication of the characteristics of the participants in the study.

Table 1

Characteristics of the Participants

Item	Category	Frequency	Percentage
Gender	Male	254	79,90
	Female	64	20,10
	Missing values	2	0,60
Race	Caucasian	182	56,90
	African	129	40,30
	Missing values	3	0,90
Language	Afrikaans	148	46,30
	African languages	128	40,00
	English	41	12,80
	Missing values	3	0,90
Age	22-29 years	42	13,10
	30-39 years	126	39,40
	40-49 years	104	32,50
	50-69 years	43	13,40
	Missing values	4	1,30
Marital status	Married	73	22,70
	Not married	244	76,30
	Missing values	3	0,90
Level of qualification	Secondary education	192	59,90
	Tertiary education	122	38,10
	Missing values	6	1,90

According to Table 1, 79,90% of the participants were males, of which 56,90% were Caucasian and 40,30% African. In total, 148 (46,30%) of the participants were Afrikaans-speaking, while 128 (40,00%) of the participants spoke African languages. In total, 244 (76,30%) of the participants were not married (either single or divorced) and 73 (22,70%) were married. A total of 192 (59,90%) of the participants had a secondary educational qualification (grade 12 or lower), while 122 (38,10%) had a tertiary education qualification. The majority of the participants were between the ages of 30 to 49 years old.

3.2 MEASURING BATTERY

In this section, the development and rationale, administration and scoring, validity and reliability and motivation for use of the measuring instruments are discussed.

3.2.1 The Utrecht Work Engagement Scale

The Utrecht Work Engagement Scale (UWES; Schaufeli, Salanova, González-Romá & Bakker, 2002) was used to measure work engagement. The development and rationale, administration and scoring, validity and reliability and motivation for using the UWES are presented below.

3.2.1.1 Development and rationale of the UWES

Arguing that work engagement cannot be effectively measured by using the opposite scores of the Maslach Burnout Inventory (MBI), Schaufeli, Salanova et al. (2002) developed a self-report questionnaire (the UWES) to assess work engagement. The UWES includes all three constituting aspects of work engagement, namely vigour, dedication, and absorption. Originally, the UWES included 24 items, while a large part of the vigour-items and dedication-items were positively rephrased MBI-items. These reformulated MBI-items were subsequently supplemented with original vigour and dedication items and new absorption items, to constitute the UWES-24.

After psychometric evaluation in two different samples of employees and students, seven items appeared to be unsound and were therefore eliminated, resulting in a 17-item questionnaire: six vigour items, five dedication items, and six absorption items (Schaufeli, Salanova et al., 2002). The items concern aspects such as “At my work I am bursting with energy” (vigour); “I am enthusiastic about my job” (dedication); and “I am immersed in my work” (absorption). Individuals who score high on vigour are usually considered to have much energy and stamina when working, whereas those who score low on vigour have less energy and stamina as far as their work is concerned. Those who score high on dedication are considered to be able to strongly identify with their work because it is experienced as meaningful, inspiring, and challenging, and they usually feel enthusiastic and proud about

their work. Those who score low feel neither enthusiastic nor proud about their work. Individuals who score high on absorption feel that they usually are contentedly captivated in their work in that they have difficulties detaching from it because it carries them away. Those who score low on absorption do not feel engrossed or immersed in their work; neither do they have difficulty to detach from it. The three subscales contained in engagement assists in assessing the different aspects of work engagement.

3.2.1.2 Administration and scoring of the UWES

The UWES takes about 5 to 10 minutes to complete and may be used for individual assessment as well as for group assessment. The instruction at the top of the UWES test form guides the participant to indicate how often, if at all, he or she experiences the aspects described in each item. The participant is subsequently requested to indicate next to each statement an answer between 0 (*never*) and 6 (*every day*) that best describes how frequently he or she feels that way. The UWES has furthermore been designed to avoid bias that might result from specific connotations related to the term “work engagement”. The title therefore reads: “*Work & Well-being Survey*” with UWES between parentheses.

The mean scale score of the three UWES subscales is computed by totalling the scores on the particular scale (vigour, dedication and absorption) and dividing the sum by the number of items of the subscale involved. A similar procedure is then followed for the total score. Hence, the UWES yields three subscale scores and/or a total score that result in an answer between 0 and 6.

3.2.1.3 Reliability and factorial validity of the UWES

Recent confirmatory factor-analytic studies confirmed the factorial validity of the UWES (Schaufeli, Bakker, Hoogduin, Schaap & Kladler, 2001; Schaufeli, Martinez, Pinto, Salanova & Bakker, 2002; Schaufeli, Salanova et al., 2002). The findings of a cross-cultural study regarding the UWES for undergraduate students ($n = 314$) in Spain, Portugal and the Netherlands, confirmed internal consistency results for the three subscales of the UWES. However, factor loadings of absorption were found to be invariant across all samples, while factor loadings of vigour were invariant for only two of the three student groups. The sample comprising of the students as well as a sample of employees ($n = 619$), showed adequate

Cronbach alphas as follows: Vigour, $\alpha = 0,68$ and $0,80$; Dedication, $\alpha = 0,91$ for both samples and Absorption, $\alpha = 0,73$ and $0,75$. In the student sample, the Cronbach alpha value for the total scale was improved after three items were eliminated ($\alpha = 0,79$). Also, the fit of the hypothesised three-factor model was found to be superior to the one-factor solution (Schaufeli, Salanova et al., 2002; Maslach, Schaufeli & Leiter, 2001).

Storm and Rothmann (2003), Naudé and Rothmann (2004) and Coetzee and Rothmann (in press) studied the factorial validity and internal consistency of the UWES in South Africa. In their study, Storm and Rothmann found that a re-specified one-factor model (after deleting items 3, 11, 15 and 16) fitted the data the best in their random, stratified sample of police members. Although a re-specified three-factor model was also initially tested and satisfactory results obtained, the fit with the data was superior for a one-factor model. Internal consistencies of the three subscales were $0,78$ (Vigour); $0,89$ (Dedication) and $0,78$ (Absorption). Naudé and Rothmann found a two-factor model of work engagement, consisting of Vigour/Dedication and Absorption. The Cronbach alpha coefficient of the Vigour/Dedication scale was acceptable ($\alpha = 0,87$), but the coefficient for the Absorption scale was doubtful ($\alpha = 0,61$). Coetzee and Rothmann confirmed the validity of the three-factor structure of the UWES and found that the internal consistency of the scales was indeed satisfactory with vigour ($\alpha = 0,84$), dedication ($\alpha = 0,88$) and absorption ($\alpha = 0,87$).

As a result of the recent shift of research to the field of the so-called “positive” organisational psychology and the subsequent development of the UWES (Schaufeli, Salanova et al., 2002) not many studies have been conducted regarding the levels of work engagement among employees. Of the few studies that have been performed however, a number of validity studies were carried out to examine the relationship between work engagement, burnout and workaholism as well as to identify possible causes and consequences of work engagement. Although differently correlated, all three dimensions of work engagement was found to be negatively related to burnout (Salanova, Schaufeli, Llorens, Pieró & Grau, 2000; Demerouti et al., 2001; Schaufeli, Salanova et al.; Schaufeli, Martinez, et al., 2002; Montgomery, Peeters, Schaufeli & Den Ouden, 2003; Schaufeli & Bakker, in press). Work engagement was found to be hardly related to workaholism (Schaufeli, Taris & Van Rhenen, in press).

Possible causes of work engagement were found to be job resources (Demerouti et al., 2001; Salanova, Grau, Llorens & Schaufeli, 2001; Salanova, Llorens, Cifre, Martinez & Schaufeli,

2003; Schaufeli et al., in press; Schaufeli & Bakker, in press; Bakker, Euwema & Van Dieren, in press; Mostert, Cronje & Pienaar, 2006), the extent to which an employee recovers from a previous working day (Sonnentag, 2003), self-efficacy (Salanova et al., 2001), and the extent to which an employee takes positive feelings from work to home (Montgomery et al., 2003). Consequences of work engagement were found to be a positive spillover of engagement from one working spouse to the other (Bakker, Demerouti & Schaufeli, 2005), an increased ability of an employee to mobilise job resources better (Bakker, Salanova, Schaufeli & Llorens, in press), positive attitudes towards an organisation such as job satisfaction, organisational commitment and lower turnover intention (Demerouti et al., 2001; Salanova et al., 2000; Schaufeli & Bakker, in press; Schaufeli et al., in press), better health (Schaufeli et al., in press; Demerouti et al., 2001) and a positive organisational service climate that leads to customer satisfaction (Salanova, Agut, & Peiró, in press).

Work engagement has been found to play a mediating role between job resources and positive work attitudes (Schaufeli & Bakker, in press; Hakanen, Schaufeli & Bakker, in press), service climate and job performance (Salanova et al., in press) and proactive organisational behaviour (Sonnentag, 2003). Work engagement has also been found to occur in groups and not only amongst individuals (Salanova et al.; Bakker & Schaufeli, 2001).

3.2.1.4 Motivation for using the UWES

The UWES is the most widely-used and well-validated self-report questionnaire on work engagement. It has been shown to be a valid and reliable indicator of work engagement. In addition to the new trend of organisations, in focusing their attention on their most valuable asset (employees), the UWES will assist in guiding management's attention to the problematic areas of an organisation's functioning by sustaining the positive aspects associated with work engagement and addressing the negative aspects through active intervention and change.

3.2.2 The Job Characteristics Questionnaire

To determine the specific job characteristics that employees experienced in their work, several focus group sessions were held in the respective mining houses. Within the focus

groups, specific factors that hindered or assisted employees in doing their work were identified and analysed. Three major job demands (pressure, poor working conditions and job insecurity) and six job resources (autonomy, task characteristics, social support, instrumental support, pay and benefits and general resources) were identified.

The items for pressure, autonomy and support were derived from existing questionnaires and measured on a four-item scale ranging from 1 (*almost never*) to 4 (*always*). Items for *Pressure* were derived from the Job Content Questionnaire (JCQ; Karasek, 1985) (seven items, e.g. "Do you have enough time to get the job done?"). *Autonomy* was measured by seven items from the validated questionnaire on experience and evaluation of work (Van Veldhoven, Meijman, Broersen & Fortuin, 1997) (e.g. "Can you take a short break if you feel that it is necessary?"), with higher scores denoting a higher level of autonomy. *Social support* was measured with items addressing support from the JCQ (nine items, e.g. "Can you count on your colleague when you come across difficulties in your work?"; "My supervisor is helpful in getting the job done").

The other demands and resources were measured using self-developed items: poor working conditions (eleven items, e.g. "Are you exposed to health risks in your work environment such as HIV/Aids, tuberculosis, gasses, etc.?"), job insecurity (three items, e.g. "Do you need to be more secure that you will be working in one year's time?"), task characteristics, (six items, e.g. "Do you have enough variety in your work"), instrumental support (six items, e.g. "Do you receive sufficient technical support to complete your tasks?"), pay and benefits (five items, e.g. "Does your job offer you the possibility to progress financially?") and general resources (seven items, e.g. "Is material (i.e., equipment) available when you need it?"). All items were scaled on a four-point scale, ranging from 1 (*never*) to 4 (*always*).

3.2.3 The Survey Work-Home Interaction Nijmegen (SWING)

In this section, the development and rationale, administration and scoring, validity and reliability and motivation for using the Survey Work Home Interaction Nijmegen (SWING) will be discussed.

3.2.3.1 Development and rationale of the SWING

The SWING is a self-report questionnaire, developed by Geurts et al. (2005) at the Radboud University in Nijmegen, the Netherlands, to measure the four dimensions of work-home interaction. The Effort-Recovery (E-R) model (Meijman & Mulder, 1998) provided the theoretical basis for the development of this instrument. The E-R model presupposes that recovery plays an important role in the interaction of demands between an individual's work and private-life domains.

In developing the SWING, Geurts et al. (2005) defined its dimensions using theory-guided definitions and distinguished between the *direction* of influence (work to home influence vs. home to work influence) and the *quality* of influence (negative vs. positive). Consequently, four types of work-home interaction were established, namely (1) *negative WHI*, when negative load reactions that have been built up at work as a result of specific job demands coupled with a lack of resources, hamper an individual's functioning at home; (2) *positive WHI*, when positive experiences at work facilitate an individual's functioning at home; (3) *negative HWI*, when negative load reactions developed at home as a result of a lack of resources and strenuous demands impede an individual's functioning at work; and (4) *positive HWI*, when positive experiences developed at home facilitate and individuals functioning at work (Geurts et al.).

An item pool was subsequently generated and evaluated which resulted in a 27-item questionnaire of which 17 items were newly developed. Negative WHI was measured by five strain-based items (e.g. "You do not fully enjoy the company of your spouse/family/friends because you worry about your work?") and four time-based items (e.g. "Your work schedule makes it difficult for you to fulfil your domestic obligation?"). Positive WHI was measured by mostly self-developed items which tapped the spillover of positive mood developed at work to the home domain (two items, e.g. "After a pleasant working day/working week, you feel more in the mood to engage in activities with you spouse/family/friends?"), as well as the transfer of skills learned at work that improve functioning at work (four items, e.g. "You are better to keep your appointments at home because your job requires this as well?"). Negative HWI was measured by adapted and self-developed items (six items, e.g. "You do not fully enjoy your work because you worry about your home situation?"). Positive HWI was measured by predominantly self-developed items which captured the spill over of positive

mood developed at home to the work domain (two items, e.g. "After spending time with your spouse/family/friends, you go to work in a good mood, positively affecting the atmosphere at work?"), as well as the transfer of skills learned at home that facilitate functioning at work (four items, e.g. "You manage your time at work more efficiently because at home you have to do that as well?") (Geurts et al., 2005). The items are divided into a 4-response format questionnaire varying from 0 (*never*) to 3 (*always*).

3.2.3.2 Administration and scoring of the SWING

The SWING questionnaire takes about 10 to 15 minutes to complete and may be used to assess individuals as well as groups. The instruction at the top of the SWING test form guides the participant to indicate how often, if at all, he or she experiences the aspects described in each item. The participant is subsequently requested to indicate an answer next to a response category by marking a cross over a numerical number that best describes how frequently he or she feels that way. The numbers reflected on the questionnaire are between 0 (*never*) and 3 (*always*). The title of the questionnaire is "SWING" and no reference to work-home interaction is made, in order to avoid answering bias.

The mean scale score of the four SWING subscales is computed by totalling the scores on the particular scale (negative WHI, positive WHI, negative HWI and positive HWI) and dividing the sum by the number of items of the subscale involved. A similar procedure is then followed for the total score. Hence, the SWING yields three subscale scores and/or a total score that result in an answer between 0 and 3.

3.2.3.3 The validity and reliability of the SWING

In order to determine the psychometric properties of the SWING, Geurts et al. (2005) examined the internal and external validity of the SWING using data obtained from five cross-sectional studies conducted among employees from five different service and manufacturing organisations ($n = 2\,472$). Confirmatory factor analyses provided strong support for the four-dimensional structure of the SWING. However, five items had to be omitted, which resulted in a final questionnaire consisting of 22 items, of which 13 items were newly developed. The four dimensional structure proved to be theoretically and empirically distinct as well as invariant across all five samples. This provided evidence

regarding the SWING's robustness and functionality. In South Africa, the four-dimensional structure of the SWING was confirmed for the earthmoving equipment industry (Pieterse & Mostert, 2005) and the nursing profession (Van Tonder & Mostert, in press).

Regarding the internal consistency of the SWING, Geurts et al. (2005) found the four SWING scales to be reliable with acceptable Cronbach alpha coefficients for negative WHI ($\alpha = 0,84$), positive WHI ($\alpha = 0,75$), negative HWI ($\alpha = 0,75$) and positive HWI ($\alpha = 0,81$). Reliable Cronbach alpha coefficients are also reported in South African studies. Pieterse and Mostert (2005) reported sufficient Cronbach alpha coefficients (negative WHI $\alpha = 0,87$; positive WHI $\alpha = 0,79$; negative HWI $\alpha = 0,79$; positive HWI $\alpha = 0,79$), as well as Van Tonder and Mostert (in press) (negative WHI $\alpha = 0,86$; positive WHI $\alpha = 0,67$; negative HWI $\alpha = 0,81$; positive HWI $\alpha = 0,78$) and Mostert and Oldfield (in press) (negative WHI $\alpha = 0,90$; positive WHI $\alpha = 0,74$; negative HWI $\alpha = 0,78$; positive HWI $\alpha = 0,77$). In a sample of police officers, Marais and Mostert (in press) also confirmed the reliability of all four scales for the SWING and found acceptable Cronbach alpha coefficients for negative WHI ($\alpha = 0,90$), positive WHI ($\alpha = 0,84$), negative HWI ($\alpha = 0,87$) and positive HWI ($\alpha = 0,82$).

3.2.3.4 Motivation for using the SWING

Instruments that measure both negative and positive interaction between the work and home domain are largely absent (Geurts, et al., 2005). At present, only two instruments exist that measure negative and positive interference from work and home, namely Geurts et al. and Grzywacz and Marks (2000). However, critique against Grzywacz and Marks's instrument is that it tends to confound negative work-home spillover with proposed antecedents (Geurts et al.). To the contrary, the SWING is a theory-based instrument that measures both the *direction* of influence (work to home interaction vs. home to work interaction), as well as the *quality* of influence (negative vs. positive) in a person's life.

Several studies in Europe (e.g. Bakker & Geurts, 2004; Demerouti, Geurts, & Kompier, 2004; Montgomery et al., 2003; Peeters, Montgomery, Bakker, & Schaufeli, 2005) and also South Africa (e.g. Koekemoer & Mostert, 2006; Mostert, 2006; Mostert et al., 2006; Mostert & Oosthuizen, 2006) used the SWING to assess work-home interaction. This is also the only work-home interaction instrument of which the psychometric properties (construct validity,

construct equivalence and reliability) have been extensively researched in the South African context (Mostert).

As a result of numerous tests and modifications, the SWING has been transformed into a reliable measuring instrument. Research has confirmed a positive effect on company profits where organisations have invested in better work-life situations for their employees (Reynolds, 1999; Taylor, 2000). By using the SWING, organisations will gain insight into the interaction process between work and the private-lives of their employees. This will allow organisations to address the necessary pre-requisites for the interaction process to be one that is healthy in nature, benefiting not only the organisation but also the employee.

3.3 RESEARCH PROCEDURE

After approaching various mining companies in the Gauteng, North West and Northern provinces, including gold, platinum and phosphate mines, a random sample ($n = 320$) was taken. The sample consisted of employees from different grade and section levels. The levels ranged from management, to employees working underground. Pre-planned visits with the mining companies were made. After obtaining permission from all the relevant departments concerned, focus group sessions were arranged for the purpose of gathering information on the work environment and factors that might help or hinder employees in doing their job. A selected number of employees participated in the focus groups. After obtaining an idea of what the recurring topics and main concerns of the employees were, the measuring battery was compiled and questionnaires were distributed. A letter to explaining the goal and importance of the study was included with the questionnaire. Participants were assured of the confidentiality of the information they provided. Participants were given three weeks to complete the questionnaires, after which they were personally collected or returned by ordinary mail.

3.3.1 Negotiations with management

Before commencing with the research, a meeting with the respective management officials of the mining houses were scheduled. The purpose was to obtain approval for the conducting of the research. After discussing the research proposal with them, their approval and

commitment towards the study were obtained. It was also decided that feedback would be given to management in the form of a general, anonymous report, as well as to individuals who indicated that they were interested in receiving feedback. Dates were subsequently set to administer the measuring instruments.

3.3.2 Administration of the measuring instruments

After explaining the purpose as well as the objectives of the research, the participants were assured that all results would be treated with the necessary confidentiality. It was made clear that the confidential aspect of the study would be treated with meticulous respect and that no employee would be negatively affected by the results obtained from the measuring battery.

It was also stressed that the process was of a voluntary nature and that no person was persuaded to participate. In an attempt to ensure that everyone understood the process, presentations were provided in English and Afrikaans. No time limits were set for in the answering of the questions and assistance was provided during the process to those individuals you were not sure of what were expected from them. The questionnaire also included a biographical segment that had to be completed by each participant. After the questionnaires had been completed, the results were scored and statistically analysed. The process applied in this instance was strictly according to the prescribed procedure.

3.4 STATISTICAL ANALYSIS

The statistical analysis was carried out with the help of the SPSS programme (SPSS Inc., 2005) and the AMOS programme (Arbuckle, 2003). Exploratory factor analyses were carried out to determine the construct validity of the job characteristics questionnaire. Firstly, a simple principle components analysis was conducted on all the items. Eigenvalues and scree plots were studied to determine the number of factors underlying the measuring instrument. Secondly, a principal component analysis with direct oblimin rotation was conducted if factors were related. A principal component analysis with varimax rotation was used if the obtained factors were not related (Tabachnick & Fidell, 2001).

Confirmatory factor analysis, using the AMOS programme (Arbuckle, 2003), was used to test the construct validity of the SWING and the UWES. The χ^2 statistic and several other goodness-of-fit indices summarise the degree of correspondence between the implied and observed covariance matrices. The χ^2 statistic provides clarity with regard to the degree of correspondence between the implied and pragmatic covariance matrices. A small χ^2 value is indicative of good fit. However, because the χ^2 statistic equals $(N - 1)F_{\min}$, this value tends to be substantial when the model does not hold and the sample size is large (Byrne, 2001). Researchers have addressed the χ^2 limitations by developing goodness-of-fit indexes that take a more pragmatic approach to the evaluation process. Firstly, the χ^2 /degrees of freedom ratio (CMIN/DF) (Wheaton, Muthén, Alwin & Summers, 1977) was one of the first fit statistics to address the problems associated with the χ^2 statistic.

The Goodness of Fit Index (GFI) indicates the relative amount of the variances in the sample predicted by the estimates of the population. It typically varies between 0,00 and 1,00 and a result of 0,90 or above indicates a good model fit. Regarding the Incremental Fit Index (IFI), values close to 1,00 are indicative of a good fit, where values of 0,90 or above indicates good model fit. The Tucker-Lewis Index (TLI) (Tucker and Lewis, 1973), is a relative measure of covariation explained by the model that is specifically developed to assess factor models. The Comparative Fit Index (CFI) represents the class of incremental fit indices in that it is derived from the comparison of a restricted model with that of an independence model in the determination of goodness-of-fit. To overcome the problem of sample size, Browne and Cudeck (1993) suggested using the Root Mean Square Error of Approximation (RMSEA). The RMSEA estimates the overall amount of error; it is a function of the fitting function value relative to the degrees of freedom. The RMSEA point estimate should be 0,05 or less to be indicative of a good fit, and the upper limit of the confidence interval should not exceed 0,08. MacCallum, Browne and Sugawara (1996) recently elaborated on these cut-off points and noted that RMSEA values ranging from 0,08 to 0,10 indicate mediocre fit, and those greater than 0,10 indicate poor fit.

Descriptive statistics and effect sizes were used to decide on the significance of the findings. The results are described and compared by way of means, standard deviations, skewness and kurtosis. In this study, the mean was used to measure the central tendency of the results. The standard deviation presents the average distance of the individual scores from the mean. Two

components of normality are skewness and kurtosis. Skewness has to do with the evenness of the distribution; a skewed variable is a variable whose mean is not in the centre of the distribution. Kurtosis has to do with the peakedness of a distribution; a distribution is either too peaked or too flat (Tabachnick & Fidell, 2001).

Cronbach's coefficient alpha was calculated to assess the internal consistency and reliability of the measuring instruments that have different scoring and response scales (Kerlinger & Lee, 2000). This index is indicative of the extent to which all the items in the UWES and SWING questionnaire are measuring the equivalent characteristics (Huysamen, 1993). High internal consistency implicates a high generalisation of items in the test as well as items in parallel tests.

Pearson product-moment correlation coefficients (r) were used to specify the relationship between the relevant variables. The product-moment coefficient of correlation was used to calculate the relationship between sets of ordered pairs in order to obtain more precise approximations of the direction and degree of relationship. Product-moment coefficient of correlation is based on the related variation of the members of sets of ordered pairs. If they vary together, it is said that there is a positive or negative relation as the case may be. Thus, if a relationship exists between the variables, it can be termed a positive relationship. A negative relationship occurs when a decrease in the measurement of one variable leads to an increase in the other variable (Ferguson, 1981). If they do not co-vary, it is said that no relationship exists (Kerlinger & Lee, 2000). In terms of statistical significance, it was decided to set the value at a 95% confidence interval level ($p \leq 0,05$). Effect sizes (Cohen, 1988; Steyn, 1999) were used in addition to statistical significance to determine the practical significance of relationships. Effect sizes provide insight whether obtained results are important (while statistical significance may often show results which are of little practical relevance). The use of only statistical significance testing in a routine manner has been regarded as problematic and various editors have appealed to place more emphasis on effect sizes (Steyn, 1999). Cut-off points of 0,30 (medium effect, Cohen, 1988) and 0,50 (large effect) were set for the practical significance of correlation coefficients.

Finally, logistic regression analysis was performed to examine 1) if there were differences in work engagement for different demographic groups; 2) if job characteristics contributed to

work engagement; and 3) if work-home interaction contributed to work engagement. Prior to conducting the logistic regression, the scores on work engagement were dichotomised in order to create a group of employees who are low in work engagement (51,5%) and group of employees who are high in work engagement (48,4%). The scores were dichotomised in such a way that scores 0 to 3,55 were classified as low engagement (31,8%), scores 3,56 to 5,18 were classified as average engagement (27,27%), and scores 5,19 to 6,00 were classified as high engagement (37,37%). Since the interest was to compare low and high engagement groups, the lowest tertile (representing the low engagement group) was subsequently compared with the highest tertile (representing the high engagement group). This variable was coded 0 for low engagement and 1 for high engagement.

Employees who are respectively low and high in work engagement were compared for demographic characteristics, job characteristics and work-home interaction using χ^2 tests (p -values were obtained from Pearson's chi-square tests) en t -tests. Respondents were categorised as males or female. Respondents' age was categorised as 22-29, 30-39, 40-49 or 50-69. The race/ethnicity of respondents was classified as White or African, while language was classified as Afrikaans, English or African languages (Setswana, Xhosa, Sesotho etc.). Respondents' household situation was categorised as marital status (married or not married) and parental status (with children or without children). Education was classified as respondents with a school education (grade 10 to grade 11) or respondents with a higher education (postgraduate degree). Subsequently, predictors that were significant at the $p \leq 0,05$ were included in the logistic regression.

Logistic regression modelling techniques were used to avoid the problems associated with nonlinearity of the dichotomous dependent variable and those related to isolation of the other underlying ordinary least squares assumptions. Traditionally, research questions with a dichotomous outcome were addressed by either ordinary least squares (OLS) regression or linear discriminant function analysis. Both techniques were subsequently found to be less than ideal for handling dichotomous outcomes due to their strict statistical assumptions, namely linearity, normality, and continuity for OLS regression and multivariate normality with equal variances and covariances for discriminant analysis (Cabrera, 1994; Cleary & Angel, 1984; Cox & Snell, 1989; Efron, 1975; Lei & Koehly, 2000; Press & Wilson, 1978; Tabachnick & Fidell, 2001). Logistic regression was proposed as an alternative in the late

1960s and early 1970s (Cabrera), and it became routinely available in statistical packages in the early 1980s (Peng, Lee & Ingersoll, 2002).

Logistic regression is similar to discriminant analysis using a dichotomous dependent variable. Like discriminant analysis equation, logistic regression equations reveal relative effects of independent variables on membership in one of two categories of a dependent variable. However, independent variables with nominal and ordinal scaling are not readily accommodated in discriminant analysis. Linearity and normality assumptions are more stringent for discriminant analysis. Also, logistic regression presents results in terms of odds. Therefore, interpretation of logistic regression is more straightforward than for discriminant analysis.

The soundness of the logistic regression model is estimated by fitting models, on the basis of available predictors, to the observed data. Therefore, a model is fit to the data that allows one to estimate values of the outcome variable from known values of the predictor variable(s). In order to estimate the fit of the model, attention was given to 1) overall model evaluation; 2) goodness-of-fit statistics; and 3) statistical tests of individual predictors.

Overall model evaluation. A logistic model is said to provide a better fit to the data if it demonstrates an improvement over the intercept-only model (also called the null model). An intercept-only model serves as a good baseline because it contains no predictors. Consequently, according to this model, all observations would be predicted to belong in the largest outcome category. An improvement over this baseline is examined by using the likelihood ratio. The log-likelihood is based on summing the probabilities with the predicted and actual outcomes (Tabachnick & Fidell, 2001) and is an indicator of how much unexplained information there is after the model has been fitted. Large values of the log-likelihood indicate poor fitting statistical models because the larger the value of the log-likelihood, the more unexplained observations there are.

Goodness-of-fit statistics. Goodness-of-fit statistics assess the fit of a logistic model against actual outcomes. The inferential goodness-of-fit test is the Hosmer-Lemeshow (H-L). The H-L statistic is the proportional reduction in the absolute value of the log-likelihood measure and as such it is a measure of how much the badness-of-fit improves as a result of the inclusion of the predictor variables. The H-L statistic is therefore a Pearson chi-square

statistic, calculated from a $2 \times g$ table of observed and estimated expected frequencies, where g is the number of groups formed from the estimated probabilities. Ideally, each group should have an equal number of observations, the number of groups should exceed 5, and expected frequencies should be at least 5. Two additional descriptive measures of goodness-of-fit were used, namely those of Cox and Snell (1989) and Nagelkerke (1991). These indices are variations of the R^2 concept defined for the ordinary least squares regression model. In linear regression, R^2 has a clear definition: It is the proportion of the variation in the dependent variable that can be explained by predictors in the model. Attempts have been devised to yield an equivalent of this concept for the logistic model. None, however, renders the meaning of variance explained (Long, 1997; Menard, 2000). Furthermore, none corresponds to predictive efficiency or can be tested in an inferential framework (Menard). For these reasons, a researcher can treat these two R^2 indices as supplementary to other, more useful evaluative indices, such as the overall evaluation of the model, tests of individual regression coefficients, and the goodness-of-fit test statistic (Peng et al., 2002).

Statistical tests of individual predictors. The statistical significance (for the inclusion or exclusion from the model) of individual regression coefficients (i.e., β s) was tested using the Wald chi-square statistic. The Wald test calculates a Z -statistic, which is then squared, yielding a Wald statistic with a chi-square distribution. Several authors have, however, identified problems with the use of the Wald statistic. Menard (1995) warns that for large coefficients, standard errors are inflated, lowering the Wald statistic (chi-square) value. Therefore, Agresti (1996) states that the likelihood-ratio test is more reliable for small sample sizes than the Wald test. Odds ratios ($Exp\ b$) and 95% confidence intervals (CIs) for each group in the model were estimated. $Exp\ (B)$ is an indicator of the change in odds resulting from a unit change in the predictor. The odds of an event occurring are defined as the probability of an event occurring divided by the probability of that event not occurring. The proportionate change in odds is $exp\ b$, so we can interpret $exp\ b$ in terms of the change in odds. A value greater than 1 indicates that as the predictor increases, the odds of the outcome occurring increase. Conversely, a value less than 1 indicates that as the predictor increases, the odds of the outcome occurring decrease.

3.5 CHAPTER SUMMARY

This chapter dealt with all the aspects pertaining to the method used for the empirical study. The choice and compilation of the participants, measuring battery, administration and scoring of the measuring instruments were discussed and the statistical methods used to analyse the data were discussed.

Chapter 4 deals with the report and discussion of results of the empirical study.

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CHAPTER 4

RESULTS AND DISCUSSION

In this chapter the results of the empirical study are reported and discussed. The construct validity of the measuring instruments is presented, followed by the descriptive statistics, the reliability and the correlations between the measuring instruments. The results of the logistic regression analysis are reported and discussed. The chapter is concluded with a discussion of the results obtained.

4.1 RESULTS OF THE EMPIRICAL STUDY

The results of the empirical study are reported in this paragraph. Firstly, the results of the construct validity of the Job Characteristics, SWING and UWES questionnaires are discussed. Secondly, the descriptive statistics, Cronbach's coefficient alpha and product moment correlations of the measuring instruments are given, followed by the results of the χ^2 and *t*-tests and logistic regression analysis.

4.1.1 CONSTRUCT VALIDITY

In this section, the construct validity of job characteristics questionnaire, work-home interaction and work engagement will be given. Exploratory factor analysis (using SPSS) was used to determine the construct validity of the job characteristics questionnaire, while confirmatory factor analysis (using AMOS) was used to determine the construct validity of the SWING and the UWES.

Construct validity of the job characteristics questionnaire

A simple principal components analysis was carried out on the job characteristics items. An analysis of the eigenvalues ($> 1,00$) and scree plot indicated that nine factors could be extracted, which explained 54,18% of the total variance. A principle components analysis with a varimax rotation (because the factors were not strongly related) was then performed on the 64 items. The results of the exploratory factor analysis are shown in Table 2. Loadings of variables on factors and communalities are also shown in Table 2. Loadings under 0,40 were replaced by zeros. Labels are suggested for each factor in a footnote.

Table 2

Principal Component Analysis with a Varimax Rotation for Job Characteristics

Component	F1 ^a	2	3	4	5	6	7	8	9	h ²
Adequate resources	0,00	0,76	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,69
Available Material	0,00	0,83	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,75
Right resources to complete tasks	0,00	0,83	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,76
Material issued on time	0,00	0,78	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,66
Access to resources when needed	0,00	0,72	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,62
Sufficient personnel to handle workload	0,00	0,49	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,41
Sufficient staff	0,00	0,51	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,44
Working under time pressure	0,00	0,00	0,00	0,46	0,00	0,00	0,00	0,00	0,00	0,29
Work hard	0,00	0,00	0,00	0,57	0,00	0,00	0,00	0,00	0,00	0,35
Periods of intense concentration	0,00	0,00	0,00	0,43	0,00	0,00	0,00	0,00	0,00	0,28
Tasks interrupted	0,00	0,00	0,00	0,48	0,00	0,00	0,00	0,00	0,00	0,37
Job hectic	0,00	0,00	0,00	0,68	0,00	0,00	0,00	0,00	0,00	0,51
Too much work	0,00	0,00	0,00	0,66	0,00	0,00	0,00	0,00	0,00	0,55
Work left	0,00	0,00	0,00	0,62	0,00	0,00	0,00	0,00	0,00	0,49
Excessive amount of work	0,00	0,00	0,00	0,68	0,00	0,00	0,00	0,00	0,00	0,53
Difficult to complete tasks	0,00	0,00	0,00	0,60	0,00	0,00	0,00	0,00	0,00	0,47
Meet impossible targets	0,00	0,00	0,00	0,51	0,00	0,00	0,00	0,00	0,00	0,38
Get on well with supervisor	0,61	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,46
Feel appreciated by supervisor	0,74	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,64
Supervisor thinks of performance	0,69	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,59
Sufficient information on results of work	0,73	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,58
Supervisor inform on how well work	0,79	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,70
Updated on issues affecting your job	0,59	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,47
Discuss problems with supervisor	0,70	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,57
Count on supervisor when faced with difficulties	0,67	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,53
You and colleagues treated fairly	0,66	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,62
Secure about working in a year's time	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,87	0,78
Secure about keeping current job in a years time	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,90	0,86
Secure about keeping same function level	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,85	0,78
Organisation pays good salaries	0,00	0,00	0,00	0,00	0,00	0,83	0,00	0,00	0,00	0,76
You are being paid enough	0,00	0,00	0,00	0,00	0,00	0,85	0,00	0,00	0,00	0,77
Possibility to progress financially	0,00	0,00	0,00	0,00	0,00	0,65	0,00	0,00	0,00	0,62
Live comfortable on pay	0,00	0,00	0,00	0,00	0,00	0,81	0,00	0,00	0,00	0,75
Organisation provides good benefits	0,00	0,00	0,00	0,00	0,00	0,63	0,00	0,00	0,00	0,48
Work socially undesirable hours	0,00	0,00	0,42	0,00	0,00	0,00	0,00	0,00	0,00	0,35
Work overtime	0,00	0,00	0,31	0,00	0,00	0,00	0,00	0,00	0,00	0,23
Events affecting work performance	0,00	0,00	0,46	0,00	0,00	0,00	0,00	0,00	0,00	0,38
Exposed to health risks	0,00	0,00	0,68	0,00	0,00	0,00	0,00	0,00	0,00	0,52
Security risks	0,00	0,00	0,55	0,00	0,00	0,00	0,00	0,00	0,00	0,37
Dealing with crisis situations	0,00	0,00	0,66	0,00	0,00	0,00	0,00	0,00	0,00	0,56
Critical decisions	0,00	0,00	0,67	0,00	0,00	0,00	0,00	0,00	0,00	0,55
Performance affected by legal appointment	0,00	0,00	0,51	0,00	0,00	0,00	0,00	0,00	0,00	0,32
Work in dangerous conditions	0,00	0,00	0,76	0,00	0,00	0,00	0,00	0,00	0,00	0,64
Work in unsafe conditions	0,00	0,00	0,71	0,00	0,00	0,00	0,00	0,00	0,00	0,57
Stressful working conditions	0,00	0,00	0,62	0,00	0,00	0,00	0,00	0,00	0,00	0,55
Count on co-workers	0,00	0,00	0,00	0,00	0,00	0,00	0,71	0,00	0,00	0,55
Ask co-workers for help	0,00	0,00	0,00	0,00	0,00	0,00	0,78	0,00	0,00	0,64
Co-workers help you	0,00	0,00	0,00	0,00	0,00	0,00	0,73	0,00	0,00	0,59
Sufficient technical support	0,00	0,00	0,00	0,00	0,00	0,00	0,64	0,00	0,00	0,59
Correct technical support	0,00	0,00	0,00	0,00	0,00	0,00	0,60	0,00	0,00	0,58
Support from others	0,00	0,00	0,00	0,00	0,00	0,00	0,51	0,00	0,00	0,34
Sufficient demands on skills and capacities	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,32	0,00	0,32
Enough task variety	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,41	0,00	0,33
Opportunities for personal growth	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,82	0,00	0,77
Achieve something	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,78	0,00	0,69
Opportunities to follow training courses	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,44	0,00	0,45
Opportunity for promotion	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,72	0,00	0,61
Freedom in carrying out work	0,00	0,00	0,00	0,00	0,51	0,00	0,00	0,00	0,00	0,43
Decide for yourself to carry out work	0,00	0,00	0,00	0,00	0,73	0,00	0,00	0,00	0,00	0,59
Influence over decisions to complete tasks	0,00	0,00	0,00	0,00	0,71	0,00	0,00	0,00	0,00	0,56
Own decision on time spent on task	0,00	0,00	0,00	0,00	0,69	0,00	0,00	0,00	0,00	0,56
Solve problems yourself	0,00	0,00	0,00	0,00	0,68	0,00	0,00	0,00	0,00	0,51
Determine content of work	0,00	0,00	0,00	0,00	0,68	0,00	0,00	0,00	0,00	0,56
Influence in planning work activities	0,00	0,00	0,00	0,00	0,64	0,00	0,00	0,00	0,00	0,46

a Factor labels: F₁ Social Support F₂ Resources F₃ Poor Working Conditions F₄ Pressure F₅ Autonomy F₆ Pay and Benefits F₇ Instrumental Support F₈ Task Characteristics F₉ Job Insecurity

Table 2 shows that the principal component analysis with a varimax rotation resulted in nine factors:

- Items loading on the first factor relate to Social Support and refer to the support received from a supervisor and colleagues.
- The second factor addresses Resources and refers to the availability and adequacy of resources, suitability of material, equipment and labour to complete the job.
- The third factor represents Poor Working Conditions and refer to the conditions an individual experiences at work with specific regard to the amount of hours worked, hazardous working situations, critical decision-making, health and security risks.
- The fourth factor represents Pressure and relates to excessive work load, the complicated nature of the job and targets that have to be accomplished.
- The fifth factor represents Autonomy and relates to the levels of an individual's discretion to conduct and complete tasks and to regulate the time spent on completing a specific task.
- The sixth factor represents Pay and Benefits and relates to the way in which the organisation responds financially to workers and whether there are possibilities for promotion.
- The seventh factor represents Instrumental Support and relates to the amount of technical and co-worker support in the completion of tasks.
- The eighth factor represents Task Characteristics and relates to the variety of tasks, whether there are sufficient demands on skills and capacities, opportunities for personal growth, accomplishment and advancement within the organisation.
- The ninth factor represents Job Insecurity and relates to an individual's expectations on job function and the availability of future employment within the organisation.

Construct validity of the SWING and UWES

Next, the construct validity of work-home interaction and work engagement was tested by means of structural equation modelling. For work-home interaction, a four-factor model was tested including negative work-home interference (WHI), positive WHI, negative home-work interference (HWI) and positive HWI. For engagement, two competing factorial models were tested. Model 1 assumes that all the engagement items load on one latent factor, while Model

2 assumes that work engagement consists of two correlated factors, namely Vigour and Dedication. The results are reported in Table 3.

Table 3

Construct Validity of Work-home Interaction and Work Engagement

Model	χ^2	χ^2/df	GFI	IFI	TLI	CFI	RMSEA
Work-home Interaction							
Four-factor Model	369,10	1,79	0,92	0,93	0,93	0,93	0,05
Final Model	307,84	1,66	0,92	0,95	0,94	0,95	0,50
Work Engagement							
One-factor Model	103,46	2,35	0,94	0,96	0,95	0,96	0,07
Two-factor Model	103,18	2,40	0,94	0,96	0,95	0,96	0,07

Inspection of the fit indices of the four-factor model of the SWING suggests a good model fit. However, on inspection of the standardised regression weights, one item seems to be problematic (“How often does it happen that after spending a pleasant weekend with your spouse/family/friends, you have more fun in your job?”). The first model was therefore re-specified with this problematic item deleted. As can be seen in Table 3, the second model fitted the data significantly better than the first model ($\Delta\chi^2 = 61,26_{(N = 320)}$, $df = 20$, $p < 0,001$). Since this model fit was satisfactory and the results agreed with the theoretical assumptions underlying the structure of the SWING, no further modifications of the model were deemed necessary. These results confirm that work-home interaction can be characterised as a four-dimensional construct that distinguishes between the direction (work to home, and home to work) and quality (negative and positive) of influence. Regarding the model fit of the UWES, the results indicate that there was not a statistically significant difference between the first model (the one-factor model) and the second model (the two-factor model) ($\Delta\chi^2 = 0,28_{(N = 468)}$, $df = 1,00$, $p < 0,01$). For the purpose of this study, engagement was therefore assessed as a one-factor model.

4.1.2 DESCRIPTIVE STATISTICS, RELIABILITY AND PRODUCT MOMENT CORRELATIONS

In this section, the descriptive statistics (mean, standard deviation, skewness and kurtosis), reliability of the scales (assessed by Cronbach’s coefficient alpha) and Pearson’s product-

moment correlations are reported and discussed. Table 4 shows the descriptive statistics and the Cronbach alpha coefficients of the measuring instruments.

Table 4

Descriptive Statistics and Cronbach Alpha Coefficients of the Measuring Instruments

Item	Mean	SD	Skewness	Kurtosis	α
Pressure	2,50	0,51	0,30	-0,24	0,80
Poor Working Conditions	2,27	0,62	0,29	-0,50	0,84
Job Insecurity	2,73	0,97	-0,25	-1,05	0,89
Autonomy	2,89	0,62	-0,02	-0,73	0,82
Task Characteristics	2,57	0,69	0,19	-0,67	0,78
Social Support	2,89	0,74	-0,30	-0,85	0,89
Instrumental Support	2,90	0,60	-0,13	-0,44	0,78
Pay and Benefits	2,12	0,83	0,52	-0,62	0,87
Resources	2,89	0,68	-0,15	-0,69	0,89
Negative WHI	1,18	0,68	0,47	-0,21	0,90
Positive WHI	1,46	0,67	0,05	-0,16	0,74
Negative HWI	0,68	0,62	0,99	0,71	0,78
Positive HWI	1,67	0,76	0,02	-0,60	0,77
Work Engagement	4,25	1,32	-0,69	-0,13	0,92

As indicated in Table 4, the scores on all the scales were normally distributed. The Cronbach alpha coefficients of all the measuring instruments were considered to be acceptable compared to the guideline of $\alpha > 0,70$ (Nunnally & Bernstein, 1994), indicating that all the scales are reliable.

Product-moment correlation coefficients between the constructs are reported in Table 5.

Table 5

Descriptive statistics, reliability and product-moment correlations

Item	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Pressure	1,00												
2 Poor Working Conditions	0,42	1,00											
3 Job Insecurity	0,05	0,23	1,00										
4 Autonomy	-0,06	-0,08	0,04	1,00									
5 Task Characteristics	0,02	0,04	-0,02	0,43	1,00								
6 Social Support	-0,29	-0,08	0,02	0,34	0,41	1,00							
7 Instrumental Support	-0,04	-0,03	0,04	0,22	0,36	0,31	1,00						
8 Pay & Benefits	-0,10	-0,01	-0,11	0,17	0,32	0,36	0,23	1,00					
9 Resources	-0,15	-0,38	-0,25	0,27	0,26	0,34	0,20	0,28	1,00				
10 Negative WHI	0,47	0,44	0,11	-0,14	-0,15	-0,18	-0,18	-0,15	-0,37	1,00			
11 Positive WHI	0,02	-0,01	0,21	0,28	0,25	0,17	0,12	-0,04	0,05	0,08	1,00		
12 Negative HWI	0,19	0,25	0,13	-0,11	-0,05	0,03	-0,01	-0,13	-0,15	0,35	0,07	1,00	
13 Positive HWI	0,00	0,03	0,24	0,08	0,04	0,04	0,18	-0,09	-0,07	0,12	0,36	0,14	1,00
14 Work Engagement	0,01	-0,11	0,01	0,31	0,37	0,28	0,27	0,06	0,09	-0,06	0,36	-0,08	0,32

All correlations $\geq 0,15$ are statistically significant; $r \geq 0,19$, $p < 0,01$; $0,15 \leq r \leq 0,18$, $p < 0,05$

All correlations $0,30 \leq r \leq 0,49$ are practically significant (medium effect)

All correlations $\geq 0,50$ are practically significant (large effect)

Table 5 provides the correlation coefficients of the study variables. As indicated, Work Engagement was positively, statistically and practically significantly correlated with Autonomy ($r = 0,31$, $p < 0,01$) and Task Characteristics ($r = 0,37$, $p < 0,01$) and positively and statistically significantly correlated with Social Support ($r = 0,28$, $p < 0,01$) and Instrumental Support ($r = 0,27$, $p < 0,01$). Work Engagement was also positively, statistically and practically significantly correlated with Positive WHI ($r = 0,36$, $p < 0,01$) and Positive HWI ($r = 0,32$, $p < 0,01$). However, no statistically significant correlation could be found between Work Engagement and Pressure ($r = 0,14$, $p < 0,01$), Poor Working Conditions ($r = -0,11$, $p < 0,01$), Job Insecurity ($r = 0,12$, $p < 0,01$), Pay and Benefits ($r = 0,06$, $p < 0,01$) and Resources ($r = 0,09$, $p < 0,01$).

4.1.3 SIGNIFICANT DETERMINANTS OF LOW AND HIGH WORK ENGAGEMENT

In this section, employees who are respectively low and high in work engagement were compared for demographic characteristics, job characteristics and work-home interaction using χ^2 tests en *t*-tests. The results of the χ^2 tests are reported in Table 6 for the demographic variables, while the results of the independent sample *t*-tests for job characteristics and work-home interaction are reported in Table 7.

Table 6

Associations between Demographic Characteristics and Individuals Low and High on Work Engagement

	Low Engagement		High Engagement		<i>p</i> value
	<i>N</i>	%	<i>N</i>	%	
Race					<i>p</i> = 0,00*
White	75	68,2	35	31,8	
Black	27	32,5	56	67,5	
Gender					<i>p</i> = 0,42
Males	80	50,6	78	49,4	
Females	22	57,9	16	42,1	
Age					<i>p</i> = 0,41
22-29	21	65,6	11	34,4	
30-39	35	50,7	34	49,3	
40-49	34	48,6	36	51,4	
50-69	11	47,8	12	52,2	
Marital Status					<i>p</i> = 0,43
Married	24	57,1	18	42,9	
Single	77	50,3	76	49,7	
Parental Status					<i>p</i> = 0,21
With Children	74	49,3	76	50,7	
Without Children	27	60,0	18	40,0	
Qualifications					<i>p</i> = 0,94
School Education	66	52,4	60	47,6	
Higher Education	36	52,9	32	47,1	

* Statistically significant difference: $p \leq 0,05$

As shown in Table 6, statistically significant differences were found only based on race/ethnicity. In total, 110 participants (57,0% of the total) were White and of these, 75 (68,2%) were low in engagement and 35 (31,8%) were high in engagement. 83 (43,0%) were Black, of which 27 (32,5%) were low in engagement and 56 (67,5%) were high in engagement. We can also see that 73,5% of the White group was low in engagement (compared to the 26,5% Blacks), and that 38,5% of the Whites were high in engagement (compared to the 61,5% Blacks). Based on these results, *Hypotheses 1a, 1b, and 1e* are accepted. However, *Hypotheses 1c, 1d and 1f* are rejected.

Table 7

Association between Job Characteristics, Work-Home Interaction and Individuals Low and High on Engagement

Item	Low Engagement		High Engagement		p value
	M	SD	M	SD	
Pressure	2,48	0,49	2,51	0,54	$t = -0,46, df = 196, p = 0,65$
Poor Working Conditions	2,36	0,63	2,20	0,61	$t = 1,81, df = 196, p = 0,07$
Job Insecurity	2,67	0,93	2,79	1,01	$t = -0,85, df = 196, p = 0,40$
Autonomy	2,72	0,60	3,06	0,61	$t = -4,07, df = 196, p = 0,00^*$
Task characteristics	2,36	0,63	2,80	0,68	$t = -4,74, df = 196, p = 0,00^*$
Social Support	2,72	0,69	3,08	0,75	$t = -3,50, df = 196, p = 0,00^*$
Instrumental Support	2,75	0,56	3,06	0,60	$t = -3,72, df = 196, p = 0,00^*$
Pay & Benefits	2,10	0,73	2,14	0,93	$t = -0,31, df = 196, p = 0,76$
Resources	2,84	0,63	2,93	0,74	$t = -0,96, df = 196, p = 0,34$
Negative WHI	1,25	0,66	1,11	0,70	$t = 1,38, df = 196, p = 0,17$
Positive WHI	1,29	0,61	1,63	0,70	$t = -3,64, df = 196, p = 0,00^*$
Negative HWI	0,74	0,59	0,62	0,64	$t = 1,37, df = 196, p = 0,17$
Positive HWI	1,46	0,63	1,90	0,83	$t = -4,22, df = 196, p = 0,00^*$

* Statistically significant difference: $p \leq 0,05$

As illustrated in Table 7, there were no significant differences found between Engagement and Pressure, Working Conditions, Job Insecurity, Resources, Pay and Benefits, Resources, Negative WHI and Negative HWI. However, statistically significant differences were found between Engagement and Autonomy, Task Characteristics, Social Support, Instrumental Support, Positive WHI and Positive HWI. Based on these results, the hypotheses regarding the relationship between job characteristics and work engagement are accepted (i.e., *Hypotheses 2a* and *2b*). With reference to the relationship between work-home interaction and engagement, there was a significant relationship between Positive WHI / Positive HWI and work engagement. *Hypothesis 3a* and *Hypothesis 3c* are therefore accepted. However, no relationship was found between Negative WHI / Negative HWI and work engagement. Therefore, *Hypothesis 3b* and *Hypothesis 3d* were rejected.

4.1.4 LOGISTIC REGRESSION

To assess the relationship of the study variables on engagement, three multiple logistic regression models were constructed, including the variables that showed statistically significant differences in the χ^2 tests and *t*-tests. The first logistic regression model was adjusted for demographic variables (i.e., race). The second was adjusted for job characteristics (i.e., Autonomy, Task Characteristics, Social Support and Instrumental Support). Finally, the third was adjusted for Positive WHI and Positive HWI. The groups of variables were entered in the analyses using the *Enter* method.

Table 8

Logistic Regression Models Predicting Low and High Engagement

Model	Predictor	β	SE β	Wald's χ^2	df	p	e^β	95% CI for e^β
1	Constant	0,73	0,23	9,70	1	0,00	2,07	
	Race	-1,49	0,31	22,99	1	0,00*	0,23	(0,12 – 0,41)
	<u>Overall model evaluation and goodness-of-fit</u>				χ^2	df	p	
	Log-likelihood statistic			24,606	1	0,00		
	Hosmer & Lemeshow			0,00	0,00	0,00		
2	Constant	- 4,90	1,20	16,80	1	0,00	0,01	
	Race	- 1,59	0,35	21,19	1	0,00*	0,21	(0,10 – 0,40)
	Autonomy	0,73	0,31	5,68	1	0,17	2,07	(1,14 – 3,77)
	Task Characteristics	0,55	0,29	3,67	1	0,55	1,74	(0,99 – 3,06)
	Social Support	0,21	0,26	0,68	1	0,41	1,24	(0,75 – 2,06)
	Instrumental Support	0,52	0,31	2,86	1	0,91	1,69	(0,92 – 3,10)
	<u>Overall model evaluation and goodness-of-fit</u>				χ^2	df	p	
	Log-likelihood statistic			55,02	5	0,00		
	Hosmer & Lemeshow			11,65	8	0,17		
3	Constant	- 5,87	1,31	20,10	1	0,00	0,00	
	Race	- 1,41	0,37	14,40	1	0,00*	0,25	(0,12 – 0,51)
	Autonomy	0,73	0,32	5,19	1	0,02*	2,08	(1,11 – 3,91)
	Task Characteristics	0,63	0,30	4,48	1	0,03*	1,88	(1,05 – 3,38)
	Social Support	0,21	0,26	0,60	1	0,42	1,24	(0,74 – 2,06)
	Instrumental Support	0,39	0,32	1,52	1	0,22	1,48	(0,79 – 2,76)
	Positive WHI	0,07	0,30	0,05	1	0,83	0,94	(0,52 – 1,69)
	Positive HWI	0,68	0,25	7,33	1	0,01*	1,98	(1,21 – 3,24)
<u>Overall model evaluation and goodness-of-fit</u>				χ^2	df	p		
	Log-likelihood statistic			63,15	7	0,00		
	Hosmer & Lemeshow			15,03	8	0,60		

Note. All statistics are presented for all variables in the logistic regression equations. For Model 1, Cox and Snell $R^2 = 0,12$ and Nagelkerke $R^2 = 0,16$; for Model 2 Cox and Snell $R^2 = 0,24$ and Nagelkerke $R^2 = 0,33$; for Model 3 Cox and Snell $R^2 = 0,28$ and Nagelkerke $R^2 = 0,37$.

The results of the logistic regression model are presented in Table 8. The β s are the logistic regression coefficients. Negative β s reveal a negative or inverse relationship, whereas positive β s indicate a positive relationship. The odds (e^β) in the second last column are more

straightforward in interpretation than the β s (log odds). Odds of 1 are equivalent to log odds of 0. Odds of 1 and log odds of 0 signify no relation of the independent variable to the dependent variable. The odds are the probability that an event will happen divided by the probability that the event will not happen (Norusis, 1994).

According to Table 8, after adjusting for all the variables, Race ($\beta = -1,41$; Wald's $\chi^2 = 14,40$; $p = 0,00$), Autonomy ($\beta = 0,73$; Wald's $\chi^2 = 5,19$; $p = 0,02$), Task Characteristics ($\beta = 0,63$; Wald's $\chi^2 = 4,48$; $p = 0,03$) and Positive HWI ($\beta = 0,68$; Wald's $\chi^2 = 7,33$; $p = 0,01$), but not Social Support ($\beta = 0,21$; Wald's $\chi^2 = 0,60$; $p = 0,42$), Instrumental Support ($\beta = 0,39$; Wald's $\chi^2 = 1,52$; $p = 0,22$) and Positive WHI ($\beta = 0,07$; Wald's $\chi^2 = 0,05$; $p = 0,83$) were predictive of Work Engagement. The odds on Race is 0,25 (CI = 0,12–0,51). Therefore, Whites were 25% as likely as Africans to be low in Work Engagement. Autonomy had significant positive effects on Work Engagement (CI = 1,11–3,91). A two degree increase on this 4-point scale produced a 8% increase in the odds of being high in Work Engagement. Task Characteristics was predictive of high Work Engagement (CI = 1,05–3,38), where a one-degree increase on this 4-point scale resulted in a 88% increase in the odds of high Work Engagement. Finally, Positive HWI was significantly related to high Work Engagement (CI = 1,21–3,24). Individuals who have high positive HWI were 1,98 times more likely to be high on Work Engagement.

4.2 DISCUSSION

After establishing the reliability of the job characteristics questionnaire, the SWING and the UWES, possible relationships between work engagement and certain demographic characteristics, job characteristics and work-home interference were examined. The χ^2 -test was used to determine differences between engagement and demographic characteristics and t -tests were used to determine differences between job characteristics, work-home interference and work engagement.

After conducting the χ^2 -test, the only demographic characteristic that revealed a statistically significant relationship was race/ethnicity. Little research has been done to establish a relationship between race and the levels of engagement amongst employees. A South African study conducted by Storm (2002), found no practical significant differences between race and the three dimensions of work engagement. Contrary to this finding, the current findings

indicated that African participants were experiencing higher levels of work engagement than their White co-employees. Compared to the White participants, more African individuals were found to fall within the high engagement group, whereas more White participants were found to fall within the low engagement group. The relationship between race and work engagement could be a result of the introduction of previously disadvantaged groups to the workforce. It is common knowledge that in the past black persons experienced discriminatory laws regarding opportunities to obtain work in South Africa. Since the introduction of South Africa's preliminary constitution in 1994, the landscape has changed dramatically. In reaction to new found opportunities and the rebuilding of a broken community, it is argued that all these factors could play a role in African employees in the mining industry experiencing higher work engagement.

The *t*-tests revealed significant relationships between various job resources (i.e., autonomy, task characteristics, social support and instrumental support). However, no significant relationships were found between job demands and work engagement. A positive association between social support and work engagement was found. This finding coincides with the findings of Bakker, Euwema and Van Dieren (2004), Schaufeli and Bakker (2004) and Demerouti, Bakker, Nachreiner and Schaufeli (2001a), who all found that individuals who experience social support from work are more likely to be engaged. Therefore, employees who feel appreciated by their supervisors, receive sufficient information on the results of their work, receive feedback from their supervisors regarding how well they have performed in their tasks and those who can count on their supervisors when faced with difficulties are prone to be high in work engagement.

A positive association was also found between instrumental support and work engagement. This finding supports the general findings of Barkhuizen (2005), Coetzer (2004), Jackson (2004), Montgomery, Peeters, Schaufeli and Den Ouden (2003), Mostert (2006) and Schaufeli and Bakker (2004) that job resources are positively associated with work engagement. In line with the Job Demands-Resources (JD-R) model (Bakker, Demerouti, De Boer, & Schaufeli, 2003; Demerouti et al., 2001b) instrumental support relates to social resources (Demerouti et al., 2001a) and technical resources experienced at work. Therefore, employees who can count on co-workers when they need help in performing a specific task and who receive correct and sufficient support from their work and their co-employees are more likely to feel that their work is meaningful and purposeful and that they are bursting with energy, allowing them to work for very long periods at a time.

In line with the Effort-Recovery (E-R) model (Meijman & Mulder, 1998), which supposes that sufficient recovery from effort expenditure plays an important role in the interaction process between work-life and private-life, sufficient support was found for the existence of a positive relationship between positive WHI and work engagement. This finding confirms the findings of Montgomery et al. (2003), Mostert (2006), Mostert, Cronje, and Pienaar (2006) and (Sonntag, 2003), all of whom have found positive correlations between these two constructs. Therefore, employees who go home cheerfully after a successful day at work and have the ability to positively affect the atmosphere at home or engage in activities with their spouse or family members are in all probability more likely to feel like going to work when they get up in the mornings and persevere at work, even when things do not go well.

After conducting the χ^2 -tests and *t*-tests, significant predictors were included in the logistic regression in order to determine the most powerful predictors of high work engagement in the logistic regression analyses. After the model was adjusted for demographic variables (race), job characteristics (autonomy, task characteristics, social support and instrumental support) and work-home interaction (positive WHI and positive HWI), significant predictors of low and high work engagement were race, autonomy, task characteristics and positive HWI.

With reference to the relationship between autonomy and work engagement, it seems that those individuals who had the freedom in carrying out work, who had the most influence over their decisions to complete specific tasks, who could decide on the time spent in completing tasks and who could solve problems themselves, were prone to be in the high work engagement group. This finding is also supported by Schaufeli and Bakker, (2004) who found that autonomy plays an extrinsic motivational role by being instrumental in achieving work goals. This is furthermore supported by the mechanism of the JD-R model (Bakker et al., 2003; Demerouti et al., 2001b). Autonomy can therefore be considered a resource which is purposeful in achieving work goals, reduces job demands and encourages personal growth and development. The finding of this study also supports the findings of Gilbert (2001), who found that a workers' motivation by the job and in particular job autonomy, might predict an individuals level of engagement in their work, while Winter, Taylor and Sarros (2002) found that autonomy allows individuals to engage in more meaningful work activities. Mostert et al. (2006) also found support for a positive relationship between autonomy and work engagement.

Task characteristics also predicted high work engagement. Therefore, those characteristics associated with tasks at work that allow individuals opportunities for personal growth, a sense of achievement, opportunities to follow training courses, opportunities for promotion and task variety are strong predictors of high work engagement. A positive correlation between task variety and work engagement was found by Schaufeli and Bakker (2004), Winter et al. (2002), Salanova and Schaufeli (in press) and Mostert et al. (2006), who all found that individuals who have access to a variety of tasks and growth opportunities will ultimately have higher energy levels and be more dedicated to the job and organisation.

Finally, the results of the logistic regression analysis showed that positive HWI plays a significant role in predicting high levels of engagement amongst the participants. Little research has been done to determine the relationship between positive HWI and work engagement. However, this finding seems to be in line with the findings of Geurts et al. (2005), who argued that when an individual has sufficient time to recover from demands faced at home such as household tasks and child care responsibilities, the individual is able to invest more time and energy to complete tasks at work. This association between positive HWI and engagement also supports the findings of Sonnentag (2003) who, in line with the E-R model, found that recovery has a positive effect on work engagement and proactive organisational behaviour. Therefore, employees in the mining environment that have the ability to take the good moods that they may experienced with family at home to work, who are better able to keep appointments at work because they are required to do so at home and those who have better self confidence at work because of the fact that their home lives are well organised, will on a preponderance of probabilities feel more enthusiastic, inspired and proud about their work.

4.3 CHAPTER SUMMARY

In this chapter the results of the empirical study were reported and discussed. The construct validity of the measuring instruments was presented, followed by the descriptive statistics, the reliability and the correlations between the measuring instruments. The results of the logistic regression analysis were reported and discussed. The chapter was concluded with a discussion of the results obtained.

Thus the following specific objectives have been accomplished, namely to determine the relationship between work engagement, demographic characteristics, job characteristics and

work-home interaction in a sample of employees in the mining environment and to determine the characteristics of employees with low and high work engagement with respect to demographic characteristics (gender, age, marital status, parental status and education), job characteristics and work-home interaction.

In Chapter 5 conclusions and limitations are discussed and recommendations are made.

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CHAPTER 5

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

This chapter contains a discussion of the conclusions drawn in respect of the research objectives. Limitations of the study are explained, as well as recommendations for organisations and future research.

5.1 CONCLUSIONS

The first objective of this study was to determine how work engagement, job characteristics and work-home interaction was conceptualised in literature. In line with the first objective, it was found that two different but related schools of thought assisted in the establishment of the work engagement construct (Maslach & Leiter, 1997; Schaufeli, Salanova, González-Romá & Bakker, 2002). Schaufeli and Bakker (2003) defined work engagement as a positive, fulfilling, work-related state of mind that is characterised by vigour, dedication and absorption. However, researchers have criticised the inclusion of absorption as a core dimension of engagement and consider it to play a less critical role (González-Romá, Schaufeli, Bakker & Lloret, in press; Schaufeli & Bakker, 2001, 2004; Schaufeli et al., 2001).

With the assistance of the Job Demands-Resources (JD-R) model (Bakker, Demerouti, De Boer & Schaufeli, 2003; Demerouti et al., 2001), job characteristics were found to be prearranged into two separate groups, namely job demands and job resources. Job demands were found to be those aspects of the job that are associated with certain psychosocial and/or psychological costs (Demerouti et al., 2001), whereas job resources refer to those physical, psychological, social or organisational features of the job that (1) are purposeful in achieving work goals; (2) decrease job demands and the associated physiological and psychological costs; or (3) encourage personal growth and development.

An example of a model used to illustrate the fundamental operation of work-home interaction is the Effort-Recovery (E-R) model (Meijman & Mulder, 1998) which suggests that effort-exposure requires recovery to avoid the building-up of negative load effects that might interfere with the work and private life domains. Geurts et al. (2005) found that work-home interference is comprised of four dimensions, namely (1) negative work-home interference (WHI), which refers to a situation in which negative load reactions built up at work hamper a person's functioning at home; (2) negative home-work interference (HWI), referring to negative load reactions developed at home that interferes with a person's functioning at work; (3) positive WHI, defined as positive load reactions built up at work that facilitates functioning at home; and (4) positive HWI, occurring when positive load reactions developed at home.

The second objective of this study was to establish what researchers found in respect of the relationship between work engagement, demographic characteristics, job characteristics and work-home interaction. With regard to demographic characteristics and specific regard to gender, Schaufeli and Bakker (2003) found that men score slightly higher than woman on the dedication and absorption aspects of engagement. Coetzee and Rothmann (in press) have found no statistical significant differences. Schaufeli and Bakker also found that work engagement correlates weakly but positively with age. Research conducted in South Africa on the correlation between engagement levels and age has yielded no statistically significant differences (Coetzee & Rothmann, in press; Barkhuizen & Rothmann, in press). Little international academic attention has been paid to the relationship between work engagement and race/ethnicity. A study conducted by Storm (2002) found no practical significant differences between race and work engagement. However, there is currently no research available on whether engagement can be correlated positively to an employee's marital status. This is also the position with regard to the parental status of employees. Storm found no statistically or practically significant differences between work engagement and level of education whereas Barkhuizen and Rothmann (in press), found that academics in possession of a doctoral degrees were more absorbed in their jobs than those with a four-year or honours degree.

Internationally, it has been found that work engagement positively correlates with job characteristics which might be labelled as resources (Bakker, Euwema & Van Dieren, in press;

Demerouti et al., 2001; Salanova et al., 2003; Schaufeli & Bakker, 2004). South African studies similarly revealed a positive correlation between job resources that are intended to help employees cope with the demands of their jobs and work engagement (Mostert, Cronje & Pienaar, 2006; Mostert, 2006).

With reference to the relationship with work-home interaction, Montgomery, Peeters, Schaufeli and Den Ouden (2003) found a statistically significant relationship between positive WHI and the dedication dimension of work engagement. This was confirmed in South African studies performed by Mostert (2006) and Mostert et al. (2006). Likewise, Mostert found that negative WHI is related to lower levels of work engagement. With regard to positive HWI, Sonnentag (2003) found support for a positive effect of recovery on work engagement and proactive organisational behaviour. Bakker and Geurts (2004) contend that a home setting which permits an individual to self-regulate effort expenditure, offers the possibility that a positive effect may spill-over in the work domain. Mostert confirms that individuals who have sufficient time to recover will feel more revitalised and motivated, leading to an experience of higher levels of engagement during the next working day. Geurts and Demerouti (2003) confirm that home demands that require too much effort accompanied by a lack of recovery, may result in a negative spill-over effect at work, causing the home domain to negatively interfere with the work domain. Similarly Mostert and Mostert et al. found that negative HWI is negatively related to work engagement.

The third objective of this study was to determine the relationship between work engagement, demographic characteristics, job characteristics and work-home interaction in a sample of employees in the mining environment. After conducting the χ^2 -test, the only demographic characteristic that revealed a statistically significant relationship was race/ethnicity. This finding is contrary to the findings of Storm (2002) who found that no practical significant relationship between race and the three dimensions of work engagement existed. The *t*-tests revealed significant relationships between engagement and autonomy, task characteristics, social support and instrumental support.

The fourth objective of this study was to determine the characteristics of employees with low and high work engagement with respect to demographic characteristics (i.e., gender, age, marital status, parental status and education), job characteristics and work-home interaction. The significant predictors of low and high work engagement were race, autonomy, task characteristics and positive HWI. With reference to the relationship between autonomy and work engagement, it seems that those individuals who had the freedom in carrying out work, who had the most influence over their decisions to complete specific tasks, who could decide on the time spent in completing tasks and who could solve problems themselves, were prone to be in the high work engagement group. It was also found that those characteristics associated with tasks at work that allow individuals opportunities for personal growth, a sense of achievement, opportunities to follow training courses, opportunities for promotion and task variety are strong predictors of high work engagement. Finally it was shown that employees in the mining environment that have the ability to take the good moods that they may experienced with family at home to work, who are better able to keep appointments at work because they are required to do so at home and those who have better self confidence at work because of the fact that their home lives are well organised, will on a preponderance of probabilities feel more enthusiastic, inspired and proud about their work.

5.2 LIMITATIONS

The first limitation of this study was that the research design was cross-sectional in nature. While the utilisation of a cross-sectional methodological design might have its advantages, a definite drawback is the fact that a cross-sectional survey does not allow the measurement of changing variable values over time. As a result, it is not possible to establish the cause and effect of identified relationships between two or more constructs. In other words, a cross-sectional design allows one to identify the existence of a relationship between two variables, but confines one in the sense that one cannot rule out alternative explanations with regard to the outcomes of a given measurement. At some point, engagement research will have to move beyond this method of obtaining results in order to reveal the entire scope and intricacy of its conceptualised character. However, even though cross-sectional designs fail to prove causation, they offer a valuable

method of determining which causal hypotheses are likely to justify testing by way of longitudinal designs (Montgomery et al., 2003).

The second limitation relates to the fact that all the results were obtained exclusively by means of self-report questionnaires. This could result in an increase in the common method variance problem. Despite not being able to test the strength of this type of variance, research has suggested that common method variance is not as troublesome as might be expected (Spector, 1992; Semmer, Zapf & Grief, 1996).

The third limitation relates to the fact that participants were required to self-evaluate their abilities and feelings. The issue of self-perception relates to a subjective test that undoubtedly has an influence on the accuracy with which a participant may assess his level of knowledge, ability and experiences. The validity of the results obtained in this fashion might change drastically if other individuals were asked to evaluate the participant's levels of engagement. It is therefore argued that objective measures are required to assist in the attainment of more accurate results.

The fourth limitation relates to the size of the sample ($n = 320$). Especially with regard to the distribution of races, which was found to be significantly related to engagement, there was not an equal amount of participants included in the study. Only Caucasian and African individuals took part in the study. Future research may address this problem by including various other ethnical groups as well.

The final limitation relates to the fact that the study was conducted in a homogenous sample which consisted of individuals working in the mining industry. Although the individuals who participated were from different job grades and section levels, specific organisational cultures within these levels could have influenced the participants' responses. The inference is that the results cannot be generalised to other contexts or professions. Therefore, there is a need for this study to be repeated in other occupations and professions as well.

5.3 RECOMMENDATIONS

The following recommendations are made for the organisation in question as well as for future research.

5.3.1 Recommendations for the organisation

The purpose of this study was to investigate the existence of possible relationships between work engagement on the one hand and demographic characteristics, job characteristics and work-home interaction on the other hand. In terms of demographic characteristics, the study revealed a positive relationship between race and work engagement. African participants were central to the unique finding, whereas the majority of Caucasian participants fell within the low engagement group. It is recommended that mining organisations should consider addressing this area of concern with a more in-depth investigation into the reasons why white workers are less engaged than their African co-workers.

In terms of job characteristics, positive relationships were found between work engagement and specific job resources, of which autonomy and task characteristics were found to be the most prevalent. In order to establish a climate apt for employees who feel enthusiastic about their work and inspired by their jobs, mining organisations should provide their employees with the freedom to perform work, allow their employees to exercise their own measure of influence over their decisions to complete tasks and also allow them opportunities to determine the content of the work they do. Similarly, mining organisations should also emphasise the existence of opportunities for growth and provide employees with sufficient task variety. This will certainly create a work environment which is characterised by employees who are engaged in the work that they do.

The spirit of these recommendations suggests that mining organisations must realise the need to explain to and advise their employees on what work engagement constitutes and how it not only contributes to the well-being of the organisation but also the wellbeing of employees. Mining organisations need to explain the significance of the relationship between job resources and work

engagement. This will allow employees to identify specific job resources within their work environment, which could help them in their functioning at work and which will allow them to cultivate a sense of engagement with their work.

In line with the findings of this study (i.e., the positive correlation between work engagement and positive home-work interference (HWI)), it is also suggested that mining organisations should stress the importance of recovery from effort expenditure at work. The importance of a healthy family/private home-life should be emphasised. Sufficient home resources could be made available to employees who are in desperate need of it. In light of the organisation's attempt to create awareness of the importance of balance between work and home domains, certain problem areas can be addressed through the development of wellness programmes which will contribute to the prevention of crisis situations and assist in the day-to-day management of staff. These specific interventions will not only result in the long-term well-being of employees but also in the prosperity of the organisation.

5.3.2 Recommendations for future research

Regardless of the limitations of the present study, the findings of this study can offer valuable suggestions for studies conducted in the future. The most obvious suggestion relates to the use of longitudinal studies. This will provide a deeper understanding of the so-called "cause" and "effect" of relationships between certain demographic and job characteristics and the work engagement construct, as well as insight into whether these relationships are sustainable over time. However, Montgomery et al. (2003) suggest that longitudinal surveys should only be used in circumstances when its research power is necessary to obtain the most advantageous results.

Future studies on the work engagement construct in South Africa need to be done across various occupations. This would allow different occupational groups to determine which specific demographic and job characteristics inspire a sense of work engagement among their employees. Research conducted over a range of occupational groups could lead to the establishment of norms and practices within specific professions, which can subsequently be compared and tested among the different groups.

Research conducted in the mining environment in South Africa should emphasise the importance of facilitating employees to align their work and home domains in such a way that positive balances between their work lives and private lives are obtained. In this way, possible adverse health effects on employees could be evaded. Despite the fact that work-home interaction is a newly researched domain, there is a need for longitudinal studies in this field of study (Demerouti, Geurts & Kompier, 2004). Similarly, this would provide organisations with the necessary insight into why stable work and home characteristics influence the interaction process between these two life domains. Much more research is needed in the positive HWI field. Positive HWI was found to contribute strongly and positively to work engagement. It was also found to be a powerful predictor of work engagement. Future research will contribute to the validity of the findings in this study, and in all probability allow organisations to realise the potential of investing in the well-being of employees in their private life domains.

In studying the work engagement construct, it is suggested that future research should be aimed at considering whether work engagement contributes to productivity, job satisfaction and the production of quality goods and superior services.

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