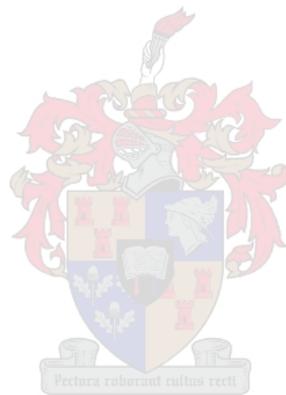


Motivating Potential Score (MPS) as a job resource within the Job Demands-Resources model in the South African Mining Industry.

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Thesis submitted in partial fulfilment of the requirements for the degree of Master of Commerce (Industrial Psychology) in the Faculty of Economic and Management Sciences at Stellenbosch University

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March 2020

DECLARATION

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

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ABSTRACT

Relevant literature related to the mining industry consistently highlights the challenging job demands and conditions faced by these employees and the effect it has on individual well-being and motivation. In addition, noteworthy changes have taken place within the mining sector with employees faced with greater workloads, a struggling economy that has led to retrenchments, and greater government interference (Iverson & Maguire, 1999). This combined with the automation of mining jobs and political unrest within the industry has led to South African mining communities experiencing lower levels of job satisfaction, motivation and higher levels of reported job insecurity and employee unrest (O’Conner, 2017).

Although alarming, Bakker and Demerouti (2014) stated that some individuals, regardless of experiencing high job demands, do not develop burnout but rather seem to handle the high demanding and stressful work environments better. Remaining aligned with these findings, the present study aimed at investigating factors that influences the well-being of mining employees. Furthermore, due to the limited research aimed at motivating potential score as a construct and its effects as a job resource on employee engagement and burnout within the mining industry, the following research-initiating question was asked:

- What causes variance in Engagement and Burnout amongst mining employees within South Africa?

The job demands-resources (JD-R) model (Bakker and Demerouti, 2004) was utilised as a framework in order to investigate the research-initiating question for mining employees within South Africa.

The primary objective of this research study was to develop and test a motivating potential score structural model, which could explain the antecedents of variance in work engagement and burnout. The antecedents investigated in the study comprised of motivating potential score (as a job resource), strength use behaviour (as a personal resource), deficit correction behaviour (as a personal resource) and work overload (as a job demand) present within the mining environment.

An *ex post facto* correlation design was utilised in order to test the formulated hypotheses. Quantitative data was collected from 257 employees by means of non-probability convenience sampling. A hard copy, self-administrating questionnaire was distributed to mining employees,

situated in the North-West. This approach was undertaken after organisational approval was received as well as ethical clearance from Stellenbosch University, given that the mining employees had agreed to participate in the study.

The measuring instruments consisted of 1) the Utrecht Engagement Scale (UWES-17); 2) the Maslach Burnout Inventory-General Survey (MBI-GS); 3) the revised Job Diagnostic Survey (JDS); 4) Strength Use Behaviour and Deficit correction questionnaire (SUDCO); and 5) Job Demands-Resources Scale (JDRS). The data gathered was analysed by using item analysis as well as structural equation modelling, whereby partial least squares path analysis was conducted to determine the significance of the hypothesised relationship.

From the 11 hypotheses that was formulated for this research study, five were found to be significant. More specifically, hypotheses 1, 2, 3, 4 and 5 were all found to be statistically significant and as a result, supported the JD-R theory (Bakker & Demerouti, 2014), which advocates that job and resources are the most important predictors of employee engagement as well as job demands being the most important predictors of burnout. Hypotheses 6, 7, 8, 9, 10 and 11 were found to be not significant, these hypotheses however were linked to the moderating effects.

Furthermore, the investigation and interpretation of the final scores indicated that mining employees stationed in the North-West were highly engaged, experienced high levels of burnout, had access to mining jobs that had a variety of job characteristics, had high self-start behaviour and seemed to experience high levels of job demands.

The findings of this research study shed light on the importance of organisational interventions that fosters job and personal resources in the pursuit of optimising employee engagement and burnout. Furthermore, the importance of motivating potential score as a job resource was highlighted for the mining industry and effect it has on employee engagement as well as aid to cope with their existing job demands, which ultimately leads to lower levels of experienced burnout.

OPSOMMING

Relevante literatuur oor die myn industrie beklemtoon die uitdagende werkseise en omstandighede wat werknemers in die gesig staar en watter effek dit op individuele welstand en motivering het. Boonop, opmerklike veranderinge het plaasgevind in die myn sektor wat veroorsaak het dat mynwerkers groter werkladinge, 'n sukkelende ekonomie wat lei tot afleggings en groter regering betrokkeheid in die gesig staar (Iverson & Maguire, 1999). Dit gekombineer met die outomatisasie van myn werke en politiese onrus binne die industrie het gelei tot Suid Afrikaanse myn gemeenskappe wat laer werktevredenheid, motivering en hoër vlakke van werksonsekerheid en werknemeronrus (O'Connor, 2017).

Alhoewel skokkend het Bakker en Demerouti (2014) verklaar dat sekere individue, ongeag van hulle hoë werklading, nie uitbranding ontwikkel nie, maar eerder die veeleisende en stressvolle werksomgewing beter hanteer. Deur bylenend die bly met hierdie bevindinge, mik die huidige studie om faktore te ondersoek wat die welstand van mynwerkers beïnvloed. Verder, aangesien beperkte navorsing wat gemik teenoor motivering potensiaal telling as 'n konstruk en die effek van hierdie konstruk as 'n werkhulpbron op werknemerbetrokkeheid en uitbranding binne die myn industrie bestaan, is die volgende navordingsinisiërende vraag gevra:

- Wat veroorsaak variënsie in werknemerbetrokkeheid en uitbranding tussen myn werkers van Suid Afrika?

Die werkseise-hulpbronne-model (job demands-resources (JD-R) model) (Bakker and Demerouti, 2004) is as 'n raamwerk gebruik om hierdie navordingsinisiërende vraag in die myn industrie van Suid Afrika te beantwoord.

Die primêre doelwit van hierdie studie was om 'n strukturele model vir motivering potensiaal telling te ontwerp en te toets, wat die antesedente van variënsie in werkbetrokkeheid en uitbranding te verklaar. Die antesante behels motivering potensiaal telling (as 'n werkhulpbron), selfkrag gedrag (as 'n persoonlike hulpbron), tekort regstellende gedrag (as 'n persoonlike hulpbron) en werksoorlading (as 'n werkseis) wat vertoonwoordig is binne die mynbedryf.

'n *Ex post facto* korrelasionele ontwerp is gebruik om die geformuleerde hipoteses te toets. Kwantitatiewe data is deur middel van nie-waarskynlikheids-gerieflikheidssteekproefneming by 257 mynwerkers versamel. 'n Selftoegedienende vraelys op harde kopie was versprei by na

mynwerkers in die Noord Wes. Hierdie benadering was onderneem, slegs na toestemming by die organisasie ontvang was, asook etiese goedkeuring van die Universiteit Stellenbosch, en gegee dat die mynwerkers ingestem het om aan die navorsing deel te neem.

Die meetinstrumente het bestaan uit 1) the *Utrecht Engagement Scale* (UWES-17); 2) the *Maslach Burnout Inventory-General Survey* (MBI-GS); 3) the *Revised Job Diagnostic Survey* (JDS); 4) *Strength Use Behaviour and Deficit correction questionnaire* (SUDCO); and 5) *Job Demands-Resources Scale* (JD-RS). Die data is met behulp van itemanalises en Strukturele Vergelykingsmodellering (SEM) geanaliseer, waar PLS pad-ontleding onderneem is om die betekenisvolheid van die gehipoteseerde verhoudings te bepaal.

Van die 11 hipoteses wat in die studie geformuleer is, is vyf betekenisvol bevind. Meer spesifiek is hipoteses 1, 2, 3, 4 en 5 almal statisties betekenisvol bevind, wat beteken dat hierdie hipoteses JD-R-teorie ondersteun (Bakker & Demerouti, 2014). Hierdie teorie postuleer dat werk en persoonlike hulpbronne oor die algemeen die belangrikste voorspellers van werksbetrokkenheid is, terwyl werkseise oor die algemeen die belangrikste voorspellers is van beroepsgesondheidsprobleme is. Hipoteses 6, 7, 8, 9, 10 en 11 is nie betekenisvol bevind nie; hierdie hipoteses hou egter verband met die matigende effekte.

Verder is daar gevind tydens die ondersoek en interpretasie van die finale resultate dat mynwerkers wat gestationeer is in die Noord Wes is hoogs betrokke by hul werk, het hoë vlakke van uitbranding ervaar, toegang het tot 'n werk wat toegerus is met 'n verskeidenheid werkskenmerke, hoë selfinisieering gedrag en hoë vlakke van werkseise te ervaar.

Die bevindinge van die studie werp lig op die belangrikheid van organisatoriese ingrypings wat werks en persoonlike hulpbronne bevorder in die nastrewing van die optimering van werksbetrokkenheid en uitbranding. Verder, die belangrikheid van motivering potensiaal telling as 'n werks-hulpbron was benadruk vir die myn bedryf en die effek wat dit het op werknemerbetrokkenheid sodat hulle hul huidige werkseise meer doeltreffend kan hanteer, wat dan kumulatief 'n afname in werknemers se vlak van uitbranding sal veroorsaak.

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I am now utterly convinced that patience is the ability to accept that things can happen in a different order than I had in mind.

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CHAPTER 1

BACKGROUND TO THE STUDY

1.1 INTRODUCTION

Worldwide today, a growing emphasis is placed on organisational outputs. Competitive markets have forced organisations to shift their primary focus towards the human capital sphere of operation and the productivity of human resources. Organisations today are faced with overwhelming demands, forcing companies to place their principal focus on profit as well as individuals who can contribute to this goal.

Organisational profit and the achievement of these targets are reliant on employee satisfaction and organisational commitment (Pinho, Carlos, Paula, & Dibb, 2014). According to Hussein, Khachfe, Haj-Ali and Aridi (2016), job satisfaction is an effective indicator of the success of any business as it reflects an environment where employees are motivated to perform their various duties efficiently. Work engagement contributes towards the success of any organisation (Hussein, et al., 2016). As a result, Jackson, Rothman, & Van De Vijver, (2006) advocated for the importance of investigating factors that foster employee engagement, since the core of any organisation lies within its human capital and the effectiveness thereof.

Work engagement has been an extensively researched topic within the Industrial Psychology domain. Work engagement, which is acknowledged as the business initiative associated with organisational success, can be defined as “a positive, fulfilling, work-related state of mind, most commonly characterised by vigour, dedication and absorption” (Geldenhuis, Laba & Venter, 2014) (Lockwood, 2007). Due to the increase in job demands faced by employees, many organisations today are faced with a disengaged workforce (Allam, 2017).

Allam (2017) further states that conditions such as burnout could be the result of a continuous increase of job demands placed on employees. Demands such as lack of organisational support and individual growth, an increase in working hours and cost of living are taking its toll on the workers class, with many not having adequate resources to withstand the pressure (Geldenhuis, et al., 2014). Furthermore, the unstableness of the South African economy and lack of job security also raises the demands faced by these professionals (Bebbington, Hinojosa, Bebbington, Burneo and Warnaars, 2008).

Burnout was recognised and investigated in the early 1970s, and the term burnout has since been used to describe a state of emotional, cognitive and physical exhaustion (Shirom, 2003). From the onset, it has been found that burnout has detrimental effects for the individual as well as for the organisation (Allam, 2017). Burnout contributes towards employee dissatisfaction, disengagement, poor work performance, intention to quit, absenteeism, and other dysfunctional behaviours that impact the overall targets of the organisation and the productivity thereof (Shirom, 2003).

The mining industry plays an imperative role within the South African economy despite the challenges this sector is faced with (Palo & Rothmann, 2016). These challenges lead to employees within this sector to struggle to remain engaged and satisfied with their jobs (Palo & Rothmann, 2016). Hamann (2004) stated that although South Africa is labelled as one of the countries that are richest in earthly minerals, the lack of proper leadership, corruption, social unrest, and an unmotivated workforce has resulted in mines merely reaching 63% of their mining potential. Jackson et al. (2006) stated that job dissatisfaction, anxiety, depression, HIV Aids and numerous physical health problems are prominent within the South African Mining sector fuelling high employee turn-over rates, union interventions and employee absenteeism.

According to Milner and Khoza (2008), the continuous increase in workloads experienced by mining employees have resulted in miners showcasing detachment, higher levels of absenteeism and disengagement. A steadily increase in job demands the last decade, combined with a lack of proper resources, have resulted in a rapid change of organisational requirements and as a result more pressure has been asserted onto mining employees (Milner& Khoza, 2008).

Palo & Rothmann (2016) explained that the unstable economic climate within the South African economy leads to an increase in competitiveness amongst employees; exaggeration of achievement; and a win at all cost mentality which has contributed to an unbalanced mining sector. This was supported by Baxtor (2016), who stated that close to sixty thousand mining jobs have been lost due to the increase in minimum wages and the weak rand.

The information mentioned above clearly states that the continuous transformation of this industry unquestionably impacts on employee well-being (engagement and burnout). As outlined earlier, organisation's expectations in terms of employee availability outside of working hours, reaching of higher production targets, personal development, and the continuous effort

towards their work has fuelled the job demands that exceed the resources many of these individuals have to buffer the effects of the job demands. Thus, the resources (job and personal) as well as the job demands placed on employees will undeniably impact employee well-being and in turn impact individual and organisational output. It is therefore essential to determine the factors that impact employee engagement and job burnout amongst employees in the mining industry in order to intervene and aid employee well-being within this sector.

This will also highlight where organisations can develop human resource supportive interventions to aid mining employees faced with overwhelming job demands and who do not have the resources to combat these difficulties.

1.2 RELEVANCE OF THE STUDY

Understanding employee well-being is of utmost importance due to the amount of money, time and resources companies invest in their employees (Saks, 2006). Organisations strive to ensure employee engagement, motivation and the successful combat of burnout, ensuring organisational growth, global competitiveness and high levels of organisational output (Baxtor, 2016).

Initially, the focus was placed on how burnout could be addressed within the workplace. However, a shift towards this approach was investigated from a positive psychology perspective (Malaka, 2014). The findings supported the view of a positive psychology approach, which advocated for the consideration of using human strengths and happiness, opposed to focussing on weaknesses and unhappiness (Malaka, 2014). Engagement therefore sprouted from individuals applying their strengths when pursuing gratification (Malaka, 2014). This was supported by Schaufeli, Salanova, González-Romá and Bakker (2002) who advocated that engagement could be seen as an independent construct but could still be seen as the antipode for burnout.

Various studies have supported the view that employee engagement predicts positive organisational outcomes such as: job satisfaction, return on employee investment, organisational output, productivity, employee motivation, low turnover intention and individual commitment (Bakker, Schaufeli, Leiter, & Taris, 2008).

Based on the importance of an engaged employee and the dangers of employees facing burnout, an Industrial Organisational Psychologist (IOP) / HR Management within an

organisation has a key function in determining individual well-being as well as advising on best practices to induce higher levels of employee engagement. As a result, the importance of investigating burnout and engagement as research topics are essential to ensure the effective management of these variables within the workplace.

Thus, the purpose of the study is to investigate why some employees experience engagement and job burnout within the mining industry and why other employees do not. If, through statistical analysis, the hypothesised paths of the structural model are shown to be significant, the gained insights would prove useful in providing the necessary resources and support in addressing the motivational potential score of the occupation.

1.3 THE RESEARCH-INITIATING QUESTION (RIQ)

Given the introductory argument, it can be stated that some employees experience burnout and others do not, while some employees show higher levels of engagement while others do not. This is grouped with some employees relying more on personal resources than on job resources as well as others being more reliant on job resources than personal resources.

The following research-initiating question was thus the driving force behind the study:

- *What causes variance in Engagement and Burnout amongst mining employees within South Africa?*

1.4 RESEARCH AIM AND OBJECTIVES

Given the research question, the overarching aim of this study was to develop a and empirically test a structural model that explains the antecedents of variance that influence the engagement and burnout of employees within the mining industry.

The study focused on the following research objectives:

- Determine the level of burnout and engagement experienced by mining employees employed and situated in the North West, South Africa.
- Identify the most prominent antecedents that influence variance in burnout and engagement experienced by mining employees, operating in the South African Mining Industry;

- Development of a conceptual model, which depicts the complex dynamics of the variables proposed to explain the variance in the psychological processes underlying employee motivation;
- Determine the strength of the influence these salient variables have on the engagement and burnout of employees; thus, test the fit of the proposed model and assess the significance of the different hypothesised paths.
- Examine modification indices in order to investigate possible changes to the model.
- Highlight the findings, conclusions, shortcomings of the study as well as suggest implications for organizations.

1.5 IMPORTANCE AND CONTRIBUTIONS OF THE STUDY

The primary aim of this research study was primed at determining whether the constructs in the proposed structural model accounted for the significant variance in engagement and burnout by investigating the motivational process of the model and its outcomes. The study, therefore, placed emphasis on how specific salient variables, such as personal and job resources as well as job demands relates to the engagement and burnout of employees within the mining industry.

This study concentrated on the paths stipulated in the model. Investigative attention was not aimed to the sub-components of constructs or hypotheses related. For example, although motivating potential score (job resource) consists of five sub-dimensions, namely skill variety, task identity, task significance, autonomy and feedback, no hypotheses were stated individually for these components that would explain the relationship between the sub-dimensions and for example, engagement. This approach was due to the whole approach of the research, which aimed to answer the relation amongst these constructs and not the subcomponents.

However, specific attention was paid to and hypotheses were formulated for each of the Strengths Use and Deficit Correction Questionnaire (SUDCO) constructs, Strength Use Behaviour (SUB) and Deficit Correction Behaviour (DCB) as personal resources due to the differing definitions of these constructs. The researcher did not make any effort to improve the psychometric properties of the measures, utilised, for example by manipulating the dataset using Factor Analysis, attendant strategies or item deletion.

1.6 CHAPTER OUTLINE

Chapter 1 provides an overview of engagement and burnout of employees and the effect thereof. This is followed by a discussion of the Job demands-resources model can be applied to investigate the variance of engagement and burnout within the mining industry. The relevance of the research is discussed, and the research objectives are outlined.

Chapter 2 gives an in-depth literature review to support the theoretical objective of the study. All latent variables are defined, explained and discussed in terms of existing academic literature. The relationship between variables are explored and a theoretical model is developed to graphically portray these relationships grouped with the research hypotheses.

Chapter 3 comprises of the methodology of this study. The substantive research hypotheses as well as the structural model is presented. Additionally, a discussion of the research design, research participants and measuring instruments are provided. Lastly, missing values, statistical analyses and research ethics are provided.

Chapter 4 reports the results consequent of the statistical analyses. The participant scores are discussed, and the hypotheses are interpreted.

Lastly, the managerial implications of the variance in engagement and burnout as well as the practical interventions are discussed in Chapter 5. In addition, the limitations of this research study and recommendations for future research endeavours are outlined.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The purpose of this chapter is to investigate the relevant constructs of the study through the theoretically defining, investigating and explaining the relevant variables from which the proposed structural model was developed. As a result, the literature study will focus on previous studies to provide the foundational background and basis for this study. This chapter starts with a brief overview of the job demands-resources (JD-R) model, which was used as a conceptual framework to explain why variance exist in engagement and burnout experienced by mining employees by focusing on the job demands and the job and personal resource domains of an organisation.

2.2 THE JOB DEMANDS-RESOURCES MODEL OF OCCUPATIONAL WELL-BEING

According to Bakker and Demerouti (2017), the Job Demands-Resources (JD-R) model was developed as a theoretical basis that provides individual spheres of operation for every occupation and assumes that each occupation has its own specific demands and resources that in essence effects the well-being of the individual. These two broad classifications - resources and demands- can be applied to all occupations, regardless of the specific demands and resources involved.

The core of the JD-R model suggests that personal and job resources successfully predict the work engagement showcased by employees, depending on the moderation of the job demands (Bakker & Demerouti, 2017). Bakker and Demerouti (2014) stated that in the instance where job demands are high, grouped with high job and personal resources, the engagement of individuals will be greater than when these components are low.

As a result, the model proposes that job and personal resources grouped with the specific job demands initiates two distinct, but related processes (Mostert, Cronje, & Pienaar, 2006). Firstly, the motivational process fuels the engagement of employees in terms of work engagement, motivation, organisational commitment and job enjoyment. The second process refers the health impairment outcome, which is characterised by a de-energising process, where high

demands (personal or job) reduce an employees' resources (mental and physical) leading to health impairments and burnout (Schaufeli & Bakker, 2004).

Bakker et al. (2014) stated that although job demands and job resources initiate different processes, they also result in combined effects since there are two distinct ways in which job demands and resources affect individual well-being and performance. Firstly, research has shown that job resources buffer the effect of job demands such as burnout, as individuals consisting of various resources will be better able to cope with daily demands (Boyd, Bakker, Pignata, Winefield, Gillespie & Stough, 2011). The second interaction described by Bakker et al. (2014) is one in which job demands strengthen the impact of job resources on motivation and individual engagement. Bakker and Demerouti (2018) found that job resources have the strongest positive impact when job demands are high. Therefore, when an employee is faced with challenging job demands (Work overload), job resources will become imperative to foster engagement towards the task at hand.

Bakker, Demerouti and Euwema (2005) stated that the JD-R model initially only considered job characteristics, nonetheless this resulted in a limitation of the model upon which personal resources were integrated to better understand the interaction between the person and their environment. Personal resources, as defined by Bakker & Demerouti (2018) refers to an individual's psychological characteristics that provides the ability to operate successfully in one's environment (Bakker & Demerouti, 2018). These resources contribute to the functionality of an individual's work goals, individual growth and personal development (Bakker & Demerouti, 2018).

Furthermore, Bakker and Demerouti (2016) stated that employees that are motivated are more likely to exhibit better job performance and increases the likelihood of engaging in job crafting behaviours, which refers to an individual pursuing additional resources and challenges with the aim of decreasing job demands and ultimately promotes "gain spirals" (Demerouti, 2016). As a result, job crafting is assumed to correlate positively with the resource – motivation relationship. For example, a mining employee may experience higher work engagement due to the higher level of autonomy (job resource), based on the latest reasoning it can then be assumed that this individual will engage in activities to further his/her resources and craft his/her job accordingly.

Additionally, the term “self-undermining behaviour” was subsequently introduced and proposed by Bakker and Costa (2014, p.115) which describes “behaviour that creates obstacles that may undermine performance” which promotes “loss spirals”. Additionally, Bakker (2016) referred to self-undermining behaviour as “shooting oneself in the foot”. As a result, self-undermining is assumed to correlate positively with the demand – strain relationship. Using the previous example, should the mining employee be faced with higher levels of job demands which ultimately effects the level of strain and be highly self-critical, the employee might wonder if he/she will be able to conquer the current situation which ultimately fuels the loss spiral. A schematic representation of the JD-R model can be seen in Figure 2.1 below.

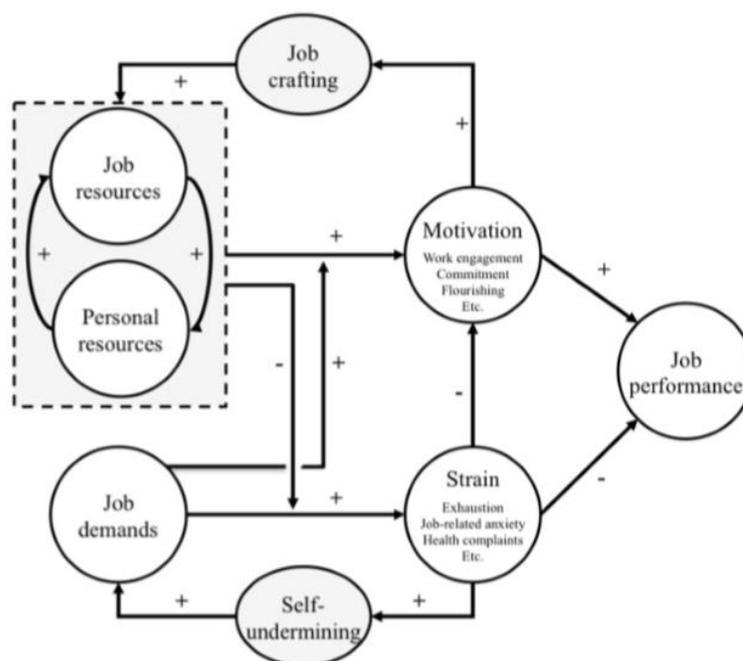


Figure 2.1. The Job Demands-Resource (JD-R) model (Bakker & Demerouti, 2018).

2.3 RELEVANT LATENT VARIABLE

2.3.1 Engagement

Within the world of work, engagement has become an important aspect due to the positive consequences it has for the organisation. Research has highlighted the correlation found between highly engaged employees and higher levels of organisational commitment, job satisfaction, health & well-being, and individual performance (Masvure, Ruggunan and Maharaj, 2014). This was supported by Schaufeli & Bakker (2004), who found a correlation between work engagement and lower levels of absenteeism and turnover rates. A correlation

was also found between work engagement and higher levels of personal initiatives, proactive behaviour and learning motivation (Schaufeli & Bakker, 2004).

Alternatively, Schaufeli et al. (2004) argued that work engagement varies within persons. The level of engagement is also dependent on the amount of job resources that are available (Boyd, et al., 2011). As a result, the importance of a resourceful working environment becomes imperative.

Employee productivity exists when an employee experiences (a) satisfaction within the work setting and (b) has frequent positive emotions with infrequent negative emotions (Bakker & Oerlemans, 2012). High levels of employee engagement and job satisfaction indicates positive emotions that individuals experience at work, whereas burnout or work overload is evidence of negative emotions experienced at work (Bakker & Oerlemans, 2012).

Employee engagement, often times researched on the backdrop of burnout, has been portrayed as the absence of tiredness, an energetic approach to an individual's job, which is showcased in organisational outputs (Dollard & Bakker, 2010). Engaged employees, unlike those who suffer from burnout, view their daily tasks as challenging instead of overwhelming and stressful (Bakker, Schaufeli, Leiter, & Taris, 2008).

Engagement as defined by Bakker et al. (2004) refers to a work-related state of mind that is characterised by vigour, dedication and absorption with an overarching positive approach. Vigour is characterised by a willingness to invest time and effort in one's work while simultaneously showcasing high levels of mental resilience and energy as well as perseverance amidst challenges (Bakker et al., 2008). Dedication refers to an individual having a strong connection with their work as well as experiencing a sense of enthusiasm and significance towards their contribution (Bakker et al., 2008). Lastly, absorption refers to a fully focused and happily immersed individual invested in their work, whereby time passes quickly (Bakker et al., 2008).

2.3.2 Burnout

In contrast, negative forms of occupational well-being include burnout and work overload (Poghosyan, Aiken, & Sloane, 2010). Burnout, which is defined as a psychological syndrome that involves emotional exhaustion, depersonalisation and a diminished sense of personal accomplishment, has major implications to the organisation as well as the individual

(Poghosyan et al., 2010). Emotional exhaustion, which is characterised by having feelings of emotional depletion, extreme tiredness and a general lack of energy, ultimately lead to a feeling of being drained of emotional resources and decreases the ability to cope with continuing demands (Maslach & Jackson, 1986). Cynicism can be characterised by an uncaring response towards people encountered at work and/or an effort to deal with work stress by separating oneself from others. Lastly, a diminished sense of personal accomplishment refers to the comparison that employees make with regards to their current levels of competence versus their previous levels before emotional exhaustion and depersonalisation manifested (Poghosyan, Aiken, & Sloane, 2010). During this self-evaluation when employees conclude that their competence has decreased, feelings of inadequacy, low self-esteem, lack of achievement and lower productivity follows (Nink, 2015).

Worldwide today, one of the biggest psychological problems is burnout (Reuters, 2012). Burnout, which is often described as the state of emotional, mental, and physical exhaustion is the result of excessive and prolonged stress. Symptoms of burnout have become a work-related phenomenon worldwide (Hetherington, 1989). A study in Germany showed that 34% of the active working population displayed symptoms of burnout (Nink, 2015) while a study done in the USA showed that 77% of the working population suffered from physical symptoms of burnout (APA, 2007).

Burnout is not a new occurrence in South Africa. A study reported that as many as 53% of the South African working population do not take their entire annual leave, and this results in physical and psychological symptoms of burnout (Joubert and Snyman, 2014). Statistics South Africa shows that the South African economy loses between R12 billion and R16 billion annually during employee absenteeism that is a result of failure to recognize and address the early warning signs of burnout (Malaka, 2014).

According to Pullen (2012), burnout has major implications for the organisation that include absenteeism, presenteeism, low productivity and early retirement. It has dire effects on the individual as well, which includes increased illness, loss of appetite, anxiety, depression and decreased motivation (Carter, 2013).

Burnout occurs when an individual feels overwhelmed by daily tasks, are emotionally drained and unable to meet constant demands (Smith, M., Segal, J., Robinson, L., & Segal, R. 2016), which is a result of prolonged exposure to chronic emotional and/or physical stressors at work.

As a result, the question emerges as to why some individuals are engaged and enthusiastic about their work, while others are burnt out and appear to be disconnected (Bakker & Demerouti, 2014).

2.3.3 Resources

Bakker & Demerouti (2007) advocated that people's primary motivation is not merely to protect and preserve their current available resources, but to gather additional resources, whether for job or personal resources.

Schaufeli & Bakker (2004) refers to job resources as any physical, psychological, social or organisational aspects of the job that either/or: a) reduces job demands and the associated physiological costs; b) aids to the functionality of achieving work goals; c) stimulates personal growth, learning and development. Resources may be located in the task itself (e.g., skill variety, autonomy), as well as in the context of the task, for instance, organisational resources (e.g., job security), social resources (e.g., managerial support) and in personal resources (e.g., self-efficacy) (Alarcon & Edwards, 2011). When employees are faced with a lack of resources, their organisational engagement decreases due to their pre-occupation with overwhelming demands and straining elements of the job.

While there are many job and personal resources that lead to engagement (e.g. task complexity, task mastery, feedback) the focus for this study will be on the Motivation Potential Score (MPS) (skill variety, task identity, task-significance, autonomy and feedback) derived from the Job Characteristics model.

Employees strive to accumulate and increase their job resources (Skill Variety, Task Identity, Task significance, Autonomy and Feedback).

2.3.3.1 Motivating Potential Score as a job resource

Employee demotivation, dissatisfaction and marginal performance has the ability to cripple any organisation (Boonzaier, Ficker and Rust, 2001). Consequently, Hackman and Lawler (1971) investigated the job characteristics theory and formulated it as a model of job design. This theory was refined and termed as the Job Characteristics Model in 1976 by Hackman and Oldham. This model has been considered the most influential model of job characteristics and the research thereof (Hackman & Oldham, 1976).

According to Boonzaier et al. (2001), this model has been utilised to address complex human resource problems and specifies the conditions under which workers will showcase higher levels of motivation, satisfaction and productivity. This model has been found to be an effective indicator for the success of any business as it motivates the employees to perform their vast duties more effectively (Hussein, Khachfe, Haj-Ali & Aridi, 2016).

Hussein, Khachfe, Haj-Ali & Aridi (2016) defines employee motivation as an individual's internal process which accounts for the person's intensity, direction and persistence of effort towards attaining a goal. Employee motivation has been linked to higher levels of productivity, organisational output and lower levels of intention to quit, and therefore it should be viewed as a key indicator in job design (Schaufeli & Bakker, 2004).

Hackman and Oldham (1976) designed a Job Diagnostic Survey (JDS) as an attempt to make a measurable assessment tool for job satisfaction, since a positive correlation was established between employee satisfaction, employee motivation and organisational output. The JDS provides direct measures for all the variables within the Job Characteristics Model. The JDS is an effective tool used to detect and identify the weak points affecting the employees' effectiveness and performance (Casey and Robbins, 2009).

Congruently, the JDS was adapted by George and Jones (2012) whereby a single index referred to as the Motivating Potential Score (MPS) for a job (Yaverbaum and Culpan, 2011). This measure focusses on dimensions affecting employee motivation and computes a score reflecting the overall motivating potential of a job in terms of five job characteristics (e.g. Skill variety, Task identity, Task significance, Autonomy and Feedback) (Boonzaier et al., 2001). These five core dimensions influence employee motivation and test the fulfilment of the job characteristics experienced by employees. Combining these five core dimensions provide key insights into employee reasoning and commitment.

Firstly, Skill variety, refers to the type of activities an employee does as well as the scope of different skills required by an employee to complete a variety of tasks (Hussein, et al., 2016). Task identity, whereby employees understand a holistic view of a project and being involved from beginning to end (Hussein, et al., 2016). Task significance, which refers to the substantial impact the work an employee does has on the organisation (Boonzaier et al., 2001). Autonomy, referring to the freedom of scheduling and decision making has been found to have a substantial impact on employee motivation (Boonzaier et al., 2001). Lastly, Feedback refers to

the continuous feedback that is provided, commenting on the effectiveness of employees, which has been found to play an imperative role in employee performance (Hussein, et al., 2016).

Boonzaier (2001) stated that significant inter correlations are found between job characteristics. In general, when jobs are high on any one of the job characteristics, they will also reflect a high score on the other job characteristics (Boonzaier, 2001). As a result, jobs reflecting high motivating potential, often reflect good scores in numerous ways (Boonzaier, 2001). Conversely, jobs low in motivating potential usually possess a lower score on other dimensions (Boonzaier, 2001). For example, jobs requiring a variety of skills, usually also possess greater task significance, task identity and offer more autonomy and feedback (Boonzaier, 2001).

A study conducted by Bahrami, Aghaei, Barati and Tafti (2016) found the motivating potential score and three of its components, including skill variety, feedback, and autonomy, to have a significant positive correlation with organizational commitment. These results confirm that any improvement of job characteristics will lead to organizational commitment incensement. This was supported by a study conducted within South Africa, whereby a positive correlation was found between higher scores on job characteristics and levels of work engagement (Van Deventer, 2015).

Limited research has been conducted with regards to the MPS within a South African mining context. This offers the platform for research that will provide insight into the perceived job resources employees experience and deliver valuable insight for higher managerial levels to develop supporting structures in addressing these limitations.

2.3.3.2 Strength Use Behaviour and Deficit Correction Behaviour as a personal resource

Competitive working environments grouped with work scarcity has forced organisations to seek out individuals with exceptional strengths and lower weaknesses during the recruitment phase (Pinho, et al., 2014). However, the positive psychology approach as mentioned, focus the shift on how employee weakness could be addressed within the workplace by advocating for the consideration of using a balanced approach regarding individual strengths and weaknesses (Malaka, 2014).

Various views advocate to primarily focusing on strengths, due to the amplification of strengths being more effective than the overcoming of weaknesses (Woerkom, et al., 2015). One

common denominator however arose: psychology professionals should focus on synthesizing the positives and negatives of humans (Woerkom, et al., 2015). Simply put, professionals should aim to repair weaknesses but also nurture strengths (Woerkom, Mostert, Els, Bakker, De Beer & Rothmann, 2015). Sonnentag (2003) stated that proactive behaviour, which is defined as taking the initiative to improve their current circumstances, rather than just acceptance, is an individual strength that not only organisations value but also has been linked to employee engagement.

Strength Use Behaviour (SUB) refers to an individual's will to engage in proactive behaviour aimed at using their own strengths at their place of work (Woerkom, et al., 2015). Similarly, Deficit Correction Behaviour (DCB) refers to individuals taking the initiative to overcome their shortfalls in a proactive manner. Simply put, Strength Use Behaviour refers to an individual's proactive approach to use their strengths, whereby Correction Deficit Behaviour refers to an individual's proactive approach to improving their deficits within the workplace. E.g. Should an employee be overwhelmed with job demands (work overload), but they perceive their strength as coping well under pressure, they are more likely to be engaged than burnt out (Woerkom, et al., 2015). Alternatively, should an employee struggle to prioritise when faced with overwhelming job demands (work overload), DCB will fuel the behaviour of aiming to plan better, ensuring that the weakness is overcome (Woerkom, et al., 2015).

Quinlan, Swain & Vella-Brodrick (2011) stated that investigating these variables could be beneficial to organisations faced with high job demands due to the level of insight individuals showcase to remain engaged and productive. The outcomes of research within this field could lay the foundation for enhancing personal growth initiatives as well as develop employee performance.

2.3.3 Work overload as a job demand

Literature investigating the negative effects of work stressors such as work overload is very extensive. Work overload which can be described the extent to which job demands are excessive (Gashi, Alfes, Van de Voorde and Gelissen, 2014). Furthermore, the state of work overload describes situations where employees experience too many responsibilities or activities expected from them in light of available time, individual ability and other constraints. It is argued by Coetzer and Rothmann (2011) that excessive workloads could impact employee satisfaction negatively. This is supported by one of the dual processes of the JD-R model which

advocates that poorly designed jobs, or overbearing job demands (i.e. work overload) causes individual strain, physically and mentally and could potentially lead to a depletion of energy (i.e. exhaustion – burnout), health problems and job dissatisfaction (Bakker & Demerouti, 2016).

In addition, noteworthy changes have taken place within the mining sector with employees faced with greater workloads, a struggling economy that has led to retrenchments, and greater government interference (Iverson & Maguire, 1999). Studies among a mining community in Western Australia showed that the most noteworthy stressors of employee roles were harsh working conditions, extreme working hours, and lack of organisational support (Iverson & Maguire, 1999). Combined with the automation of mining jobs and political unrest has led to South African mining communities experiencing lower levels of job satisfaction, motivation and higher levels of reported job insecurity and employee unrest (O’Conner, 2017).

2.3.4 Summary of latent variables

This section provided the definitions and discussion of the relevant variables of interest within this study. The respective relationships between consequent hypotheses related to these variables will now be discussed.

2.4 INTERRELATIONS AMONGST THE LATENT VARIABLES OF INTEREST

2.4.1 Engagement and Burnout

Although the relationship between engagement and burnout has been a highly researched topic over the past 20 years, many researchers still struggle to depict if these constructs are empirically and conceptually different or whether they constitute two faces of one spectrum (Gole, Walter, Bedeian & O’Boyle, 2012).

Maslach and Lieter (1997) viewed engagement as a direct opposite of burnout which can be assessed by the opposite pattern of scores on the three dimensions of the Maslach Burnout Inventory which includes exhaustion, cynicism and ineffectiveness. Burnout which is described as the erosion of engagement whereby “Energy turns into exhaustion; involvement turns into cynicism and efficacy turns into ineffectiveness” (p.24). The authors advocated that employee engagement indicates the lack of burnout and as a result it was assumed to be the positive antipode of burnout (Boyd, et al., 2011).

However, the Utrecht Work Engagement Scale (UWES) was developed on the premise of research conducted by Schaufeli, Salanova, Gonzalez-Roma and Bakker (2002) which concluded that the absence of engagement did not necessarily imply the presence of burnout and vice versa. Research conducted by Taris, Ybema and Beek (2017) aimed to answer the persisting question of the fundamental differences between these two variables with results indicating that these constructs overlap to a large degree and that their differences should not be overestimated.

Scaufeli and Bakker (2004) found that burnout and engagement was negatively related, sharing between 10 percent and 25 percent of their variance. Furthermore, the results agree with earlier findings obtained by Scaufeli, et al. (2002) who found a negative correlation between burnout and engagement among undergraduate students (sample 1) and from public and private companies (sample 2) in Spain. Similarly, within the South African Context, Rothmann (2003) found a significant negative correlation between work engagement and two of burnout's dimensions, namely exhaustion and cynicism.

Therefore, it can be concluded that a negative relationship can be found between engagement and burnout. As a result, the following hypothesis is suggested:

Hypothesis 1: Burnout (η_1) has a negative linear relationship with Engagement (η_2).

2.4.2 Motivating Potential and Engagement

The fundamental assumption of the JD-R theory is that job demands, and resources continuously interacts and predicts occupational well-being. Job demands and resources may have an interaction effect on employees in two possible ways. Firstly, numerous studies have highlighted the value of job resources, such as managerial support, feedback, continuous development and autonomy in the potential these resources have to mitigate the impact of job demands on strain, including burnout (Bakker et al., 2014). Previous studies have shown that employees who perceive higher levels of organisational resources, showcase lower levels of intention to quit, higher levels of organisational commitment and employee productivity (Schaufeli & Bakker, 2004).

Parallel to the findings related to organisational resource, personal resources related to work engagement which have also received extensive research focus include, but are not limited to PsyCap dimensions, sense of coherence, personality dimensions (extraversion,

conscientiousness, emotional stability), active coping styles, flexibility, adaptability and emotional intelligence. Therefore, individuals who have many resources are better equipped to cope with their daily job demands (Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007).

Secondly, job demands amplify the effect that resources have on engagement. For instance, Bakker et al., (2004) advocated that resources become prominent and have the strongest positive influence on engagement when an individual is faced with high job demands. Job and personal resources not only buffer the negative effects of job demands, but also gain urgency when job demands are high. As a result, employees mobilise and activate their available resources when a job becomes more demanding, which allows them to direct their attention to their work resulting in higher levels of engagement. As a result, job and personal resources are key contributors to work engagement (Schaufeli & Bakker, 2004).

The characteristics of an individual's job has also been found to affect the level of engagement experienced by employees (Van den Broeck, Vansteenkiste, De Witte and Lens, 2008). According to Christian, Garza and Slaughter (2011), work engagement has been found to positively correlate with job characteristics such as Skill Variety, Task Identity, Task Significance, Autonomy and Feedback. This was supported by a study conducted by Merghan (2012), who found a significant relationship between job characteristics and critical psychological states such as engagement. As a result, it could be argued that at the presence of these five core characteristics, personal and organisational outcomes will maximise.

Hackman and Oldham (1974) advocated the use of two distinct indexes to measure MPS. Firstly, the simple weighted additive index, which is used to test moderations effects and the unweighted additive index. The unweighted additive index of job complexity is computed by adding the scores of the five job characteristics. Evans and Ondrack (1991), declared the preferred formula to be used should be the unweighted additive index, especially with regards to job redesign interventions.

The weighted additive job complexity index is computed as follows:

$$\text{MPS} = \text{Skill variety} + \text{Task identity} + \text{Task significance} + \text{Autonomy} + \text{Feedback}$$

Mining employees are often faced with economic restraints, repetitive work schedules and minimal feedback, which has a dire effect on the productivity of these employees over the long term (Masvaure, Ruggunan & Maharaj, 2014). As a result, when employees experience higher

levels of Motivating Potential, or higher levels of organisational support, employees are more likely to showcase higher levels of engagement and productivity. Therefore, the following hypothesis is suggested:

Hypothesis 2: *Motivating Potential Score (ξ_1) has a positive linear relationship with Engagement (η_1).*

2.4.3 Strength Use Behaviour and Engagement

Individual characteristics has also been found to affect the level of engagement experienced by employees (Van den Broeck, Vansteenkiste, De Witte and Lens, 2008). Similarly, to the findings of job resources, Sonnentag (2003) stated that the utilisation of personal strengths within the organisation has been found to positively correlate with employee engagement.

Due to the ever-increasing job demands, mining employees are often faced with challenging working conditions, grouped with limited job resources to buffer these demands. As a result, personal resources become imperative in combating these demands. This is supported by a study conducted by Woerkom, Oerlemans and Bakker (2015), which found a positive association between strength use behaviour and work engagement, as well as self-efficacy and proactive behaviour work.

This was further supported by the significant findings between strength use behaviour and work engagement conducted in a study at South African call centres (Stander, Mostert & De Beer, 2014). As a result, when employees experience higher levels of SUB, employees are more likely to showcase higher levels of engagement and productivity. Therefore, the following hypothesis is suggested:

Hypothesis 3: *Strength Use Behaviour (ξ_2) has a positive linear relationship with Engagement (η_1).*

2.4.4 Deficit Correction Behaviour and Engagement

According to Mostert, Theron and De Beer (2017), taking the initiative in overcoming, developing and correcting areas of weakness and deficit becomes imperative in the labour market. Aligned with the goal orientation theory originally proposed by Van de Walle (1997), one might argue that mining employees are currently faced with several new obstacles that they have to overcome. It is likely that many mining employees may showcase the desire for personal development through acquiring new skills and improving their personal competencies.

As a result, employees might aim to take a proactive approach/initiative in looking for opportunities to correct or develop one's weaknesses/shortcomings. This aims to facilitate a higher positive relationship with work engagement (Woerkom, Mostert, Els, Bakker, De Beer & Rothmann Jr, 2016). This was supported by a study conducted on South African first year students by Mostert et al (2017) which found a positive correlation between strength use behaviour, deficit correction behaviour, work engagement and life satisfaction.

In another South African study, Mahomed and Rothmann (2019) found a strong correlation between strength use behaviour, deficit correction behaviour and thriving, which has a great level of overlap with engagement. As a result, when employees experience higher levels of DCB, employees are more likely to showcase higher levels of work engagement and individual productivity. Therefore, the following hypothesis is suggested:

Hypothesis 4: Deficit Correction Behaviour (ξ_3) has a positive linear relationship with Engagement (η_1).

2.4.4 Work overload and Burnout

Job demands can be described as the physical, social or organisational aspects of work that drain physical or emotional energy, whether through workload, complexity or job-conflicts (LePine, Podsakoff & Lepine, 2005). Various demands increase the probability of burnout. For example: Job complexity, lack of autonomy, work overload, organisational conflict and lack of personal resources have been shown to increase the probability of developing burnout (Schaufeli & Bakker, 2004).

Demands moderate the relationship between resources and engagement (Schaufeli & Bakker, 2004). Bakker and Demerouti (2007) stated that resources and demands function on a polarised spectrum. Either resources can exceed demands or demands exceeds resources. When demands exceed the amount of available resources required to adequately deal with these demands, the probability of burnout is increased. Employees within the mining industry are often faced with overwhelming demands with a limited amount of resources (personal or job resources) to effectively combat these demands. As a result, the health impairment process occurs, and consequently negative results such as burnout becomes prominent. For example, an employee experiencing high levels of task complexity grouped with a high workload could lead to burnout.

Alternatively, should demands meet resources, employees have sufficient resources to meet high demands. For example, an employee experiencing lower levels of task complexity grouped with a high workload would mean that burnout will probably not develop so severely. This results into a motivational process that develops growth and continuous learning of employees, with employees being motivated to deal with demands by learning the appropriate skills to mobilise their resources and adapt to the challenges faced (Bakker & Demerouti, 2007).

Lastly, when an individual's resources exceed demands, work can become redundant and repetitive (LePine et al., 2005). For example, where employees are faced with a low level of task complexity grouped with a low level of workload.

As a result, the moderating effect of job demands, and job resources becomes an essential role in determining the relationship between resources and engagement as well as the relationship between demands and burnout.

Maslach and Leiter (1977) identified six domains of an individual's work environment that can cause strain; namely work overload, lack of control, insufficient rewards, breakdown of community, lack of fairness and conflicting values. While numerous job demands has the potential to lead to burnout, for the purposes of this study work overload will be focused on and the relationship between work overload, burnout and engagement.

Work overload occurs when individuals have too much to do in too little time, with too little resources. A positive relationship has been found between work overload and burnout, more specifically emotional exhaustion (Hakanen, Bakker and Schaufeli, 2006). This relationship is a direct result of the depletion of individual capacity to meet the demands of a job (Bakker & Demetouri, 2007). Alternatively, a more manageable workload, provides employees the opportunity to use, adopt and attain the necessary skills to overcome challenging areas of one's work. As a result, a more manageable workload, halts the cycle of exhaustion that is the driving force behind burnout (Nirel, Goldwag, Feigenberg and Abadi, 2008).

Employees within the mining industry experience higher levels of stress as demands rise significantly to increase organizational profit. These employees are driven to higher accomplishment, reduction of work cost, and increase in company profit. (Phakathi, 2011; Yu and Chen, 2013; Chen et al., 2015). Further adding to the stress that these employees face is pressure to obtain manufacturing goals to receive a bonus. (McLean, 2012; Chimamise et al., 2013).

Factors such as shift work, extended work periods, working back and forth over a long-distance, indigent living conditions and excessive workloads contribute to higher levels of fatigue, stress, and burnout, and places workers at risk for psychological and relational ill-health. (Takahashi et al., 2006; Sharma and Rees, 2007; Sharma, 2008; Lovell and Critchley, 2010; Bowers, 2011; McLean, 2012; Ryser et al., 2016; Jimenez and Dunkl, 2017).

According to a study on a South African coal-mining population

difficult conditions at work and prolonged periods of higher production levels contributed to burnout levels. (Roets, 2004) Van der Walt (2008) also indicated that overload and a decrease chance of promotion were predictors of burnout in 199 employees working in the South African mining industry.

Developing countries are more focused on physical risks and the difficult work of the working environment of employees, usually being short of legislation for the psychological well-being of these workers (Nel & Kotze, 2017). In South Africa the socially sustainable improvement found beyond the borders of the mining environment is inspected and explored more often than the psychological environment. (Sieberhagen et al., 2009; Abrahamsson et al., 2014). Furthermore, a study conducted by Rothmann & Joubert (2007) at a platinum mine in the North West Province found a correlation between experienced exhaustion and workload increase, job insecurity and lacking job resources which consequently resulted in psychological ill-health such as cynicism, and low levels of dedication and vigour (Rothmann & Joubert, 2007). Results confirmed that burnout is anticipated by job demands such as workload and job insecurity, and lack of job resources such as low organisational support and prospects of advancing (Rothmann & Joubert, 2007). Lastly, a study conducted within the South African context (Van der Colff & Rothmann, 2009) confirmed that burnout is a result of job demands and therefore it is hypothesised that work overload leads to burnout.

Hypothesis 5: Work overload (ξ_4) has a positive linear relationship with Burnout (η_2).

2.5 MODERATING RELATIONSHIPS BETWEEN THE LATENT VARIABLES OF INTEREST

According to Theron (2017), a moderating variable is a third variable that influences the strength of the relationship between the dependant and independent variables. Should a significant

influence be found through statistical analysis, moderators can either amplify or weaken the effect between variables.

For the purpose of this study, it was assumed that job resources and personal resources would weaken the impact of job demands on burnout. As well as job demands amplifying the impact of job and personal resources on engagement. The following hypotheses were formulated concerning the moderating effect that job resources (Motivating Potential Score) and personal resources (Strength Use behaviour and Deficit Correction Behaviour) have on the relationship between job demands and burnout. Followed by the hypotheses formulated concerning the moderating effect that job demands (Work overload) has on work engagement.

2.5.1 The first interaction effect

The first interaction is where the impact of job demands on burnout is buffered by job resources and personal resources.

According to Ali and Farooqi (2014) the factors that have a direct influence on individual work engagement can be argued from an occupational stress model vantage point, which JD-R is an example of. As discussed earlier, the JD-R model functions on the premise that regardless of the occupation, all working factors can be divided into two distinct categories: job demands and job resources. Continuous exposure to job demands could result in strain and job resources stimulate individual growth (Mauno, Kinnunen and Ruokolainen, 2006). As a result, remaining in this line of reasoning, it can be argued that employees with higher levels of MPS, when faced with high demands, will be able to effectively navigate the landscape and overcome these challenges. This ability aids employees to avoid stressors and as a result it can be argued that employees with higher levels of MPS will be less likely to develop burnout symptoms. This is supported by a study conducted by Masvaure, Ruggunan, & Maharaj in 2014 whereby the focus was to determine the levels of work engagement, motivation and job satisfaction among mining employees.

This study indicated that job satisfaction and work engagement have a significant relationship, as well as job satisfaction and intrinsic motivation (Masvaure, Ruggunan, & Maharaj, 2014). Results also showed that work engagement and employee motivation (when a person performs because the activity is experienced as pleasurable or challenging, and not because of external motivation or a reward system) can enhance job satisfaction amongst these miners (Masvaure,

Ruggunan, & Maharaj, 2014). This indicates that these job characteristics constructs have an implication on the efficacy in and organization (Masvaure, Ruggunan, & Maharaj, 2014).

In line with the theoretical underpinning of the JD-R model and the buffering effect that resources have on the relationship between demands and burnout, it is hypothesised that a higher level of MPS (Job resource) will act as a buffer in the work overload and burnout relationship.

Hypothesis 6: *Motivating Potential Score (ξ_1) moderates the relationship between Work overload (ξ_3) and Burnout (η_2).*

It may also be argued, keeping in line with previous reasoning, that employees with higher levels of SUB, when faced with high demands, will be able to overcome these challenges quite effectively. This ability aids employees to avoid stressors and as a result it can be argued that employees with higher levels of SUB will be less likely to develop burnout symptoms. This is supported by a research study conducted on the South African mining industry by Mphahlele, Els, De Beer and Mostert (2018) which found a positive correlation between perceived organisational support, strength use behaviour, deficit correction behaviour and work engagement. Additionally, a moderation effect was found between perceived organisation support, strength use behaviour, perceived job demands and strain (i.e. burnout). In line with the above and the theoretical underpinning of the JD-R model which advocates for the buffering effect that resources have on the relationship between demands and burnout, it is hypothesised that a higher level of SUB (Personal resource) will act as a buffer in the work overload and burnout relationship.

Hypothesis 7: *Strength Use Behaviour (ξ_2) moderates the relationship between Work overload (ξ_4) and Burnout (η_2).*

Additionally, it may be argued that employees with higher levels of DCB, when faced with high demands, will be able to overcome these challenges quite effectively. This ability aids employees to approach deficits in a proactive approach and as a result it can be argued that employees with higher levels of DCB will be less likely to develop burnout symptoms. This is supported by a study conducted by Lloyd, Bond and Flaxman (2017), which found that work-related self-efficacy (i.e. DCB) acted as a moderating training intervention between worksite stress (i.e. job demands) and individual emotional exhaustion and depersonalisation (i.e. burnout).

In line with the above and the theoretical underpinning of the JD-R model which advocates for the buffering effect that resources have on the relationship between demands and burnout, it is hypothesised that a higher level of DCB (Personal resource) will act as a buffer in the work overload and burnout relationship.

Hypothesis 8: *Deficit Correction Behaviour (ξ_3) moderates the relationship between Work overload (ξ_4) and Burnout (η_2).*

2.5.2 The second interaction effect

The second interaction effect is where the impacts of the job and personal resources are buffered/strengthened by job demands.

In the present study, work overload is regarded as a job demand, which supports the introductory argument that work overload experienced by mining will amplify the impact of job and personal resources on employee engagement. A study conducted by Mojza, Demerouti and Bakker (2012) found a moderating effect of job stressors (i.e. work overload) between individual recovery (i.e. SUB and DCB) and work engagement. This is supported by a study conducted by Ghosh, Rai, Chauhan, Gupta and Singh (2015) which found a moderating effect of job demands between job characteristics (i.e. MPS) and engagement.

Consequently, the following hypotheses can be formulated concerning the moderating effect that demands (i.e. work overload) has on the relationship between MPS (job resource) and engagement, SUB (personal resource) and engagement as well as DCB (personal resource) and engagement:

Hypothesis 9: *Work overload (ξ_4) moderates the relationship between Motivating Potential Score (ξ_1) and Engagement (η_1).*

Hypothesis 10: *Work overload (ξ_4) moderates the relationship between Strength Use Behaviour (ξ_2) and Engagement (η_1).*

Hypothesis 11: *Work overload (ξ_4) moderates the relationship between Deficit Correction Behaviour (ξ_3) and Engagement (η_1).*

2.5 CHAPTER SUMMARY

This section has provided an overview of the constructs included in this study. From the literature and the theoretical arguments presented it is evident that constructs such as job demands, Motivating Potential, Strength Use Behaviour and Deficit Correction Behaviour are able to explain why variance exist in the level of engagement and burnout amongst mining employees, stationed in North West, South Africa. Depicting these arguments, and the overview of the constructs in this chapter, the conceptual model (Figure 2.2) was developed. The presented structural model was tested to determine whether it does, in fact, offer a valid explanation for the research initiating question. The research-initiating questions that originated from the literature review and relevant theory therefore asks:

- What causes variance in Engagement and Burnout amongst mining employees within South Africa?

In Chapter 3, the methodology used to conduct the research will be presented as well as to investigate the stipulated hypotheses.

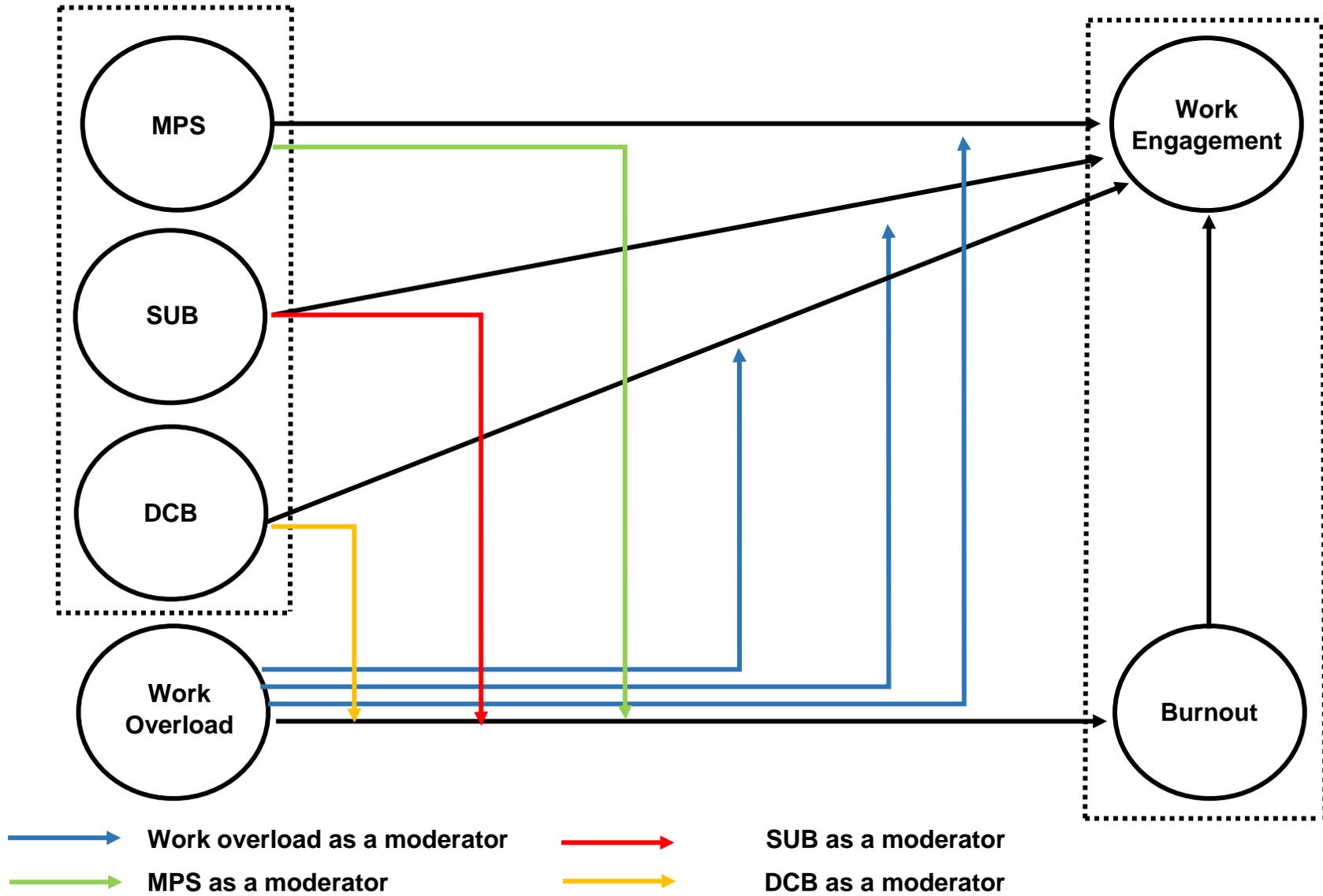


Figure 2.2. Conceptual Model

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

Following the literature review that was aimed at answering the research initiating question (RIQ) of “What causes variance in Engagement and Burnout amongst mining employees within South Africa”, this section focusses on the methodology applied throughout the research process in order to answer the RIQ.

In order for this research to answer the RIQ, a conceptual model was developed that showcased the relationships of variables that might influence what variance exist in the work engagement and burnout amongst mining employees within South Africa.

The aim of this study was to propose a network of variables that provides a realistic explanation for the variance in work engagement and burnout amongst mining employees. The JD-R model served as a theoretical foundation for the study. Through understanding the processes that influence the engagement and burnout of mining employees, organisations and the government will be better equipped to provide the necessary resources required to ensure a high engagement work ethic grouped with lower levels of burnout experienced through motivating potential positions within the employment system. Individuals faced with the lower levels of job motivation, can be successfully identified and interventions can be designed to overcome this hurdle.

Framed within the context of the JD-R model, the formulated research question investigates ‘What causes variance in Engagement and Burnout amongst mining employees within South Africa?’

The following research objectives helped to answer the research question:

- Develop a conceptual model that clarifies the variance in employee motivation,
- Investigate the significance of the differing hypotheses,
- Examine modification indices in order to determine recommended changes to the model, and
- Highlight the findings and conclusions as well as suggest implications for organisations.

This section aims to provide specific procedures that were used to provide a description of the research design chosen for this study, followed by a discussion of how participants were selected and the chosen sample. The measurement instruments used for this study are also discussed. Specific attention is given to the research question, aim of the study, hypotheses and ethical considerations. Finally, the data collection procedures as well as data capturing is explained, followed by a discussion on the statistical analysis methods utilised.

3.2 SUBSTANTIVE RESEARCH HYPOTHESES

This study aimed to determine whether various elements of the JD-R Model, including specific job demands, personal resources and job resources, could be used to differentiate amongst employee engagement and burnout. The theoretical arguments from the literature study resulted in the inclusion of the following JD-R variables, Motivating Potential Score, SUDCO and Work overload. The resultant conceptual model is presented in Figure 2.2.

The primary substantive hypothesis of this study was that the reduced structural model depicted in Figure 3.1 would provide a valid description of the psychological processes causing variance in work engagement and burnout among mining employees within South Africa. The primary substantive hypothesis was dissected into the following path specific substantive research hypotheses:

Hypothesis 1: *Burnout (η_1) has a negative linear relationship with Engagement (η_2).*

Hypothesis 2: *Motivating Potential Score (ξ_1) has a positive linear relationship with Engagement (η_1).*

Hypothesis 3: *Strength Use Behaviour (ξ_2) has a positive linear relationship with Engagement (η_1).*

Hypothesis 4: *Deficit Correction Behaviour (ξ_3) has a positive linear relationship with Engagement (η_1).*

Hypothesis 5: *Work overload (ξ_4) has a positive linear relationship with Burnout (η_2).*

The reduced structural model is subsumed in the conceptual model, which also includes six moderation effects. The six hypotheses for the interaction effects include:

- *Hypothesis 6:** *Motivating Potential Score (ξ_1) moderates the relationship between Work overload (ξ_3) and Burnout (η_2).*
- *Hypothesis 7:** *Strength Use Behaviour (ξ_2) moderates the relationship between Work overload (ξ_4) and Burnout (η_2).*
- *Hypothesis 8:** *Deficit Correction Behaviour (ξ_3) moderates the relationship between Work overload (ξ_4) and Burnout (η_2).*
- *Hypothesis 9:** *Work overload (ξ_4) moderates the relationship between Motivating Potential Score (ξ_1) and Engagement (η_1).*
- *Hypothesis 10:** *Work overload (ξ_4) moderates the relationship between Strength Use Behaviour (ξ_2) and Engagement (η_1).*
- *Hypothesis 11:** *Work overload (ξ_4) moderates the relationship between Deficit Correction Behaviour (ξ_3) and Engagement (η_1).*

3.3 THE STRUCTURAL MODEL

The literature study discussed earlier concludes in a structural model (i.e. schematic representation of the hypotheses constructed). After the latent variable have been operationalised, the model allows for the formulation and empirical testing of specific hypotheses. This proposed structural model is represented in Figure 3.1.

Based on the comparison found between the conceptual model (Figure 2.2) and the structural model (Figure 3.1), clear differences can be observed. The additional variables observed in Figure 3.1 represent *dummy* variables, which aims to represent the moderating effects between the latent variables. In order to test the moderation effect within a PLS/structural equation modelling (SEM) a separate variable must be created by multiplying the scores of the moderating variable with the score of the independent variable that is hypothesised to influence the dependent variable.

The moderating variables (indicated by '*' in Table 3.1) thus becomes a dummy variable that directly influences the endogenous variable. Table 3.1 provides a summary of the latent variables as well as the dummy variables that are represented in Figure 3.1.

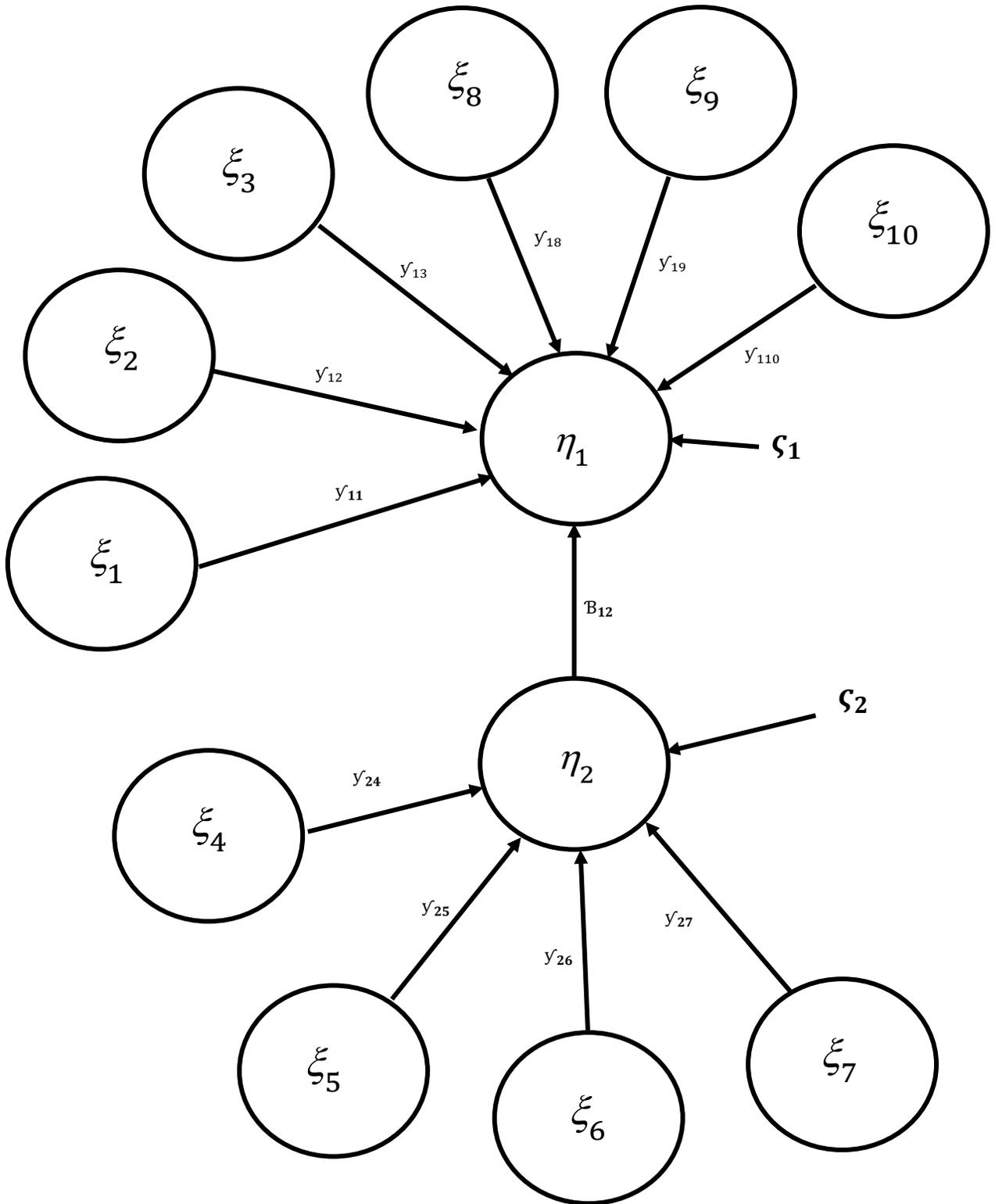


Figure 3.1. Structural Model**Table 3.1
Summary of latent variables**

η_1	Engagement
η_2	Burnout
ξ_1	Motivating Potential Score (MPS)
ξ_2	Strength Use Behaviour (SUB)
ξ_3	Deficit Correction Behaviour (DCB)
ξ_4	Work Overload
ξ_5	MPS*Workload influence engagement
ξ_6	SUB*Workload influence engagement
ξ_7	DCB*Workload influence engagement
ξ_8	Work Overload*MPS influence burnout
ξ_9	Work Overload*SUB influence burnout
ξ_{10}	Work Overload*DCB influence burnout

3.4 STATISTICAL HYPOTHESES FOR THE REDUCED STRUCTURAL MODEL

The statistical hypotheses for the reduced structural model were formulated using the R notational system (Ihaka & Gentleman, 1993). The following statistical hypotheses were formulated using the reduced structural model in Figure 3.1. The overarching substantive research hypothesis advocates that the structural model provides a binding account of the psychological processes underlying employee engagement and burnout.

The substantive research hypothesis was separated into eleven, more specific research hypotheses that can be correlated with the formulated hypotheses in Chapter 2. These hypotheses were translated into the following eleven path coefficient hypotheses:

Hypothesis 1:

$$H_{01}: \beta_{12} = 0$$

$$H_{a1}: \beta_{12} < 0$$

Hypothesis 2:

$$H_{02}: \gamma_{11} = 0$$

$$H_{a2}: \gamma_{11} > 0$$

Hypothesis 3:

$$H_{03}: \gamma_{12} = 0$$

$$H_{a3}: \gamma_{12} > 0$$

Hypothesis 4:

$$H_{04}: \gamma_{13} = 0$$

$$H_{a4}: \gamma_{13} > 0$$

Hypothesis 5:

$$H_{05}: \gamma_{24} = 0$$

$$H_{a5}: \gamma_{24} > 0$$

Hypothesis 6:

$$H_{06}: \gamma_{25} = 0$$

$$H_{a6}: \gamma_{25} > 0$$

Hypothesis 7:

$$H_{07}: \gamma_{26} = 0$$

$$H_{a7}: \gamma_{26} > 0$$

Hypothesis 8:

$$H_{08}: \gamma_{27} = 0$$

$$H_{a8}: \gamma_{27} > 0$$

Hypothesis 9:

$$H_{09}: \gamma_{18} = 0$$

$$H_{a9}: \gamma_{18} > 0$$

Hypothesis 10:

$$H_{10}: \gamma_{19} = 0$$

$$H_{10}: \gamma_{19} > 0$$

Hypothesis 11:

$$H_{11}: \gamma_{110} = 0$$

$$H_{11}: \gamma_{110} > 0$$

3.5 RESEARCH DESIGN

According to Babbie and Mouton (2001), a research design is a plan that one plans on utilises on how to conduct the research and ultimately answer the RIQ. The primary aim is to produce the observed covariance matrix as close as possible. If the model fails to accurately reproduce the observed covariance matrix, it can be concluded that the reduced structural model does not provide an acceptable explanation for the observed covariance matrix. It should however be noted that the opposite is not true. A high degree of fit only implies that the processes that are represented in the structural model only provides one feasible explanation for the observed covariance matrix.

Research design maximises the systematic variance, minimises the error variance and controls extraneous variance (Babbie & Mouton, 2001). Within explanatory research, a distinction should be made between two broad categories of research design, namely experimental design and *ex post facto* designs. The most significant difference between the two designs are that within the experimental design, the researcher experimentally manipulates the independent variables and randomly assigns research participants to experimental treatments, whereas the *ex post facto* design does not have manipulative control over of the independent variables either because their manifestations have already occurred or because they inherently cannot be manipulated (Labaree, 2009).

Within the current study, experimental manipulation of the latent variables was not possible. As a result, the statistical analysis technique appropriate for the analysis of data from an *ex post facto* correlational design with two or more indicators per latent variable is Structural Equation Modelling (SEM). The SEM convention is related to the use of the “R” program. As a result, the notational system used in the formulation of these statistical hypotheses is that of Structural Equation.

3.6 RESEARCH PROCEDURE AND SAMPLING SIZE

According to Patton (1990), sampling refers to the process of identifying a segment of the total population. In this study the target population was mining employees from the South African context. The sampling population refers to the population of element from which the sample is actually selected (Babbie & Mouton, 2001). The sampling population for this study was employees from the mining community situated outside of Rustenburg, South Africa. The

sampling organisation consists of 1 700 employees, with an additional 3 500 fulltime contracting employees. The sampling organisation consists of a Chief Technical Officer, Head of departments, line managers, superintendents, foremen/foreladies, supervisors, operators and attendants.

An appointment was made with the Head of Sustainable Development, who also referred the research to the organisational development coordinator. Thereafter, the researcher needed to apply formally by submitting a proposal and obtaining written consent. After consent was obtained it was established that only 31% of employees have internet access, and as a result the researcher needed to convert the online survey to a pen-and-paper version and hand deliver the questionnaires to the relevant shift changes. After Stellenbosch University had granted ethical clearance, the questionnaire was distributed.

Although, far from ideal, depending on the size of a population, investigating an entire population may be difficult. Therefore, a sample can be utilised for a smaller representative group from which generalisations can be made (Etikan, 2016).

Alvi (2016) stated that the identification of sampling methods can be done through either *probability* (i.e. random, stratified, cluster and systematic sampling) or *non-probability sampling* (i.e. quota, purposive, convenience/availability sampling). The researcher made of use non-probability sampling. Which meant the selection depended on the availability of employees. To maximise the representatives of the sample, the demographics of participants aimed to vary in terms of age, gender, race, cultural background and income status. More specifically, a convenience sampling design was utilised, which refers to a sampling procedure of using individuals who are readily available. Etikan (2016) refers to non-probability convenience sampling as the selection of subjects based on the convenient accessibility and proximity of the researcher and the subjects. This technique was chosen due to organisational time constraints (limited time for data collection) and practical limitations (the survey was distributed as a hand copy due to the lack of internet). In the selection of the sample, the possibility of bias was considered, which refers to a systematic over- or underrepresentation of certain segments of the population specifically relevant to the research question.

No pressure was placed on employees to complete the questionnaires but were rather encouraged to complete it and submit it in the containers provided should they feel the need to participate.

An important including criterion was a minimum of 12 months service at the company. This allowed at least twelve months within which the employee would be aware of resources provided by the organisation, the organisational demands and what personal resources are required to adequately buffer burnout.

Many disagreements exist on the adequate amount of sample sizes (Etikan, 2016). However, a common agreement is found in which researchers agree that a bigger sample size is preferred due to the higher probability of producing stable correlations between variables and displaying greater replicability of outcomes (Etikan, 2016). According to Alvi (2016) a recommended sample size is greater than 200 but doesn't exceed 500. As a result, the researcher aimed to obtain a sample size of at least 250 which was classified as sufficient. However, due to the length of the questionnaire and high levels of illiteracy found within the mining industry, 400 questionnaires were distributed to ensure the minimum of 250 questionnaires were achieved. Of the 400 questionnaires that were distributed, 257 were completed, giving a response rate of 64.25%. The biographical information of the participants who completed the questionnaire is reported in Table 3.2. The discussion regarding the measurement instruments that formed part of the questionnaire follows.

3.7 MEASUREMENT INSTRUMENTS

Each latent variable captured in the conceptual model requires a measuring instrument that provides empirical evidence against which the hypotheses can be tested. However, these instruments must possess appropriate psychometric qualities that will ensure valid and reliable results (Etikan, 2016).

A merged questionnaire was compiled by the researcher, which consisted of questions from different existing questionnaires. The composite self-administering questionnaire consisted of six sections. The first section was aimed at obtaining the biographical information of the participants, while section two to six aimed at measuring the relevant variables. The five instruments used for this study, as well as a discussion of the nature, composition and psychometric properties of these measuring instruments follows. These measures are 1)

Utrecht Work Engagement Scale (UWES-17), 2) Maslach Burnout Inventory General Survey (MBI-GS), 3) Job Diagnostic survey, 4) Strengths Use and Deficit Correction Questionnaire (SUDCO) and the 5) Job Demands-Resources Scale (JDRS).

3.7.1 Biographical information

The biographical section included in the research questionnaire was used to gather information about the demographic characteristics of the participants (including gender, years of service, age range, home language, race, highest level of education).

Table 3.2

Biographical information of the sample population (N = 257)

Gender		
Variables	Frequency	Percentage
Male	150	58%
Female	107	42%
Years of service		
Variables	Frequency	Percentage
Shorter than 1 year	0	0%
Between 1 and 3 years	137	53%
Between 3 and 5 years	37	14%
Longer than 5 years	83	33%
Age		
Variable	Frequency	Percentage
18 to 25 years	10	4%
26 to 35 years	147	57%
36 to 55 years	96	37%
56 years and older	4	2%
Home Language		
Variable	Frequency	Percentage
English	5	2%
IsiXhosa	21	8%
Setswana	94	37%
IsiZulu	15	6%

SeSotho	11	4%
Afrikaans	50	19%
SePedi	38	15%
Venda	15	6%
SiSwati	5	2%
Ndebele	1	1%
XiTonga	2	1%
Other	0	0%

Race

Variable	Frequency	Percentage
African	207	81%
White	42	16%
Coloured	8	3%
Indian	0	0%
Other	0	0%

Highest level of education

Variable	Frequency	Percentage
Lower than grade 10	18	7%
Grade 10 or Grade 11	23	9%
Matric Certificate	95	37%
Diploma	47	18%
Technical Certificate	45	17%
Degree	20	8%
Honors Degree	7	3%
Master's degree	2	1%
PHD Doctoral	0	0%
Other	0	0%

3.7.2 The Utrecht Work Engagement Scale

3.7.2.1 Description of instrument

For the purposes of this study, the work engagement of employees was measured by the UWES-17. The UWES consists of 17 items (Bakker et al., 2004). The scale measure three distinct sub-dimensions of engagement, namely vigour (six items), dedication (five items) and absorption (six items).

The internal consistency reliability has been established as excellent with a Cronbach's alpha of 0.93 (Schaufeli & Bakker, 2003). The three components are scored on a seven-point frequency rating scale, varying from zero ("never") to six ("daily/always"). High scores are indicative of high levels of vigour, dedication and absorption, while low scores can be interpreted as the opposite (Schaufeli et al., 2002).

Vigour is tested in questions 1, 4, 8, 12, 15 and 17. All questions are scored positively and consequently should an individual score high on questions 1, 4, 8, 12, 15 and 17 it should provide an individual with a high score in vigour. An example of a question in the UWES-Vigour subscale reads, "At my job, I feel strong and vigorous."

Secondly, dedication is tested in questions 2, 5, 7, 10 and 13. All questions are scored positively and consequently should an individual score high on questions 2, 5, 7, 10 and 13 it should provide an individual with a high score in dedication. An example of a question in the UWES-Dedication subscale reads, "I am enthusiastic about my job."

Lastly, absorption is tested in questions 3, 6, 9, 11, 14 and 16. All questions are scored positively and consequently should an individual score high on questions 3, 6, 9, 11, 14 and 16 it should provide an individual with a high score in absorption. An example of a question in the UWES-Absorption subscale reads, "Time flies when I am working."

3.7.2.2 Previous findings on the psychometric properties of the Utrecht Work Engagement Scale

The internal consistencies of the UWES-17 subscales are provided in Table 3.3 below.

Table 3.3
Cronbach's alphas of the UWES-17 subscales

Subscale	Cronbach's alpha
Vigour	.82
Dedication	.89
Absorption	.83
Total of scale	.93

(Goliath-Yarde & Roodt, 2011; Schaufeli & Bakker, 2003)

Based on the above findings from table 3.3, it can clearly be derived that the UWES-17 has high internal consistency for all three subscales. This conclusion can be made on the premise of Cronbach alphas higher than .7, with values ranging from .8 to .9 as indicated in Table 3.3.

3.7.3 The Maslach Burnout Inventory – General Survey

3.7.3.1 Description of instrument

Burnout is the syndrome that involves reduces personal accomplishment, emotional exhaustion and depersonalisation (Maslach et al., 2001). The Maslach Burnout Inventory-General Survey (MBI-GS) is a 16-item questionnaire, designed for workers in occupations other than human services or education (Maslach et al., 2001). This instrument measures three aspects of burnout, namely, Exhaustion (five items), Cynicism (five items) and Personal Efficacy (6 items). The items are scored on a seven-point frequency rating scale, varying from zero (“never”) to six (“daily/always”). Exhaustion and Cynicism has a negative scoring whereby Personal Efficacy has a positive scoring. Maslach et al (2001) advocated that the MBI-GS be used as a unidimensional construct: all individual scores should be interpreted in a summative manner by combining the results into a single, global score.

Exhaustion is tested in questions 1, 2, 3, 4 and 5. All questions are scored negatively and consequently should an individual score high on questions 1, 2, 3, 4 and 5 it should provide an individual with a high score in exhaustion. An example of a question in the MBI-GS Exhaustion subscale reads, “Working all day is really stressful for me.”

Secondly, Cynicism is tested in questions 6, 7, 8, 9 and 10. All questions are scored negatively and consequently should an individual score high on questions 6, 7, 8, 9 and 10 it should provide an individual with a high score in cynicism. An example of a question in the MBI-GS Cynicism subscale reads, “I just want to do my job and not be disturbed.”

Lastly, personal efficacy is tested in questions 11, 12, 13, 14, 15 and 16. All questions are scored positively and consequently should an individual score high on questions 11, 12, 13, 14, 15 and 16 it should provide an individual with a high score in personal efficacy. An example of a question in the MBI-GS personal efficacy subscale reads, “In my opinion, I am good in my job.”

According to Mukherjee, Tenant, Beresford (2019); Maslach et al. (2001) burnout is indicative when individuals score high on the exhaustion and cynicism scales while scoring low on the personal efficacy scale.

3.7.3.2 Previous findings on the psychometric properties of the Maslach Burnout Inventory General Survey

According to Maslach et al. (2001), the reliability coefficients were found to be 0.90 for emotional exhaustion, 0.71 for personal accomplishment and 0.79 for cynicism. Another study conducted by Choi, Choi, Park, Uhm, Lee, Chang and Kim (2019) found Cronbach’s alphas as .92 for exhaustion, .87 for cynicism and .89 for personal efficacy. The measurement was found to be an accurate measure for occupational burnout and indicate that the MBI-GS is a measure that can be used in any occupational context (Bakker & Scaufelli, 2004). The internal consistencies of the MBI-GS subscales are provided in Table 3.4 below.

Table 3.4
Cronbach’s alphas of the MBI-GS subscales

Subscale	Cronbach’s alpha	
	2001 Study	2019 Study
Exhaustion	.9	.92
Cynicism	.71	.87
Personal Efficacy	.79	.89
Total of scale	.82	.91

(Maslach et al. (2001); Choi, Choi, Park, Uhm, Lee, Chang and Kim, 2019)

Based on the above findings from Table 3.4, it can clearly be derived that the MBI-GS has high internal consistency for all three subscales due to the various studies supporting the internal consistency to be higher than .7, with values ranging from .7 to .9 as indicated in Table 3.4.

3.7.4 Revised Job Diagnostic Survey

3.7.4.1 Description of instrument

Boonzaier et al. (2001) advocates that the revised version of the Job Diagnostic Survey (JDS) provides a direct measure of job characteristics. This was supported by Hussein, Khachfe, Haj-Ali & Aridi, (2016) which argued that this survey identifies weak points that effect employee effectiveness and performance and ultimately identifies job characteristics that negatively influence job performance. This revised JDS measures the five job characteristics of skill variety, task identity, task significance, autonomy and feedback. The revised JDS was utilised to measure the five characteristics and consequently compute the Motivating Potential Score (MPS) of employees.

The MPS survey is a 30-item questionnaire, which provides a score ranging from 0 (Low level of MPS) to 35 (High level of MPS). The five characteristics are measured on seven-point scales, ranging from 1 (“very inaccurate”) to 7 (“very accurate”). The compilation of scores for the revised JDS questionnaire are as follows:

Skill variety is tested in Question 3 of Section 1 as well as statements 1 and 4 from Section 2. All questions are scored positively and consequently should an individual score high on Question 3 of section 1 as well as statements 1 and 4 from section 2 it should be interpreted as the individual’s job contains skill variety. An example of a question in the revised JDS subscale reads, “The job allows me to use a number of complex or high-level skills.”

Task identity is tested in Question 2 of Section 1 and statements 2 and 7 of Section 2. All questions are scored positively and consequently should an individual score high on Question 2 of Section 1 and statements 2 and 7 of Section 2 it should be interpreted as the individual’s job has task identity. An example of a question in the revised JDS subscale reads, “The job is arranged so that I can do an entire piece of work from beginning to end.” That is to what extent the job provides the opportunity to complete a whole piece of work.

Task significance is tested in Question 4 of Section 1 and statements 5 and 10 of Section 2. All questions are scored positively and consequently should an individual score high on Question 4 of Section 1 and statements 5 and 10 of Section 2 it should be interpreted as the individual's job includes task significance. An example of a question in the revised JDS subscale reads, "The job is one where a lot of other people can be affected by how well the work gets done." That is to what extent the job provides the opportunity to make an impact.

Autonomy is tested in Question 1 of Section 1 and statements 6 and 9 of Section 2. All questions are scored positively and consequently should an individual score high on Question 1 of Section 1 and statements 6 and 9 of Section 2 it should be interpreted as the individual's job compromises of autonomy. An example of a question in the revised JDS subscale reads, "The job gives me considerable opportunity for independence and freedom in how I do the work."

Feedback is tested in Question 5 of Section 1 and statements 3 and 8 of Section 2. All questions are scored positively and consequently should an individual score high on Question 5 of Section 1 and statements 3 and 8 of Section 2 it should be interpreted as the individual's job includes feedback. An example of a question in the revised JDS subscale reads, "After I finish a job, I know whether I performed well." That is to what extent the job provides the opportunity to receive feedback on work performed.

These scores are then combined into a motivating potential score, as mentioned by Evans and Ondrack (1991). The weighted additive job complexity index is computed as follows:

$$\text{MPS} = \text{Skill variety} + \text{Task identity} + \text{Task significance} + \text{Autonomy} + \text{Feedback}$$

3.7.4.2 Previous findings on the psychometric properties of the revised Job Diagnostic Survey

The internal consistencies of the revised Job Diagnostic Survey (JDS) subscales are provided in Table 3.5 below. The alpha coefficients found for the sub-scales by a study conducted by Buys, Olckers and Schaap (2007) range from between 0.67 and 0.79, which shows that all Cronbach's alphas are satisfactory, except for the task identity subscale. This is supported by a study conducted by Scott, Swortzel & Taylor (2005), which found a range between .59 and .71.

Morgan and Griego (1998) originally advocated that a 0.7 was an acceptable reliability coefficient, but according to Santos (1999), lower thresholds can be accepted in literature especially if the items on a scale are of smaller numbers. The overall reliability of the revised JDS is still satisfactory, with the five-factor structure supported in other research studies (Boonzaier & Boonzaier, 1994). Therefore, it can be concluded that the revised JDS could still be utilised for the current study measuring job characteristics.

Table 3.5

Cronbach's alphas of the revised JDS subscales

Subscale	Cronbach's alpha
Skill Variety	.71
Task Identity	.59
Task Significance	.66
Autonomy	.66
Feedback	.71

(Scott, Swortzel & Taylor, 2005)

Based on the above findings from Table 3.5, it can clearly be derived that the revised JDS has satisfactory internal consistency for four out of the five subscales due to the various studies supporting the internal consistency to be higher than .7. Due to the supporting research the scale is deemed satisfactory for this research study.

3.7.5 Strengths Use and Deficit Correction Questionnaire

3.7.5.1 Description of instrument

The Strengths Use and Deficit Correction Questionnaire (SUDCO) is an instrument measuring strength use and deficit improvement within the organisational context. Based on the conceptualisation of strengths use and deficit development, the SUDCO was developed to measure the four dimensions: POSSU, POSDC, SUB and DCB. POSSU refers to the encouragement individuals receive from the organisation to use their strengths, whereby the POSDC refers to employee's perception that the organisation supports the improvement of their deficits. SUB refers to the self-starting, pro-active behaviour by employees to use their strengths in the workplace, and DCB refers to the extent an individual has towards self-starting behaviour to improve their deficits in the workplace (Els, Mostert & Brouwers, 2016).

The SUDCO was developed by Van Woerkom, Mostert, Els, Bakker, De Beer & Rothmann (2016) to measure the four dimensions of POSSU, POSDC, SUB & DCB. The POSSU and POSDC has eight items each with examples including, 'In this organisation, people can use their talents and 'In this organisation, employees receive training to improve their weak points' respectively. The SUB measures nine items, e.g. 'In my job, I try to apply my talents as much as possible' and DCB measures eight items, e.g. 'I engage in activities to develop my weak points at work'.

These four constructs are measured on a 7-point Likert-type scale ranging from 0 = almost never; 1 = rarely; 2 = occasionally; 3 = sometimes; 4 = frequently; 5 = usually; 6 = almost always. v

The SUDCO (Van Woerkom et al., 2016) was adapted for the purpose of this study. The factor which loads on personal resources that was measured for this study is Strength Use Behaviour (SUB) (individuals self-starting behaviour to use their strengths in the workplace) as well as Deficit Correction Behaviour (DCB) (individuals proactively working on overcoming their shortcomings). Therefore, the SUDCO (Van Woerkom et al., 2016) was reduced from 33 items, as mentioned earlier, to 17 items. An example of a question of Strength Use Behaviour is: "I actively look for job tasks I am good at". Whereby an example of a question for Deficit Correction Behaviour is: "I engage in activities to develop my weak points at work".

3.7.5.2 Previous findings on the psychometric properties of the Strengths Use and Deficit Correction Questionnaire

The internal consistencies for each of the dimensions were good with Cronbach's alpha coefficients for POSSU = 0.96, POSDC = 0.93, SUB = 0.92 and DCB = 0.92 (Van Woerkom et al., 2016). As a result of both SUB and DCB showing coefficient alphas of .92 and .92. This is supported by a study conducted across multiple South African industries which investigated the biasedness and structural equivalence (Els, Mostert & Bouwers, 2016). This study found the Cronbach's alphas for both SUB and DCB to be .92 and .89 respectively, which is higher than the required .7, and as a result it was concluded that the SUDCO shows high reliability. These results also concluded that future studies utilizing the SUDCO among other ethnic groups within South Africa will be unbiased and equivalent.

3.7.6 The Job Demands-Resources Scale

3.7.6.1 Description of instrument

The Job Demands-Resources Scale (JDRS) was developed by Jackson and Rothmann (2005) to measure job demands and job resources. The JDRS consists of 42 items measuring the pace and amount of work experienced by employees. Factors such as mental load, emotional load, variety in work, opportunities to learn, independence in work, relationships with colleagues and career possibilities are also measured. The scale makes use of a 4-point Likert scale ranging from 1 (never) to 4 (always).

The JDRS (Jackson & Rothmann, 2005) will be adapted for the purpose of this study. The factor which loads on job demands that will be measured for this study is work overload (the amount of work as well as the emotional and mental load experienced by the employee) (Rothmann, Mostert and Strydom (2006). As a result, the JDRS will be reduced from 42 items, as mentioned earlier, to 7 items. An example of a question for overload is: "Does your work put you in emotionally upsetting situations?"

3.7.6.2 Previous findings on the psychometric properties of the Job Demands-Resources Scale

The measurement tool has good psychometric properties with a Cronbach's Alpha of .75 (Jackson & Rothmann, 2005). This is supported by a study conducted by Rothmann et al. (2006), which found the measure to be valid, reliable and indicative of the workload experienced by individuals. Additionally, a study conducted by De Braine and Roodt (2011) found the Job demands-resources scale to have high internal reliability, with demands having a Cronbach alpha of .81 and the resources having a Cronbach alpha of .94. Lastly, the subscale of overload had an acceptable internal consistency of .78, which is higher than the required .7, and as a result it was concluded that the JDRS shows high reliability and can be utilised for this research study.

3.8 MISSING VALUES

When collecting data, the probability of encountering missing values are great. This could be due to non-response or employee absenteeism and can influence the efficiency of the indicator variables if it is not dealt with before the analysis starts. Various methods can be utilised to deal with the problem and depend on the number of missing values as well as the nature of the data

(Etikan, 2016). Depending on the amount of missing values and patterns of missing values, a method can be utilised to address these concerns (Etikan, 2016). However, within the present study, no questionnaire had missing values present and as a result no method was implemented.

3.9 STATISTICAL ANALYSIS

3.9.1 Data analysis

Depending on the type of research questions, data analysis techniques can be utilised in aiming to answer these questions. In this research study, all data collected were analysed by PLS/SEM techniques which aimed to test the structural model. According to Savalei and Bentler (2010), structuring equation modelling is used for analysing multivariate data, with an appropriate method of theory testing. It is stated that SEM goes beyond common regression modelling to ensure an integration of multiple independent and dependent variables, as well as hypothetical latent constructs that may be represented by groups of observed variables. An explanation of the different techniques utilised is provided below.

3.9.2 Computer package

As discussed, for the purposes of this research study, item analysis as well as PLS analysis methods were utilised to analyse the collected data. Statistica version 12, which was used to perform item analysis and consequently provide the reliabilities of the items as well as the constructs. SmartPLS version 3 was utilised to investigate the relationships between the different variables, which in turn aimed to provide path coefficients between the variables and ultimately estimate the PLS model.

3.9.3 Item analysis

Etikan (2016) stated that each measuring instrument are composed of items that record the behaviour, which underlies the construct and consequently make the behaviour more “observable”. Item analysis provides insight into the reliability as well as provide suggestions on how to improve the test’s characteristics. Item analysis, has the potential to pinpoint test items that do not measure the correct constructs or that are poorly worded, limiting the reliability and the validity of tests.

Each variable identified carries a distinct definition, with every item used to measure behaviour required to align with this definition. Each instrument's items have been developed to indicate the view of the participant as well as act as an incentive for the responses of the participant in terms of the underlying constructs. Therefore, the responses for each item is recorded as the behaviour and as a result make It more observable in the form of data (Etikan, 2016).

However, the process of item analysis can aid the researcher in investigating possible poor items that might be inconsistent or a poor interpretation of the construct (Etikan, 2016). By initiating this process, poor item's quality and internal consistency reliabilities for respective scales can be identified. In general research suggests that 0.70 Cronbach alphas reliabilities or higher are satisfactory (Morgan and Griego, 1998).

Based on the results obtained by the item analysis, a decision is required regarding the nature of poor items, should these items be present. Items negatively impacting the reliability of instruments or scales can either be transformed or deleted (Etikan, 2016). Should the instrument/scale show an improvement, after these items have been omitted, they can be excluded from the succeeding analyses. For the purpose of this study, Cronbach alphas as well as average inter-item correlations were used for each scale.

3.9.4 Partial least squares structural equation modelling analysis

For the purposes of this study, the researcher utilised PLS modelling, which differs from the modelling approach of SEM in terms of the softer versus harder respectively (Etikan, 2016). PLS modelling was utilised due to its exploration and predicting of values, as well as the recommendation to make use of PLS modelling with regards to any research that requires early stage theoretical development, which includes testing and validation of exploratory models.

The PLS models include two sets of equations, specifically the outer model as well as the inner model. The outer model aims to analyse the relationships between latent variables and the observed/manifested variables, in addition, the inner model aims to analyse the relationship between unobservable/latent variables (Rauleckas, 2018).

Yet, before the commencement of the PLS modelling estimation, various analyses were required. Initially, the reliability of the latent variables was investigated. This process required the examination of composite reliabilities, average variance extracted (AVE) and R-squares.

When Cronbach alphas exceeded 0.70, they were deemed acceptable (Morgan and Griego, 1998). Once the reliability evaluation was completed, the PLS estimates showed the reliability as well as the validity of the measuring model.

Secondly, once the latent variable scores showed evidence of satisfactory reliability and validity, the structural model needed to be evaluated (Rauleckas, 2018). The structural model aims to relate latent variables to each other. A bootstrapping sampling procedure was conducted to assess the significance of the main and interaction effects. Consequently, the accuracy of the path estimates to the true effects were investigated.

Lastly, the moderating effects were analysed, using PLS path modelling. The process includes two steps, namely, the iterative process, which is known as latent variable scores that are estimated for each latent variable, which is then in turn entered as dependent and independent variables into one or more regressions. Subsequently, the testing of moderating effects within multiple regression through PLS path modelling is followed. For the purposes of this study, the researcher investigated the moderating effects of latent variables on the direct relationship between latent variables.

3.10 RESEARCH ETHICS

Babbie et al. (2001) stated that empirical behavioural research, which requires the involvement of people must health caution with regards to ethical considerations to ensure that the rights and well-being of the participants are protected. These questions must be weighed against the purpose of the study as discussed in the introduction phase of the research study.

This research study was deemed as low-risk by the Department/Faculty Ethics Screening Committee (DESC/FESC) as well as the REC: Social, Behavioural and Education Research (SBER) with project number of IPSY-2019-10564, due to the lack of serious risks or discomforts found in the research study. However, a practical concern was the potential conflict of interest due to the researcher being stationed at the sampling population, since the researcher did not want to force participants to partake in the study, questionnaires were distributed and a collection point (i.e. container) was allocated.

Another concern was the requirements of the Job Diagnostic Survey, which required participants to reflect on job characteristics that might require negative reflections for the employer. As a result, the researcher assured that all questionnaires were kept confidential.

Participants' names and details was not disclosed, with all participants remaining anonymous throughout the whole study. The anonymity of all participants was guaranteed due to the minimal circulation of the results, which was limited to the researcher, the supervisor and the statistical analyst. Furthermore, there were no identification questions required from the participant. Additionally, all participants were informed of the voluntary basis involvement, and therefore the participant could choose whether he/she wanted to participate.

Annexure 12 of the Ethical Rules of Conduct for Practitioners Registered under the Health Professions Act (Act no. 56 of 1974) (Republic of South Africa, 2006, p.41) requires researchers to obtain permission from the chosen institution from which the research participants will be chosen. As a result, permission was obtained from the various participating departments.

Furthermore, the act requires a researcher to enter into an agreement with participants regarding the study. As a result, an informed consent form was provided to ensure the participant understood the purpose of the study, which included, what was required from the participant, how the results would be used, who the researchers were, what their affiliation was, what rights the participants have and where they could obtain more information should they require it (Babbie et al., 2001). The informed consent form formed part of the preamble of the questionnaire.

Based on the requirements of this agreement (Health Professions Act, Act no. 56 of 1974, Annexure 12, p. 77) requires:

“(1) The researcher used language that was reasonably understandable to the research participant concerned in obtaining his/her informed consent.

(2) The informed consent was appropriately documented, and in obtaining such consent the researcher:

- a) Informed the participant of the nature of the research;
- b) Informed the participant that he/she was free to participate or decline to participate in or to withdraw from the research;
- c) Explained the foreseeable consequences of declining or withdrawing;
- d) Informed the participant of significant factors that could be expected to influence his/her willingness to participate;
- e) Explained any other matters about which the participant enquired.”

Due to the investigation of well-being factors, the assessment of variables that included the possibility of exceptionally high or low scores, which could indicate a threat to the participants well-being, the following was also considered by the researcher, regarding Annexure 12 of the Ethical Rules of Conduct for Practitioners Registered under the Health Professions Act no. 56 of 1974, p. 59), which requires any researcher to disclose confidential information under the following circumstances:

“A psychologist researcher may disclose confidential information:

- a) Only with the permission of the participant concerned;
- b) When permitted by law to do so for a legitimate purpose, such as providing a participant with the professional services required;
- c) To appropriate professionals and then for strictly professional purposes only; or
- d) To protect a participant or other persons from harm.”

As a result, participants were provided with a contact number should the need arise, although stating clearly that neither the researcher nor institution could be held liable for the cost of treatment.

To conclude, the research study posed no worrying ethical concerns, due to the implementation of the above procedures and practices to guide the research study as well as protect the anonymity of all participants. Therefore, the researcher was confident that all requirements, whether ethical or legal was adhered to.

3.11 CHAPTER SUMMARY

Chapter 3 provided a description of the methodical choices made for this study to obtain answers regarding the research initiating question and the consequential hypotheses. To conclude, an ex-post facto correlation research design was used to collect data for this study. non-probability convenience sampling was used to select the sample. Quantitative data was collected from employees who were currently working within the sampling organisation, using a pen-and-paper version.

The following measures were used:

- Utrecht Work Engagement Scale Questionnaire (UWES-17)

- Maslach Burnout Inventory General Survey (MBI-GS)
- Revised Job Diagnostic Survey (JDS)
- Strengths Use and Deficit Correction Questionnaire (SUDCO)
- Job Demands-Resources Scale (JDRS)

The data that was collected was analysed by making use of item analysis and PLS modelling. Chapter four presents the findings derived from the statistical analyses, followed by the interpretation of the results.

CHAPTER 4

RESULTS

4.1 INTRODUCTION

This chapter reports the statistical results obtained after data analysis were conducted according to the methods discussed in Chapter 3. Item analysis was used to calculate the reliability of the different measurement instruments used to measure the latent variables (engagement, burnout, MPS, SUB, DCB, Work overload). After item analysis was performed, SEM was used to provide evidence supporting the reliability of the different measures. Additionally, SEM was used to analyse and investigate the relevant paths between the latent variables that provided the opportunity to investigate structural model relationships, after the PLS model was fitted.

Therefore, the purpose of this chapter is to present and discuss the statistical results of the various analyses that were performed. Initially, item analysis was performed to investigate the psychometric accuracy of the measurement instruments. This was followed by investigating the path analyses of the structural models to examine the structural model relationships. Lastly, the final scores obtained, and hypotheses were interpreted.

4.2 ITEM ANALYSIS: VALIDATING THE MEASUREMENT MODEL FIT

The item analysis provided an initial indication of the value of the subsequent statistical analyses. The validity and reliability of constructs used in this study are declared satisfactory (≥ 0.7) although the criteria usually depend on the nature of the constructs included (Buys et al., 2007). In addition, item correlations evaluate the consistency between items. The inter-item correlations are a subtype of internal consistency reliability. Values obtained between 1.00 and $> .50$ are considered excellent. Consequently, values between $.50$ and $> .00$ indicate acceptable reliability (Peters, 2014).

The items included in the composite questionnaire for data collection was taken through an item analysis process. Table 4.1 provides an item analysis summary, which also includes the Cronbach's alpha and average inter-item correlation of all the total scales. Item analysis was not performed on the subscales, due to the research study only making use of total scores.

Table 4.1
Internal consistency reliabilities of scales

Scale	Sample Size	Number of Items	Mean	Standard Deviation	Cronbach's Alpha	Average Inter-Item correlation
WE	257	17	4.58	.99	.76	.52
B	257	7	2.08	.94	.76	.53
MPS	257	30	5.37	.97	.67	.48
SUB	257	9	4.82	.91	.85	.57
DCB	257	8	4.76	.99	.87	.63
WO	257	16	2.83	.63	.77	.49

WE = Work Engagement; B = Burnout; MPS = Motivating Potential Score; SUB = Strength Use Behaviour; DCB = Deficit Correction Behaviour; WO = Work Overload

4.2.1 Engagement

Based on the results, the Utrecht Work Engagement Scale (UWES-17) obtained a Cronbach's alpha coefficient of .76, which showcase a high internal consistent reliability. According to Peters (2014), the composite reliability of scales should be higher than .7 to be regarded as a satisfactory indication of high internal consistency reliability. The UWES-17 scale is comprised of three subscales or dimensions, namely vigour, dedication and absorption. Due to none of the individual items affecting the coefficient negatively, no items were deleted.

This internal consistency score was supported by an average inter-item correlation of .52. Ideally, the average inter-item correlation should be .3 or higher (Etikan, 2016). As a result, this score can be regarded as a remarkably good average inter-item correlation. Overall, the results show that the UWES-17 measures what it is supposed to be measuring.

4.2.2 Burnout

The Maslach Burnout Inventory (MBI-GS) obtained a Cronbach's alpha coefficient of .76, which showcase a high internal consistent reliability. The MBI-GS scale is comprised of three

subscales or dimensions, namely exhaustion, cynicism and personal efficacy. None of the individual items affected the coefficient negatively, and therefore no items were deleted.

This internal consistency score was supported by an average inter-item correlation of .53. As a result, this score can be regarded as a remarkably good average inter-item correlation. Overall, the results show that the MBI-GS measures what it is supposed to be measuring.

4.2.3 Motivation Potential Score (MPS)

The adapted version of the Job Diagnostic Survey (JDS) obtained a Cronbach's alpha coefficient of .67, which showcase a less than preferred internal consistent reliability. According to Peters (2014), although a composite reliability is recommended to be higher than .7 to be regarded as a satisfactory indication of high internal consistency reliability, lower scores can be accepted depending on other supporting evidence. Due to the more than acceptable internal consistency score obtained, the Cronbach's alpha was accepted. The JDS scale is comprised of five subscales or dimensions, namely Skill variety, Task identity, Task significance, Autonomy and Feedback. None of the individual items affected the coefficient negatively, and therefore no items were deleted.

This internal consistency score was supported by an average inter-item correlation of .48. As a result, this score can be regarded as a good average inter-item correlation. Overall, the results show that the JDS measures what it is supposed to be measuring.

4.2.4 Strength Use Behaviour and Deficit Correction Questionnaire (SUDCO)

The adapted Strengths Use and Deficit Correction Questionnaire (SUDCO) obtained a Cronbach's alpha coefficient of .85 and .87 for the Strength Use Behaviour and Deficit Correction Behaviour respectively, which showcase high internal consistent reliability. The adapted SUDCO scale utilised for this research study comprised of two subscales or dimensions, namely Strength Use Behaviour and Deficit Correction Behaviour. None of the individual items affected the coefficient negatively, and therefore no items were deleted.

This internal consistency score was supported by an average inter-item correlation of .57 and .63 respectively. As a result, this score can be regarded as an exceptionally good average inter-item correlation. Overall, the results show that the SUDCO measures what it is supposed to be measuring.

4.2.5 Work Overload

The adapted Job Demands-Resources Scale (JDRS) obtained a Cronbach's alpha coefficient of .77, which showcase a high internal consistent reliability. The adapted JDRS scale has one subscale or dimension, namely work overload. This individual item did not affect the coefficient negatively, and therefore no items were deleted.

This internal consistency score was supported by an average inter-item correlation of .49. As a result, this score can be regarded as an exceptionally good average inter-item correlation. Overall, the results show that the JDRS measures what it is supposed to be measuring.

4.2.6 Decision regarding the reliability of latent variable scales

The aim of the initial item analysis was to evaluate the functionality for each of the latent variable and to assessing the psychometric integrity of the indicator variables for the latent variables. The item analysis results provided satisfactory evidence to support the inclusion of the items in the measuring instruments. All items were found to be internally consistent and reliable at an acceptable level as the Cronbach's alpha coefficients were above .70 (Peters, 2014), except for the MPS measurement instrument that had a Cronbach's alpha of .67. However due to the more than acceptable internal consistency, it was deemed acceptable.

Due to the lack of poor item detection, the researcher had no need to make use of deletions. These results were verified by the above satisfactory inter-item correlations obtained for each total scale. The average inter-item correlations of the scales ranged between .48 and .63, and therefore it can be concluded that these results are acceptable. Consequently, the conclusion was made that the results recovered from the item analysis were satisfactory and therefore warranted the subsequent analyses.

4.3 PARTIAL LEAST SQUARES ANALYSIS

According to Peters (2014) a two-step process is recommended when the Partial Least Square (PLS) approach to structural equation is utilised. Firstly, it involves the evaluation of the measurement model (Often referred to as the outer model in PLS), which is then followed by the evaluation of the structural model (Which is often times referred to as the inner model within PLS). The structural model refers to the structural component of the model. The main purpose of step one (Evaluation) is to determine the measuring quality of the construct that will be utilised in the evaluation of the inner model. The reliability of each latent variable scale was

established, after which path coefficients were examined with the aim of determining the significance of the hypothesised relationships. Subsequently, the paths between variables can be tested as well as evaluated to allow confirmation for the structural model relationships.

4.3.1 Evaluation and interpretation of the measurement model

The reliability analysis is aimed towards examining the reliability of the specified latent variable scales. The composite reliability and average variance extracted (AVE) were used to evaluate and interpret the reliabilities of each latent variable. The composite reliability value measures whether the reliability of the of all the latent variables is satisfactory. According to Peters (2014) the composite reliability value should be equal to or higher than .70, to be deemed satisfactory. All reliability scores, except for MPS were found to be > .70 and as a result it can be concluded to be satisfactory.

The AVE values measure the amount of variance in the indicator variables, explained by common factors. According to Valentini and Damasio (2016), a score above .50 indicates that the relevant construct is indeed measured by the correct indicator variables. Most of the latent variable's AVE values were equal to or above .50 which gives indication that these constructs explained more than 50% of the variance of the items. These reliability statistics can be found in Table 4.2

Table 4.2
Reliability statistics of the PLS model

Scale	Composite Reliability	AVE
WE	.93	.83
B	.79	.56
MPS	.89	.63
SUB	.88	.47
DCB	.9	.54
WO	.82	.41

WE = Work Engagement; B = Burnout; MPS = Motivating Potential Score; SUB = Strength Use Behaviour; DCB = Deficit Correction Behaviour; WO = Work Overload

In addition, to establish the *construct validity* of the measurements, additional analyses were performed. According to Babbie et al. (2001) construct validity refers to the degree in which a scale measures what it is intended to measure. Secondly, the discriminant validity of each measurement scale was also tested using Fornel Laker criteria. All scales passed the test, thus indicating that each scale utilised in the study had discriminant validity.

Lastly, the evaluation of item reliability for the latent variable scales was done by utilising a PLS bootstrap analysis. Bootstrapping was conducted in order to determine whether the outer loadings were significant or not. By investigating whether zero fell within the 95% confidence interval or not, it can be concluded whether the outer loading is significant or not. If zero falls within the interval, it can be concluded that the outer loadings are significant, should it fall outside the interval, the outer loadings are not significant (Babbie et al., 2001).

Table 4.3 aims to illustrate the strength of the relationships between the latent variables and the relevant items measuring these variables in the questionnaire. As a result, it can be concluded that the paths between the relevant latent variables namely, work engagement, burnout, motivating potential score, strength use behaviour, deficit correction behaviour and work overload and the items are all statistically significant. These results are derived from zero not falling within the 95% confidence interval. This confirms the reliability of each item included in the latent variable scales.

Table 4.3

Outer loadings

Latent Variables	Path	Original Sample	95%	95%	Significant
			confidence interval (lower)	confidence interval (upper)	
Work	WE_Absorption ← Work engagement	.9	.87	.93	Significant
Engage- ment	WE_Dedication ← Work engagement	.9	.87	.92	Significant
	WE_Vigour ← Work engagement	.92	.9	.94	Significant
Burnout	Burnout_Cynicism ← Burnout	.8	.72	.86	Significant
	Burnout_Exhaustion ← Burnout	.83	.78	.88	Significant
	Burnout_Personal Efficacy (reversed) ← Burnout	.59	.41	.71	Significant

	JC_Autonomy ← MPS	.79	.73	.85	Significant
Motivating	JC_Feedback ← MPS	.82	.74	.87	Significant
Potential	JC_Skill Variety ← MPS	.83	.77	.88	Significant
Score	JC_Task Identity ← MPS	.78	.71	.84	Significant
	JC_Task Significance ← MPS	.75	.64	.82	Significant
	SUDCO1 ← SUB	.39	.22	.55	Significant
Strength	SUDCO2 ← SUB	.57	.38	.71	Significant
Use	SUDCO3 ← SUB	.73	.61	.81	Significant
Behaviour	SUDCO4 ← SUB	.82	.75	.87	Significant
	SUDCO5 ← SUB	.79	.72	.84	Significant
	SUDCO6 ← SUB	.64	.52	.74	Significant
	SUDCO7 ← SUB	.68	.55	.78	Significant
	SUDCO8 ← SUB	.71	.61	.79	Significant
	SUDCO9 ← SUB	.71	.65	.77	Significant
Deficit	SUDCO10 ← DCB	.74	.65	.8	Significant
Correction	SUDCO11 ← DCB	.81	.75	.86	Significant
Behaviour	SUDCO12 ← DCB	.74	.62	.82	Significant
	SUDCO13 ← DCB	.54	.36	.66	Significant
	SUDCO14 ← DCB	.74	.63	.81	Significant
	SUDCO15 ← DCB	.83	.73	.88	Significant
	SUDCO16 ← DCB	.76	.65	.83	Significant
	SUDCO17 ← DCB	.7	.61	.77	Significant
Work	JDRS1 ← Work overload	.47	.32	.59	Significant
overload	JDRS2 ← Work overload	.76	.66	.82	Significant
	JDRS3 ← Work overload	.55	.35	.69	Significant
	JDRS4 ← Work overload	.4	.17	.57	Significant
	JDRS5 ← Work overload	.74	.65	.8	Significant
	JDRS6 ← Work overload	.71	.59	.79	Significant
	JDRS7 ← Work overload	.73	.62	.81	Significant

Therefore, the results indicate that all the latent variable scales included in the research study are deemed statistically significant. This confirms that reliability of the items included in these latent variable scales.

4.3.2 Evaluation and interpretation of the structural model

In order to determine the value of the relationships between the specified latent variables, the structural model was analysed. Thus, the PLS structural model's analysis was primarily aimed

towards determining to what level the latent variables were related to one another. Consequently, the relationship between the exogenous and endogenous variables as well as the influence these variables on one another were determined. As previously discussed, the structural model is often referred to as the 'inner model', since it aims to determine factors inside the structural model (Peters, 2014). The analysis included the evaluation of the R-squares, testing for multicollinearity and evaluation as well as interpretation of the main and moderating effects.

The model in Figure 4.1 illustrates the relationship between engagement and burnout, with the hypothesis being that engagement affects burnout. Primary circles represent the latent variables (engagement, burnout, motivating potential score, strength use behaviour, deficit correction behaviour and work overload), whereby the circles with a "*" indicate moderation effects illustrated in the conceptual model (Figure 2.2).

The four latent variables, which are hypothesised to act as moderators between certain variables are included in the conceptual model (Figure 2.2). These moderating variables are Motivating Potential Score (MPS), Strength Use Behaviour (SUB), Deficit Correction Behaviour (DCB) and Work Overload. Firstly, As seen in Figure 4.1, the hypothesis that work overload moderates the relationship between MPS and engagement is represented at the top-right hand corner. Secondly, the hypothesis that work overload acts as a moderator between SUB and engagement is captured as the second right hand circle. Thirdly, the hypothesis that work overload moderates the relationship between DCB and engagement is represented as the third circle. Fourthly, the hypothesis that MPS moderates the relationship between work overload and burnout is captured as the fourth circle. Second to last, the hypothesis that SUB moderates the relationship between work overload and burnout is captured as the fifth green circle. Lastly, the hypothesis that DCB acts as a moderator between work overload and burnout is captured as the sixth green circle.

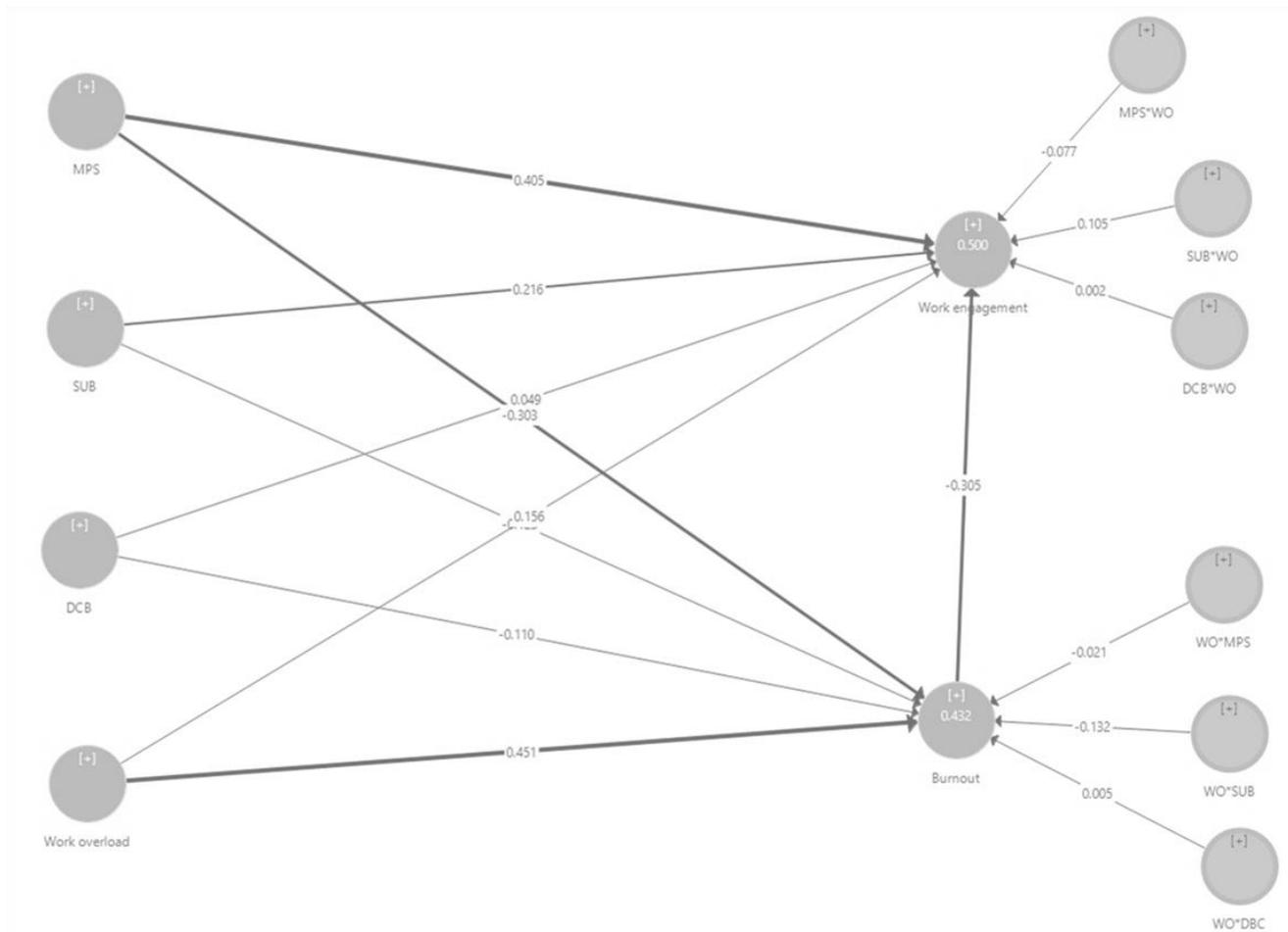


Figure 4.1 PLS model

4.3.2.1 Multicollinearity

When regression analysis is conducted, various predicting variables are present, however it should be assumed that not all predictors are correlated with each other. Occasionally, when predictors correlate too highly with each other, it could result in unstable regressions which is determined by estimated coefficients.

The researched tested for multicollinearity using a variance inflation factor (VIF). VIF's primary aim is to examine and explain the degree to which variance of the estimated regression coefficients are inflated compared to a case in which predictor variables are not linearly related. Consequently, this information is used to describe the multicollinearity (correlation between predictors) in a regression analysis. However, it should be noted that multicollinearity can be

problematic seeing that it can increase the variance of the regression coefficients, therefore resulting in unstable regression coefficients and ultimately make interpretation difficult.

Although, multiple recommendations are to be found in literature regarding the acceptable level of VIF, a recommended maximum VIF value of five, seems to be the norm (Peters, 2014). As a result, all values of five or higher was considered to be problematic in the current study. The investigation of values indicated that no scores were found to be equivalent to or higher than five and as a result no indication of multicollinearity problems were found.

4.3.2.2 Evaluation and interpretation of the R-square

The value of the R-square can be used to determine and explain the level of variance in the endogenous variables within the full model. Table 4.4 contains the summary of the R-square scores for the endogenous variables.

Table 4.4
R-square scores for the endogenous variables

	R-square for PLS
Work Engagement	.43
Burnout	.5

The work engagement score was found to be .43 in the model (Figure 4.1). This indicates that 43% of the variance in work engagement could be explained by the effect of exogenous variables in the model. Moreover, 50% of the variance in burnout could be explained by the effect of exogenous variables.

4.3.2.3 Evaluation and interpretation of the main effects

According to Hair, Ringle and Sarstedt (2011) the main purpose of the PLS path modelling is not necessarily to test a theory but rather facilitating a prediction. The reliability of each latent variable scale was established, after which the various path coefficients were examined to determine the strength and significance of the hypothesised relationships. As previously discussed, in order to determine significance between variables, the bootstrap method was utilised. Based on this methodology, when zero falls within the confidence interval, it can be derived that the corresponding coefficient will be insignificant and vice versa.

In Table 4.5, it is indicated whether the path coefficients in the PLS model was significant or not. In order to establish the strength as well as significance of the hypothesised paths as proposed in the structural model (Figure 3.1), path coefficients were investigated by determining whether zero fell within the 95% confidence interval, as discussed earlier. The significance of the path coefficients was investigated. Additionally, information regarding the significance of the hypothesised paths was also provided for each path.

Table 4.5

Path coefficients between variables in PLS model

Path	Path Coefficient	95% Confidence interval (lower)	95% Confidence interval (upper)	Description
H1: B → WE	-.3	-.46	-.15	Significant
H2: MPS → WE	.4	.27	.52	Significant
H3: SUB → WE	.22	.07	.34	Significant
H4: DCB → WE	.05	-.1	.21	Significant
H5: WO → B	.45	.36	.56	Significant

WE = Work Engagement; B = Burnout; MPS = Motivating Potential Score; SUB = Strength Use Behaviour; DCB = Deficit Correction Behaviour; WO = Work Overload

Hypothesis 1: Burnout (η_1) has a negative linear relationship with Engagement (η_2).

The hypothesized relationship between burnout and engagement was found to be *significant* (PLS path coefficient -.3), with zero not falling in the 95% confidence interval. As supported by initial research, the relationship was found to be negative. As a result, it can be concluded that mining employees experiencing higher levels of burnout will experience lower levels of engagement and vice versa.

Hypothesis 2: Motivating Potential Score (ξ_1) has a positive linear relationship with Engagement (η_1).

The hypothesized relationship between motivating potential and engagement was found to be *significant* (PLS path coefficient .4), with zero not falling in the 95% confidence interval. As supported by initial research, the relationship was found to be positive. As a result, it can be

concluded that mining employees experiencing higher levels of Motivating Potential will experience higher levels of engagement and vice versa.

Hypothesis 3: *Strength Use Behaviour (ξ_2) has a positive linear relationship with Engagement (η_1).*

The hypothesized relationship between strength use behavior (SUB) and engagement was found to be *significant* (PLS path coefficient .22), with zero not falling in the 95% confidence interval. As supported by initial research, the relationship was found to be positive. As a result, it can be concluded that mining employees experiencing higher levels of SUB will experience higher levels of engagement and vice versa.

Hypothesis 4: *Deficit Correction Behaviour (ξ_3) has a positive linear relationship with Engagement (η_1).*

The hypothesized relationship between deficit correction behaviour (DCB) and engagement was found to be *significant* (PLS path coefficient .05), with zero not falling in the 95% confidence interval. Although the score is low, it can still be derived that DCB has a positive relationship with work engagement. As a result, it can be concluded that mining employees experiencing higher levels of DCB will experience higher levels of engagement and vice versa.

Hypothesis 5: *Work overload (ξ_4) has a positive linear relationship with Burnout (η_2).*

The hypothesized relationship between work overload and burnout was found to be *significant* (PLS path coefficient .45), with zero not falling in the 95% confidence interval. As supported by initial research, the relationship was found to be positive. As a result, it can be concluded that mining employees experiencing higher levels of Work overload will experience higher levels of burnout.

4.3.2.4 Evaluation and interpretation of the proposed moderating hypotheses

In order to test the significance of the moderating effects, two approaches were applied. Firstly, the R^2 change test for interaction was utilised by using three variables (independent, moderator and dependent) to test whether the R^2 would increase significantly when the interaction between independent and moderating variables (independent*moderator) were included. Table

4.6 provides the change in R^2 as well as the p-values in order to evaluate whether moderating effects exist between the different paths. It should be noted that $p < .05$ is statistically significant at the 95% confidence level.

Secondly, path coefficients of interaction terms included in the PLS model were utilised in order to determine the strengths, significance and direction of the hypothesised moderating effects within the structural model. It should be noted that the significance of a hypothesised path depends on whether zero falls between the lower and upper bootstrapping values. For this study, the analysis was done using 95% confidence level, as discussed earlier. The data utilised in determining the relationships of the hypotheses are presented in Table 4.7

Table 4.6
 R^2 change and p-values for the moderating effects

Path	R^2 change	F – to remove	P-value
H6: WO*MPS → B	-.02	7.77	.01
H7: WO*SUB → B	-.01	4.38	.04
H8: WO*DCB → B	-.02	5.67	.02
H9: MPS*WO → WE	0	.28	.06
H10: SUB*WO → WE	0	.25	.62
H11: DCB*WO → WE	0	.12	.73

WE = Work Engagement; B = Burnout; MPS = Motivating Potential Score; SUB = Strength Use Behaviour; DCB = Deficit Correction Behaviour; WO = Work Overload

Table 4.7
Moderating path coefficients for PLS model

Path	Path Coefficient	95% Confidence interval (lower)	95% Confidence interval (upper)	Description
H6: WO*MPS → B	-.02	-.11	.09	Not Significant
H7: WO*SUB → B	-.13	-.27	.01	Not Significant

H8: WO*DCB → B	0	-.13	.11	Not Significant
H9: MPS*WO → WE	-0.08	-.19	.04	Not Significant
H10: SUB*WO → WE	.11	-.02	.24	Not Significant
H11: DCB*WO → WE	0	-.11	.13	Not Significant

WE = Work Engagement; B = Burnout; MPS = Motivating Potential Score; SUB = Strength Use Behaviour; DCB = Deficit Correction Behaviour; WO = Work Overload

Hypothesis 6: Motivating Potential Score (ξ_1) moderates the relationship between Work overload (ξ_3) and Burnout (η_2).

The p-value for Motivating Potential Score (MPS) operating as a moderator of the relationship between work overload and burnout was found to be lower than .05 ($p = .01$). P-value scores lower than .05 shows MPS has a statistically significant moderating effect on the relationship between work overload and burnout.

The nature of MPS as a moderator in the relationship between work overload and burnout is represented in Figure 4.2. When the MPS of mining employees are low, it shows that the work overload has a higher impact on the burnout experienced by mining employees. In contrast if MPS is high amongst mining employees, the effects of work overload are far less severe on the level of burnout experienced by these employees. As a result, it is clear that the preference should be for higher MPS scores amongst mining employees, since it acts as a buffer for the negative effects of burnout on employee well-being.

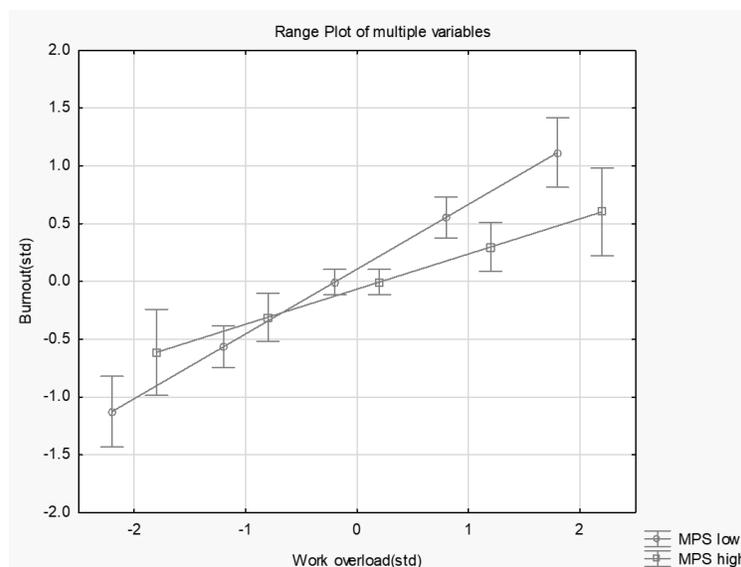


Figure 4.2 The moderating effect of motivating potential score on the relationship between work overload and burnout

However, a contradicting finding was found what the moderating finding of MPS on the relationship between work overload and burnout was tested through PLS bootstrapping. It was found that the hypothesized moderating effect of MPS on the relationship between work overload and burnout was *not statistically significant*. The PLS path coefficient was -.02, with zero falling in the 95% confidence interval. The exact information regarding the confidence of the lower as well as the upper intervals are provided in Table 4.7.

Hypothesis 7: Strength Use Behaviour (ξ_2) moderates the relationship between Work overload (ξ_4) and Burnout (η_2).

The p-value for Strength Use Behaviour (SUB) operating as a moderator of the relationship between work overload and burnout was found to be lower than .05 ($p = .04$). P-value scores lower than .05 shows SUB has a statistically significant moderating effect on the relationship between work overload and burnout.

The nature of SUB as a moderator in the relationship between work overload and burnout is represented in Figure 4.3. When the SUB of mining employees is low, it shows that the work overload has a higher impact on the burnout experienced by mining employees. In contrast if SUB is high amongst mining employees, the effects of work overload are far less severe on the level of burnout experienced by these employees. As a result, it is clear that the preference should be for higher SUB scores amongst mining employees, since it acts as a buffer for the negative effects of burnout on employee well-being.

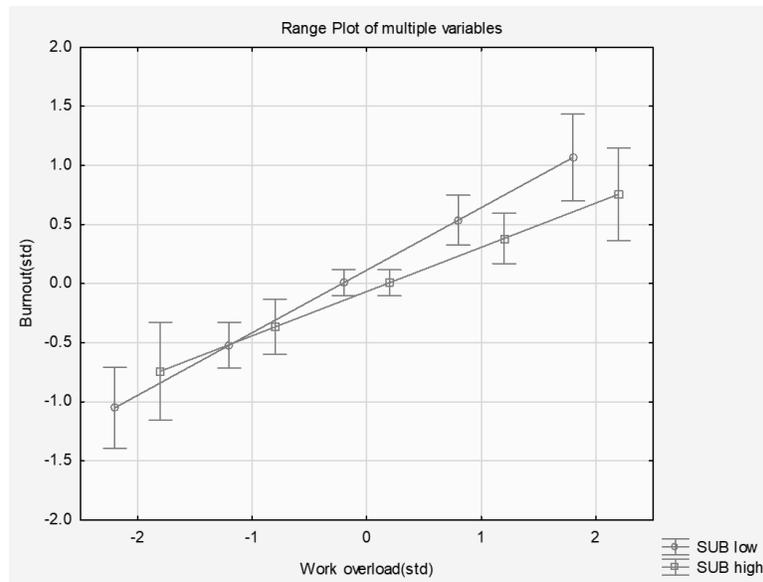


Figure 4.3 The moderating effect of strength use behaviour on the relationship between work overload and burnout

However, when this moderating effect of Strength Use Behaviour (SUB) on the relationship between work overload and burnout was tested further in terms of PLS bootstrapping, a contradicting finding was found. Instead, it was found that the hypothesized moderating effect of SUB on the relationship between work overload and burnout was *not statistically significant*. The PLS path coefficient was $-.13$, with zero falling in the 95% confidence interval. The exact information regarding the confidence of the lower as well as the upper intervals are provided in Table 4.7.

Hypothesis 8: Deficit Correction Behaviour (ξ_3) moderates the relationship between Work overload (ξ_4) and Burnout (η_2).

The p-value for Deficit Correction Behaviour (DCB) operating as a moderator of the relationship between work overload and burnout was found to be lower than $.05$ ($p = .02$). P-value scores lower than $.05$ shows DCB has a statistically significant moderating effect on the relationship between work overload and burnout.

The nature of DCB as a moderator in the relationship between work overload and burnout is represented in Figure 4.4. When the DCB of mining employees is low, it shows that the work overload has a higher impact on the burnout experienced by mining employees. In contrast if

DCB is high amongst mining employees, the effects of work overload are far less severe on the level of burnout experienced by these employees. As a result, it is clear that the preference should be for higher DCB scores amongst mining employees, since it acts as a buffer for the negative effects of burnout on employee well-being.

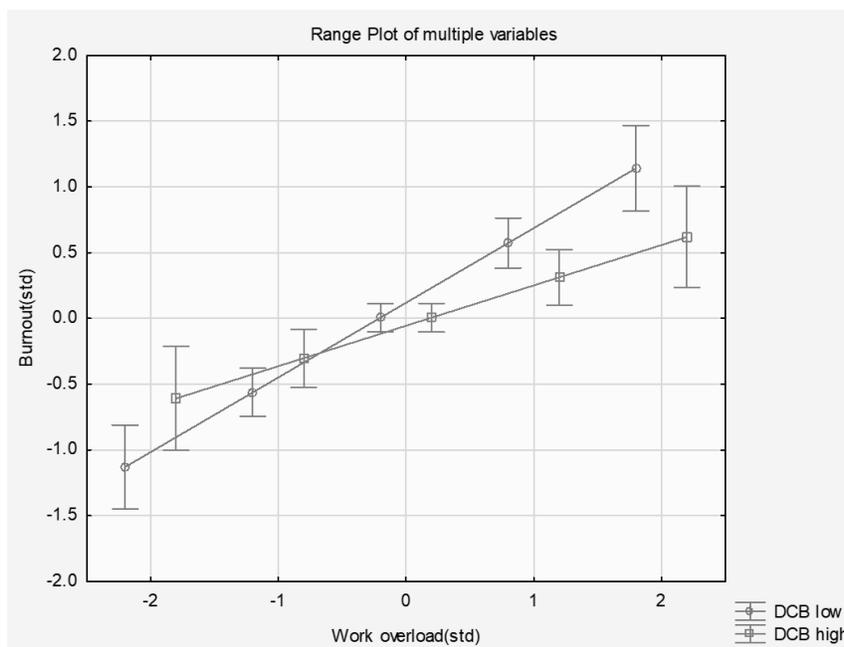


Figure 4.4 The moderating effect of deficit correction behaviour on the relationship between work overload and burnout

However, when this moderating effect of Deficit Correction Behaviour (DCB) on the relationship between work overload and burnout was tested further in terms of PLS bootstrapping, a contradicting finding was found. Instead, it was found that the hypothesized moderating effect of DCB on the relationship between work overload and burnout was *not statistically significant*. The PLS path coefficient was 0, with zero falling in the 95% confidence interval. The exact information regarding the confidence of the lower as well as the upper intervals are provided in Table 4.7.

Hypotheses 3, 6 and 7 were found to contradict the findings of previous studies which advocated that job and personal resources buffer the impact of job demands on strain (i.e. burnout) (Bakker & Demerouti, 2017; Bakker, & Oerlemans, 2012). As a result, the relationship between work overload and burnout is not weaker for employees enjoying higher levels of job resources (i.e. MPS) and who display higher levels of personal resources (i.e. SUB & DCB).

Therefore, the proposed interaction/moderation effect explained in Chapter 2, seems to not have any impact on the relationship between work overload and burnout.

Many reasons can be assigned to these nonsignificant paths. The relatively small sample size on which the research was conducted could potentially have influenced the results. Furthermore, very limited research was found on these specific variables as well as the moderating effects. As a result, more research needs to be done on the specific job and personal resources as well as their buffering/moderating effects on this specific relationship as illustrated in hypotheses 6, 7 and 8.

Hypothesis 9: *Work overload (ξ_4) moderates the relationship between Motivating Potential Score (ξ_1) and Engagement (η_1).*

The p-value for work overload operating as a moderator of the relationship between motivating potential score (MPS) and engagement was found to be higher than .05 ($p = .06$). P-value scores higher than .05 shows work overload has *no statistically significant* moderating effect on the relationship between MPS and engagement.

As a result, it can be concluded that regardless of the level of work overload, there is no interfering effect that work overload will have on the relationship mining employees have between MPS and engagement. Therefore, it is clear that the level of work overload experienced by mining employees should not be seen to have a moderating effect on the relationship between MPS and engagement.

Consequently, this moderating effect of work overload on the relationship between motivating potential score (MPS) and engagement was tested further in terms of PLS bootstrapping, and a supporting finding was found. It was found that the hypothesized moderating effect of work overload on the relationship between motivating potential score (MPS) and engagement was *not statistically significant*. The PLS path coefficient was -.08, with zero falling in the 95% confidence interval. The exact information regarding the confidence of the lower as well as the upper intervals are provided in Table 4.7.

Hypothesis 10: Work overload (ξ_4) moderates the relationship between Strength Use*Behaviour (ξ_2) and Engagement (η_1).*

The p-value for work overload operating as a moderator of the relationship between strength use behaviour (SUB) and engagement was found to be higher than .05 ($p = .62$). P-value scores higher than .05 shows work overload has *no statistically significant* moderating effect on the relationship between strength use behaviour (SUB) and engagement.

As a result, it can be concluded that regardless of the level of work overload, there is no interfering effect that work overload will have on the relationship mining employees have between strength use behaviour (SUB) and engagement. Therefore, it is clear that the level of work overload experienced by mining employees should not be seen to have a moderating effect on the relationship between strength use behaviour (SUB) and engagement.

Consequently, this moderating effect of work overload on the relationship between strength use behaviour (SUB) and engagement was tested further in terms of PLS bootstrapping, and a supporting finding was found. It was found that the hypothesized moderating effect of work overload on the relationship between strength use behaviour (SUB) and engagement was *not statistically significant*. The PLS path coefficient was .11, with zero falling in the 95% confidence interval. The exact information regarding the confidence of the lower as well as the upper intervals are provided in Table 4.7.

Hypothesis 11: Work overload (ξ_4) moderates the relationship between Deficit Correction*Behaviour (ξ_3) and Engagement (η_1).*

The p-value for work overload operating as a moderator of the relationship between deficit correction behaviour (DCB) and engagement was found to be higher than .05 ($p = .73$). P-value scores higher than .05 shows work overload has *no statistically significant* moderating effect on the relationship between deficit correction behaviour (DCB) and engagement.

As a result, it can be concluded that regardless of the level of work overload, there is no interfering effect that work overload will have on the relationship mining employees have between deficit correction behaviour (DCB) and engagement. Therefore, it is clear that the level

of work overload experienced by mining employees should not be seen to have a moderating effect on the relationship between deficit correction behaviour (DCB) and engagement.

Consequently, this moderating effect of work overload on the relationship between deficit correction behaviour (DCB) and engagement was tested further in terms of PLS bootstrapping, and a supporting finding was found. It was found that the hypothesized moderating effect of work overload on the relationship between deficit correction behaviour (DCB) and engagement was *not statistically significant*. The PLS path coefficient was 0, with zero falling in the 95% confidence interval. The exact information regarding the confidence of the lower as well as the upper intervals are provided in Table 4.7.

Hypotheses 9, 10 and 11 tested the second interaction effect as discussed in Chapter 2, in which job demands amplify the impact job and personal resources have on work engagement. These hypotheses contradicted the findings of previous research findings (Bakker and Demerouti, 2018; Bakker et al., 2014). These research studies advocated that job demands strengthen the impact of job and personal resources on motivation and individual work engagement and that job resources have the strongest positive impact when job demands are high. However, this interaction effect was not proven to be significant in this study, since all hypotheses regarding the interaction effect were found to be non-significant. It can therefore be concluded that when mining employees are confronted with high job demands (i.e. work overload), the existing job resources (i.e. MPS) and personal resources (i.e. SUB & DCB) will not become valuable. As a result, the assumption can be made that the work overload experienced by mining employees will not amplify the effect of job and personal resources on their levels of engagement.

Many reasons can be assigned to these nonsignificant paths. The relatively small sample size on which the research was conducted could potentially have influenced the results. Furthermore, very limited research was found on these specific variables as well as the moderating effects. As a result, more research needs to be done on the specific job and personal resources as well as their buffering/moderating effects on this specific relationship as illustrated in hypotheses 9, 10 and 11.

4.4 CHAPTER SUMMARY

The purpose of this chapter aimed to report on as well as discuss the findings of this research study. The measurement model was validated by conducting item analyses on each scale utilised as a measurement scale in order to establish the reliability of the items included in the various questionnaires. Furthermore, PLS modelling was used to investigate further the reliability of the items for each scale used to measure the latent variables. Thereafter, the structural model was analysed in order to determine the quality of the relationships between the latent variables that were used for the purposes of this study. Lastly, the final scores and hypothesized relationships (main as well as moderating effects) were interpreted and discussed.

After each scale's reliability was reviewed in the study, and all items confirmed, the analysis continued. From the 11 hypotheses formulated in the study and illustrated within the conceptual model (Figure 2.2), five were found to be significant. Hypotheses 6, 7, 8, 9, 10 and 11 were found to be not significant. As a result of the statistically significant findings of hypotheses 1 to 5, it can be concluded that additional support was found for the JD-R theory (Bakker & Demerouti, 2014), hypothesizing that job demands are in general terms the most important predictors of burnout, whereby job and personal resources are generally speaking the most important predictors of work engagement.

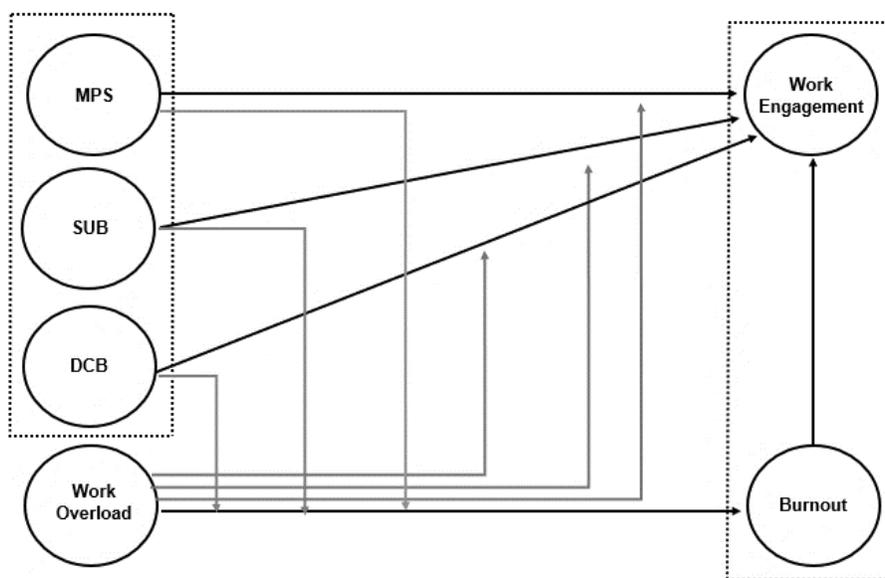


Figure 2.2 Conceptual model

Chapter 5 provides an outline of the managerial implications for this research study, which aims to assist South African industrial psychologists, managers and the mining industry at large to address problems highlighted by the research findings. The chapter will conclude with a discussion on the limitations of the current study, and recommendations for future research endeavours will be provided.

CHAPTER 5

IMPLICATIONS AND LIMITATIONS OF THE STUDY, AND SUGGESTIONS FOR FUTURE RESEARCH

5.1 INTRODUCTION

Chapter 1 of the research study provided the context as well as an overview of the research-initiating questions and the research objectives. Chapter 2 provided a detailed literature review of the applicable variables included in the research study and the derived hypotheses. Chapter 3 provided the methodology as well as the sample and statistical analyses that were utilised in the study. Chapter 4 provided the discussion of the results as well as the discussion of the participant scores and outcomes of the hypotheses.

Chapter 5 provides an outline of the managerial implications, based on the scores obtained from the research study for South African Industrial Psychologists, mining line managers as well as for the mining industry at large. Consequently, it aims to provide insight into the addressment of these problems related to the findings from Chapter 4. The results will also be evaluated against the initial JD-R theory and the level of agreement between the results and the theory. Lastly, limitations and recommendations for future research will be provided.

5.2 REPORTING AND INTERPRETING THE FINAL SCORES

5.2.1 Interpreting the Work Engagement Scale

The Utrecht Work Engagement Scale (UWES-17) aimed to determine the level of engagement experienced by mining employees in their jobs. The three scales of the UWES-17 served as a composite measurement, although only the total scores were utilised.

According to Schaufeli and Bakker (2003), the true reflection of the scores obtained for any version of the UWES should be done by interpreting the template from Table 5.1.

Table 5.1**Scoring template for the UWES mean scores**

Mean score	Mean
1 – Feels engaged once a year or less	0.00 to 0.99
2 – Feels engaged at least once a year	1.00 to 1.99
3 – Feels engaged at least once a month	2.00 to 2.99
4 – Feels engaged at least a couple of times a month	3.00 to 3.99
5 – Feels engaged at least once a week	4.00 to 4.99
6 – Feels engaged a couple of times per week or daily	5.00 to 6.00

The mean score obtained for work engagement was 4.58 (SD = .99), which shows a level of work engagement of 5 among mining employees. This shows that employees experience feelings of work engagement at least once a week.

5.2.2 Interpreting the Maslach Burnout Inventory – General Survey

The Maslach Burnout Inventory – General Survey (MBI-GS) aimed to determine the level of burnout experienced by mining employees in their jobs. The three scales of the MBI-GS served as a composite measurement, although only the total scores were utilised.

The individual responses were scored on a seven-point Likert scale (0 = “Never”; 1 = “A few times a year or less”; 2 = “Once a month or less”; 3 = “A few times a month”; 4 = “Once a week”; 5 = “A few times a week”; 6 = “Every day”). High scores from the first two scales (Exhaustion and Cynicism) and low scores on Personal Efficacy could suggest individual burnout (Maslach & Jackson, 1986).

The mean score obtained for burnout was 2.08 (SD = .94), which shows a level of burnout of 2 and 3 among mining employees. This shows that employees experience feelings of burnout between once a month to a few times a month. Furthermore, the mean score for emotional exhaustion (M = 2.71; SD = 1.47), Cynicism (M = 2.74; SD = 1.41) indicate feelings of emotional depletion and disconnectedness between once a month to at least a few times a month. Lastly, the low personal efficacy (M = 0.78; SD = .77) indicates a sense of personal accomplishment of never to merely a few times a year.

This implies that mining employees are faced with feelings of exhaustion and feeling disconnected from their job which also aims to explain why the feeling of personal accomplishment is hardly experienced, since it refers to the comparison that employees make with regards to their current levels of competence versus their previous levels before emotional exhaustion and depersonalisation manifested (Poghosyan, Aiken, & Sloane, 2010).

5.2.3 Interpreting the Job Characteristics Survey

The revised Job Diagnostic Survey (JDS) provides a score that echoes the motivating potential of a job. The scores are calculated by adding the scores obtained for the five characteristics (skill variety, task significance, task identity, feedback and autonomy) which provides a single indicator for the extent to which these characteristics are present in a job. Since no guidelines are present to interpret the scores in literature, the overall scores were categorised as low (.00 to 2.33), medium (2.34 to 4.67) and high (4.68 to 7.00) for this research study.

The mean score obtained for job characteristics were 5.37 (SD = .97), which shows that the jobs at the sampling organisation comprises of high job characteristics. The implication of these findings showcase that a higher percentage of mining jobs showcase a diversity of job characteristics (skill variety, task significance, task identity, feedback and autonomy).

5.2.4 Interpreting the Strengths Use and Deficit Correction Questionnaire

Literature does not provide guidelines to the interpretation of the strengths use and deficit correction questionnaire (SUDCO) (Van Woerkom et al., 2016). Constructs for the strength use behaviour (SUB) and deficit correction behaviour (DCB) are measured on a 7-point Likert-type scale ranging from 0 = almost never; 1 = rarely; 2 = occasionally; 3 = sometimes; 4 = frequently; 5 = usually; 6 = almost always. Consequently, mean scores were categorised as low (.00 to 2.00), medium (2.01 to 4.00) and high (4.01 to 6.00) for this study.

The mean score obtained for SUB was 4.76 (SD = .99), which shows that individuals showcase self-start behaviour to use their strengths in the workplace between frequently to usually. Furthermore, The mean score obtained for DCB was 4.82 (SD = .91) which shows that individuals frequently work proactively on overcoming their shortcomings. The implication of these findings showcase that mining employees have a high tendency to make use of their strengths and proactively work on their shortcomings.

5.2.5 Interpreting the Job Demands Score

Due to literature not providing any instructions for the interpretation regarding the job demands scale (JDS), mean scores were categorised as low (.00 to 1.33); medium (1.34 to 2.66) and high (2.67 to 4).

The mean score obtained for the revised JDS was 2.83 (SD = .63), which shows that individuals experience too much to do in too little time, with too little resources which leads to high levels of work overload. This implies that mining employees experience high levels of work requirements and not necessarily feeling that they have sufficient time and resources to complete the work.

Based on the above it is clear that distinct combinations of job resources (i.e. motivating potential), personal resources (i.e. strength use behaviour and deficit correction behaviour) and job demands (i.e. work overload) have differing influences on employee engagement and burnout on mining employees.

Based on the JD-R theory (Schaufeli & Bakker, 2003), different interactions between resources and demands are explained and accompanying outcomes. Low job demands (i.e. work overload) grouped with low resources (i.e. motivating potential, strength use behaviour and deficit correction behaviour) could potentially result in *apathy*, whereby high job demands (i.e. work overload) grouped with low resources (i.e. motivating potential, strength use behaviour and deficit correction behaviour) could possibly lead to *burnout*. Consequently, low job demands (i.e. work overload) in combination with high resources (i.e. motivating potential, strength use behaviour and deficit correction behaviour) could lead to personal *boredom*. As a result, employee engagement is a result of high job demands and high job and personal resources (Bakker & Oerlemans, 2012). Based on this conclusion, when job demands (i.e. work overload) increase among mining employees, these employees should draw on the available job resources (i.e. motivating potential score) and personal resources (i.e. strength use behaviour and deficit correction behaviour) to enable them to deal with the faced challenges set by the increased job demands.

Based on current literature, the motivating potential score as a job resource have received limited attention, especially within the mining environment. As a result, the current research study aimed to highlight the importance of this job resources amongst mining employees in order to buffer the effects of increasing job demands and increase employee engagement. As

highlighted earlier, the current mining environment is under pressure and as a result the environment could become highly stressful. This however could motivate employees to see the demands as a challenge rather than a threat especially should the job characteristics provide the necessary supporting framework. As a result, the availability of job resources and the utilisation of personal resources become imperative to ensure that job demands faced, do not translate into strain, which could potentially lead to burnout. Therefore, the engagement of employees is a product of high job demands (i.e. work overload) grouped with available job resources (i.e. motivating potential score) and the individual utilisation of personal resources (i.e. strength use behaviour and deficit correction behaviour)

This research study aimed to emphasise the importance of individual characteristics as well as how motivating potential as a job resource and the use of strength use behaviour and deficit correction behaviour as personal resources can aid in handling high job demands (i.e. work overload) within the mining industry. The level of increased knowledge regarding the resource and demand interaction will aid managers in developing interventions that can aid in the progression of these resources while aiming to achieve high employee engagement while assisting mining employees to cope with job demands. This will result in mining employees showcasing higher levels of engagement as well as showcasing lower levels of potential burnout.

5.3 PRACTICAL IMPLICATIONS

The findings of quantitative research, especially significant relationships between variables are incremental to the field of industrial psychology and managers within any working environment. Based on the PLS path analysis, which was conducted in the study provided vital information regarding the variance of this model. The PLS path analysis results shows that the model accounted for an average variance of 50% in work engagement. Additionally, 43% of variance in burnout was explained by the effect of exogenous variables. As a result, it is clear that the model provided significant findings for practical applications within workplaces.

The following section is divided into two sections, general interventions and interventions specifically on the study results.

5.3.1 General interventions that can be employed by the mining industry

As previously discussed, job dissatisfaction, anxiety, depression, HIV Aids and numerous physical health problems are prominent within the South African Mining sector fuelling high employee turn-over rates, union interventions and employee absenteeism. Therefore, the investigation of job demands, and lack of resources becomes imperative from a manager's perspective. To prevent the level of work overload fuelling individual strain, it is recommended that managers aim to monitor and evaluate the level of demands placed on employees. Additionally, motivating potential (i.e. job resource) should be investigated and developed, especially aimed at improving skill variety, task identity, task significance, autonomy and feedback.

Firstly, line managers could aim to increase skill variety experienced by employees by increasing the scope of practice, additionally the implementation of multi-skilling programs (e.g. individual development programs aimed at competence on various machines, not limited to a specialised machine) could aid employees to draw on the variety of skills should demands increase (Siengthai & Pila-Ngarm, 2016). Additionally, line managers and mining organisations could aim to provide insight into the holistic aim and sustainability of the business. By providing the flow of the organisation as well as the impact of the individual contribution, employee's understanding increases which leads to individual commitment and sense of belonging (Grant, 2008).

Furthermore, the empowerment of employees through providing the means and ability of individuals provide the line managers to handover control incrementally, which provides the opportunity for autonomy, which has been found to have a substantial impact on employee motivation (Boonzaier et al., 2001). Lastly, employers and line managers could implement performance management sessions with the aim of identifying and monitoring performance. Through the implementation and commitment of key performance discussions (e.g. KPI's) employees are provided with feedback which has been found to play an imperative role in employee performance (Hussein, et al., 2016).

Based on the above, it is recommended that managers focus on autonomy and feedback first, due to the implementation of these changes not requiring a change in the job design, which may be the case with regards to the other resources (i.e. skill variety, task significance and task identity).

Additionally, the development of individual emotional intelligence could aid employees to proactively make use of their personal resources and seek opportunities to implement and develop the job resources available (Cazan and Nastasa, 2015). Emotional intelligence, which refers to the ability to monitor one's feelings and emotions, as well as using them in guiding decision-making has been found to lower the effects of burnout and increase individual satisfaction (Cazan and Nastasa, 2015). By empowering mining employees to become aware of their emotions and develop their active decision-making capabilities could aid in increasing the resources available to utilise by individuals when faced with increasing job demands.

These interventions, proposed guidelines that the researcher could consider in addressing specific interventions that may be required to the mining employees of the sample.

5.3.2 Interventions based specifically on the results of the present study

The following section provides a discussion on the interventions recommended for the mining community. Based on the JD-R theory and the above-mentioned interventions, it becomes critical to recommend interventions that are aimed at preventing individual burnout and fostering employee engagement.

5.3.2.1 Organisational and individual-level interventions

According to Giga, Fletcher, Sgourakis, Mulvaney and Vrkljan (2018), organisational and individual interventions aid in establishing a new culture and could aid in the development of structures that could buffer the effects of occupational strain. These results could aid line managers within the mining environment, to effectively manage the demands experienced by employees and create a culture of available resources and individual awareness.

The following sections specifically shines light on the variables of this research study. It aims to provide interventions that could be implemented to create the above required culture. These interventions usually consist of training, job redesign and organisational realignment. Keeping to the alignment of the JD-R theory, interventions are proposed to reduce job demands, increase awareness of personal resources and improve on job resources.

5.3.2.1.1 Reducing job demands

The hypothesised relationship found between job demands (i.e. work overload) and burnout was found to be statistically significant (PLS path coefficient of .45.) This shows a strong relationship between work overload and burnout and highlights the need to focus on job demands (i.e. work overload) when designing interventions that could aid employees in addressing these demands effectively.

Due to the increasing effort and costs associated with burnout and employees faced with high job demands, possible ways of reducing these demands becomes imperative. Employees often time react negatively to high job demands due to the limitation of personal well-being and feelings of despondency that it creates (Baik, Song and Hong, 2018).

An intervention that has been found to be effective and recommended for organisational level interventions is the process of job redesign (Bakker & Demerouti, 2018). Job redesign, which can be described as an intervention aimed at changing how jobs, tasks and roles are structured and modified to impact organisational and individual outcomes. A possible approach to reduce job demands through job redesign is to increase the level of support and supervisory coaching provided through performance feedback (job resource) as well as providing appropriate job responsibilities that will aid in the coping of the emotional demands.

Although literature recommends increasing the job demands due to the positive impact it has on the relationship between resources and engagement, within the current study, no moderation effect was found between work overload and any of the three discussed resources and as a result, adding additional responsibilities to aid employees to manage the current job demands are not advised.

Furthermore, line managers could investigate the resources and demands that are most prevalent to employees and focus on the areas that individuals feel the highest level of attention is required. Interventions that are designed, should be aimed to address the highest concern areas of job demands and resources first before rolling it out to the rest (Bakker & Demerouti, 2018).

5.3.2.1.2 Increasing job resources (motivating potential score) through training

The hypothesised relationship found between job resources (i.e. motivating potential score) and work engagement was found to be statistically significant (PLS path coefficient of .41.) This

shows a strong relationship between motivating potential and work engagement and highlights the strong recommendation to explore additional ways of improving the motivating potential score of employee's jobs.

As discussed earlier, the focus of training interventions should be to increase awareness on managerial level and the benefits higher job resources have to offer. Implementing a multi-skilling program could aid employees to draw on the variety of skills should job demands increase (Siengthai & Pila-Ngarm, 2016). Additionally, line managers could aim to provide insight into the holistic aim and sustainability of the business. By providing the flow of the organisation as well as the impact of the individual contribution, employee's understanding increases which leads to individual commitment and sense of belonging (Grant, 2008).

Furthermore, empowering employees and providing the opportunity for autonomy as well as providing constructive feedback and performance conversations could add to the motivating potential score experienced by employees which have all been found to correlate positively with work engagement.

5.3.2.1.3 Managing personal resources (strength use behaviour and deficit correction behaviour) through training

The hypothesised relationship found between personal resources (i.e. strength use behaviour and deficit correction behaviour) and work engagement was found to be statistically significant (PLS path coefficient of .22 and .05 respectively.) This shows a strong relationship between strength use behaviour and work engagement as well as a significant relationship between deficit correction behaviour and work engagement. This highlights the strong recommendation to manage and develop the personal resources utilised by employees within the mining industry.

All training interventions should be aimed at organisational level with the purpose of developing personal resources. Training and development forms part of the foundation of human resource functions and pending on specific requirements (i.e. Sector Education and Training Authorities) organisations are required to invest in the development of their employees. According to Bakker & Demerouti (2014) training should be aimed at developing individual's personal resources.

In order for individuals to draw on their strengths and proactively work towards overcoming their deficits, insight and awareness is required. As a result, it is recommended that mining

organisations provide training interventions to increase individual awareness and provide supporting frameworks to design and implement personal interventions. The awareness of strengths and development areas becomes a crucial element in the development of any individual (Biswas-Diener, Kashdan and Minhas, 2011).

Furthermore, mining organisations could implement mentorship agreements that could aid in the awareness as well as provide opportunities to receive feedback and direction. By empowering mining employees to become more aware of their emotions and develop their active decision-making capabilities could aid in increasing the resources available to utilise by individuals and as a result, emotional intelligence workshops are recommended to aid in individual development.

5.4 LIMITATIONS OF THE STUDY AND RECOMMENDATIONS FOR FUTURE RESEARCH

In spite of adding significant value, the current study has several limitations. However, it should be noted that these limitations do not hinder the results provided in Chapter 4. Instead, these results limitations provide guidelines for future research as well as areas for improvement.

Firstly, although the sample size of 257 mining employees were satisfactory and above the recommended amount, a bigger sample size could have provided more credible results. Therefore, it is recommended that future studies attempt to obtain a larger sample size.

The second limitation is based on the sampling population. This research study only focused on a mining sample from one organisation (i.e. Sampling organisation) situated in one province (i.e. North-West province). As a result, the obtained conclusion cannot be generalised to the greater population of all mining employees from. It is recommended that a stratified sample from different mining sites across South Africa be utilised, for a more representative sample that can be generalised be used for future research endeavours.

Thirdly, the data gathering approach relied heavily on self-reporting paper-copy measures. Thus, method bias or impression management could have been evident. Due to the questionnaire not investigating impression management, one could assume that socially desirable answering was high. Participants most likely answered the questionnaire in a way that reflects a positive self-image (i.e. high on strength use and work overload). Consequently, when research is conducted by only utilising self-reporting measurements, the predicting correlations can be inflated (Navarro-Gonzales, Lorenzo-Seva and Vigil-Colet, 2016).

Therefore, it is advised that objective measures of latent variables are utilised for future research studies. It should over be noted that each approach has limitations, with objective measures facing the challenge of egocentric bias, which also has an impact on the validity and reliability of the measurements.

The fourth limitations implicate the confidentiality clause included in the informed consent form. Although complete anonymity was assured, participants could have either miss understood or have had mistrust in the consent form and as a result, it could have had an impact on participants responses.

Fifthly, the questionnaire was only available in English, which based on the biographical questionnaire only 1.94% indicated as their home language. Due to this factor, it is possible that participants misunderstood some of the questions which could have had an impact on the research results.

The sixth limitation is that although most of the PLS path analyses R-square values were significantly high, it is possible that more significant predictors were not included in the present study. The inclusion of these variables could have provided more significant results. In order to overcome this limitation, it is recommended that other variables be included on the backdrop of the JD-R model, which could aim to explain work engagement and burnout. As a result, the current study could be utilised as the foundation of future studies. Lastly, it is also recommended that the measurement instruments be further developed within the South African context to increase the validity and reliability.

Another limitation was found in the assembly of the questionnaire, due to the extensive nature of the questionnaire, and majority of participants struggling to understand English, many participants took 40-50 minutes, which was in contradiction with the aimed 20-25 minutes. It is recommended that future researchers reflect on the feasibility of such a tedious questionnaire or provide additional resources (i.e. translator) that could aid in the completion of the questionnaire.

The seventh limitation was that of the research design. Due to the implementation of an ex post facto design, which, as discussed in Chapter 3, prohibits the researcher from influencing independent variables, the research was unable to randomise the participants. Although the

research design is derived from the objectives, it is recommended that future research studies aim to make use of an alternative design, which enables randomisation.

Lastly, due to the research study only being focused on the current employee experience (i.e. cross-sectional research study), conclusions and behavioural trends could not be derived in depth as would have been the case with a longitudinal study. Therefore, it is recommended that future researchers aim to make use of multiple time waves or make use of a diary design which could aid in making more definitive conclusions.

5.5 CHAPTER SUMMARY

This chapter provided recommended managerial interventions, aimed at addressing the results derived from Chapter 4. The recommended interventions are aimed at individual as well as organisational levels. Limitations of the research study were also discussed and recommendations for future research were provided.

5.6 CONCLUSION

The primary objectives of this research study were aimed at testing the motivating potential structural model of the proposed relationships between variables as well as to determine the level of job demands (i.e. work overload), job resources (i.e. motivating potential score), personal resources (i.e. strength use behaviour and deficit correction behaviour), work engagement and burnout of a sample of mining employees. Additionally, the results, managerial implications and recommended interventions were highlighted by the researcher in order to provide insight to mining employees who participated to increase/decrease the constructs with the overarching aim of increasing work engagement and buffering burnout. Based on the set-out objectives, it can be concluded that all objectives set out for the research study was met.

The research initiating question asked:

- *What causes variance in Engagement and Burnout amongst mining employees within South Africa?*

From the eleven hypotheses that were formulated for the research study, five were found to be significant and six were found not to be. The six nonsignificant hypotheses were related to the moderating effects. These nonsignificant paths could be explained by numerous factors. The

small sample size, which was limited to one site, could have influenced the results. Additionally, the limited research found on the specific variables and their moderating effects. Therefore, it is recommended that more research be conducted on the moderating effects based on the specific job resources, personal resources and job demands from this research study.

The hypotheses of 1, 2, 3, 4 and 5 were all found to be statistically significant, which supports the ideology proposed by the JD-R theory (Bakker & Demerouti, 2014). This provides the conclusion that the participating mining employees (and other) needs to implement interventions to enable and support employees to cope with high job demands that is present in the mining industry. This also provides an opportunity for managers to take notice of the interaction and functioning of job resources (i.e. motivating potential) and personal resources (i.e. strength use behaviour and deficit correction behaviour) investigated in this study. This could empower organisations to enhance the current resources in a plea to enhance work engagement and manage the job demands experienced by employees.

The findings of the research study have contributed to the JD-R theory through the testing of the entire JD-R model as well as exploring additional paths. The inclusion of the motivating potential score as a job resource is the most valuable contribution, due to it's limited investigation within the mining industry. Additionally, the research study, provided a more comprehensive understanding of motivating potential score as a job resource, strength use behaviour and deficit correction behaviour as a personal resource as well as work overload as a job demand and the interaction of these variables with work engagement and burnout among mining employees in South Africa.

These research findings explain the impact that job demands (i.e. work overload), job resources (i.e. motivating potential score) and personal resources (i.e. strength use behaviour and deficit correction behaviour) have on work engagement and burnout. Furthermore, these results provide key insights into how industrial psychologists, line managers, HR professionals and the mining industry at large could manage problems which are related to the variables included in the research study.

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