

**JOB DEMANDS, JOB RESOURCES, BURNOUT AND ENGAGEMENT OF
EMPLOYEES IN THE MINING INDUSTRY IN SOUTH AFRICA**

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REMARKS

The reader is reminded of the following:

- The referencing, as well as the editorial style as prescribed by the *Publication Manual* (5th edition) of the American Psychological Association (APA) was followed in this thesis. This practice is in line with the policy of the Programme in Industrial Psychology of the North-West University (Potchefstroom Campus) to use APA style in all scientific documents.
- The thesis is submitted in the form of three research articles.

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SUMMARY

Subject: Job demands, resources, burnout and engagement of employees in the mining industry in South Africa.

Key terms: Job demands, job resources, burnout, engagement, mining industry, mining challenges.

The mining industry has been the bedrock of South African economy for more than a century, making an important contribution to employment opportunities, the gross domestic product and export earnings in the South African economy. Globally the mining industry is faced with a shortage of qualified talent to meet its production needs. Every year there are more people leaving than entering the mining industry to pursue job and career opportunities. The mining industry has to focus a lot on safety and health, training and development programmes, team building initiatives, and the recruitment and retention of affirmative action candidates in order to retain their valued staff. The mining industry also has to achieve production targets while at the same time assure that its employees are safe and happy workers. Therefore happy, productive and motivated employees are an important contributor to the stability and development within the mining industry. The objective of this study was to determine the relationship between job demands, job resources, burnout and engagement of employees in the mining industry.

The research method consisted of a literature review and an empirical study. A cross-sectional survey design was used to collect the data. An availability sample ($N=199$) from employees in the mining industry was taken. The Job Demands and Resources Scale (JDRS) (was used to measure job demands and job resources), the Utrecht Work Engagement Scale (was used to measure engagement) and the Oldenburg Burnout Inventory (was used to measure burnout). Descriptive statistics, product-moment correlation coefficients and multiple regression analyses were used to analyse the data.

The statistical analysis was carried out with the help of the SPSS programme. The results of this study indicated that job resources, namely organisational support (including the relationship with superiors, role clarity, information, communication, and participation) are positively related to growth opportunities (including variety, opportunities to learn, and autonomy), advancement and social support. Multiple regression analysis showed that the

best predictors of engagement were organisational support, growth opportunities and work-life balance. The best predictors of disengagement were lack of resources, including growth opportunities and social support, and demands of overload and a lack of work-life balance. The predictors of burnout were overload and a lack of advancement opportunities

Recommendations for future research are made.

OPSOMMING

Onderwerp: Werkseise, werkhulpbronne, uitbranding en begeestering van werknemers in die mynindustrie in Suid-Afrika.

Sleutelwoorde: Werkseise, werkhulpbronne, uitbranding, begeestering, mynindustrie, uitdagings in mynwese.

Die mynindustrie was nog altyd die ruggraat van die Suid-Afrikaanse ekonomie vir meer as 'n eeu, en lewer 'n belangrike bydra tot werksgeleentede, bruto binnelandse produk en uitvoer verdienste in die Suid Afrikaanse ekonomie. Globaal word die mynindustrie in die gesig gestaar met 'n tekort in gekwalifiseerde talent om aan produksiebehoeftes te voldoen. Elke jaar is daar meer mense wat die mynindustrie verlaat om ander werk en beroepsgeleentede na te jaag. Die mynindustrie moet baie fokus op veiligheid en gesondheid, opleiding en ontwikkelingsprogramme, spanbou-inisiatiewe, en die werwing en behouding van regstellende aksie kandidate om hulle waardevolle personeel te behou. Die mynindustrie moet produksieteikens bereik terwyl daar terselfdertyd seker gemaak moet word dat hulle werknemers veilige en gelukkige werkers is. Met ander woorde, gelukkige, produktiewe en gemotiveerde werknemers is 'n belangrike bydraer tot die stabiliteit en ontwikkeling van die myn industrie. Die doel van hierdie studie was om die verband tussen werkseise, werkhulpbronne, uitbranding en begeestering in die mynindustrie te bepaal.

Die navorsingsmetode het bestaan uit 'n literatuurstudie en 'n empiriese studie. 'n Kruis-seksionele vraelys ontwerp was gebruik om die data te versamel. 'n Beskikbaarheid-steekproef ($N=199$) van werknemers in die mynindustrie was geneem. Die Werkseise en Werkhulpbronne skaal (JDRS) is gebruik om werkseise en werksbegeestering te meet, die Utrecht Werksbegeesteringskaal is gebruik om begeestering te meet en die Oldenburg uitbrandingsvraelys is gebruik om uitbranding te meet. Beskrywende statistiek, produk-moment korrelasies en meervoudige regressie-analise is gebruik om die data te analiseer.

Die statistiese analise is uitgevoer met die hulp van die SPSS program. Meervoudige regressie analise het getoon dat begeestering voorspel word deur werkhulpbronne as gevolg van organisasie-ondersteuning, groeigeleentede en werk-lewe balans. 'n Gebrek aan begeestering is voorspel deur 'n tekort aan hulpbronne, waaronder groeigeleentede en sosiale ondersteuning en te veel eise van oorlading en tekort aan werk-lewe balans.

Uitbranding is die sterkste voorspel deur werkseise van oorlading en tekort aan bevorderingsgeleenthede.

Aanbevelings vir toekomstige navorsing is aan die hand gedoen.

CHAPTER 1

INTRODUCTION

This mini-dissertation focuses on the relationship between job demands, job resources, burnout and engagement of employees in the mining industry in South Africa.

Chapter 1 contains the problem statement, research objectives and research methodology employed. This chapter starts out with a problem statement, giving an overview of previous related research on job demands, job resources, burnout and engagement of employees in the mining industry, linking it with this research project and its research objectives. A discussion of the research method follows, with details regarding the empirical study, research design, participants, measuring instruments and statistical analyses. The chapter concludes with an overview of the chapters that comprise the mini-dissertation.

1.1 PROBLEM STATEMENT

South Africa is blessed with an exceptional geological heritage. As such the mining industry has been the bedrock of the South African economy for more than a century. Global mining firms make an important contribution to employment opportunities, the gross domestic product and export earnings in the South African economy. The mining industry has been the very backbone of the civilized world. It is also aptly illustrated in a developing country such as South Africa, where the mining industry made an important contribution to the national economy during the previous century. In 2003 alone, this industry contributed R78,5 billion or 7,1% to the country's gross domestic product and an additional 8,0 % through associated multiplier effects. In addition, the mining industry contributed 39,7% of the country's export earnings during 2003 (Van Zyl, Human, & Tshabalala, 2004).

“Today the mining industry operates in a radically changed environment. Democracy in South Africa has brought new social priorities. It has exposed the country to the forces of the global economy which is offering new opportunities and challenges, on a larger scale than ever before. We are, consequently, called upon to find a dynamic vision and strategy which will give mining as significant a role in the future as it has had in the past” (Mandela, 1994).

Globally the mining industry is faced with a shortage of qualified talent to meet its production needs. Every year there are more people leaving than entering the mining industry to pursue job and career opportunities. Some of the key reasons for this trend include the general image of the industry, declining numbers of graduates from mining related programs and the drain of talent and knowledge as a result of mining industry turn-over and retirement (Van der Veen & Strongman, 2003). The shortage of skilled workers in combination with high turn-over rates are among the top factors impacting industry growth; either by stopping or delaying projects that would otherwise proceed, or by significantly adding to the cost of new projects.

According to Mason (2005), a strong sense of opportunity for growth and development is reinforced through mapping future organisational needs, recognising strengths, and developing a plan for skill development that meets organisational and individual needs. Management behaviour that instils a sense of ownership includes involving employees in projects that matter (i.e., cost reductions, continuous improvement, or client satisfaction), following up on employee input and encouraging employees to take ownership of their careers. Team environments are built by accepting employees as equals, rewarding positive attitudes, communication and commitment, and providing opportunities for team success. In conclusion, mining forms a large part of South Africa's economy, and while production targets are important, more important than profit is the people that the mining industry can't do without.

Another emerging issue is Black Economic Empowerment (BEE), mainly due to the introduction of the mining charter. The mining industry like other industries in South Africa are starting to comply with government set BEE requirements and targets with which they have to comply with. The mining industry have to focus a lot of their human resources functioning on safety & health, training and development programs, team building initiatives, and the recruitment & retention of affirmative action candidates in order to retain their valued staff. The mining industry also have to achieve production targets while at the same time assure that their employees are safe. More important, their employees have to have the necessary support from management in order for them to be productive.

Shift work forms a large part of the mining industry worldwide. Shift work is prevalent in occupations and industries that require continuous operation to be cost-effective, or that offer

a product or service that is in demand late into the night or around the clock. Companies implement shift work where continuous processes span a 24-hour day. This is made possible by rotating one group of workers with another (Giovanni, 2003). Tiredness and sleeping problems are closely related to depression and burnout. It has also been linked to increased risk of infections by lowering the activity of the immune system and increased risk of musculoskeletal injuries. Landsbergis (1988) found that employees involved with weekend work reported significantly higher emotional exhaustion, job stress and psychosomatic health problems than employees not involved with weekend work. Similarly, employees on non-standard work shifts reported significantly higher overall burnout, emotional exhaustion, job stress and health problems than employees on a fixed day shift.

People have very different abilities to deal with stress. What may be stressful or very upsetting to one person may not be stressful to another. Stress is the body's natural reaction where there is an imbalance between the demands of the environment and the ability of the worker to respond to those demands (Bendak, 2003). In the US, psychological disorders, many of which result from stress, are among the 10 leading causes of work-related disease (Loomis, 2005). Physical and psychological symptoms of stress include frequent headaches, sleeplessness, and loss of appetite, depression, short temper, backache, stomach problems, ulcers, high blood pressure and heart disease (Bendak, 2003).

Burnout is a severe reaction to job stress. Burnout leads to a sense of emptiness and loss of feelings, additional to other symptoms of stress. Chronically difficult job demands, an imbalance between high demands and low resources, and the presence of conflict (whether between people, between role demands, or between important values) are consistently found in situations in which employees experience burnout. Rothmann, Mostert, and Strydom (2006) define burnout as a particular, multidimensional and chronic stress reaction that goes beyond the experience of mere exhaustion, and is seen as the final step in a progression of unsuccessful attempts to cope with a variety of negative stress conditions. According to Spielberger and Vagg (1999), a comprehensive assessment of job stress requires an evaluation of the specific aspects of one's job, which produce job strain. This supports the fact that different working environments and industries may make different job demands on individuals. Job demands refer to those aspects of the job that require sustained physical or mental effort, and are therefore associated with certain physiological and psychological costs (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001).

According to Lazarus and Folkman (1984), burnout should be distinguished from concepts such as stress and depression. The term stress refers to the temporary adaptation process that is accompanied by mental and physical symptoms, and is caused by an imbalance between job demands and the response capability of the worker. In contrast, burnout can be considered as the final stage in a breakdown in adaptation that results from the long-term imbalance of demands and resources, and is accompanied by chronic malfunctioning at work. Burnout can thus be considered as a particular kind of prolonged job stress or the consequence of chronic, ongoing stress (Lazarus & Folkman, 1984).

Brill (1984) defined burnout as a persistent, negative, work-related state of mind in 'normal' individuals that is primarily characterized by exhaustion, distress, reduced effectiveness, decreased motivation, and the development of dysfunctional attitudes and behaviours at work. The exhaustion component represents the basic individual stress dimensions of burnout. For the purpose of this research an alternative measure of burnout, the Oldenburg Burnout Inventory is used (OLBI; Demerouti, 1999). The OLBI includes two dimensions: exhaustion and disengagement from work. Exhaustion is defined as a consequence of intensive physical, affective, and cognitive strain, for example as a long-term consequence of prolonged exposure to certain demands. The OLBI covers not only affective but also physical and cognitive aspects of exhaustion. This makes it more applicable to those workers who perform physical work, like mine workers. Disengagement in OLBI refers to distancing oneself from one's work, work content, or one's work in general. The disengagement scale also refers to attitudes toward the work task as well as to a devaluation and mechanical execution of work. Furthermore, the disengagement items concern the relationship between the employee and his or her job, especially regarding engagement and identification. Individuals who are highly engaged in their jobs identify personally with the job and are motivated by the work itself. Schaufeli and Bakker (2004) define work engagement as a positive, fulfilling work-related state of mind that is characterised by vigour, dedication and absorption. The OLBI scales each includes both negatively and positively worded items. That is, both exhaustion and disengagement are measured via sets of items that require both affirmative and negating responses.

To test the relationship between job characteristics and burnout, Demerouti et al. (2001) developed the Job Demands-Resources (JD-R) model of burnout. A central proposition of the JD-R model is that, although every occupation may have its own specific job characteristics,

it is still possible to model these characteristics in two broad categories, job demands and job resources. Job demands refer to those physical, psychological, social and organisational aspects of the job that require sustained physical and/or psychological costs. Job resources refer to those physical, psychological, social or organisational aspects of the job that (1) are functional in achieving work goals; (2) reduce job demands and the associated physiological and psychological costs; or (3) stimulate personal growth and development. According to Schaufeli and Bakker (2004), job resources may play either a task motivational role (by fostering the employee's growth, learning and development); or they may play an extrinsic motivational role (by being instrumental in achieving work goals).

A second assumption in the JD-R model is that job characteristics may evoke two different processes. First, high job demands may exhaust employees' mental and physical resources and may therefore lead to burnout and health problems. Second, poor or missing job resources preclude actual goal accomplishment, which is likely to cause failure and frustration. In sum, the JD-R model proposes that the development of burnout follows two processes. In the first process, demanding aspects of work (i.e., extreme job demands) lead to constant overtaxing and in the end, to exhaustion. In the second process, a lack of resources complicates the meeting of job demands, which further leads to withdrawal behaviour. The long-term consequence of this withdrawal is disengagement from work. Theoretically, one may argue that the interaction between job demands and job resources is most important for the development of burnout that is, of exhaustion and disengagement.

Rothmann, Mostert, and Strydom (2006) saw the need for research regarding the job demands and resources as experienced by employees in different organisations in South Africa. For this aim Jackson and Rothmann (2005) developed a questionnaire to measure job demands and resources, namely the Job Demands-Resources Scale (JDERS). Rothmann et al. (2006) tested the construct validity, construct equivalence and reliability of the JDERS in different organisations in South Africa. The results showed that the JDERS is valid, reliable and equivalent for different organisations. Statistically significant differences were found between the perceptions of job demands and resources in different organisations.

During the past three decades, many studies have shown that job characteristics can have a profound impact on employee well-being such as job strain, burnout and work engagement (Bakker & Demerouti, 2006). Cordes and Dougherty (1993) have grouped the many causes

of burnout into three general categories: job and role characteristics, organisational characteristics and personal characteristics. Role conflict occurs when an employee receives conflicting demands from individuals within the organisation and role ambiguity occurs when individuals are not given enough information to effectively perform their work function. Various research studies have shown that role conflict and role ambiguity can account for significant amounts of variance in the emotional exhaustion phase of the burnout process. Organisations which foster high levels of role conflict are unpleasant for employees and more difficult thus leading to higher levels of burnout. Role overload occurs when the organisation gives the employee too many tasks to complete in not enough time. Organisations unintentionally create this overload because of the need for increased productivity; however, it is taxing on both the individual's time and energy supply (Maslach & Leiter, 1997).

Employees seek both intrinsic and extrinsic rewards from their jobs. Intrinsically, individuals hope to find work that is enjoyable; however, when conflict, ambiguity and overload characterise it, the intrinsic value is lost. Further, jobs with low pay relative to the amount of time and energy spent create a loss of extrinsic rewards (Maslach & Leiter, 1997). When rewards (e.g. salary, positive feedback or career advancement) provided by the organisation fall short of what one feels one deserves in terms of inputs, burnout may develop. Job resources are assumed to play either an intrinsic motivational role because they foster employees' growth, learning and development, or an extrinsic motivational role because they are instrumental in achieving work goals.

Social support is commonly viewed as a moderator between job stress and reactions to that stress. Cordes and Daugherty (1993) suggest that either social supports help individuals to redefine the stresses of the work environment; or that they help individuals realize their ability to effectively deal with the stresses given the aide of social support. Previous studies have consistently shown that job resources such as social support from colleagues and supervisors, performance feedback, skill variety, autonomy, and learning opportunities are positively associated with work engagement (Bakker & Demerouti, 2007).

Personal expectations can also impact an individual's propensity toward burnout. When a discrepancy exists between an individual's perception of an organisation and the realities of that organisation, these unmet expectations become a source of burnout. In addition, individuals may experience a mismatch between what they thought they were capable of

accomplishing in a particular position and what they can actually accomplish, thus facilitating the burnout process. Stressors such as poor communication, heavy job demands, inadequate training, interpersonal conflict, the inability to reach aspired career goals and organisational withdrawal behaviours (e.g. turnover, intention to quit, absenteeism and tardiness) have been strongly associated with low productivity and health problems. Individuals can also experience job insecurity regarding the future and continuation of their jobs. Individuals who experience job insecurity experience less work engagement and more exhaustion and disengagement at work (Bosman, Rothmann, & Buitendach, 2005). Burnout is not only detrimental to the individual, but it also has far-reaching impact on organisations (Schaufeli, 2003). Increased absenteeism, job turnover, poor performance and loss of productivity and inefficiency, all eventually result in financial losses for organisations. When individuals affected by burnout take leave, organisations are required to pay for the sick leave, but also needs to incur costs to fund replacement labour. Furthermore, when employees decide to leave the organisation, the replacement and training as well as the loss of productivity result in additional costs for the employer. The end result for organisations is that greater levels of burnout mean lower levels of quality and quantity produced (Maslach & Leiter, 1997).

In line with the increased focus of psychology on human strengths and optimal functioning, work engagement, although related to burnout, is viewed as the theoretical antithesis of burnout. Rothmann and Storm (2003) conducted a large cross-sectional study among 1,910 South African police officers, and found that engaged police-officers use an active coping style. They are problem-focused, taking active steps to attempt to remove or rearrange stressors. Engaged employees often experience positive emotions, including happiness, joy, and enthusiasm; experience better health; create their own job and personal resources; and transfer their engagement to others (Demerouti & Bakker, 2008).

A poll of almost 90,000 workers worldwide by workplace consultancy Towers Perrin found many employees did not believe their organisation or senior management were doing enough to help or keep them engaged. A fifth said they felt engaged at work, with more than a third admitting to feeling partly or fully disengaged. The study further showed that the companies with the highest levels of employee engagement achieved the best financial results and were more successful in retaining their most valued employees than those with lower levels. The most striking data about the linkage between employee engagement and financial performance come from a study of 40 global companies that involved a regression analysis of

company financial results against engagement data. It found that firms with the highest percentage of engaged employees collectively increased operating income by 19 per cent and earnings per share by 28 per cent year-to-year. Those companies with the lowest percentage of engaged employees showed year-to-year declines of a third in operating income and more than a tenth in earnings per share.

Several studies have shown a positive relationship between job resources and work engagement. In the context of the JD-R model, job resources by definition act as buffers of job demands on burnout (Demerouti et al., 2001). Thus, where job demands equal job resources (in low demands-low resources or high demands-high resources conditions), low levels of burnout will be experienced (Bakker & Demerouti, 2007). This combination represents a buffer effect and suggests that although demands are high, high levels of resources prevent the occurrence of burnout. Therefore, the relationship between job demands and burnout will be particularly strong when job resources are low.

The research will make certain contributions to the subject of Industrial Psychology and the practice thereof in organisations by attempting to answer the following research questions that have emerged from the problem statement:

- How are job demands, job resources, burnout and engagement conceptualised in the literature?
- What is the relationship between job demands, job resources, burnout and engagement according to literature?
- What is the relationship between job demands, job resources, burnout and engagement in a sample of employees in the mining industry?
- Do job demands foster the experience of burnout and job resources engagement?

1.2 RESEARCH OBJECTIVES

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

1.2.1 General objective

With reference to the above formulation of the problem, the general objective of this study is to determine the relationship between job demands, job resources, burnout and engagement of employees in the mining industry in South Africa.

1.2.2 Specific objectives

The specific research objectives are as follows:

- To conceptualise job demands, job resources, burnout and engagement from the literature.
- To determine the relationship between job demands, job resources, burnout and engagement according to literature.
- To determine whether job demands foster the experience of burnout and job resources engagement.
- To make recommendations for future research.

1.3 RESEARCH METHOD

The research method consists of a literature review and an empirical study. The results obtained from the research are presented in the form of a research article.

1.3.1 Literature review

The literature review focuses on previous research on job demands, job resources, burnout and engagement. An overview is given of the conceptualization of these constructs in the literature, and on the findings in terms of job demands, job resources, burnout and engagement.

1.3.2 Research design

A survey design is used to attain the research objectives. The specific design is the cross-sectional design that draws a sample from a population at one point in time (Neuman, 2000;

Shaughnessy & Zechmeister, 1997) to describe the population at that time. This design is useful to assess interrelationships between the variables within the population and is ideally suited to the descriptive and predictive purpose of correlational research (Shaughnessy & Zechmeister, 1997).

1.3.3 Participants

The participants could be described as an availability sample of employees in the mining industry in South Africa ($N=199$). The sample consisted mainly of Male (93,5%) African (Black) participants (71,4%). They were mostly within the age group of 41 to 50 (28%) with a mean education of grade 12 (43,2%). The average number of years on the current shift system was 8 years (48,7%). The participants were mainly employed in Plant Operations (79,8%) and Plant Maintenance) (13,1%).

1.3.4 Measuring battery

Three questionnaires are administered in this study, namely the Oldenburg *Burnout Inventory* (OLBI) (Demerouti et al, 2003.), the *Job Demands-Resources Scale*, and 10 items from the *Utrecht Work Engagement Scale* (UWES) (Schaufeli, Salanova, et al., 2002).

The Oldenburg Burnout Inventory (OLBI) (Demerouti et al., 2003) was used as a measure of burnout. The OLBI includes both core dimensions of burnout, known as exhaustion and disengagement (cynicism/depersonalisation). The OLBI consists of 16 items, which are measured on a four-point Likert-type scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). Eight items are phrased positively, for example “I always find new and interesting aspects in my work” and the remaining eight are phrased negatively, for example, “There are days when I feel tired before I arrive at work”. The exhaustion subscale comprises 8 items measuring affective, physical and cognitive aspects of burnout. The disengagement subscale comprises 8 items, measuring affective, physical and cognitive aspects of burnout. The disengagement subscale comprises 8 items that relate to distancing oneself from one’s work. An example of an item from the exhaustion scale would be, “During my work, I often feel emotionally drained”, whereas an example of an item from the disengagement scale would be, “I find my work to be a positive challenge”. In a study conducted by Demerouti et al. (2002), investigating the convergent validity of the MBI and OLBI by means of multitrait-

multimethod analyses, it was found that the latent variables representing both instruments are highly correlated and that all exhaustion and distancing/disengagement items of both instruments load on a single factor. Demerouti et al. (2002) obtained Cronbach alpha coefficients of 0,85 (exhaustion) and 0,84 (disengagement) respectively.

The Job Demands-Resources Scale (JDRS) was developed by Jackson and Rothmann (2005) to measure job demands and job resources. The JDRS consists of 40 items about pace and amount of work, mental load, variety in work, opportunities to learn, independence in work, relationships with colleagues, relationship with immediate supervisor, ambiguities about work, information, communications, participation, contact possibilities, uncertainty about the future, remuneration, and career possibilities. The items were rated on a four-point scale ranging from 1 (*never*) to 4 (*always*). Jackson and Rothmann (2005) found that seven factors of the JDRS were reliable according to their alpha coefficients. These were organisational support: 0,88; growth opportunities: 0,80; overload: 0,75; job insecurity: 0,90; relationship with superiors: 0,76; control: 0,71; and rewards: 0,78. Rothmann, Mostert and Strydom (2006) also found reliable alpha coefficients for the JDRS that varied between 0,76 to 0,92 in a South African sample.

The Utrecht Work Engagement Scale (UWES) (Schaufeli et al., 2002) was used to measure work engagement. This 17-item questionnaire is arranged along a seven-point frequency scale ranging from 0 (*never*) to 6 (*daily*). The UWES has three scales, namely vigour (6 items), dedication (5 items), and absorption (6 items). Examples of items relating to the three dimensions are the following “I am bursting with energy in my work” (vigour); “I find my work full of meaning and purpose” (dedication); and “When I am working, I forget everything around me” (absorption). High levels of vigour, dedication and engagement point to an individual who experiences a high level of work engagement. Regarding internal consistency, Cronbach coefficients have been determined between 0,68 and 0,91 (Schaufeli et al., 2002). Storm (2002) obtained alpha coefficients of 0,78 (vigour), 0,89 (dedication), and 0,78 (absorption) for the UWES in a South African sample.

1.3.5 Statistical analysis

The statistical analysis will be carried out with the help of the SPSS-program (SPSS, 2000). Canonical correlation will be used to determine the relationship between the dimensions of

coping, stress and burnout. Cronbach alpha coefficients, exploratory and confirmatory factor analysis will be utilized to assess the reliability and validity of the measuring instruments (Clark & Watson, 1995).

Descriptive statistics (e.g. means, standard deviations, range, skewness and kurtosis) and inferential statistics are used to analyse the data. Pearson correlation coefficients are computed to determine the relationship between variables. In the case where the distribution of scores is skew, Spearman correlation coefficients will be computed. A cut-off point of $p \leq 0,05$ will be set for the statistical significance of the results. Effect sizes (Cohen, 1988) are used to decide on the practical significance of the findings. A cut-off point of 0,30 (medium effect) is set for the practical significance of correlation coefficients (Cohen, 1998).

1.3.6 Research procedure

The identified participants will be prepared for the research by informing them about the proposed research, and the ethical aspects thereof will be discussed. They will be assured of absolute anonymity.

1.4 CHAPTER DIVISION

Chapter: 1 Introduction, Problem Statement and Objectives

Chapter: 2 Research Article

Chapter: 3 Conclusions, Limitations and Recommendations

1.5 CHAPTER SUMMARY

Chapter 1 focused on the problem statement, objectives and research method in this study.

Chapter 2 focuses on the research article.

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CHAPTER 2

RESEAR CH ARTICLE

JOB DEMANDS, JOB RESOURCES, BURNOUT AND ENGAGEMENT OF EMPLOYEES IN THE MINING INDUSTRY IN SOUTH AFRICA

ABSTRACT

The objective of this study was to determine the relationship between job demands, job resources, burnout and engagement of employees in the mining industry in South Africa. A cross-sectional survey design with an availability sample ($N=199$) was used. The Oldenburg Burnout Inventory, Utrecht Work Engagement Scale and the Job Demands-Resources Scale were administered. Multiple regression analysis showed that the best predictors of engagement were job resources, organisational support, growth opportunities and work-life balance. The best predictors for disengagement were lack of resources, growth opportunities, social support and demands of overload and a lack of work-life balance. The predictors of burnout were demands, overload and a lack of advancement opportunities

OPSOMMING

Die doel van hierdie studie was om die verband tussen werkseise, werkshulpbronne, uitbranding en begeestering van werknemers in die mynindustrie in Suid-Afrika te bepaal. 'n Dwarsdeursnee-onderzoekontwerp met 'n beskikbaarheidsteekproef ($N=199$) is gebruik. Die Oldenburg uitbrandingsvraelys, Utrecht Werksbegeesteringskaal, en die Werkseise-hulpbroneskaal is afgeneem. Meervoudige regressie-analise het getoon dat werkshulpbronne, organisasie-ondersteuning, groeigeleenthede en werk-lewe balans die beste voorspellers van begeestering was. Die beste voorspellers van 'n gebrek aan begeestering was 'n tekort aan hulpbronne, groeigeleenthede, sosiale ondersteuning en eise van oorlading en 'n gebrek aan werk-lewe balans. Die voorspellers van uitbranding was eise, oorlading en 'n tekort aan bevorderingsgeleenthede.

Mining forms a large part of South Africa's economy. Global mining firms make an important contribution to employment opportunities, the gross domestic product and export earnings in the South African economy. In 2003 alone, this industry contributed R78,5 billion or 7,1 % to the country's gross domestic product and an additional 8,0 % through associated multiplier effects. In addition, the mining industry contributed 39,7% of the country's export earnings during 2003 (Van Zyl, Human, & Tshabalala, 2004).

Globally the mining industry is faced with a shortage of qualified talent to meet its production needs. Every year there are more people leaving than entering the mining industry to pursue job and career opportunities. Some of the key reasons for this trend include the general image of the industry, declining numbers of graduates from mining related programs and the drain for talent and knowledge as a result of mining industry turn-over and retirement (Van der Veen & Strongman, 2003). The shortage of skilled workers in combination with high turn-over rates are among the top factors impacting industry growth; either by stopping or delaying projects that would otherwise proceed, or by significantly adding to the cost of new projects. The mining industry like other industries in South Africa is starting to comply with government set BEE requirements and targets with which they have to comply to. The mining industry has to focus a lot of their human resources functioning on safety & health, training and development programs, team building initiatives, and the recruitment & retention of affirmative action candidates in order to retain their valued staff. The mining industry also has to achieve production targets while at the same time assure that their employees are safe.

Employees have to have the necessary support from management in order for them to be productive. Most employees need to feel that they have the opportunity for growth and development within their respective positions. Team environments are built by accepting employees as equals, rewarding positive attitudes, communication and commitment and providing opportunities for team success.

Shift work forms a large part of the mining industry worldwide, and companies implement shift work where production requires 24-hour operations in order to be cost-effective. Tiredness and sleeping problems are closely related to depression and burnout. Landsbergis (1988) found that employees involved with weekend work reported significantly higher emotional exhaustion, job stress and psychosomatic health problems than employees not involved with weekend work. Similarly, employees on non-standard work shifts reported

significantly higher overall burnout, emotional exhaustion, job stress and health problems than employees on a fixed day shift.

People have very different abilities to deal with stress. What may be stressful or very upsetting to one person may not be stressful to another. Stress is the body's natural reaction where there is an imbalance between the demands of the environment and the ability of the worker to respond to those demands (Bendak, 2003). Burnout is a severe reaction to job stress. Burnout leads to a sense of emptiness and loss of feelings, additional to other symptoms of stress. According to Spielberger and Vagg (1999), a comprehensive assessment of job stress requires an evaluation of the specific aspects of one's job, which produce job strain, which supports the fact that different working environments and industries may make different job demands on individuals. Job demands refer to those aspects of the job that require sustained physical or mental effort, and are therefore associated with certain physiological and psychological costs (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001).

Work might impact on the well-being of employees which may differ within various working environments, depending on the unique demands and resources that exist in the specific work context. To test the relationship between job characteristics and burnout, Demerouti et al. (2001) developed the Job Demands-Resources (JD-R) model of burnout. A central proposition of the JD-R model is that, although every occupation may have its own specific job characteristics, it is still possible to model these characteristics in two broad categories, job demands and job resources. The model further state that job demands and job resources evoke two different processes: job demands drain the employee's energy resources, thus leading to burnout and health impairment, whereas the availability of job resources stimulates employee motivation in the form of work engagement and positive work outcomes such as organisational commitment (Schaufeli & Bakker, 2004). Rothmann, Mostert, and Strydom (2006) saw the need for research regarding the job demands and resources as experienced by employees in different organisations in South Africa. For this aim Jackson and Rothmann (2005) developed a questionnaire to measure job demands and resources, namely the Job Demands-Resources Scale (JDRS).

During the past three decades, many studies have shown that job characteristics can have a profound impact on employee well being such as job strain, burnout and work engagement (Bakker & Demerouti, 2006). Cordes and Dougherty (1993) have grouped the many causes

of burnout into three general categories: job and role characteristics, organisational characteristics and personal characteristics. Role conflict occurs when an employee receives conflicting demands from individuals within the organisation. Organisations which foster high levels of role conflict are unpleasant for employees and more difficult thus leading to higher levels of burnout. Role overload occurs when the organisation gives the employee too many tasks to complete in not enough time. Organisations unintentionally create this overload because of the need for increased productivity; however, it is taxing on both the individual's time and energy supply (Maslach & Leiter, 1997). Personal expectations can also impact an individual's propensity towards burnout. A discrepancy can exist between the perceptions of an individual toward his/her organisation and the realities of that organisation, also experiencing a mismatch between what an employee thought they were capable of accomplishing in their position, and what they can actually accomplish. Individuals who experience job insecurity experience less work engagement and more exhaustion and disengagement at work (Bosman, Rothmann, & Buitendach, 2005).

In line with the increased focus of psychology on human strengths and optimal functioning, work engagement, although related to burnout, is viewed as the theoretical antithesis of burnout. Rothmann and Storm (2003) conducted a large cross-sectional study among 1,910 South African police officers, and found that engaged police-officers use an active coping style. They are problem-focused, taking active steps to attempt to remove or rearrange stressors. Engaged employees often experience positive emotions, including happiness, joy, and enthusiasm; experience better health; create their own job and personal resources; and transfer their engagement to others (Demerouti & Bakker, 2008). A poll of almost 90,000 workers worldwide by workplace consultancy Towers Perrin found that many employees did not believe their organisation or senior management were doing enough to keep them engaged. A fifth said they felt engaged at work, with more than a third admitting to feeling partly or fully disengaged. The study further showed that the companies with the highest levels of employee engagement achieved the best financial results and were more successful in retaining their most valued employees than those with lower levels.

Several studies have shown a positive relationship between job resources and work engagement. In the context of the JD-R model, job resources by definition act as buffers of job demands on burnout (Demerouti et al., 2001). Previous studies have consistently shown that job resources such as social support from colleagues and supervisors, performance

feedback, skill variety, autonomy, and learning opportunities are positively associated with work engagement (Bakker & Demerouti, 2007).

Based on the above, the problem can be summed up as follow: The mining industry's production workers are being put under severe physical and sometimes emotional strain because of long working hours, physical strain and chasing of production targets. If an organisation doesn't have the necessary resources in place to support their employees, the demands of the job may overwhelm them and lead to burnout and disengagement of employees.

Burnout and engagement

A consistent theme throughout the burnout literature is the problematic relationship between the person and the work environment, which is often described in terms of imbalance or misfit. The burnout-engagement continuum recognises the variety of reactions that employees may have to the organisational environment, ranging from intense involvement and satisfaction of engagement, to indifference, and finally to the exhausted, distant, and discouraged state of burnout (Maslach, 2000). Traditionally, burnout was seen as occurring solely within the "helping" professions however, it is now seen as a widespread issue. Burnout and engagement are influenced by various organisational and personal factors. The demands of the job may exceed the capacity of the individual to cope effectively, or the person's efforts may not be met with equitable rewards. Chronically difficult job demands, an imbalance between high demands and low resources, and the presence of conflict (whether between people, between role demands, or between important values) are consistently found in situations in which employees experience burnout. According to Spielberger and Vagg (1999), a comprehensive assessment of job stress requires an evaluation of the specific aspects of one's job, which produce job strain. This supports the fact that different working environments and industries may make different job demands on individuals. Job demands refer to those aspects of the job that require sustained physical or mental effort, and are therefore associated with certain physiological and psychological costs (Demerouti et al., 2001).

According to Lazarus and Folkman (1984), burnout should be distinguished from concepts such as stress and depression. The term stress refers to the temporary adaptation process that

is accompanied by mental and physical symptoms, and is caused by an imbalance between job demands and the response capability of the worker. In contrast, burnout can be considered as the final stage in a breakdown in adaptation that results from the long-term imbalance of demands and resources, and is accompanied by chronic malfunctioning at work. Burnout can thus be considered as a particular kind of prolonged job stress or the consequence of chronic, ongoing stress (Lazarus & Folkman, 1984). Schaufeli and Enzmann (1998) defined burnout as a persistent, negative, work-related state of mind in 'normal' individuals that is primarily characterized by exhaustion, distress, reduced effectiveness, decreased motivation, and the development of dysfunctional attitudes and behaviours at work.

Quantitative job demands (e.g. too much work for the available time) have been studied by many burnout researchers, and the findings support the general notion that burnout is a response to overload. Experienced workload and time pressure are strongly and consistently related to burnout, particularly the exhaustion dimension (Maslach, Schaufeli, & Leiter, 2001). The exhaustion component represents the basic individual stress dimensions of burnout. For the purpose of this research an alternative measure of burnout, the Oldenburg Burnout Inventory is used (OLBI; Demerouti, 1999). The OLBI includes two dimensions: exhaustion and disengagement from work. Exhaustion is defined as a consequence of intensive physical, affective, and cognitive strain, for example as a long-term consequence of prolonged exposure to certain demands. The OLBI covers not only affective but also physical and cognitive aspects of exhaustion. This makes it more applicable to those workers who perform physical work, like mine workers. Disengagement in OLBI refers to distancing oneself from one's work, work content, or one's work in general. The disengagement scale also refers to attitudes toward the work task as well as to a devaluation and mechanical execution of work. Furthermore, the disengagement items concern the relationship between the employee and his or her job, especially regarding engagement and identification.

Individuals who are highly engaged in their jobs identify personally with the job and are motivated by the work itself. Schaufeli and Bakker (2004) define work engagement as "a positive, fulfilling work-related state of mind that is characterised by vigour, dedication and absorption". The OLBI scales each include both negatively and positively worded items. That is, both exhaustion and disengagement are measured via sets of items that require both affirmative and negating responses.

Schaufeli and Bakker (2001) introduced the construct of Work Engagement as the opposite pole of burnout, and the Utrecht Work Engagement Scale (UWES) (Schaufeli, Salanova, González-Romá, & Bakker, 2002) was developed for the purpose of measuring work engagement. Work engagement may be described as a positive, fulfilling work related state that is characterised by vigour, dedication, and absorption (Schaufeli et al., 2002). *Vigour* is characterised by high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties (Schaufeli & Bakker, 2004). *Dedication* refers to being strongly involved in one's work and experiencing a sense of significance, enthusiasm, inspiration, pride and challenge (Schaufeli & Bakker, 2004). *Absorption* is characterised by fully concentrating on and being happily engrossed in one's work, whereby time passes quickly and one finds it difficult to detach oneself from work (Schaufeli & Bakker, 2004).

Burnout researchers define engagement as the opposite or positive antithesis of burnout (Maslach et al., 2001). According to Maslach et al. (2001), engagement is characterised by energy, involvement, and efficacy, the direct opposite of the three burnout dimensions of exhaustion, cynicism and inefficacy. Research on burnout and engagement has found that the core dimensions of burnout (exhaustion and cynicism) and engagement (vigor and dedication) are opposites of each other. Pech and Slade (2006) define lengthy episodes of distraction, rapid task saturation, a slow tempo of activity, poor decision making, too many days away from work, and lack of interest in work as symptoms displayed by individuals who do not engage in the organisational context.

Job demands and job resources

Many studies have shown that job characteristics can have a profound impact on employee well being. Several models in the occupational health literature comes from the assumption that job strain is the result of a disturbance of the equilibrium between the demands employees are exposed to and the resources they have at their disposal. The Conservation of Resources (COR) theory by Hobfoll (1988,1989) is a theory of stress based on the central tenet that people strive to obtain, build, and protect that which they value (e.g. resources), and psychological stress occurs when these resources are lost, threatened with loss, or if individuals fail to replenish resources after significant investment (Mcpadden, 2006). According to Hobfoll and Freedy (1993), job demands threaten one's resources, and over

time, prolonged exposure to such demands will result in strain in the form of emotional exhaustion, a core dimension of burnout. The COR theory also states that job resources may potentially be motivating in their own right through the creation, maintenance and accumulation of resources (Hobfoll, 1989). Stress is produced when resources are threatened, or lost, and when individuals invest resources and do not reap the anticipated level of benefits. Generally speaking, two sets of variables can be distinguished in any kind of job: job demands and job resources.

To test the relationship between job characteristics and burnout, Demerouti et al. (2001) developed the Job Demands-Resources (JD-R) model of burnout. A central proposition of the JD-R model is that, although every occupation may have its own specific job characteristics, it is still possible to model these characteristics in two broad categories, job demands and job resources. The model further state that job demands and job resources each evoke two different processes: job demands drain the employee's energy resources, thus leading to burnout and health impairment, whereas the availability of job resources stimulates employee motivation in the form of work engagement and positive work outcomes such as organisational commitment (Schaufeli & Bakker, 2004). That is, work environments that are characterized by many resources foster the willingness to dedicate one's efforts and abilities to the work task, which in that case is likely to be accomplished successfully; which in turn leads to successful goal accomplishment and accompanied by work engagement (Lorens et al., 2007).

Job demands refer to those physical, psychological, social and organisational aspects of the job that require sustained physical and/or psychological costs (Schaufeli & Bakker, 2004). Examples are a high work pressure, role overload, heat, time pressure, emotional demands, and poor environmental conditions. Although job demands are not necessarily negative, they may turn into job stressors when meeting those demands requires high effort and is therefore associated with high costs that elicit negative responses such as depression, anxiety or burnout.

Job resources refer to those physical, psychological, social or organisational aspects of the job that (1) are functional in achieving work goals; (2) reduce job demands and the associated physiological and psychological costs; or (3) stimulate personal growth and development. According to Schaufeli and Bakker (2004), job resources may play either a task motivational

role (by fostering the employee's growth, learning and development); or they may play an extrinsic motivational role (by being instrumental in achieving work goals). A second assumption in the JD-R model is that job characteristics may evoke two different processes. First, high job demands may exhaust employees' mental and physical resources and may therefore lead to burnout and health problems. Second, poor or missing job resources preclude actual goal accomplishment, which is likely to cause failure and frustration.

Schaufeli and Bakker (2004) divide the JD-R model in two processes: (1) an energetic process of overtaxing and wearing out in which high job demands exhaust the employee's energy backup; (2) and a motivational process in which lacking resources preclude dealing effectively with high job demands and foster mental withdrawal or disengagement. The energetic process links job demands with health problems via burnout. When confronted with high job demands which required sustained effort, employees either adopt performance protection strategies which are associated with extra costs, or they accept a reduction in overt performance with no increase in costs.

In sum, the JD-R model proposes that the development of burnout follows two processes. In the first process, demanding aspects of work (i.e., extreme job demands) lead to constant overtaxing and in the end, to exhaustion. In the second process, a lack of resources complicates the meeting of job demands, which further leads to withdrawal behaviour. The long-term consequence of this withdrawal is disengagement from work. Theoretically, one may argue that the interaction between job demands and job resources is most important for the development of burnout that is, of exhaustion and disengagement.

Work might impact on the well-being of employees which may differ within various working environments, depending on the unique demands and resources that exist in the specific work context. Rothmann et al. (2006) saw the need for research regarding the job demands and resources as experienced by employees in different organisations in South Africa. For this aim Jackson and Rothmann (2005) developed a questionnaire to measure job demands and resources, namely the Job Demands-Resources Scale (JD-RS). Rothmann et al. (2006) tested the construct validity, construct equivalence and reliability of the JD-RS in different organisations in South Africa. The results showed that the JD-RS is valid, reliable and equivalent for different organisations. Statistically significant differences were found between

the perceptions of job demands and resources in different organisations. For the purpose of this study, the JDRS scale was used.

Based on the above discussion, the following hypotheses are formulated:

H1: There are practical and statistical significant relationships between job demands, job resources, burnout and engagement of employees in the mining industry.

H2: Job demands are significant predictors of burnout.

H3: Job resources are significant predictors of engagement.

METHOD

Research design

A survey design was used to attain the research objectives. The specific design is the cross-sectional design that draws a sample from a population at one point in time (Neuman, 2000; Shaughnessy & Zechmeister, 1997) to describe the population at that time. This design is useful to assess interrelationships between the variables within the population and is ideally suited to the descriptive and predictive purpose of correlational research (Shaughnessy & Zechmeister, 1997).

Participants

The participants could be described as an availability sample of employees in the mining industry in South Africa ($N=199$). The sample consisted mainly of Male (93,5%) African (Black) participants (71,4%). They were mostly within the age group of 41 to 50 (28%) with a mean education of grade 12 (43,2%). The average number of years on the current shift system was 8 years (48,7%). The participants were mainly employed in Plant Operations (79,8%) and Plant Maintenance) (13,1%).

Table 1

Characteristics of the Participants

Item	Category	Percentage
Gender	Male	93,5
	Female	6,5
Age	20-25	15,5
	26-30	13,0
	31-35	23,0
	36-40	12,5
	41-50	28,0
	>51	7,5
Race	White	21,1
	Colored	7,5
	African	71,4
Occupation	Operator Grade 2	61,8
	Shift Foreman	9,0
	Artisans	8,5
	Process Controller	8,0
	Operator Grade 1	6,5
	Operations Controller	2,0
	Maintenance Operator	2,5
	Laboratory assistant	2,0
	Learner Foreman	0,5
Years on shift	1-2 years	22,6
	3-4 years	6,5
	5-6 years	12,0
	7-8 years	58,8
Work section	Section B Plant Operations	28,6
	Section A1 Plant Operations	27,6
	Section A2 Plant Operations	19,6
	Plant Maintenance	13,1
	Plant Lab	5,5
	Section C Plant Operations	4,0
Level of education	Grade 12	43,2
	Less than Grade 10	25,6
	Grade 10	16,1
	Technical College	12,6
	Grade 11	1,5
	Technicon Diploma	1,0

Measuring battery

Three questionnaires were administered in this study, namely the Oldenburg *Burnout Inventory* (OLBI) (Demerouti et al. 2001), the *Job Demands-Resources Scale*, and 10 items from the *Utrecht Work Engagement Scale* (UWES) (Schaufeli, Salanova, et al., 2002).

The Oldenburg Burnout Inventory (OLBI) (Demerouti, 1999; Demerouti & Nachreiner, 1996) was used to measure burnout of participants. The OLBI measures burnout on two dimensions: exhaustion and disengagement. The seven items of the exhaustion subscale refer to general feelings of emptiness, overtaxing from work, a strong need for rest, and a state of physical exhaustion. Three items are positively worded and four, negatively. Disengagement refers to distancing oneself from the object and the content of one's work and to negative, cynical attitudes and behaviours toward one's work in general. This subscale comprises eight items. Three items are positively worded and five negatively. Cronbach's alphas of the exhaustion and disengagement scales were 0,82 and 0,83 respectively. The correlation between both subscales was 0,39.

The Job Demands-Resources Scale (JDERS) was used to evaluate the specific working conditions. The JDERS consists of 40 items about pace and amount of work, mental load, variety in work, opportunities to learn, independence in work, relationships with colleagues, relationship with immediate supervisor, ambiguities about work, information, communications, participation, contact possibilities, uncertainty about the future, remuneration, and career possibilities. The items were rated on a four-point scale ranging from 1 (*never*) to 4 (*always*). Jackson and Rothmann (2005) found that seven factors of the JDERS were reliable according to their alpha coefficients. These were organisational support: 0,88; growth opportunities: 0,80; overload: 0,75; job insecurity: 0,90; relationship with superiors: 0,76; control: 0,71; and rewards: 0,78. Rothmann, Mostert, and Strydom (2006) also found reliable alpha coefficients for the JDERS that varied between 0,76 to 0,92 in a South African sample.

The Utrecht Work Engagement Scale (UWES) (Schaufeli et al., 2002) was used to measure work engagement. The UWES has three scales, namely vigour (6 items), dedication (5 items), and absorption (6 items). Examples of items relating to the three dimensions are the following "I am bursting with energy in my work" (vigour); "I find my work full of meaning and purpose" (dedication) and "When I am working, I forget everything around me" (absorption). High levels of vigour, dedication and engagement point to an individual who experiences a high level of work engagement. Regarding internal consistency, Cronbach coefficients have been determined between 0,68 and 0,91 (Schaufeli et al., 2002). Storm (2002) obtained alpha coefficients of 0,78 (vigour), 0,89 (dedication), and 0,78 (absorption) for the UWES in a South African sample.

Statistical analysis

The statistical analysis was carried out with the help of the SPSS-program (SPSS, 2000). Cronbach alpha coefficients and exploratory and confirmatory factor analysis was utilized to assess the reliability and validity of the measuring instruments (Clark & Watson, 1995).

Descriptive statistics (e.g. means, standard deviations, skewness and kurtosis) and inferential statistics are used to analyse the data. Pearson correlation coefficients are computed to determine the relationship between variables. A cut-off point of $p \leq 0,05$ was set for the statistical significance of the results. Effect sizes (Cohen, 1988) are used to decide on the practical significance of the findings. A cut-off point of 0,30 (medium effect) is set for the practical significance of correlation coefficients (Cohen, 1998). Multiple regression analyses was used to investigate whether job demands and job resources predict work engagement and to determine the relationship that exists between job demands, job resources and work engagement.

RESULTS

Factor analyses

A simple principle component analysis was conducted on the 77 items of the JDRS on the sample of employees in the mining industry. Analysis of the eigenvalues (larger than 1) and the scree plot indicated that six factors could be extracted, explaining 61,13 % of the total variance. Principle factor analysis followed, using a varimax rotation to determine the factor structure of the JDRS.

The results of the factor analysis on the JDRS are shown in Table 2. Loading of variables on factors are shown. Labels for each factor are suggested in a footnote.

Table 2

Factor Loadings for Principal Factor Extraction and Varimax Rotation on JDRS Items

Item	F1	F2	F3	F4	F5	F6
Does your direct supervisor inform you about how well you are doing in your work?	0,71	0,03	0,07	0,11	0,20	0,07
Do you know exactly what your direct supervisor thinks of your performance?	0,70	0,14	0,07	0,03	0,10	0,07
Do you receive sufficient information on the results of your work?	0,69	0,00	0,13	0,06	0,21	0,00
In your work, do you feel appreciated by your supervisor?	0,62	0,09	0,11	0,02	0,06	0,01
Can you count on your supervisor when you come across difficulties in your work?	0,58	0,15	0,05	0,06	0,07	0,04
Are you kept adequately up-to-date about important issues within your department/organisation?	0,58	0,08	0,23	0,16	0,18	0,04
Do you get on well with your supervisor?	0,56	0,15	0,03	0,21	0,03	0,04
Do you receive sufficient information on the purpose of your work?	0,55	0,08	0,22	0,07	0,04	0,08
Can you participate in decisions about the nature of your work?	0,47	0,00	0,39	0,83	0,23	0,02
Is the decision-making process of your department/organisation clear to you?	0,44	0,15	0,21	0,16	0,30	0,00
Can you discuss work problems with your direct supervisor?	0,43	0,05	0,28	0,09	0,03	0,11
Do you have a direct influence on your department/organisation's decisions?	0,40	0,13	0,37	0,02	0,20	0,03
In your work, do you feel appreciated by your supervisor?	0,39	0,03	0,32	0,80	0,09	0,02
Do you know exactly what other people expect of you in your work?	0,34	0,07	0,27	0,09	0,02	0,11
Do you have to move or shift large, heavy objects?	0,46	0,62	0,06	0,13	0,02	0,12
Do you have to work extra hard in order to complete something?	0,07	0,58	0,19	0,07	0,01	0,00
Do you work under time pressure?	0,02	0,58	0,00	0,00	0,00	0,00
Do you have to bend forward when you work?	0,00	0,58	0,06	0,15	0,05	0,09
Do you have too much work to do?	0,30	0,58	0,00	0,01	0,61	0,25
Do you have to kneel when you work?	0,10	0,54	0,23	0,15	0,00	0,03
Does your work require that you reach high(to catch something or to do something)?	0,05	0,53	0,08	0,03	0,06	0,10
Do you have to carry out your work in an unusual posture?	0,16	0,49	0,15	0,09	0,05	0,13
Do you have to be attentive to many things at the same time?	0,11	0,43	0,45	0,01	0,00	0,08
Do you have to carry out your work standing?	0,08	0,39	0,02	0,13	0,00	0,02
Do you have contact with difficult people in your work?	0,09	0,38	0,21	0,00	0,00	0,27
Does your work put you in emotionally upsetting situations?	0,13	0,35	0,04	0,03	0,01	0,34
Does your work give you the feeling that you can achieve something?	0,23	0,23	0,55	0,09	0,20	0,11
Does your job offer you opportunities for personal growth and development?	0,21	0,20	0,55	0,14	0,15	0,11
Does your work require creativity?	0,03	0,22	0,53	0,05	0,12	0,08
Do you have influence in the planning of your work activities?	0,16	0,15	0,48	0,09	0,02	0,04
Do you have freedom in carrying out your work activities?	0,32	0,07	0,43	0,06	0,07	0,18
Do you have freedom in carrying out your work activities?	0,32	0,07	0,43	0,06	0,07	0,18
Do you know exactly what you are responsible for and which areas are not your responsibilities?	0,20	0,05	0,40	0,24	0,06	0,07
Can you participate in the decision about when a piece of work must be completed?	0,28	0,06	0,40	0,09	0,07	0,08
Do you have to give continuous attention to your work?	0,10	0,09	0,40	0,21	0,06	0,01
Do you have to remember many things in your work?	0,05	0,15	0,39	0,02	0,06	0,02
Do you have enough variety in your work?	0,26	0,05	0,39	0,05	0,11	0,14
Does your work make sufficient demands on all your skills and capacities?	0,16	0,10	0,38	0,86	0,17	0,40
Does your job offer you the possibility of independent thought and action?	0,33	0,08	0,38	0,13	0,15	0,03
Do your family duties prevent you from doing a better job at work?	0,02	0,00	0,05	0,75	0,09	0,04
Does your work suffer because you need to take care of your family?	0,01	0,10	0,00	0,74	0,05	0,07
Does your work keep you from doing your best for your family?	0,00	0,14	0,09	0,62	0,00	0,20

Table 2 (continued)

Factor Loadings for Principal Factor Extraction and Varimax Rotation on JDRS Items

Do your family duties prevent you from spending more time at work?	0,00	0,00	0,00	0,59	0,00	0,00
Does your job keep you from spending as much time with your family as you would like?	0,04	0,07	0,10	0,62	0,03	0,04
Does your family suffer because of your work?	0,08	0,26	0,27	0,46	0,01	0,33
Can you live comfortably on your pay?	0,09	0,00	0,02	0,06	0,81	0,01
Do you think you are paid enough for the work that you do?	0,09	0,06	0,02	0,08	0,79	0,00
Do you think that your organisation pays good salaries?	0,16	0,01	0,02	0,00	0,70	0,00
Does your job offer you the possibility to progress financially?	0,17	0,05	0,05	0,14	0,64	0,11
Does your job give you the opportunity to be promoted?	0,11	0,07	0,21	0,05	0,43	0,00
Does your organisation give you opportunities to follow training courses?	0,27	0,10	0,14	0,13	0,41	0,12
Do employees from different racial/ethnic groups discriminate against each other at work?	0,06	0,13	0,01	0,03	0,00	0,79
Do employees from different racial/ethnic groups misunderstand each other at work?	0,05	0,13	0,01	0,04	0,04	0,70
Do you miss out on important family events because of your work?	0,10	0,20	0,06	0,22	0,11	0,59
Do employees from different racial/ethnic groups show prejudice towards each other at work?	0,10	0,13	0,01	0,05	0,06	0,55
Do employees in your organisation socialise with others across racial/ethnic lines at work/ If necessary, can you ask your colleagues for help/	0,12	0,09	0,02	0,06	0,12	0,35
	0,12	0,06	0,23	0,09	0,02	0,05

Factor labels: F1: Organisational Support, F2: Overload, F3: Growth, F4: Work-Life Balance, F5: Advancement, F6: Diversity

The six factors that were extracted accounted for 61,13% of the total variance in the data. With a cut-off of 0,35 for inclusion of a variable in interpretation of a factor, 8 of the 67 items did not load on the six factors. Items 14, 46 and 68 did not load on any of the factors and were removed from the questionnaire. Items 44, 25, 67, 43 and 45 could not be grouped into a meaningful factor and were removed from the questionnaire.

The first factor was labelled *Organisational Support*. Items loading on this factor relate to managerial support, communication, role clarity, and the extent of work autonomy. The second factor was labelled *Overload*. Items loading on this factor relate to the physical aspects of work, physical execution of tasks, physical strain as well as dealing with difficult people in day-to-day work activities. The third factor was labelled *Growth*. Items loading on this factor relate to variety in the work, opportunities for personal growth and development, and feelings of achievement and influence and decision making processes. The fourth factor was labelled *Work-Life Balance*. Items loading on this factor relate to the balance between work and family life. The fifth factor was labelled *Advancement*. Items loading on this factor relate to growth and development, promotion and financial progress. The sixth factor was

labelled *Diversity*. Items loading on this factor relate to the socialization between racial/ethnic lines, discrimination, and whether one does benefit from racial/ethnic diversity.

A simple principle component analysis was conducted on the 17 items of the UWES on the sample of employees in the mining industry. Analysis of the eigenvalues (larger than 1) and the scree plot indicated that one factor could be extracted, explaining 61,13 % of the total variance.

The results of the factor analysis on the UWES are shown in Table 3. Loading of variables on the factor are shown. The label for the factor is suggested in a footnote.

Table 3
Component loadings of the UWES

Items	Component
When I get up in the morning, I feel like going to work	0,84
I feel happy when I am engrossed in my work.	0,84
My job inspires me.	0,83
I feel strong and vigorous in my job.	0,82
I am proud of the work that I do.	0,82
To me, my work is challenging.	0,81
I am immersed in my work.	0,81
I am very resilient, mentally, in my job.	0,80
I get carried away by my work.	0,80
I am enthusiastic about my work.	0,79
I find my work full of meaning and purpose.	0,77
In my job, I can continue working for very long periods at a time.	0,76
Time flies when I'm working	0,74
I always persevere at work, even when things do not go well.	0,74
When I am working, I forget everything else around me.	0,70
It is difficult to detach myself from the job.	0,70
I am bursting with energy in my work.	0,61

Component: Engagement

The one component that were extracted accounted for 61,13% of the total variance in the data. With a cut-off of 0,35 for inclusion of a variable in interpretation of a factor, all 17 items loaded on the factor.

Items loading on the *Engagement factor* relates to Vigour (energy in work) and Dedication (meaning and purpose) in one's work.

A simple principle component analysis was conducted on the 16 items of the OLBI on the sample of employees in the mining industry. Analysis of the eigenvalues (larger than 1) and the scree plot indicated that two factors could be extracted, explaining 50,36% of the total variance. Principle factor analysis followed, using a direct oblimin rotation to determine the factor structure of the OLBI.

The results of the factor analysis on the OLBI are shown in Table 4. Loading of variables on the factors are shown. Labels for the factors are suggested in a footnote.

Table 4

Factor Loadings for Principal Factor Extraction and Direct Oblimin Rotation on OLBI items

Items	F1	F2
I feel more and more engaged in my work.	0,80	0,13
When I work, I usually feel energized.	0,71	0,04
Usually, I can manage the amount of my work well.	0,60	0,16
I find my work to be a positive challenge.	0,51	0,03
I always find new and interesting aspects in my work.	0,43	0,04
I can tolerate the pressure of my work very well.	0,38	0,01
After working, I have enough energy for my leisure activities.	0,31	0,21
This is the only type of work that I can imagine myself doing.	0,05	0,02
Sometimes I feel sickened by my work tasks.	0,09	0,59
Over time, one can become disconnected from this type of work.	0,06	0,52
After my work, I usually feel worn out and weary.	0,00	0,52
After work, I tend to need more time than in the past in order to relax and feel better.	0,02	0,43
It happens more and more often that I talk about my work in a negative way.	0,28	0,40
There are days when I feel tired before I arrive at work.	0,07	0,38
During my work, I often feel emotionally drained.	0,28	0,36
Lately, I tend to think less at work and do my job almost mechanically.	0,08	0,27

Loadings: F1: Disengagement, F2: Exhaustion

The two factors that were extracted accounted for 50,36% of the total variance in the data. With a cut-off of 0,35 for inclusion of a variable in interpretation of a factor, 2 of the 16 items did not load on any of the factors. Items 10 and 13 were removed from the questionnaire. The

first factor was labelled *Disengagement*. Items loading on this factor relate to distancing one from one's work. The second factor was labelled *Exhaustion*. Items' loading on this factor includes items on the affective, physical and cognitive aspects of burnout.

Table 5

Descriptive Statistics

	Mean	SD	Skewness	Kurtosis	α
Organisational support	49,83	10,53	0,35	0,40	0,89
Growth	43,86	7,56	0,33	0,32	0,80
Overload	40,42	8,35	0,21	0,04	0,82
Social Support	19,07	3,7	0,40	0,38	0,70
Work-Life balance	18,85	6,9	0,50	0,42	0,82
Advancement	15,44	5,5	0,47	0,32	0,75
Diversity	15,44	5,5	0,47	0,32	0,75
Engagement	68,19	17,75	0,57	0,20	0,96
OLBI-engagement	16,11	3,46	0,00	0,89	0,73
Burnout	17,22	3,38	0,30	0,46	0,68

Table 5 shows acceptable Cronbach alpha coefficients varying from 0,73 to 0,89 were obtained, except for Burnout (0,68). These alpha coefficients compare reasonably well with the guideline of 0,70 demonstrating that a large portion of the variance is explained by the dimensions (internal consistency of the dimensions) (Nunnally & Bernstein, 1994). It is evident from Table 5 that most of the scales of the measuring instruments have relatively normal distributions, with low skewness and kurtosis.

Table 6
Pearson Correlations between the Variables

	1	2	3	4	5	6	7	8	9
Organisational Support	-	-	-	-	-	-	-	-	-
Overload	0,00	-	-	-	-	-	-	-	-
Growth Opportunities	0,56 ⁺⁺⁺	0,01	-	-	-	-	-	-	-
Work Life Balance	-0,16 [*]	0,25 [*]	-0,07	-	-	-	-	-	-
Advancement	0,36 ⁺⁺	0,03	0,22 [*]	0,12	-	-	-	-	-
Diversity	-0,09	0,36 ⁺⁺	-0,04	0,29 [*]	0,05	-	-	-	-
Social Support	0,44 ⁺⁺	-0,05	0,39 ⁺⁺	-0,29 [*]	0,12	-0,09	-	-	-
Engagement	0,46 ⁺⁺	-0,17 [*]	0,40 ⁺⁺	-0,24 [*]	0,19 [*]	-0,21 [*]	0,23 [*]	-	-
Disengagement	-0,33 ⁺⁺	0,25 [*]	-0,34 ⁺⁺	0,37 ⁺⁺	-0,12	0,24 [*]	-0,30 ⁺⁺	-0,47 ⁺⁺	-
Burnout	0,29 [*]	-0,20 [*]	0,19 [*]	-0,19 [*]	0,26 [*]	-0,15 [*]	0,20 [*]	0,52 [*]	-0,28 [*]

*Correlation is statistically significant $p < 0,05$

**Correlation is statistically significant $p < 0,01$

+Correlation is practically significant $r > 0,30$ (medium effect)

++Correlation is practically significant $r > 0,50$ (large effect)

Table 6 shows that Organisational Support is practically significantly related to Growth Opportunities (large effect), Advancement (medium effect) and Social Support (medium effect). Organisational Support also correlates practically significantly negatively with Disengagement (medium effect) and statistically significantly negatively with Work Life Balance and Diversity.

Overload is practically significantly related to diversity (medium effect) and statistically negative to engagement, disengagement and burnout. Growth Opportunities is practically significantly related to Social Support (medium effect) and Engagement (medium effect) and practically significantly negatively related to Disengagement (medium effect). Work Life Balance is practically significantly related to Disengagement (medium effect) and statistically negatively related to Social Support, Engagement and Burnout. Social Support is practically significantly negatively related to Disengagement (medium effect) and statistically related to Engagement and Burnout. Engagement is practically significantly negatively related to Disengagement (medium effect) and practically significantly related to burnout (large effect).

The results of multiple regression analyses with Engagement (as measured by the UWES) as dependent variable, and job demands and job resources (as measured by the JD-R) as independent variables are reported in Table 7.

Table 7

Multiple Regression Analyses with Engagement as Dependent Variable and Job Demands and Job Resources as Independent Variables

Model	Unstandardised Coefficients		Standardised Coefficients	<i>t</i>	<i>P</i>	<i>F</i>	<i>R</i> ²	ΔR^2
	B	SE	Beta					
1						15,73*	0,25	0,25*
	(Constant)	17,21	7,60	2,264	0,25			
	Organisational Support	0,58	0,14	0,34	4,194	0,00*		
	Growth Opportunities	0,49	0,18	0,21	2,71	0,01*		
	Advancement	0,09	0,21	0,03	0,43	0,67		
	Social Support	-0,04	0,34	-0,01	-0,11	0,91		
2						11,96*	0,31	0,06*
	(Constant)	42,50	9,73	4,37	0,00			
	Organisational Support	0,53	0,14	0,31	3,93	0,00*		
	Growth Opportunities	0,52	0,18	0,22	3,00	0,00*		
	Advancement	0,21	8,21	0,07	1,01	0,31		
	Social Support	-0,28	0,34	-0,06	-0,83	0,41		
	Overload	-0,23	0,14	-0,11	-1,63	0,11		
	Work Life Balance	-0,35	0,17	-0,14	-2,00	0,05*		
	Diversity	-0,43	0,27	-0,10	-1,56	0,12		

* $p < 0,05$ – statistically significant

Table 7 shows that job demands and resources (as measured by the JDRS) predict 25% of the variance in engagement as measured by the UWES. Two variables made a statistically significant contribution to the regression model as revealed by the *t* values: Organisational Support ($t = 4,19, p = 0,00$) and Growth Opportunities ($t = 2,71, p = 0,01$). A statistically significant increase in the R^2 were obtained when Work Life Balance was entered into the regression analysis ($R^2 = 31\%$). It is clear that organisational support and growth opportunities were the strongest contributors to engagement. Employees in a mining organisation seem to be more engaged when they have support from the organisation and growth opportunities (variety in the job, opportunities to learn and autonomy).

The results of multiple regression analyses with Disengagement (as measured by the OLBI) as dependent variable, and job demands and job resources (as measured by the JD-R) as independent variables are reported in Table 8.

Table 8

Multiple Regression Analyses with Disengagement as Dependent Variable and Job Demands and Job Resources as Independent Variables

Model	Unstandardised Coefficients		Standardised Coefficients	<i>t</i>	<i>P</i>	<i>F</i>	<i>R</i> ²	ΔR^2
	B	SE	Beta					
1						9,49*	0,16	0,16*
	(Constant)	25,30	1,55	16,28	0,00			
	Organisational Support	0,05	0,28	-0,15	-1,82	0,06		
	Growth Opportunities	-0,08	0,37	-0,18	-2,31	0,02*		
	Advancement	-0,03	0,44	-0,00	-0,79	0,93		
	Social Support	-0,14	0,69	-0,15	-2,11	0,03*		
2						11,21*	0,29	0,13*
	(Constant)	18,19	1,91	9,51	0,00			
	Organisational Support	-0,03	0,27	-0,11	-1,39	0,16		
	Growth Opportunities	-0,09	0,34	-0,21	-2,82	0,00*		
	Advancement	-0,04	0,41	-0,06	-9,99	0,31		
	Social Support	-0,06	0,06	-0,07	-9,86	0,32		
	Overload	0,06	0,02	0,14	2,24	0,02*		
	Work Life Balance	0,13	0,03	0,26	3,84	0,00*		
	Diversity	0,06	0,05	0,08	1,24	0,21		

* $p < 0,05$ – statistically significant

Table 8 shows that job demands and resources (as measured by the JDRS) predict 16% of the variance in Disengagement as measured by the OLBI. Two variables made a statistically significant contribution to the regression model as revealed by the *t* values: Growth Opportunities ($\beta = -0,18$) and Social Support ($\beta = -0,15$). A statistically significant increase in the *R*² were obtained when Overload, Work Life Balance and Diversity were entered into the regression analysis ($R^2 = 31\%$). Three variables made a statistically significant contribution to the regression model as revealed by the *t* values: Growth Opportunities ($\beta = -0,21$), Overload

($\beta = 0,14$) and low Work Life Balance ($\beta = 0,26$). It is clear that a lack of growth opportunities, overload and poor work life balance were the strongest contributors to disengagement.

The results of multiple regression analyses with Burnout (as measured by the OLBI) as dependent variable, and job demands and job resources (as measured by the JD-R) as independent variables are reported in Table 9.

Table 9

Multiple Regression Analyses with Burnout as Dependent Variable and Job Demands and Job Resources as Independent Variables

Model	Unstandardised Coefficients		Standardised Coefficients Beta	<i>t</i>	<i>p</i>	<i>F</i>	<i>R</i> ²	ΔR^2
	B	SE						
1						4,38*	0,06	0,06*
	(Constant)	21,46	1,25	17,20	0,00			
	Overload	-0,05	0,03	-0,14	-1,93	0,05*		
	Work Life Balance	-0,06	0,03	-0,13	-1,86	0,06		
	Diversity	-0,04	0,06	-0,05	-0,72	0,47		
2						5,85*	0,18	0,12*
	(Constant)	15,53	2,01	7,73	0,00			
	Overload	-0,06	0,02	-0,15	-2,20	0,02*		
	Work Life Balance	-0,05	0,03	-0,11	-1,62	0,10		
	Diversity	-0,03	0,05	-0,04	-0,66	0,50		
	Organisational Support	0,05	0,02	0,16	1,83	0,06		
	Growth Opportunities	0,01	0,03	0,02	0,33	0,74		
	Advancement	0,12	0,04	0,20	2,92	0,00*		
	Social Support	0,04	0,07	0,04	0,63	0,53		

* $p < 0,05$ – statistically significant

Table 9 demonstrates that 6% of the variance in Burnout is explained by job demands. The standardised regression coefficient of Overload ($\beta = 0,14$) is statistically significant. When job resources were added to the regression equation, a total of 18% of the variance in Burnout (as has been measured by the OLBI) was. The regression coefficients of the following variables were statistically significant: Overload ($\beta = -0,15$) and Advancement ($\beta = 0,20$). When

employees experience overload and a lack of opportunity for advancement in the organisation they will experience burnout.

DISCUSSION

The objective of this study was to determine the relationship between job demands, job resources, burnout and engagement in the mining industry. First, a simple factor analysis was conducted on the JDRS, identifying a six-factor structure explaining 61,13% of the variance. These factors were labelled Organisational Support, Overload, Growth, Work-life balance, Advancement and Diversity. A simple factor analysis was conducted on the UWES (one-factor structure: engagement) and OLBI (two-factor structure: disengagement and exhaustion).

The results of this study confirmed that job resources, namely organisational support (including the relationship with superiors, role clarity, information, communication, and participation) are positively related to growth opportunities (including variety, opportunities to learn, and autonomy), advancement and social support. The study also showed that a lack of organisational support, work-life balance and an appreciation of diversity will lead to disengaged employees. Literature confirmed strong and consistent correlations between poor engagement with a lack of job resources (Schaufeli et al., 2002).

This study showed that the main factors influencing engagement of employees in this study were if there were enough support from the organisation, enough growth opportunities as well as the way they were able to balance their work and private life. The study found evidence in support of previous findings that work engagement is related to job resources (Bakker et al., 2003, Bakker & Geurts, 2004, Schaufeli & Bakker, 2004). A lack of growth opportunities, social support, overload and work-life balance will disengage employees. Burnout of employees was mainly predicted by job demands, namely overload (physical strain of the work, dealing with difficult people).

The results of this study indicate that job resources play an important role in the engagement levels of employees in a mining organisation. It seems that these employees are more energetic and enthusiastic when the organisation provides them with the necessary resources. Organisational support such as supportive supervisor relationships, communication,

information, role clarity and participation, as well as growth opportunities that include factors like variety in the job, learning opportunities and autonomy, play a critical role in enhancing work engagement. Therefore, one can assume that factors like growth opportunities in a job, such as variety, learning opportunities, and autonomy play an important motivational role for employees in a mining organisation.

Many employees in a large mining organisation have little variety in their jobs, especially production workers who are constantly doing routine work. Also, most of the mine workers operate under dangerous conditions while working with chemicals, heavy machinery, and tools. The danger lies in the fact that routine work can lead to boredom which in turn can lead to accidents. In providing these employees with more variety will give them more meaning and purpose in their jobs and in the process acts as motivation.

There was also an indication in the results that organisational support, including the relationship with supervisors, role clarity, information, communication and participation play an important motivational role for employees in this study. It will thus be more possible for an employee to be productive if he/she has the necessary information available. With more information, employees will have more detail to work with to complete tasks and, with effective role clarity and support from their supervisor, they will know exactly what is expected of them. Social support is perceived as a very important part of the nature of the job. Social support is commonly viewed as a moderator between job stress and reactions to that stress. Cordes and Daugherty (1993) suggest that either social support help individuals to redefine the stresses of the work environment, or that they help individuals realise their ability to effectively deal with the stresses given the aide of social support. In this study the results showed that the lack of social support may lead to disengagement of employees in the mining industry.

In addition, a lack of job resources such as low autonomy (e.g. no freedom in carrying out work activities), poor task characteristics (e.g. not enough variety in the job, no opportunities for personal growth, development or promotion), a lack of social and instrumental support (e.g. support from supervisor and colleagues, technical support to complete tasks) and poor salaries and benefits could further contribute to burnout and disengagement from their work. We can, therefore, conclude that burnout amongst the employees in this mining organisation is facilitated by high job demands and little support from the organisation. The lack of variety

and learning opportunities in the job further contribute to the burnout level of the employees. These findings are supported by previous studies done in various industries such as government, educators, electricity supply organisations and production workers (Bakker et al., 2001, Bakker et al., 2003, Bakker & Geurts, 2004, Jackson et al., 2006, Rothmann et al., 2003, Rothmann et al., 2005).

The results of this study showed that a lack of organisational support may lead to disengagement and exhaustion of employees in this mining organisation. The results also showed that if there is a lack of growth opportunities within the organisation, it may lead to disengagement and exhaustion of employees. This study further confirmed the theory of the JDERS model (Demerouti et al., 2001) that lack of job resources are related primarily to disengagement.

RECOMMENDATIONS

The importance of the mining industry for the South-African economy and job creation is apparent. As a result, it is important to assist the mining industry in ensuring that job characteristics (i.e. job demands and job resources) be examined in each specific organisation. Every organisation has its own job demands and resources, and therefore every organisation will benefit to examine its positive and negative demands and resources. This study showed that job resources, like organisational support are positively related to engagement.

Organisational strategies should focus on changing the work environment or conditions that are causing disengagement and burnout. By addressing the source of disengagement and burnout is likely to have an impact on workers' wellbeing over the long-term. The factors that impact on burnout and disengagement are likely to differ between organisations, work units, teams and individuals. In this situation the workers should be seen as the "experts". An organisational strategy to address burnout and disengagement will probably be more successful if it is developed in collaboration with workers. A stress audit can be conducted to establish workers current wellbeing (stress, burnout job satisfaction) and the key factors they perceive to positively or negatively influence their wellbeing at work. This could be conducted on a regular basis to monitor and evaluate any changes that may occur in workers' wellbeing as a result of changes to the work environment.

More research is needed to test the job demands and resources within different organisations, because of the difference in demands in each organisation. In order for an organisation to put the necessary resources into place, they need to know which demands their organisation is putting on their employees. This information can be used not only to plan and structure interventions, but also to inform human resource policies in organisations. It is also important for an organisation to be proactive in preventing burnout before it happens, and this can be done by regularly doing culture analyses of the organisation in order to detect disengagement and possible burnout between their employees before it happens.

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CHAPTER 3

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

This chapter contains conclusions regarding the literature review and the empirical study according to the specific objectives. The limitations of the research are discussed, followed by recommendations for the research problem in the organisations and, lastly, suggestions are made for future research.

3.1 CONCLUSIONS

The first objective of this study was to conceptualize job demands, job resources, burnout and engagement from the literature, and the second objective was to determine the relationship of these constructs according to literature. Work engagement was conceptualized as a positive, fulfilling, and work-related state of mind that is characterized by vigour, dedication, and absorption (Schaufeli, Salanova, Gonzales-Roma, & Bakker, 2002). Vigour is characterized by high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties. Dedication refers to being strongly involved in one's work and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge. Absorption is characterized by being fully concentrated and happily engrossed in one's work, in a situation where time passes quickly and one has difficulty detaching oneself from work (Schaufeli et al., 2002).

Engaged employees have been described as a sense of energetic effective connection with their work and see themselves as able to deal effectively with the demands of their job. Rather than a momentary and specific state, engagement refers to a more persistent and pervasive affective-cognitive state that is not focused on any particular object, event, individual or behaviour. Previous research indicates that job resources are the most important predictors of work engagement (Schaufeli & Bakker, 2004). For instance work engagement has been found to be positively related to job resources such as social support from co-workers and superiors, performance feedback, coaching, job control, task variety and training facilities (Schaufeli & Salanova, 2008). Empirical research on work engagement reports that high levels of engagement lead to enhanced organisational commitment, increased job satisfaction, lower absenteeism and turnover rates, improved health and well being, more

extra role behaviours, higher performance and a greater exhibition of personal initiative, proactive behaviour and learning motivation (Schaufeli & Salanova, 2008).

Work engagement has been mostly analysed within the framework of the job demands-resources model. The basic premise of this model is that employees may work in different working environments but the characteristics of these work environments can be classified into two broad categories: (1) job demands; and (2) job resources (Bakker & Demerouti, 2006; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). The job-demands resources model is basically based on two main propositions. The first proposition of this model states that burnout and engagement may be notably influenced by job demands and job resources (Bakker & Demerouti, 2007; Demerouti, et al., 2001).

Job demands are those aspects of the job that require intense physical or mental effort and are therefore linked with certain physiological and/or psychological costs. Job resources in contrast are those features of the job that (a) are instrumental in attaining work-related goals (b) decrease job demands and the physiological and psychological costs linked to these demands, and (c) cultivate personal growth and development (Bakker & Demerouti, 2006). Examples of job resources include job control, performance feedback, social support and supervisory coaching (Schaufeli & Salanova, 2007).

The second proposition of this model suggests that job demands and job resources bring forth two psychological processes, which result in the development of burnout and engagement. The first is the health impairment process, which begins with persistent job demands, which may diminish employees' energy resources and may thus lead to burnout and weakening of health (Hakanen, Bakker, & Schaufeli, 2006). Rothmann, Mostert, and Strydom (2006) define burnout as a particular, multidimensional and chronic stress reaction that goes beyond the experience of mere exhaustion, and is seen as the final step in a progression of unsuccessful attempts to cope with a variety of negative stress conditions.

The second psychological process proposed by the JD-R model is the motivational process which starts with the availability of job resources and is likely to lead to work engagement and positive outcomes such as greater organisational commitment and enhanced job performance (Salanova, Agut, & Peiro, 2005).

The third objective of this study was to determine whether job demands foster the experience of burnout, and job resources engagement. Job resources seem to be positively related to work engagement. The regression analysis confirmed that 25 % of the variance of work engagement was predicted by job resources. Organisational support and growth opportunities seem to be the strongest predictors of work engagement in this particular study and were equally strong in the regression analyses. Organisational support refers to the support organisations provide to employees in terms of the relationship that exists between the employee and his or her superior, the clarity in job descriptions, the information that is provided, effective communication structures, and the level of participation experienced by the employee. The results of this study indicate that overall organisational support must be increased in order to improve engagement among employees.

The second dimension that was strongly related to work engagement was growth opportunities. The results confirmed that variety in the job, learning opportunities that exist in the organisation, and the level of autonomy that individuals experience in their work will have an influence on the work engagement level of employees in the mining industry. In a study conducted by Mostert et al. (2006), it was found that the availability of job resources may have helped police officers cope with the demanding aspects of their work and simultaneously stimulated them to learn from, and grow in their job. It was found that the presence of support from the organisation, advancement possibilities, growth opportunities and socialising with colleagues at work led police officers to higher energy levels and more dedication to the job and organisation. The results confirmed that an increase in job resources will have a positive effect on work engagement. Employees in the mining industry are more likely to be engaged in their work if the provision of job resources is increased.

The regression analysis confirmed that 16 % of the variance of work disengagement was predicted by job demands. Four job demands seem to be relevant in this study, growth, social support, overload, and work-life balance. Employees in a mining industry are more likely to be disengaged from their work when they experience a lack of variety in their work, the opportunity for personal growth and development, and the feeling that they have influence on the decision making processes within the organisation. Also the lack of social support from colleagues and supervisors are likely to lead to disengagement. These include the lack of sufficient information on the results of their work, feedback from their supervisors on how well they perform in their tasks and counting on their supervisors when faced with

difficulties. The study also showed that the physical execution and strain of employees in the mining industry may lead to overload and disengagement. Also, if employees have difficulties in balancing their work and family life, they may be more prone to being disengaged in their work. A chronic lack of resources may result in a negative interference of work with family life, which implies more effort expenditure in the long run (Mostert, 2006).

The regression analysis confirmed that 18 % of the variance of burnout was predicted by job demands. Two job demands seem to influence the propensity for burnout to occur in this study namely overload and advancement. Employees in a mining industry are more likely to experience burnout when they experience physical strain and when dealing with difficult people in their day to day work activities. The results of this study also indicated that employees who experience a lack of advancement opportunities in their organisation may be more likely to experience burnout.

3.2 LIMITATIONS

The first limitation of this study was that the research design was cross-sectional. While the utilization of a cross-sectional methodological design might have its advantages, a definite drawback is the fact that a cross-sectional survey does not allow the measurement of changing variable values over time. As a result, it is not possible to establish the cause and effect of identified relationships between two or more constructs. In other words, a cross-sectional design allows one to identify the existence of a relationship between two variables, but confines one in the sense that one cannot rule out alternative explanations with regard to the outcomes of a given measurement. However, even though cross-sectional designs fail to prove causation, they offer a valuable method of determining which causal hypotheses are likely to justify testing by way of longitudinal designs (Montgomery et al., 2003). The second limitation relates to the fact that all the results were obtained exclusively by means of self-report questionnaires. This could result in an increase in the common method variance problem. The issue of self-perception relates to a subjective test that undoubtedly has an influence on the accuracy with which a participant may assess his/her level of knowledge, ability and experiences. The validity of the results obtained in this fashion might change drastically if other individuals were asked to evaluate the participant's levels of engagement. It is therefore argued that objective measures are required to assist in the attainment of more accurate results.

3.3 RECOMMENDATIONS

The following recommendations for organisations as well as for future research are made.

3.3.1 Recommendations for organisations

Because of the important contribution the mining industry has on the economy of South Africa, various companies in the mining industry need to maintain a competitive advantage in complying with the demands of change, and as a result, impose various forms of stressors on their employees. These stressors are characterised by certain demanding work characteristics, including high levels of workload, time pressure and role conflicts. These factors are not only related to negative outcomes for the individual, including depression, a sense of failure, fatigue, and loss of motivation, but also to negative outcomes for the organisation. These include absenteeism, high turnover rates and lower productivity (Bakker, Demerouti, & Schaufeli, 2003). It is generally known that management's most fundamental directive is to increase the wealth of shareholders.

The mandate of management, in traditional organisations, has been characterized by a strong emphasis on strict organisational structures and economic principles such as cost reduction, efficiency and cash flow. Lack of resources and burnout go together when there's a constant expectation of delivery. If you don't have something to draw from, it's pretty hard to deliver. In a continuously changing environment it is important that organisations, including the mining industry, need a workforce that is characterised by engaged employees. It is also important to determine what stimulates work engagement and what its consequences are. This insight would further allow for a deeper understanding of whether the levels of work engagement can be positively correlated to certain employee characteristics and working conditions.

This study suggested that at least two aspects should be addressed to increase the work engagement of employees in mining organisations, namely organisational support and growth opportunities. Interventions should be implemented to ensure organisational support, including role clarity, good relationships with supervisors, communication, information and participation in decision-making. This can be done by being fair to employees, by coaching

them, and by interviewing them on a regular basis about their personal functioning, professional development, and career development.

The results of this study suggest that interventions should be aimed at both the reduction of job demands and the increase of job resources. More research is needed to test the job demands and resources within different organisations, because of the difference in demands in each organisation. In order for an organisation to put the necessary resources into place, they need to know which demands their organisation is putting on their employees. This information can be used not only to plan and structure interventions, but also to inform human resource policies in organisations. It is also important for an organisation to be proactive in preventing burnout before it happens, and this can be done by regularly doing culture analyses of the organisation in order to detect disengagement and possible burnout between their employees before it happens.

3.3.2 Recommendations for future research

Because of the negative organisational outcomes that result from burnout and disengaged employees, more research is needed to test the job demands and resources within different organisations, especially mining organisations because of the difference in demands in each organisation. In order for an organisation to put the necessary resources into place, they need to know which demands their organisation is putting on their employees.

It is recommended that a more powerful sampling method be used and that longitudinal designs be employed in order to enable causal inferences. The use of larger samples might also provide increased confidence that study findings would be consistent across other similar groups.

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