

A MODEL OF WORK-RELATED WELL-BEING IN THE CHEMICAL INDUSTRY

Yvette Niemand, M.Com

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

Supervisor: Prof. S. Rothmann

Potchefstroom

2008

REMARKS

The reader is reminded of the following:

- The references and the style as prescribed by the Publication Manual (4th edition) of the American Psychological Association (APA) were followed in this mini-dissertation.
- The mini-dissertation is submitted in the form of a research article.

ACKNOWLEDGEMENTS

My sincere gratitude and appreciation to the following:

- My creator who opened the doors for me to do this mini-dissertation and gave me the courage to complete it.
- My study leader, Prof. S. Rothmann for his dedication, guidance and support.
- Prof. S. Rothmann for his statistical analysis of the empirical data.
- My husband, Johan and my children, Johandré and Karina for their patience, understanding and support during this time.
- My employer who afforded me the opportunity to do the study.

TABLE OF CONTENTS

	Page
List of figures	v
List of tables	vi
Abstract	vii
Opsomming	ix
CHAPTER 1: INTRODUCTION	
1.1 Problem statement	1
1.2 Research objectives	5
1.2.1 General objectives	6
1.2.2. Specific objectives	6
1.3 Research method	6
1.3.1 Research design	6
1.3.2 Participants	7
1.3.3 Measuring instrument	7
1.3.4 Statistical analysis	8
1.4 Chapter division	9
1.5 Chapter summary	9
Chapter references	11
CHAPTER 2: ARTICLE	
Abstract	16
Opsomming	16
Problem statement	17
Method	24
• Research design	24
• Participants	24
• Measuring instrument	26
• Statistical analysis	27
Results	28
Discussion	34

Recommendation	36
Chapter references	38

CHAPTER 3: CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

3.1	Conclusions	43
3.2	Limitations of this research	45
3.3	Recommendations	45
3.3.1	Recommendations to solve the research problem	45
3.3.2	Recommendations for future research	47
	Chapter references	48

LIST OF FIGURES

Figure	Description	Page
Figure 1		
	Job demands and job resources	20
Figure 2		
	The dual-process model	21
Figure 3		
	Structural model of work-related well-being within a Chemical Industry	33

LIST OF TABLES

Table	Description	Page
Table 1		
	Characteristics of Participants	25
Table 2		
	Descriptive Statistics and Cronbach's Alpha Coefficients of the SAEHWS	29
Table 3		
	Pearson's Correlation Coefficients between the Scales	30

ABSTRACT

Subject: A model of work-related well-being in the chemical industry.

Key terms: Work engagement, burnout, job demands, job resources.

Organisations in the chemical industry face many demands. They have to distinguish themselves from their competitors in the market through technological advancement, market changes and the constant drive to be the best. Other demands include political pressures, e.g. employment equity and diversity management. Furthermore they have to attempt to reduce costs as well as to increase productivity. These pressures may have either a negative or positive effect on employees which could in turn impact on their energy and motivation. Higher job demands and a lack of job resources could result in high levels of exhaustion, demotivation, dissatisfaction and disengagement. Job demands refer to those physical, psychological or organisational aspects of the job that require specific effort and are associated with physiological and psychological costs. Job resources refer to the aspects of the job that may be functional in meeting task requirements and may reduce the physiological and psychological costs; they may also stimulate growth as well as the development of an individual.

The objective of this study was to test a structural model of work-related well-being showing the relationships amongst the variables of job demands, job resources, exhaustion, mental distance, vitality, work devotion, health and organisational commitment. A cross-sectional survey design was used. The participants ($N=265$) included employees working for a business within the chemical industry. The South-African Employee Health and Wellness Survey (SAEHWS) was used to gather data on the work-related well-being of employees. Descriptive statistics, Cronbach's alpha coefficients, correlation coefficients and structural equation modelling were used to analyse the data.

The results indicated that high job demands and insufficient job resources resulted in high levels of burnout (exhaustion and mental distance), which led to physical and psychological ill health. Adequate job resources on the other hand resulted in work-related well-being (low burnout and high work engagement), which in turn resulted in organisational commitment.

Growth opportunities within the job and organisational support played an important role in the well-being of the employees.

Recommendations for future research were made.

OPSOMMING

Onderwerp: 'n Model van werkverwante welstand in die chemiese industrie.

Sleutelterm: Werksbegeestering, uitbranding, werkseise, hulpbronne.

Die chemiese industrie moet hulself van hul mededingers in die mark onderskei deur die nuutste tegnologie, markveranderings en voortdurende wedywing om die beste te wees. Ander tipes druk sluit politieke druk soos regstellende aksie en diversiteit in. Dan is daar ook die druk om kostes te verlaag terwyl produktiwiteit moet verhoog. Hierdie druk kan 'n negatiewe of 'n positiewe effek hê op die werknemers wat dan weer uiteindelik lei tot siekte- of gezondheidstoestande. Hoër werkseise kan tot gevolg hê dat hoë vlakke van uitputting, demotivering, ontevredenheid en onttrekking voorkom. Werkseise verwys na daardie fisiese, psigologiese en organisatoriese aspekte van die werk wat sekere eise aan die individu stel en geassosieer word met sekere fisiologiese en psigologiese kostes. Werkshulpbronne verwys na daardie aspekte van die werk wat funksioneel kan bydra tot taakverwesenliking en die verlaging van sosiale en psigologiese kostes. Dit kan ook persoonlike groei en die ontwikkeling van die individu stimuleer.

Die doel van hierdie studie was om 'n strukturele model van werkverwante welstand te toets wat die verwantskappe tussen werkseise, werkshulpbronne, uitputting, psigiese afstand, energie, toewyding, gezondheid en organisasieverbondenheid aandui. 'n Dwarssnee- opname-ontwerp is gebruik. Die studiepopulasie ($N=265$) het bestaan uit werknemers van 'n besigheid in die chemiese industrie. Die Suid-Afrikaanse Werknemers se Gesondheid- en - Welstandsvraelys (South-African Employee Health and Wellness Survey, SAEHWS) is gebruik om data te bepaal ten opsigte van die welstand van werknemers. Beskrywende statistiek, Cronbach alfa-koëffisiënte, korrelasies en strukturele vergelykingsmodellering is gebruik om die data te analiseer.

Die resultate het aangetoon dat uitbranding (uitputting en psigiese afstand) verwant is aan te hoë werkseise en te min of ontoereikende werkshulpbronne wat lei tot fisieke en psigologiese ongesondheid. Voldoende werkshulpbronne aan die ander kant het gelei tot werkverwante welstand (lae uitbranding en hoë werksbegeestering), wat weer tot organisasieverbondenheid

aanleiding gegee het. Groeigeleenthede in die werk en ondersteuning van die organisasie het ook 'n belangrike rol gespeel in die welstand van werknemers.

Aanbevelings vir toekomstige navorsing is aan die hand gedoen.

CHAPTER 1

INTRODUCTION

This mini-dissertation deals with a model of work-related well-being for employees in the chemical industry.

In this chapter the problem statement is discussed. Research objectives are set out and the research method is explained. Finally the division of chapters is given.

1.1 PROBLEM STATEMENT

The chemical industry has undergone many changes during the past decades. The new democracy in South Africa brought employment equity, and the need to manage diversity in the workplace. It is becoming the trend that companies all over the world aim to be the best in their class, not to mention the technical advancements, political pressures and market changes (Kreitner & Kinicki, 2001). Employment opportunities for employees are becoming fewer because of various factors which include technology requiring fewer people doing the work, a much bigger workforce, etc.; yet, the pressure on employees is ever increasing. The nature of work has changed from manual to mental and emotional demands (Barling, 1999; Turner, Barling, & Zacharatos, 2002), which contributes to work stress. Furthermore, many organisations have implemented practices directed at reducing costs but increasing the productivity of employees at the same time. These practices have led to a culture that values profitability over the well-being of employees.

The work-related well-being of individuals can be measured in two dimensions, namely *energy* at work and *identification* with work. Energy at work consists of two components, namely exhaustion and vitality. Identification with work also focuses on two components, namely mental distance and work devotion. When the levels of exhaustion and mental distance are high for too long it could lead to ill health, whereas vitality and work devotion could result in organisational commitment.

According to Schaufeli and Enzmann (1998), burnout can be considered as a particular kind of prolonged job stress. Ill health is divided into physical and psychological ill health.

Physical ill health symptoms includes a weakened immune system with increased short- and long-term illness, ulcers, heart palpitations, hyperventilation, headaches, and even colds and flu (Kirkcaldy, Cooper, & Ruffalo, 1995). Psychological ill health includes emotional reactions, depression, and anxiety (Anderson, Litzenberger, & Plecas, 2002). Work engagement is defined as a positive, fulfilling, work-related mindset with energy focused to meet the goals of the organisation (Rothmann, 2005). Commitment in the organisation is the relative strength of an individual's identification with the involvement in an organisation (Mowday, Porter, & Steers, 1982).

Psychological experiences of work impact on the attitudes and behaviour of individuals at work (Kahn, 1990). According to Gold (1984), an accumulation of work-related stressors can lead to burnout, as burnout is usually related to high job demands (Levert, Lucas, & Ortlepp, 2000). Other work-related stressors include a lack of resources which leads to withdrawal and eventually disengagement (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). On the other side of the continuum we need to acknowledge that work is an opportunity for people to express themselves through various activities. According to Schaufeli and Bakker (2004), work engagement is strongly influenced by job resources. Examples of job resources could include social support, job enhancement opportunities, autonomy, participation in decision-making, and being psychologically well (Hobfoll, 1989; Lee & Ashforth, 1996).

The definition of health seems to be the absence of disease and it does not include a focus on the presence of positive states of mind. According to Nelson and Simmons (2003), medicine has always been concerned with the physical body only, and with the return of the physical body from states of disease back to normal functioning. Strümpfer (1990) states that the health and social sciences have been characterised by a pathogenic paradigm, thus the orientation towards the abnormal, with the question: "Why do people fall ill?" The causes of the individual's dissatisfaction and unhappiness is seen as being the emotional maladjustment of the employee as opposed to aspects of the job itself (Wright, 2003). The cure usually involves prevention-based therapy (Wright & Cropanzano, 2000).

Originally burnout was restricted to the helping professions, but now it is recognised as a phenomenon found in a variety of occupational groups (Cordes & Dougherty, 1993). Schaufeli and Enzmann (1998) present a "working" definition of burnout as a phenomenon which is a persistent, negative, work-related state of mind in 'normal' individuals that is

primarily characterised by exhaustion, accompanied by distress, a sense of reduced effectiveness, decreased motivation, and the development of dysfunctional attitudes and behaviours at work.

According to Schaufeli and Bakker (2001), empirical studies reveal that some employees, regardless of high job demands and long working hours, do not develop burnout when compared to others, but seem to find pleasure in hard work and dealing with job demands. These employees can be described as engaged in their work. Kelloway and Barling (1991) point out that work which is goal-directed and well structured could result in mental health outcomes. This will affect the life-satisfaction of individuals (Hart, 1999). According to Kirchler (1985) and Warr (1983), the effects of unemployment show that the lack of work has negative effects such as depression, alcoholism, psychological complaints as well as suicide.

The dual-process model of Schaufeli and Bakker (2004) integrates the positive and negative aspects of work-related well-being. Consequently, theoretical and empirical studies have commenced on the concept of work engagement, theoretically viewed as the antithesis of the burnout construct. The assumption is that the working characteristics may evoke two psychologically different processes, namely an energetic process of wearing out in which high job demands exhaust the employee's energy, as well as a motivational process in which a lack of resources precludes dealing effectively with job demands and fosters mental withdrawal (Demerouti et al., 2001).

The energetic process is a response of the body and mind. People become tired by their everyday work activities, but their energy remains sufficient to meet the task demands. When an individual works under high levels of mental workload and already feels fatigued, extra energy is necessary to ensure that task performance is maintained. This may result in acute fatigue which may in turn lead to chronic effects on health and well-being, because incomplete recovery from workload demands disrupts the energetic homeostasis (Demerouti et al., 2001).

The motivational process refers to the way organisations provide - or reward - employees with job resources. When these are withheld from individuals, the long-term consequence is withdrawal from work as well as reduced motivation and commitment. This withdrawal is potentially important for self-protection to prevent future frustration when work-related goals

can not be obtained. The conservation of resources theory predicts that employees could experience a loss of resources or failure in order to gain an investment (Hobfoll, 1989; Hobfoll & Freedy, 1993). Individuals will attempt to minimise losses in order to reduce discomfort or job stress.

According to Schaufeli and Bakker (2004), the energetic process links job demands with health problems via burnout, and the motivational process links job resources via engagement with organisational outcomes. Burnout is also related to turnover intentions and mediates the relationship between job demands and health problems. Engagement mediates the relationship between job resources and turnover intentions.

The dual-process model combines burnout and work engagement with situational causes and the outcomes thereof, based on the Job Demand-Resources (JD-R) model of Demerouti, Bakker, Nachreiner, and Schaufeli (2001). According to Demerouti et al. (2001), the central assumption of the JD-R model is that every occupation may have its own specific work characteristics associated with well-being, but it is still possible to model these characteristics into two broad categories which include job demands and job resources.

Some experts regard burnout as the final step of a range of unsuccessful attempts to cope with stressful conditions (Gold, 1984). Burnout can be considered as a particular kind of prolonged stress according to Schaufeli and Enzmann (1998). Lazarus and Folkman (1984) conclude that burnout can be seen as a final stage of a breakdown in adaptation, which can result from the long-term imbalance of demands and resources, and is accompanied by chronic malfunctioning at work. This phenomenon has been researched and studied in various countries over the world (Maslach, Schaufeli, & Leiter, 2001), and it has been the motivation for many books to be written (e.g. Edelwich & Brodsky, 1980). Initially burnout was associated only with the helping professions (Maslach et al., 2001), but Schaufeli, Martinex, Pinto, Salanova, and Bakker (2002) have shown that employees in any occupational group can develop burnout.

Extensive research on burnout in various occupations has been completed in South Africa, viz. police officers (Storm, 2002), pharmacists (Rothmann, Malan, & Rothmann, 2001), emergency workers (Naudé & Rothmann, 2004), psychiatric nurses (Levert, Lucas, & Ortlepp, 2000), pharmacist assistants (Mostert, Van Rensburg, & Rothmann, 2004), managers

in the manufacturing industry (Jansen van Vuuren & Rothmann, 2002), tertiary students (Jackson, Mostert, & Pienaar, 2004) as well as student leaders in higher education institutions (Sieberhagen & Pienaar, 2004).

According to Roberts and Davenport (2002), work engagement is defined as a person's involvement in his or her job. Individuals who are highly engaged in their jobs identify personally with the job and are motivated by the work itself. They therefore tend to work harder and more productively than others. They are more likely to produce good results. Engaged individuals report that their jobs make good use of their skills and abilities and find it challenging and stimulating, which in turn provides them with a sense of personal accomplishment. Work engagement is related to positive organisational outcomes such as job satisfaction, motivation and low turnover intention (Bakker, Demerouti, & Schaufeli, 2003; May, Gilson, & Harter, 2004; Schaufeli & Bakker, 2004).

Due to the many changes in technology, the political changes as well as other stressors, the chemical industry has been experiencing a high turnover, less safety consciousness, a demotivated workforce and lower productivity. This has an effect on the culture of the business as it creates a lot of negativity, therefore people find it easy to look for opportunities elsewhere. These symptoms are evident across the entire workforce, from employees to the managers. No studies have been done in South Africa in the chemical industry on a model of their work-related well-being.

The following research questions arise, based on the abovementioned description of the research problem:

- How is work-related well-being defined and how can it be explained according to the dual process model or well-being?
- Do job demands and a lack of job resources lead to burnout in the chemical industry?
- Do job resources lead to work engagement in the chemical industry?
- Does burnout lead to physical and psychological ill health in the chemical industry?
- Does work engagement lead to organisational commitment in the chemical industry?

1.2 RESEARCH OBJECTIVES

The research objectives consist of a general objective and specific objectives.

1.2.1 General objective

The general objective of this study is to test a model of work-related well-being within the chemical industry.

1.2.2 Specific objectives

The specific objectives of this study are as follows:

- To define work-related well-being and to investigate the relationships between job demands, job resources, burnout, work engagement, ill health, and organisational commitment according to the dual-process model of work-related well-being.
- To investigate whether job demands and a lack of resources lead to burnout (exhaustion and mental distance) in the chemical industry.
- To determine whether job resources lead to work engagement (vitality and devotion to work) in the chemical industry.
- To establish if burnout leads to physical and psychological ill health in the chemical industry.
- To establish if work engagement leads to organisational commitment in the chemical industry.

1.3 RESEARCH METHOD

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

1.3.1 Research design

A cross-sectional survey design will be used to reach the objectives of this research. This design is used to determine the inter-relationships amongst the variables within a population and will assist to achieve the objectives of the research (Shaughnessy & Zechmeister, 1997).

1.3.2 Participants

The participants used in the research were taken from the chemical industry in South Africa. A random sample ($n = 265$) was taken from a population of 400 employees of the relevant business. According to Field (2005), a sample is a smaller, but hopefully a representative, collection of units from a population used to determine truths about that population (e.g. how a given population behaves in certain conditions).

1.3.3 Measuring instrument

The South African Employee Health and Wellness Survey (SAEHWS) was developed to measure employee health and well-being. It is a self-reporting instrument which is based on the dual-process model of work-related well-being (Rothmann, 2005). The following sub-scales of the SAEHWS will be used for the purposes of this study: Work-related Well-being (energy at, and identification with your work), the Job Demands-Resources Scale, the Health Survey and the Organisational Commitment Scale.

The Work-related Well-being Scale consists of 20 items which measure work-related well-being in terms of two dimensions, namely energy at work and identification with work. Energy at work consists of two components, namely Exhaustion and Vitality. Identification with work also consists of two components, namely Mental Distance and Work Devotion. The Job Demands-Resources Scale consists of 48 items which measures two dimensions, namely Overload (consisting of pace and amount of work, cognitive overload and emotional overload), and job resources (consisting of Growth Opportunities, Organisational Support, Social Support, Job Security and Advancement).

Ill health is measured as Physical Ill Health (symptoms of stress e.g., sleep loss and headaches) and Psychological Ill Health (symptoms of stress e.g., constant tiredness and

irritability). It is important to note that an unhealthy lifestyle may cause physical ill health and that stress-related illnesses may be due to stressors outside the workplace. Organisational Commitment is measured in terms of Normative and Affective Commitment.

Exploratory and confirmatory analyses were used to assess the factor structures of all the components of the measurement model of the SAEHWS. The results may be summarised as follows:

- Job demands and job resources: Exploratory factor analysis consistently indicates that five factors could be extracted from work experiences, as part of the SAEHWS. These factors include Overload, Organisational Support, Growth Opportunities, Advancement and Job Security. Social Support by colleagues load on a separate factor in some studies, and on organisational support in other studies. Second-order factor analysis shows that these factors result in two higher-order factors, namely job demands and job resources.
- Affective well-being. Two-factor models (compared to one-factor models) are superior for Exhaustion and Mental Distance as well as Vitality and Work Devotion.
- Ill health. Exploratory as well as confirmatory factor analysis results in two factors namely Physical Ill Health and Psychological Ill Health.
- Organisational commitment. Factor analysis confirms that organisational commitment consists of two related factors, namely Affective Commitment and Normative Commitment (Rothmann & Rothmann, 2006).

Studies further showed that the factor structures of the measuring instruments are similar for different ethnic groups and organisations. Looking at reliability, we see that the internal consistency of all the subscales of the SAEHWS is highly acceptable ($\alpha > 0,70$).

1.3.4 Statistical analysis

The statistical analysis is carried out with the help of the SPSS Program (SPSS, 2005). Descriptive statistics, including means and standard deviations were used to explore the data.

Cronbach alpha coefficients were used to assess the internal consistency of the measuring instrument (Clark & Watson, 1995). Coefficient alpha conveys important information regarding the proportion of error variance contained in a scale. Pearson's product-moment correlation coefficients were used to specify the relationships between the variables. The level of statistical significance was set at $p \leq 0,05$. Effect sizes were used to decide on the significance of the findings. A cut-off point of 0,30 (medium effect) was set for the practical significance of correlation coefficients.

Structural equation modelling (SEM) methods, as implemented by AMOS (Arbuckle, 1997), were used to test the structural model, using the maximum likelihood method (Byrne, 2001). Hypothesised relationships in the structural model are tested empirically for goodness of fit with the sample data. The χ^2 and several other goodness-of-fit indices summarise the degree of correspondence between the implied and observed covariance matrices. However, because the χ^2 statistic equals $(N - 1) F_{min}$, this value tends to be substantial when the model does not hold and the sample size is large (Byrne, 2001). The following goodness-of-fit-indices were used as adjuncts to the χ^2 statistics: a) The Goodness of fit Index (GFI); b) The Adjusted Goodness of Fit Index (AGFI); c) The Normed Fit Index (NFI); d) The Comparative Fit Index (CFI); e) The Tucker-Lewis Index (TLI), and f) The Root Mean Square Error of Approximation (RMSEA).

1.4 DIVISION OF CHAPTERS

The chapters are presented as follows in this mini-dissertation:

Chapter 1: Introduction

Chapter 2: Research article

Chapter 3: Conclusions, Limitations and Recommendations.

1.5 CHAPTER SUMMARY

In this chapter the problem statement and motivation were discussed. The general and specific objectives for the research were formulated and the method for the research was described. The method of statistical analysis was also discussed.

Chapter 2 focuses on the research article.

REFERENCES

- Anderson, G. S., Litzenberger, R., & Plecas, D. (2002). Physical evidence of police officer stress. *Policing: An International Journal of Police Strategies & Management*, 25, 399-420.
- Arbuckle, J. L. (1997). *Amos user's guide version 3.6*. Chicago: Smallwaters.
- Bakker, A. B., Demerouti, E., & Schaufeli W. B. (2003). Dual processes at work in a call centre: An application of the job demand-resources model. *European Journal of Work and Organizational Psychology*, 12, 393-417.
- Barling, J. (1999). Changing employment relations: Empirical data, social perspectives and policy options. In D. B. Knight & A. Joseph (Eds.) *Restructuring societies: Insights from the social sciences* (pp. 59-82) Ottawa, Canada: Carlton University Press.
- Borg, M. G. (1990). Occupational stress in British educational settings: A review. *Educational Psychology*, 10, 103-126.
- Byrne, B. M. (2001). *Structural equation modelling with AMOS: Basic concepts, applications and programming*. Mahwah, NJ: Erlbaum.
- Clark, L. A., & Watson, D (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment*, 7, 309-319.
- Cordes, C. L., & Dougherty, T. W. (1993). A review and an integration of research on job burnout. *Academy of management Review*, 18, 621-656.
- Demerouti, E., Bakker, A. A., Nachreiner, P., & Schaufeli, W. B. (2001). The job demands resources model of burnout. *Journal of Applied Psychology*, 86, 499-512.
- Edelwich, J., & Brodsky, A. (1980). *Burn-out: Stages of disillusionment in the helping professions*. New York: Human Sciences Press.
- Erez, A., & Isen, A. M. (2002). The influence of positive affect on the components of expectancy motivation. *Journal of Applied Psychology*, 87, 1055-1067.
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology*, 2, 300-319.
- Gold, Y. (1984). The factorial validity of the Maslach Burnout Inventory in a sample of California elementary and junior high school classroom teachers. *Educational and Psychological measurement Journal*, 44(4), 1009-1016.
- Hart, P. M. (1999). Predicting employee life satisfaction: A coherent model of personality, work and non-work experiences, and domain satisfaction. *Journal of Applied Psychology*, 84, 564-584.

- Hobfoll, S. E. (1989). Conservation of resources: A new approach at conceptualizing stress. *American Psychologist*, 44, 513-524.
- Hobfoll, S. E., & Freedy, J. (1993). Conservation of resources: A general stress theory applied to burnout. In W. B. Schaufeli, C. Maslach, & T. Marek (Eds.), *Professional burnout: Recent development in theory and research* (pp.115-129). Washington, DC: Taylor & Francis.
- Kahn, W. A. (1990). Psychological conditions of personal engagement and disengaging at work. *Academy of Management Journal*, 33, 692-724.
- Kelloway, E. K., & Barling, J. (1991). Job characteristics, role stress and mental health. *Journal of Occupational Psychology*, 64, 291-304.
- Kirchler, E. (1985). Job loss and mood. *Journal of Economic Psychology*, 6(1), 9-25.
- Kirkcaldy, B., Cooper, C. L., & Ruffalo, P. (1995). Work stress and health in a sample of US police. *Psychological Reports*, 76, 700-702.
- Kreitner, R., Kinicki, A. (2001). *Organisational behaviour: Case studies*. London: Irwin.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal and coping*. New York: Springer-Verlag.
- Lee, R. T., & Ashforth, B. T. (1996). A meta-analytic examination of the correlates of the three dimensions of job burnout. *Journal of Applied Psychology*, 81, 123-133.
- Levert, T., Lucas, M., & Ortlepp, K. (2000). Burnout in psychiatric nurses: Contributions of the work environment and a Sense of Coherence. *South African Journal of Psychology*, 30, 36-43.
- Maslach, C., & Jackson, S. E. (1984). Patterns of burnout among a national sample of public contact workers. *Journal of Health and Human Resources Administration*, 7, 184-212.
- Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, 52, 397-422.
- May, D. R., Gilson, R. L., & Harter, L. M. (2004). The psychological conditions of meaningfulness, safety and availability and the engagement of the human spirit at work. *Journal of Occupational and Organizational Psychology*, 77, 11-37.
- Mowday, R. T., Porter, L. W., & Steers, R. M. (1982). *Employee-organisational linkages: The psychology of commitment, absenteeism and turnover*. New York: Academic Press.
- Naudé, J. L. P., & Rothmann, S. (2004). The validation of the Utrecht Work Engagement for emergency medical technicians in Gauteng. *South African Journal of Economic and Management Sciences*, 7, 473-487.

- Nelson, D. L., & Simmons, B. L. (2003). Health psychology and work stress: A more positive approach. In J. C. Quick & L. E. Tetrick (Eds.), *Handbook of occupational health psychology* (pp. 97-119). Washington, D.C.: American Psychological Association.
- Roberts, D. R., & Davenport, T. O. (2002, Autumn). Job engagement: Why it's important and how to improve it. *Employment Relations Today*, 21-29.
- Rothmann, S. (2005, September). *Work-related well-being in South Africa organisations: What do we know?* Paper presented at the 7th Annual Conference of the Employee Assistance Professionals Association of South Africa, Durban.
- Rothmann, S., Malan, A. M., & Rothmann, J. C. (2001, August). Sense of coherence, coping and burnout in a corporate pharmacy group. Paper presented at the 7th Annual PSYSSA Conference, Johannesburg, South Africa.
- Ryff, C. D., & Singer, B. (1998). The contours of positive human health. *Psychological Inquiry*, 9, 1-28.
- Schaufeli, W. B., & Bakker, A. B. (2001). Werk en welbevindeng: Naar een positieve benadering in de Arbeids- en Gezondheidspsychologie [Work and well-being: Towards a positive occupational health psychology]. *Gedrag en Organizatie*, 14, 229-253.
- Schaufeli, W. B., & Bakker, A. B. (2004) Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organisational Behaviour*, 25, 293-315.
- Schaufeli, W. B., & Enzmann, D. (1998). *The burnout companion to study and practice: A critical analysis*. London: Taylor & Francis.
- Schaufeli, W. B., Martinez, I. M., Pinto, A. M., Salanova, M., & Bakker, A. B. (2002). Burnout and engagement in university students. *Journal of Cross-Cultural Psychology*, 33, 464-481.
- Schaufeli, W. B., Leiter, M. P., Maslach, C., & Jackson, S. E. (1996). *MBI-General Survey*. Palo Alto, CA: Consulting Psychologists Press.
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55, 5-14.
- Shaughnessy, J. J., & Zechmeister, E. B. (1997). *Research methods in psychology* (4th ed.). New York: McGraw-Hill.
- Snyder, C. R., & Lopez, S. J. (2002). *Handbook of positive psychology*. Oxford, UK: Oxford University Press.
- Spector, P. E. (2000). *Industrial and organizational psychology: Research and practice* (2nd ed.). New York: John Wiley.

- SPSS Inc. (2005). *SPSS 14.0 for Windows*. Chicago, IL: SPSS Inc.
- Storm, K. (2002). *Burnout and engagement in the South African Police Service*. Unpublished doctoral thesis, North-West University. Potchefstroom.
- Strümpfer, D. J. W. (1990). Salutogenesis: A new paradigm. *South African Journal of Psychology*, 20, 265-276.
- Turner, N., Barling, J., & Zacharatos, A. (2002). Positive psychology at work. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 715-728). Oxford, UK: Oxford University Press.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Boston, MA: Allyn & Bacon.
- Warr, P. (1983). Work, jobs and unemployment. *Bulletin of the British Psychological Society*, 36, 305-511.
- Wright, T. A. (2003). Positive organizational behaviour: An idea whose time has truly come. *Journal of Organizational Behaviour*, 24, 437-442.
- Wright, T. A., & Cropanzano, R. (2000). The role of organizational behaviour in occupational health psychology: A view as we approach the millennium. *Journal of Occupational Health Psychology*, 5, 5-10.

CHAPTER 2

RESEARCH ARTICLE

A MODEL OF WORK-RELATED WELL-BEING IN THE CHEMICAL INDUSTRY

ABSTRACT

The objective of this study was to test a structural model of work-related well-being by determining the relationships amongst the variables of job demands, job resources, exhaustion, mental distance, vitality, work devotion, health, and organisational commitment. A cross-sectional survey design was used. The study population ($N=265$) consisted of personnel working for a business within the chemical industry. The South African Employee Health and Wellness Survey was used as a measuring instrument. Structural equation modelling showed that job demands and a lack of job resources result in burnout and ultimately in ill health. Job resources lead to work engagement, which results in organisational commitment.

OPSOMMING

Die doelstelling van hierdie studie was om 'n strukturele model van werk- verwante welstand te toets deur die verhoudings te bepaal tussen werkseise, werkshulpbronne, uitputting, psigiese afstand, energie, werkstoewyding, gesondheid, en organisasieverbondenheid. 'n Dwarssnee opname-ontwerp is gebruik. Die deelnemers ($N=265$) het bestaan uit personeel wat werksaam is by 'n besigheid in die chemiese industrie. Die Suid-Afrikaanse Werknemers Gesondheid en Welstandvraelys is as meetinstrument gebruik. Strukturele vergelykingsmodellering het aangetoon dat werkseise en 'n tekort aan hulpbronne tot uitbranding en uiteindelik gesondheidsprobleme lei. Werkshulpbronne het gelei tot werksbegeestering en uiteindelik tot organisasieverbondenheid.

Key terms: Work engagement, burnout, job demands, job resources, ill health, organisational commitment.

The employment relationships and the types of work that people do are changing (Barling, 1999). **What** employees do, as well as **when** they are doing it, is changing. Turner, Barling, and Zacharatos (2002) conclude that employees even face diminishing choice and control because they are forced to take on working hours and working arrangements which are against their preferences. Technical advancement, political pressures and market changes also add to these pressures (Kreitner & Kinicki, 2001). In South Africa employees have to cope with additional stressful factors such as employment equity and the need to manage diversity in the workplace, not to mention the trends of companies working towards becoming the best in their class in order to stay abreast of the rest of the related industries. There are many organisations which have implemented practices that attempt to reduce costs and increase productivity. This could lead to a mentality that favours profitability over the welfare of people.

Work could create ambivalent feelings. On the one hand, it requires effort and is associated with lack of freedom and negative feelings. Studies regarding the effects of unemployment show that a lack of work (unemployment) has detrimental effects, such as depression, alcoholism, psychological complaints and even suicide (Kirchler, 1995; Warr, 1983). It could also cause illness: research in the Netherlands has shown that between 4% and 10% of the working population have reported serious burnout complaints (Bakker, Schaufeli, & Van Dierendonck, 2000). On the other hand work gives energy, enables development and generates positive feelings. Thus, work could lead to both illness and health (Schaufeli & Bakker, 2001).

The pathogenic paradigm entails an orientation towards the abnormal and focuses on why people become ill (Strümpfer, 1990). The answer to these questions could then be used to look for ways to treat and prevent diseases. This is traditionally researched much more often than positive feelings. According to Diener, Suh, Lucas, and Smith (1999), it is evident that 17 times more scientific articles have been published on negative feelings than positive feelings. Burnout, stress, violations of psychological contracts, job insecurity and downsizing are the most popular topics for study (Turner et al., 2002).

Antonovsky (1979) introduces the concept of salutogenesis, proposing that the origins of health should rather be studied than those of disease. In contrast to “what can go

wrong”, research has now started to shift to “what can go right” (Strümpfer, 2002) which has proven to use a different set of attributions and assumptions about health and potential. Thus the focus has shifted to “positive psychology” (Ryan & Deci, 2000; Seligman & Csikszentmihalyi, 2000). Seligman and Csikszentmihalyi (2000, p. 5) express the focus of positive psychology as follows: “The field of positive psychology at the subjective level is about valued subjective experiences; well-being, contentment, and satisfaction (in the past); hope and optimism (for the future) and flow and happiness (in the present)”.

Employees in the chemical industry are exposed to high job demands which could result in high levels of exhaustion. These demands are caused by certain job characteristics, including excessive workload, qualitative demands, physical work conditions, adverse co-worker behaviour, qualification potential, and a lack of social support by co-workers (Schnorpfeil et al., 2004). Employees also seem to be demotivated by low pay, long working hours, poor communication, poor training, lack of responsibility, dissatisfaction with their jobs due to heavy work, boring jobs and a lack of appreciation (Bent, Seaman, & Ingram, 1999). This could result in low levels of work engagement and lack of required resources to keep employees motivated, which ultimately impacts on turnover, absenteeism, commitment and performance levels.

Low commitment and performance levels lead to employees not attaining working goals, which in turn has an impact on the organisation’s goals (Caldwell, Chatman, & O’Reilly, 1990). Thus it is imperative that organisations understand which part of the human being seeks fulfilment through self-expression at work. For the human spirit to thrive at work, individuals must be able to immerse themselves in their work and engage the cognitive, emotional and physical dimensions of themselves in their work (May, Gilson, & Harter, 2004). The self and role exist in some dynamic negotiable relationship in which a person both drives personal energies into role behaviours, and displays the self within the roles (Kahn, 1990).

According to Kelloway and Barling (1991), goal-directed, structured activity translates directly into positive mental health outcomes, and indirectly affects the life satisfaction of employees (Hart, 1999; Judge & Watanabe, 1993). Work could be used to promote psychological well-being. A definition for human well-being as a multi-dimensional

process involves intellectual, social, emotional and physical health (Ryff & Singer, 1998). This implies that health is regarded as the presence of the positive in the mind as well as in the body.

Studies in South Africa have confirmed the negative effects of work (Levert, Lucas, & Ortlepp, 2000; Van der Linde, Van der Westhuizen, & Wissing, 1999). According to Rothmann and Joubert (2007), extreme job demands because of high workload and job insecurity together with lack of job resources due to insufficient organisational support and advancement opportunities, contributed to a significant level of exhaustion.

Mental distance can be predicted by a lack of job resources for various reasons. A lack of growth opportunities in the job (variety, opportunities to learn and independence in the job), and a lack of organisational support (poor relationship with supervisors and colleagues, flow of information, communication, role clarity and participation in decision-making) can cause mental distance (Rothmann & Pieterse, 2007). It is also important to note that poor advancement (remuneration, career possibilities and training opportunities) contribute to cynicism when overload forms a part of the package (Rothmann & Pieterse, 2007).

Rothmann and Pieterse (2007) found that work engagement (including vigour and dedication) can be predicted by growth opportunities in the job and a strong sense of coherence. Therefore, employees who perceive that they have variety of choice, opportunities to learn and independence in their jobs, and who experience stimuli as comprehensible, manageable and meaningful, present higher levels of work engagement.

Does the well-being of employees then have any effect on the chemical industry? There are recurrences of high turnover, less safety consciousness, a demotivated workforce and lower productivity. These have an impact on the culture of the business and symptoms are evident across the entire workforce, from employees to the managers. No research has been done in South Africa for the chemical industry on a model of their work-related well-being and it can contribute to a greater understanding of why they have certain problems. It can also result in a strategy for the future in order to ensure that different results are attained in the process.

The objective of this study was to test a structural model of work-related well-being within the chemical industry.

The dual-process model

The dual-process model of Bakker, Demerouti, and Schaufeli (2003) is a theoretical model that can be used to ensure understanding for the impact of work on the well-being of employees. According to the Job Demands-Resources (JD-R) model, job characteristics can be organised into two categories, job demands and job resources (Bakker et al., 2003; Demerouti et al., 2001). The effects of job demands and job resources are illustrated in the Figure 1.

		Job Demands	
		Low	High
Job Resources	High	<i>Easy Job</i>	<i>Challenging Job</i>
	Low	<i>Boring Job</i>	<i>Stressful Job</i>

Figure 1. Job demands and job resources

The dual-process model is illustrated in Figure 2.

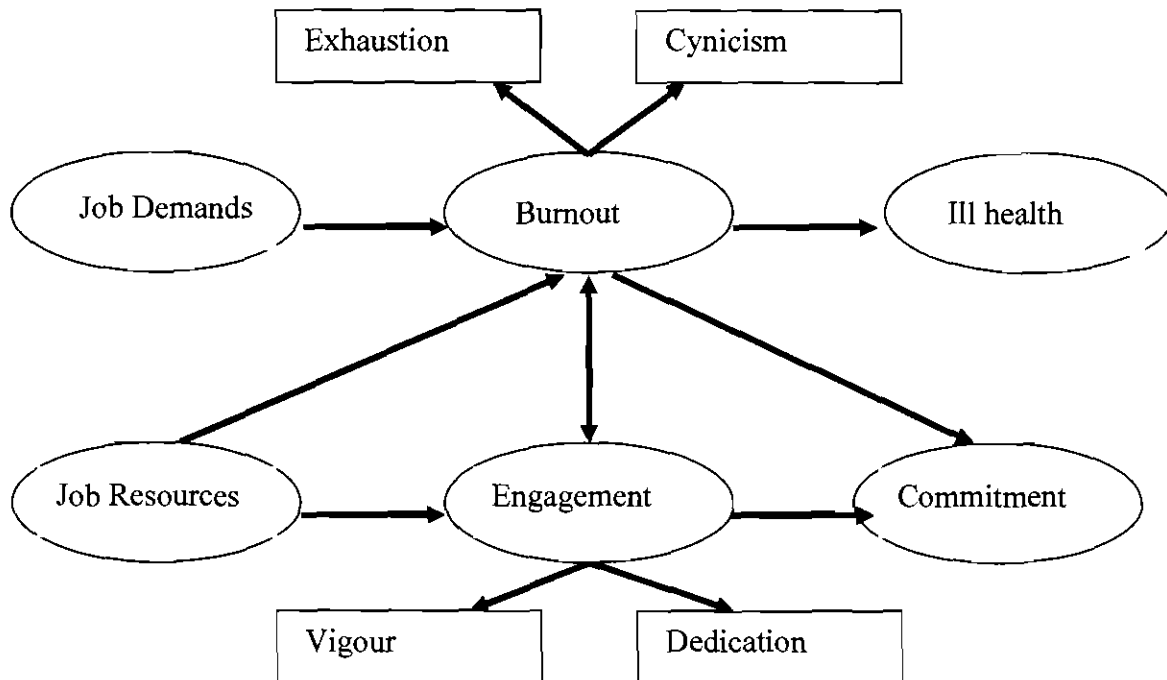


Figure 2. The dual-process model

The dual-process model is characterised by an energetic process, linking the job demands like overload, role problems and work/home interference with ill health via burnout, and a motivational process which links job resources with the organisational commitment via work engagement (Bakker, Demerouti, & Schaufeli, 2003).

Schaufeli and Enzmann (1998, p. 36) define burnout as a persistent, negative, work-related state of mind in “normal” individuals that is primarily characterised by exhaustion. Burnout is the result of long-term involvement in a situation that is demanding. Work engagement is defined as a person’s involvement in his or her job. Employees who are highly engaged in their jobs identify personally with the job and are motivated by the work itself. They tend to work harder and are more productive than others. They are also more likely to produce the results their customers and organisations want. These individuals make good use of their skills and abilities as it provides them with a sense of personal accomplishment (Roberts & Davenport, 2002).

Job demands are defined as those physical, social, or organisational aspects of the job that require sustained physical or mental energy (Demerouti et al., 2001). Examples of

job demands include high work pressure and high physical or emotional demands (Bakker & Geurts, 2004; Bakker et al., 2003). Job resources are those physical, psychological, social or organisational aspects of the job that may be functional in achieving work goals, reducing job demands, and stimulating personal growth and development (Demerouti et al., 2001).

There is a possibility that job demands could interact with job resources in order to affect the work-related well-being of individuals. When an employee faces high job demands, but he or she lacks the job resources to cope with those demands, then the work climate and the employee's work could be regarded as highly stressful, resulting in exhaustion and disengagement. If the job demands are high, but the employee has sufficient resources to his or her disposal, the climate as well as the job could be regarded as challenging, which could result in work engagement and commitment to the organisation (Demerouti et al., 2001).

Health and commitment have a direct link to objective indicators which include absenteeism, performance, medical costs, industrial relations incidents, turnover, as well as accidents or injuries at work (Rothmann & Rothmann, 2006).

Depending on the conditions at work, job demands and job resources may result in different outcomes (Bakker, Demerouti, & Schaufeli, 2003). Job resources may lead to a motivational process, and reduce job demands, foster goal accomplishment and stimulate personal growth and development. It could also lead to a health impairment process, where severe job demands may exhaust employees' mental, physical and emotional resources. A continued exhaustion of resources may lead to the depletion of energy and result in health problems (Demerouti et al., 2000; Demerouti et al., 2001; Lee & Ashforth 1996; Leiter, 1993). On the other hand, job resources could reduce job demands, and foster goal accomplishment as well as stimulate personal growth and development which may lead to motivational outcomes, including strong involvement in terms of organisation commitment and dedication to work. According to Demerouti et al. (2001) and Schaufeli and Bakker (2004), job demands are the main predictors of burnout, and job resources are the main predictors of work engagement.

Work engagement is strongly influenced by job resources (Schaufeli & Bakker, 2004). The Conservation of Resources Theory of Hobfoll (1989, 1998) is relevant for understanding the

effect of job resources, or the lack thereof, on employees. The COR's central theory is that people strive to obtain, retain and protect what they value. Workload, role ambiguity, role conflict and stressful events in general are examples of job demands (Wright & Hobfoll, 2004), and social support, job enhancement opportunities, autonomy, participation in decision-making, and being psychologically well, are examples of job resources (Hobfoll, 1989; Lee & Ashforth, 1996). When the external environment lacks resources, individuals cannot reduce the potentially negative influences of high job demands and they cannot achieve their work goals. It becomes difficult to develop or further themselves in their job or organisation. Thus the COR theory predicts that in such a situation employees will experience a loss of resources or failure to gain an investment. In an attempt to reduce the discomfort or job stressors, they will try to minimise the loss by doing away with further negative, personal consequences through reducing their discretionary inputs (Hobfoll, 1989).

The Effort-Recovery (E-R) model is a theoretical framework that is frequently used to illustrate the underlying mechanism of work-home interaction (Meijman & Mulder, 1998). Mental or physical workload requires effort, and is associated with a certain amount of effort expenditure and short-term psycho-physiological reactions which include mood changes, increased hormone secretion and accelerated heart rate. Within the individual, specific load reactions develop which would be on a physiological, behavioural and subjective level as a result of the effort required to deal with workload. These reactions are adaptive and reversible (e.g. when the workload becomes less, or the functional systems which were active stabilise within a period of time). As a result of the recovery process, fatigue and other effects of the stressful situation are also reduced. If, however, the demands do not diminish, and no recovery occurs, the originally adaptive responses develop into a negative load, that may spill into a home domain. If the individuals do not recover fully at home, they must invest additional effort to perform adequately when confronted with new work demands. The functional systems are activated again before having a chance to stabilise at a baseline level, and the increased intensity of negative load reactions appeal even stronger to the recovery process. If this situation persists it may manifest and become irreversible, which could seriously affect the health and well-being of the individuals (e.g. prolonged fatigue and/or other manifests health problems) (Sluiter et al., 2001; Van Hooff et al., 2005).

METHOD

Research design

A cross-sectional survey design was used to reach the objectives of this study. This design is used to determine the inter-relationships amongst the variables within a population and will assist to achieve the objectives of the research (Shaughnessy & Zechmeister, 1997).

Participants

The participants in this study were from a chemical industry in South Africa. A random sample ($n = 265$) was taken from a population of 400 employees of the relevant business. According to Field (2005), a sample is a smaller, but hopefully representative collection of units from a population used to determine truths about that population (e.g. how a given population behaves in certain conditions). Spector (2000) states that the random process increases the accuracy of the conclusions made regarding the population. Table 1 presents some of the characteristics of the participants.

Table 1

Characteristics of Participants (N = 265)

Item	Category	Frequency	Percentage
Gender	Male	226	85,3
	Female	39	14,7
Home Language	Afrikaans	110	41,5
	English	44	16,6
	African	108	40,8
	Other	3	1,1
Age	18 – 25	30	11,3
	26 – 35	86	32,5
	36 – 45	75	28,3
	46 – 55	54	20,4
	56 – 66	20	7,5
Qualification	Grade 11 and Lower	48	18,1
	Grade 12	111	41,9
	3 Year Degree/Diploma	35	13,2
	4 Year Degree/Diploma	32	12,0
	5 -7 Year Degree/Diploma	2	0,8
	Master's Degree	13	4,9
	Doctoral Degree	2	0,8
	Technical College Qualification	22	8,3
Department	Human Resources	7	2,6
	Finance	2	0,8
	Marketing	30	11,3
	Logistics	45	17,0
	Poly Operations Management	7	2,7
	Engineering	56	21,1
	TSG	13	4,9
	Turbo Project or Poly 3	58	21,9
	Poly 1 Process	16	6,0
	Poly 2 Process	31	11,7

According to Table 1, the majority of the participants are males (85,3%) between the age of 26 to 35 years (32,5%). Afrikaans speaking (41,5%) participants are the most prominent followed by African speaking (40,8%) participants. A total of 41,9% of the participants possess a grade 12 qualification and the most participants are from the Turbo Project or Poly 3 (21,9%) and Engineering (21,9%) departments.

Measuring instrument

The South African Employee Health and Wellness Survey (SAEHWS) was developed to measure employee health and well-being. It is a self-reporting instrument which is based on the dual process model of workrelated well-being (Rothmann, 2005). The following sub-scales of the SAEHWS were used for the purposes of this study: Work-related Well-being (energy at, and identification with, your work), the Job Demands-Resources Scale, the Health Survey and the Organisational Commitment Scale.

The Work-related Well-being Scale consists of 20 items which measures work-related well-being in terms of two dimensions, namely energy at work and identification with work. Energy at work consists of two components, namely Exhaustion and Vitality, and an employee. Identification with work also consists of two components, namely Mental Distance and Work Devotion. The Job Demands-Resources Scale consists of 48 items which measures two dimensions, namely Overload (consisting of pace and amount of work, cognitive overload and emotional overload), and job resources (consisting of Growth Opportunities, Organisational Support, Social Support, Job Security and Advancement).

Ill health is measured as Physical Ill Health (symptoms of stress e.g., sleep loss and headaches) and Psychological Ill Health (symptoms of stress e.g., constant tiredness and irritability). It is important to note that an unhealthy lifestyle may cause physical ill health and that stress-related illnesses may be due to stressors outside the workplace. Organisational Commitment is measured in terms of Normative and Affective Commitment.

Exploratory and confirmatory analyses were used to assess the factor structures of all the components of the measurement model of the SAEHWS. The results may be summarised as follows:

- Job demands and job resources. Exploratory factor analysis consistently indicates that five factors could be extracted from work experiences, as part of the SAEHWS. These factors include Overload, Organisational Support, Growth Opportunities, Advancement and Job Security. Social Support by colleagues loads on a separate factor in some studies, and organisational support in other studies. Second-order factor analysis shows that these factors result in two higher-order factors, namely job demands and job resources.

- Affective well-being. Two-factor models (compared to one factor models) are superior for Exhaustion and Mental Distance as well as Vitality and Work Devotion.
- Ill health. Exploratory as well as confirmatory factor analysis resulted in two factors namely Physical Ill Health and Psychological Ill Health.
- Organisational commitment. Factor analysis confirmed that organisational commitment consists of two related factors, namely Affective Commitment and Normative Commitment (Rothmann & Rothmann, 2006).

Studies further showed that the factor structures of the measuring instruments are the same for different ethnic groups and organisations. Looking at reliability, we see that the internal consistency of all the subscales of the SAEHWS is highly acceptable ($\alpha > 0,70$).

Statistical analysis

The statistical analysis was carried out with the help of the SPSS Program (SPSS ,2005). Descriptive statistics, including means standard deviations, skewness, and kurtosis, were used to explore the data. Cronbach alpha coefficients were used to access the internal consistency of the measuring instrument (Clark & Watson, 1995). Coefficient alpha conveys important information regarding the proportion of error variance contained in a scale. The Pearson product-moment correlation coefficients were used to specify the relationships between the variables. Effect sizes were used to decide on the significance of the findings. A cut-off point of $p \leq 0,05$ was set for statistical significance, while a cut-off point of 0,30 (medium effect) was set for the practical significance of correlation coefficients.

Structural equation modelling as implemented in AMOS (Arbuckle, 1997) was used to test the structural model of work-related well-being using the maximum likelihood method. Among the fit indices produced by the AMOS program is the Chi-square statistic (χ^2), which is the test of absolute fit of the model. However, the χ^2 value is sensitive to sample size. Therefore, additional goodness-of-fit indices such as the Goodness of Fit Index (GFI), the Adjusted Goodness of Fit Index (AGFI), the Normed Fit Index (NFI), the Comparative Fit

Index (CFI), the Tucker–Lewis Index (TLI) and the Root Mean Square Error of Approximation (RMSEA) were used in this study.

RESULTS

Table 2 identifies the descriptive statistics and Cronbach alpha coefficients of the scales.

Table 2

Descriptive Statistics and Cronbach's Alpha Coefficients of the SAEHWS (N = 265)

Item	Mean	SD	Skewness	Kurtosis	α
Exhaustion	12,88	7,39	0,31	-0,59	0,86
Mental Distance	7,53	5,87	0,59	-0,40	0,78
Vitality	21,32	5,81	-0,70	0,26	0,70
Work Devotion	22,72	6,87	-0,91	0,10	0,87
Organisational support	43,03	9,37	-0,22	-0,62	0,91
Growth Opportunities	25,46	5,74	-0,21	-0,74	0,84
Social Support	19,66	3,09	-0,42	-0,66	0,73
Advancement	13,77	4,51	0,30	-0,63	0,84
Insecurity	8,23	3,30	-0,23	-1,37	0,91
Overload	24,03	4,52	0,08	-0,08	0,77
Physical Ill Health	12,66	4,09	0,28	-0,60	0,77
Psychological Ill Health	17,63	5,83	0,50	-0,40	0,86
Affective Commitment	21,57	6,02	-0,80	-0,24	0,88
Normative Commitment	18,70	4,07	-1,13	1,14	0,77

According to Table 2, the scores of the SAEHWS are normally distributed except for Normative Commitment and Insecurity. The Cronbach alpha coefficients of all the measured items are considered to be acceptable when compared to the guidelines of $\alpha > 0,70$ (Nunnally & Bernstein, 1994).

The Pearson correlations between the scales are reported in Table 3.

Table 3

Pearson Correlation Coefficients between the Scales (N = 265)

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Exhaustion	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 Mental Distance	0,56 ^{***}	-	-	-	-	-	-	-	-	-	-	-	-	-
3 Vitality	-0,28 [*]	-0,50 ^{***}	-	-	-	-	-	-	-	-	-	-	-	-
4 Work Devotion	-0,39 [*]	-0,61 ^{***}	0,78 ^{***}	-	-	-	-	-	-	-	-	-	-	-
5 Organisational Support	-0,41 ^{***}	-0,46 ^{***}	0,50 ^{***}	0,57 ^{***}	-	-	-	-	-	-	-	-	-	-
6 Growth Opportunities	-0,37 ^{***}	-0,45 ^{***}	0,53 ^{***}	0,63 ^{***}	0,67 ^{***}	-	-	-	-	-	-	-	-	-
7 Social Support	-0,29 [*]	-0,29 [*]	0,38 ^{***}	0,35 ^{***}	0,42 ^{***}	0,42 ^{***}	-	-	-	-	-	-	-	-
8 Advancement	-0,32 ^{***}	-0,36 ^{***}	0,29 [*]	0,39 ^{***}	0,50 ^{***}	0,54 ^{***}	0,16 [*]	-	-	-	-	-	-	-
9 Insecurity	-0,09 [*]	-0,07 [*]	0,12 [*]	0,18 [*]	0,07 [*]	0,07 [*]	0,07 [*]	0,04	-	-	-	-	-	-
10 Overload	0,41 ^{***}	0,20 [*]	-0,00	-0,08 [*]	-0,07 [*]	0,06 [*]	-0,06 [*]	-0,18 [*]	-0,03 [*]	-	-	-	-	-
12 Physical Ill Health	0,46 ^{***}	0,34 ^{***}	-0,21 [*]	-0,23 [*]	-0,22 [*]	-0,23 [*]	-0,15 [*]	-0,17 [*]	0,03	0,18 [*]	-0,47 ^{***}	-	-	-
13 Psychological Ill Health	0,58 ^{***}	0,42 ^{***}	-0,31 ^{***}	-0,32 ^{***}	-0,36 ^{***}	-0,31 ^{***}	-0,26 [*]	-0,20 [*]	-0,09 [*]	0,19 [*]	-0,53 ^{***}	0,71 ^{***}	-	-
14 Affective Commitment	-0,42 ^{***}	-0,53 ^{***}	0,48 ^{***}	0,54 ^{***}	0,57 ^{***}	0,53 ^{***}	0,25 [*]	0,58 ^{***}	0,04	-0,17 [*]	0,43 ^{***}	-0,20 [*]	-0,33 ^{***}	-
15 Normative Commitment	-0,36 ^{***}	-0,46 ^{***}	0,49 ^{***}	0,50 ^{***}	0,45 ^{***}	0,45 ^{***}	0,20 [*]	0,43 ^{***}	-0,03	-0,10	0,44 ^{***}	-0,13 [*]	-0,23 [*]	0,79 ^{***}

^{*} $p < 0,05$ ^{*} $r > 0,30$ - practically significant (medium effect)^{***} $r > 0,50$ - practically significant (large effect)

Table 3 indicates that Exhaustion is statistically and practically significantly positively related to Mental Distance and Psychological Ill Health (both large effects), and to Overload and Physical Ill Health (medium effects). Exhaustion is statistically and practically significantly negatively related to Organisational Support, Growth Opportunities, Advancement, Overload and Physical Ill Health (all medium effects).

Mental Distance is statistically and practically significantly negatively related to Vitality, Work Devotion, and Affective Commitment (all large effects), and to Organisational Support, Growth Opportunities, Advancement and Normative Commitment (all medium effects). Mental Distance is statistically and practically significantly positively related to Physical and Psychological Ill Health (medium effect).

Vitality is statistically and practically significantly positively related to Work Devotion, Organisational Support and Growth Opportunities (large effect), and to Social Support, Affective and Normative Commitment (all medium effects). Vitality is statistically and practically significantly negatively related to Psychological Ill Health (medium effect).

Work Devotion is statistically and practically significantly positively related to Organisational Support, Growth Opportunities, Affective and Normative Commitment (all large effects), and to Social Support and Advancement (both medium effects). Work Devotion is statistically and practically significantly negatively related to Psychological Ill Health (medium effect).

Organisational Support is statistically and practically significantly positively related to Growth Opportunities, Advancement and Affective Commitment (all large effects), and to Social Support and Normative Commitment (both medium effects). Organisational Support is statistically and practically significantly negatively related to Psychological Ill Health (medium effect).

Growth Opportunities are statistically and practically significantly positively related to Advancement and Affective Commitment (both large effects), and Social Support, and Normative Commitment (both medium effects). Growth Opportunities are statistically and practically significantly negatively related to Psychological Ill Health (medium effect). Advancement is statistically and practically significantly positively related to Affective

Commitment (large effect), and to Normative Commitment (medium effect). Physical Ill Health is statistically and practically significantly negatively related to Psychological Ill Health (large effect). Psychological Ill Health is statistically and practically significantly negatively related to Affective Commitment (medium effect). Affective Commitment is statistically and practically significantly positively related to Normative Commitment (large effect).

The study set out to test a structural model of work-related well-being in the chemical industry by determining the relationships amongst the variables job demands, exhaustion, mental distance, health, job resources, vitality, work devotion and organisational commitment. In our view, burnout and work engagement should not be modelled here as independent constructs. We modelled their covariance by adding a latent variable called work well-being.

Results indicate that the model fitted adequately to the data: $\chi^2(83, N = 265) = 263,78, p < 0,01$; $\chi^2/df = 3,18$; IFI = 0,91; CFI = 0,91, and RMSEA = 0,09. The model is presented in Figure 3.

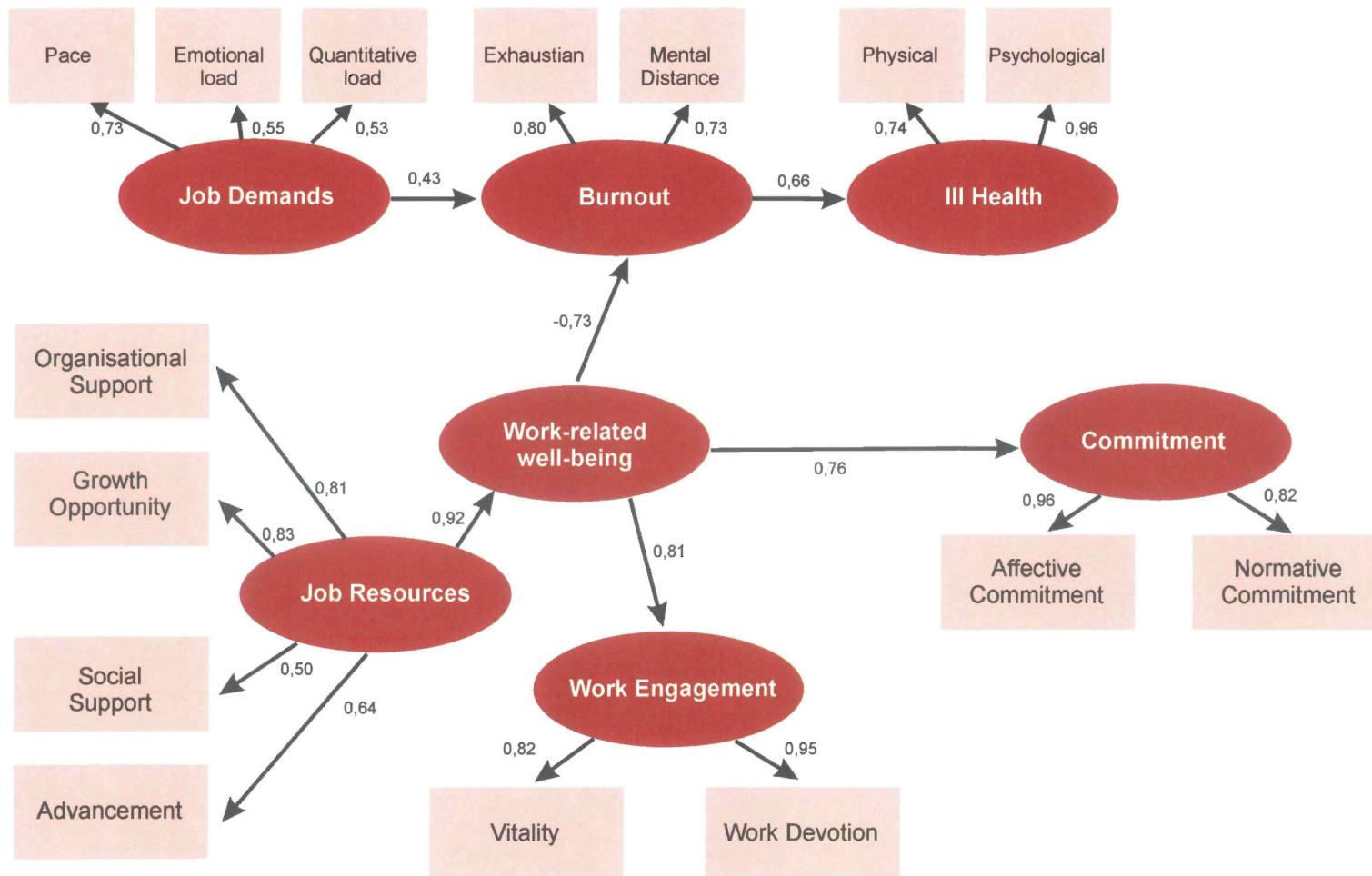


Figure 3. Structural model of work-related well-being within a chemical industry

As can be seen, Job Demands correlates positively with Burnout (a latent variable consisting of Exhaustion and Mental Distance). This means that if Pace and Amount of Work, Emotional Load and Quantitative Load increase, then Burnout also increases. Burnout mediates the relationship between Job Demands and Ill Health (a latent variable consisting of Physical and Psychological Ill Health). Job Resources lead to Work-related Well-being (a dummy variable consisting of Burnout and Work Engagement). This implies that increases in Organisational Support, Growth Opportunities, Social Support and Advancement are associated with increases in Work-related Well-being. Work-related Well-being mediates the relationship between Job Resources and Organisational Commitment. If Job Resources are high then the Work-related Well-being of employees is also high. If there is a lack of Job Resources, Work-related Well-being decreases as is evident in higher Burnout and lower Work Engagement. In addition, Burnout increases if Job Demands are also high. If Work-related Well-being increases, Organisational Commitment (Affective and Normative Commitment) increases.

DISCUSSION

The objective of this study was to test a model of work-related well-being within the chemical industry. A good fit was found for a model in which job demands and a lack of resources predict burnout (exhaustion and mental distance). Job resources predict work-related well-being (low burnout and high work engagement).

According to Maslach (2000), perceived stressors lead to emotional reaction, which, in turn then leads to physical and psychological ill health. These results confirm the findings of Maslach et al. (2001) and Cooper et al. (2001) that burnout is related to job demands and a lack of job resources. Adequate job resources, especially organisational support (relationships with supervisors, role clarity, information, participation and communication) and growth opportunities (variety, autonomy, opportunities for growth and control in the job), as well as social support (support from colleagues and contact possibilities) and advancement (remuneration and career opportunities) result in work-related well-being. Work-related well-being, in turn predicts organisational commitment (affective and normative).

The total sample compares very well to the South African norm on a collective level and represents a normal distribution pattern, i.e. individuals with very low risks, an average

middle group, and a high risk group. Exhaustion is somewhat high compared to other groups or organisations whilst work devotion and vitality are benchmarked as higher than other groups or organisations. High levels of exhaustion and/or mental distance are evident for burnout, over-commitment, and distraction states, which influence the psychological fitness of people resulting in a decreased safety conscientiousness, lower productivity, turnover intentions and absenteeism. The level of exhaustion of the total sample is moderate and the level of mental distance is below average.

Job demands (overload) in the total sample are lower than the national norm. If job demands increase with a lack of increase in job resources, it will have a negative effect on the work engagement levels of employees (Hakanen, Bakker, & Demerouti, 2005). Ill health, which is divided into physical and psychological ill health, is below average. High exhaustion levels and high mental distance levels are both strongly linked to suffering from psychological illness such as depression, anxiety, sleep disorders and high perceptions of stress. These poor well-being outcomes will probably affect the productivity levels of the participants in the long term. The components of the organisational commitment are above average relative to the national norm.

According to the COBE model of Schaufeli and Bakker (2004), job resources play an intrinsic motivational role by fostering the employee's growth, learning and development, or and extrinsic motivational role by being instrumental in achieving work goals. If business does not provide these resources, it could have a negative long-term effect which could include low performance levels, high absenteeism levels and high employee turnover (Hackman & Oldham, 1980).

The structural model provides support for the JD-R model (Demerouti et al., 2001), which in turn provides support for the SAEHWS instrument. In conclusion the SAEHWS instrument is useful to manage and prevent burnout of employees of a business unit within in the chemical industry. In the structural model it is evident that a fast pace and large amount of work is one of the biggest contributors to job demands which leads to burnout (Exhaustion and mental distance). Burnout relates negatively to work-related well-being, which implies that if there is burnout there will be low work-related well-being. Burnout in turn leads to ill health (psychological and physical ill health). Job resources (especially growth opportunities and organisational support) are highly related to work-related well-being (low burnout and high

work engagement), which leads to organisational commitment. Work engagement consisted of work devotion and vitality). Organisational commitment consisted of affective normative commitment. In a similar type of study for educators in South Africa, it was found that burnout mediated the relationship between job demands and ill health, while work-related well-being mediated the relationship between job resources and organisational commitment (Jackson, Rothmann, & Van de Vijver, 2006). According to Rothmann (2007), in a study for support staff in a higher education institution in South Africa, the results show that job demands and a lack of job resources contribute to burnout. Burnout, in turn, mediated the effects of Job demands and a lack of job resources on ill health. The chemical industry is currently experiencing a high turnover of employees, lots of safety related problems which could potentially lead to disaster, and low motivational levels which result in low productivity. Work-related well-being is crucial if a different outcome for all of these problems is desired. If this condition persists it could potentially lead to a snowball effect which could have even more negative results.

Some limitations of this study were as follows: First, the most prominent languages used by the employees were Afrikaans and English, but for many employees it was their second or third language as there were nine other language groups in this study sample. Thus there could have been misinterpretation of the questions. Second, the study sample of the group was 265 out of a total of 400 employees, thus only 66% of the total group. Future studies of this nature should make use of larger samples. Third, a cross-sectional design was used to assess the relationship between variables. Therefore, causality of the obtained relationships cannot be proved. Future studies should employ longitudinal designs to study the causal relationships between the variables.

RECOMMENDATIONS

Management should attend to the stressors of their employees. On a primary level the following interventions are proposed: Investigate the reasons for high levels of exhaustion and mental distance whilst considering lifestyle issues for example long working hours, overtime, and taking work home. Job redesign may have to be considered after job evaluation, as there are perceptions of job overload. The results suggest that interventions aimed at increasing the job resources should contribute to lowering the exhaustion and the mental distance. Aspects of the work that employees find most engaging should be explored and

reworked into performance agreements to enhance positive aspects of the work experience. The performance management system should be used to set goals and generate positive feedback. The staff consultation processes and mechanisms should be checked. There are perceptions of lack of organisational support, and management style may need to be investigated. Growth opportunities need to be redesigned in career plans as there is a perception that these are limited. Team building exercises are necessary to strengthen team cohesion.

On a secondary level prevention can be done by presenting awareness programmes pertaining to the importance of effort-recovery for well-being, health and work outcomes and ensuring that individuals understand stress management and coping skills. Awareness should be created regarding physical and psychological ill health and promoting healthy behaviour, relaxation, exercise and the role of posture and ergonomic factors. On a tertiary level it is vital that certain high risk individuals should receive counselling as soon as possible. Recovery leave should also be available for these individuals in need of rest.

It would be advisable for a follow-up study to be done to determine whether the proposed interventions have had a favourable effect on this business.

REFERENCES

- Antonovsky, A. (1979). *Health, stress and coping: New perspectives on mental and physical well-being*. San Francisco, CA: Jossey-Bass.
- Antonovsky, A. (1987). *Unraveling the mystery of health: How people manage stress and stay well*. San Francisco, CA: Jossey-Bass.
- Arbuckle, J. L. (1997). *Amos user's guide version 3.6* Chicago: Smallwaters.
- Bakker, A. B. & Demerouti, E., & Schaufeli W.B. (2003). Dual processes at work in a call centre: An application of the job demand-resources model. *European Journal of Work and Organizational Psychology*, 12, 393-417.
- Bakker, A. B., & Geurts, S. A. E. (2004). Towards a dual-process model of work-home interference. *Work and Occupations*, 31, 345-366.
- Bakker, A., Schaufeli, W. B., & Van Dierendonck, D. (2000). Burnout: Prevalentie, risicogroepen en risicofactoren. In I. L. D. Houtman, W. B. Schaufeli & T. Taris (Eds.), *Psychische vermoeidheid en werk: Cijfers, trends and analyses* (pp. 65-82). Alphen a/d Rijn: Samsom.
- Barling, J. (1999). Changing employment relations: Empirical data, social perspectives and policy options. In D. B. Knight & A. Joseph (Eds.) *Restructuring societies: Insights from the social sciences* (pp. 59-82) Ottawa, Canada: Carlton University Press.
- Bent, R., Searman, C. E. A., & Ingram, A. (1999). Staff motivation in small food manufacturing enterprises. *British Food Journal*, 101, 654-667.
- Caldwell, D., Chatman, J., & O'Reilly, C. (1990). Building organizational commitment: A multiform study. *Journal of Occupational Psychology*, 63, 245-261.
- Clark, L. A., & Watson, D (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment*, 7, 309-319.
- Cooper, C. L., Dewe, P. J., & O'Driscoll, M. P. (2001). *Organizational stress: A review of critique of theory, research, and applications*. Thousand Oaks, CA: Sage.
- Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands resources model of burnout. *Journal of Applied Psychology*, 86, 499-512.
- Demerouti, E; Bakker, A. B., Nachreiner, F. & Schaufeli, W. B. (2000). A model of burnout and life satisfaction among nurses. *Journal of Advanced Nursing*, 32: 454-464.
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. I. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125, 267-302.

- Erez, A. & Isen, A. M. (2002). The influence of positive affect on the components of expectancy motivation. *Journal of Applied Psychology*, 87, 1055-1067.
- Field, A. P. (2005). Is the meta-analysis of correlation coefficients accurate when population correlations vary? *Psychological methods*, 10(4), 444-467.
- Fredrickson, B.L. (1998). What good are positive emotions? *Review of General Psychology*, 2, 300-319.
- Geurts, S. A. E., Demerouti, E. (2003). Work/non-work interface: A review of theories and findings. In M. J. Schabracq, J. A. M. Winnubst, & C. L. Cooper, (Eds.), *The handbook of work and health psychology* (pp. 279-312). Chichester, UK: John Wiley and Sons Limited.
- Hakanen, J. J., Bakker, A. B., & Demerouti, E. (2005). How dentists cope with their job demands and stay engaged: The moderating role of job resources. *European Journal of Oral Sciences*, 113, 1-9.
- Hackman, J. R., & Oldham, G. R. (1980). *Work redesign*. Reading, MA: Addison-Wesley.
- Hart, P. M. (1999). Predicting employee life satisfaction: A coherent model of personality, work and non-work experiences, and domain satisfaction. *Journal of Applied Psychology*, 84, 564-584.
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44, 513-524.
- Hobfoll, S. E. (1998). *The psychology and philosophy of stress, culture, and community*. New York: Plenum Books.
- Jackson, L. T. B., Rothmann, S., & van de Vijver, F.J.R. (2006) A model of work-related well-being for educators in South Africa. *Stress and Health*, 22, 263-274.
- Judge, T. A., & Watanabe, S. (1993). Another look at the job satisfaction-life satisfaction relationship. *Journal of Applied Psychology*, 78, 939-948.
- Kahn, W. A. (1990). Psychological conditions of personal engagement and disengaging at work. *Academy of Management Journal*, 33, 692-724.
- Kelloway, E. K., & Barling, J. (1991). Job characteristics, role stress and mental health. *Journal of Occupational Psychology*, 64, 291-304.
- Kirchler, E. (1985). Job loss and mood. *Journal of Economic Psychology*, 6(1), 9-25.
- Lee, R. T. & Ashforth, B.T. (1996). A meta-analytic examination of the correlates of the three dimensions of job burnout. *Journal of Applied Psychology*, 81, 123-133.

- Leiter, M. P. (1993). Burnout as a developmental process: Consideration of models. In Schaufeli, W. B; Maslach, C., & Marek, T. (eds.), *Professional burnout: Recent development in theory and research* (pp. 237-250). Washington, DC: Taylor and Francis.
- Levert, T., Lucas, M., & Ortlepp, K. (2000). Burnout in psychiatric nurses: Contributions of the work environment and a Sense of Coherence. *South African Journal of Psychology*, 30, 36-43.
- Marks, S. R. (1997). Multiple roles and role strain: Some notes on human energy, time and commitment. *American Sociological Review*, 42, 921-936.
- May, D. R., Gilson, R. L., & Harter, L. M. (2004). The psychological conditions of meaningfulness, safety and availability and the engagement of the human spirit at work. *Journal of Occupational and Organizational Psychology*, 77, 11-37.
- Maslach, C. (2000). Job burnout. *Annual Review of Psychology*, 52, 397-422.
- Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, 52, 397-422.
- Meijman, T. F., & Mulder, G. (1998). Psychological aspects of workload. In Drenth, P.J., Thierry, H., de Wolff, C.J. (Eds.), *Handbook of Work and Organizational Psychology* (2nd ed., pp. 5-33). Hove. UK: Erlbaum.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.) New York: McGraw-Hill.
- Roberts, D. R. & Davenport, T. O. (2002, Autumn). Job engagement: Why it's important and how to improve it. *Employment Relations Today*, 21-29.
- Rothmann, S. (2005, September). *Work-related well-being in South Africa organisations: What do we know?* Paper presented at the 7th Annual Conference of the Employee Assistance Professionals Association of South Africa, Durban.
- Rothmann, S. (2007). Job characteristics, optimism, burnout, and ill health of support staff in a higher education institution in South Africa. *South African Journal of Psychology*, 37(1), 135–152.
- Rothmann, S., & Joubert, J. H. M. (2007). Job demands, job resources, burnout and work engagement of managers at platinum mine in the North West Province. *South African Journal of Business Management*, 38, 49-61.
- Rothmann, S., & Pieterse, J. (2007). Predictors of work-related well-being in sector education training authorities. *South African Journal of Economic and Management Sciences*, 10, 298-312.

- Rothmann, S., & Rothmann, J. C. (2006). *The South African Employee Health and Wellness Survey©: User manual*. Potchefstroom: Afriforte (Pty) Ltd.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68-78.
- Ryff, C. D., & Singer, B. (1998). The contours of positive human health. *Psychological Inquiry*, 9, 1-28.
- Schnorpfeil, P., Noll, A., Writz, P., Schulze, R., Ehlert, U., Frey, K., & Fischer, J. E. (2004). Assessment of exhaustion and related risk factors in employees in the manufacturing industry: A cross-sectional study. *International Archives of Occupational and Environmental Health*, 75, 535-540.
- Schaufeli, W. B., & Bakker, A. B. (2001). Werk en welbevinden: Naar een positieve benadering in de Arbeids- en Gezondheidspsychologie [Work and well-being: Towards a positive occupational health psychology]. *Gedrag en Organizatie*, 14, 229-253.
- Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behaviour*, 25, 293-315.
- Schaufeli, W. B., & Enzmann, D. (1998). *The burnout companion to study and practice: A critical analysis*. London: Taylor & Francis.
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55, 5-14.
- Shaughnessy, J. J., & Zechmeister, E. B. (1997). *Research methods in psychology* (4th ed.). New York: McGraw-Hill.
- Sluiter, J. K., Frings-Dresen, M. H. W., Van der Beek, A. J., & Meijman, T. F. (2001). The relation between workinduced neuroendocrine reactivity and recovery, subjective need for recovery, and health status. *Journal of Psychosomatic Research*, 50, 29-37.
- Snyder, C. R., & Lopez, S. J. (2002). *Handbook of positive psychology*. Oxford, UK: Oxford University Press.
- Spector, P. E. (2000). *Industrial and organizational psychology: Research and practice* (2nd ed.). New York: John Wiley.
- SPSS Inc. (2005). *SPSS 14.0 for Windows*. Chicago, IL: SPSS Inc.
- Strümpher, D. J. W. (1990). Salutogenesis: A new paradigm. *South African Journal of Psychology*, 20, 265-276.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Boston, MA: Allyn & Bacon.

- Turner, N., Barling, J., & Zacharatos, A. (2002). Positive psychology at Work. In C.R. Snyder & S.J. Lopez (Eds.). *Handbook of positive psychology* (pp. 715 – 728). Oxford, UK: Oxford University Press.
- Van der Linde, A. H., Van der Westhuizen, P. C., & Wissing, M. P. (1999). Burnout in female educators. *South African Journal of Education, 19*, 192-196.
- Van Hooff, M., Geurts, S. A. E., Taris, T. W., Kompier, M. A. J., Dikkers, J. S. E., Houtman, I. L. D., & Van Den Heuvel, F. (2005). Disentangling the relationships between work-home interference and employee health: A longitudinal study among Dutch police officers. *Scandinavian Journal of Work, Environment and Health, 31*, 15-29.
- Warr, P. (1983). Work, jobs and unemployment. *Bulletin of the British Psychological Society, 36*, 305-511.
- Wright, T. A., & Hobfoll, S. E. (2004). Commitment, psychological well-being and job performance: An examination of Conservation of Resources (COR) theory and job burnout. *Journal of Business and Management, 9*, 389-406.

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 organisations as well as suggestions for future research.

3.1 CONCLUSIONS

The objective of this study was to test a structural model of work-related well-being. The results confirm that work-related well-being is defined as the mediator between burnout and job resources, as well as that it mediates between job resources, work engagement and commitment. Too many job demands and a lack of resources lead to burnout which manifests through ill health, both physical and psychological, whereas adequate or high job resources result in work engagement and organisational commitment.

The second objective was to test a structural model of work-related well-being of a business unit within the chemical industry. The total sample compares very well to the South African norm on a collective level and represents a normal distribution pattern, i.e. individuals with very low risks, an average middle group, and a high risk group. Exhaustion is somewhat high compared to other groups or organisations, whilst work devotion and vitality are benchmarked as higher than other groups or organisations.

Employees in the chemical industry are exposed to higher job demands than in the past. This can be ascribed to many aspects which could result in high levels of exhaustion related to certain job characteristics including excessive workload, qualitative demands, physical work conditions, adverse co-worker behaviour, qualification potential, and social support by co-workers (Schnorpfeil et al., 2004). For the human spirit to thrive at work, individuals must be able to immerse themselves in their work and engage the cognitive, emotional and physical dimensions of themselves in their work (May, Gilson, & Harter, 2004). The self and role exist in some dynamic negotiable relationship in which a person both drives personal energies into role behaviours and displays the self within the role (Kahn, 1990). According to

Kelloway and Barling (1991), goal-directed, structured activity translates directly into positive mental health outcomes and indirectly affects the life satisfaction of employees (Hart, 1999; Judge & Watanabe, 1993). Work could be used to promote psychological well-being.

Job demands correlate positively with burnout, which means that if pace and amount of work, emotional load or quantitative load increases, then burnout also increases. Burnout mediated the relationship between job demands and physical and psychological ill health. Job resources correlate well with work-related well-being which implies that when organisational support, growth opportunities, social support and advancement increase, so does work-related well-being. Work-related well-being mediates the relationship between job resources and organisational commitment. If job resources are high, then work-related well-being is high. If work-related well-being increases, then organisational commitment (affective and normative commitment) increases.

The level of exhaustion of the total sample is moderate and the level of mental distance is below average. Job demands (overload) in the total sample are lower than the national norm. If job demands increase with a lack of increase in job resources, it will have a negative effect on the work engagement levels of employees (Hakanen, Bakker, & Demerouti, 2005). Ill health, which is divided into physical and psychological ill health, of employees is below average. High exhaustion levels and high mental distance levels are both strongly linked to suffering from psychological illness such as depression, anxiety, sleep disorders and high perceptions of stress. These poor well-being outcomes thus also affect the productivity levels of the participants. The components of the organisational commitment are above average relative to the national norm. According to the COBE model of Schaufeli and Bakker (2004) job resources play an intrinsic motivational role by fostering the employee's growth, learning and development, or an extrinsic motivational role by being instrumental in achieving work goals. If a business does not provide these resources, it could have a negative long-term effect which could include low performance levels, high absenteeism levels and high employee turnover (Hackman & Oldham, 1980).

3.2 LIMITATIONS

The sample size of the research study can be seen as a limitation with a response rate of 66%. Of the 400 employees in the business unit, only 265 completed the questionnaire

The most prominent language used by the employees were Afrikaans and English, but for many employees it was their second or third language as there were nine other language groups in this study sample. Thus there could have been misinterpretation of the questions.

The study was conducted with a homogenous sample, which consists of employees within a business unit in the chemical industry. Within this industry, there would probably be unique characteristics, such as a specific organisational culture and climate, which might have influenced the participants' responses.

A confidentiality clause has been included in the survey, but lack of trust in the purpose of the study, as well as uncertainty whether the information would truly be kept confidential, may have had an influence on the responses (due to bad past experiences). This could also have influenced the results.

3.3 RECOMMENDATIONS

3.3.1 Recommendations to solve the research problem

There have been many changes in the nature of work. Demands have changed from manual to mental and emotional demands (Barling, 1999; Turner, Barling, & Zacharatos (2002). Organisations need to invest effort in increasing job resources and balancing job demands in the process. The focus should be on ensuring adequate job resources to such an extent that employees feel that they have good organisational support, with evidence of healthy supervisor relationships, sufficient information and participation opportunities. The communication should be effective in terms of sharing information and feedback on performance. Clear roles and responsibilities should be communicated as well as equipping the employees with the skills, knowledge and other necessary resources to be able to fulfil their roles with confidence. Management styles should be flexible and enhance empowerment. Growth opportunities should be clear. Where there is a perception of work overload, job

evaluations should be done and redesign initiated where relevant. Building cohesiveness for the various teams should be encouraged. Awareness programmes for the importance of leave as well as stress management and coping skills should be rolled out. Health days should be promoted which should include testing for blood pressure, eye testing, promoting healthy eating and exercise as well as relaxation techniques to ensure awareness for physical and psychological ill health. An ergonomic study should be carried out to ensure proper posture. High risk individuals should be receiving feedback and counselling as soon as possible.

According to Ryan and Deci (2000), when providing feedback, rewards and proper communication, there will be enhancement of work engagement which will lead to employees feeling more competent in their work environment. When negative feedback is received, it creates a sense of incompetence which could lead to insecurity. The 'how' in providing the feedback to the employee could affect the relationship between the supervisor and the individual. The constant increase in work demands may lead to work overload. Organisational strategies should be used to tackle this problem through job redesign, flexible work hours and goal setting strategies (Rothmann, 2003). According to Rothmann (2003), a rewarding work environment is characterised by a positive, fun working environment where employees have the decision making authority to do their jobs well, there is recognition for contributions, the encouragement to create new and better ways of doing their work, and they have supervisors who create a motivating climate. The chemical industry should promote leadership in such a way that individuals are empowered to become autonomous, participate to grow and have clear career paths. This should encourage them to align their goals with those of the organisation which in turn will ensure work engagement.

A positive organisational culture and good values would play a significant part in contributing to a healthier work environment. According to Roberts and Davenport (2002), there are three areas that could be targeted to increase employees' work engagement: career development, identification with the organisation and a rewarding work environment.

The demands in the chemical industry call for ensuring that there are enough resources to enable employees to cope with demands and prevent the experience of burnout. In turn, this could lead to unmotivated employees with high levels of absenteeism who could become ill, or result in high turnover. According to Kompier and Cooper (1999), work-related well-being interventions should be evaluated in organisations according to financial results, time and

personnel resources, customer satisfaction, and health and safety. By focusing on these strategies through promoting work engagement and the decrease of burnout, the chemical industry should find that improving the well-being of their employees results in a return on investment through more focused, productive and positive employees.

3.3.2 Recommendations for future research

Many studies have been done in various organisations throughout South Africa and there are various suggested interventions. Whether or not those interventions are initiated and completed is not always ensured. When the proposed interventions are carried through it also has an impact on the effectiveness. It would be advisable to do a follow-up study to determine whether the proposed interventions have had a favourable effect on this business or not. If not, this needs to be investigated and alternative suggestions should be made and executed.

REFERENCES

- Barling, J. (1999). Changing employment relations: Empirical data, social perspectives and policy options. In D. B. Knight & A. Joseph (Eds.), *Restructuring societies: Insights from the social sciences* (pp. 59-82) Ottawa, Canada: Carlton University Press.
- Demerouti, E., Bakker, A. A., Nachreiner, P., & Schaufeli, W. B. (2001). The job demands resources model of burnout. *Journal of Applied Psychology*, 86, 499-512.
- Hakanen, J. J., Bakker, A. B., & Demerouti, E. (2005). How dentists cope with their job demands and stay engaged: The moderating role of job resources. *European Journal of Oral Sciences*, 113, 1-9.
- Hackman, J. R., & Oldham, G. R. (1980). *Work redesign*. Reading, MA: Addison-Wesley.
- Hart, P. M. (1999). Predicting employee life satisfaction: A coherent model of personality, work and non-work experiences, and domain satisfaction. *Journal of Applied Psychology*, 84, 564-584.
- Judge, T. A., & Watanabe, S. (1993). Another look at the job satisfaction-life satisfaction relationship. *Journal of Applied Psychology*, 78, 939-948.
- Kahn, W. A. (1990). Psychological conditions of personal engagement and disengaging at work. *Academy of Management Journal*, 33, 692-724.
- Kelloway, E. K., & Barling, J. (1991). Job characteristics, role stress and mental health. *Journal of Occupational Psychology*, 64, 291-304.
- Kompier, M., & Cooper, C. (1999). *Preventing stress, improving productivity*. London: Routledge.
- May, D. R., Gilson, R. L., & Harter, L. M. (2004). The psychological conditions of meaningfulness, safety and availability and the engagement of the human spirit at work. *Journal of Occupational and Organizational Psychology*, 77, 11-37.
- Roberts, D. R., & Davenport, T. O. (2002). Job engagement: Why it's important and how to improve it. *Employment Relations Today*, 29(3), 21-29.
- Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behaviour*, 25, 293-315.
- Rothmann, S. (2003). Burnout and engagement: A South African perspective. *South African Journal of Industrial Psychology*, 29(4), 16-25.
- Rothmann, S., & Rothmann, J. C. (2006). *The South African Employee Health and Wellness Survey©: User manual*. Potchefstroom: Afriforte (Pty) Ltd.

- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68-78.
- Schnorpfeil, P., Noll, A., Writz, P., Schulze, R., Ehler, U., Frey, K., & Fischer, J. E. (2004). Assessment of exhaustion and related risk factors in employees in the manufacturing industry: A cross-sectional study. *International Archives of Occupational and Environmental Health*, 75, 535-540.
- Strümpfer, D. J. W. (2002). Resilience: A stitch that saves nine. *Paper presented at the 1st South African Burnout Conference*, Potchefstroom.
- Turner, N., Barling, J., & Zacharatos, A. (2002). Positive psychology at work. In C. R. Snyder & S. J. Lopez (Eds.). *Handbook of positive psychology* (pp. 715-728). Oxford, UK: Oxford University Press.