# THE VALIDATION OF TWO BURNOUT MEASURES IN THE SOUTH AFRICAN EARTHMOVING EQUIPMENT INDUSTRY

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# COMMENTS

The reader should keep the following in mind:

- The editorial style as well as the references referred to in this mini-dissertation follow the format prescribed by the Publication Manual (4th edition) of the American Psychological Association (APA). This practice is in line with the policy of the Programme in Industrial Psychology of the North-West University, Potchefstroom Campus, to use the APA style in all scientific documents as from January 1999.

- The mini-dissertation is submitted in the form of a research article. The editorial style specified by the South African Journal of Industrial Psychology (which agrees largely with the APA style) is used, but the APA guidelines were followed in constructing tables.

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# ABSTRACT

**Title:** The validation of the Maslach Burnout Inventory – General Survey and the Oldenburg Burnout Inventory in the South African Earthmoving Equipment Industry

**Key terms:** Burnout, Maslach Burnout Inventory – General Survey (MBI-GS), Oldenburg Burnout Inventory (OLBI), validity, reliability, construct equivalence, item bias, earthmoving equipment industry, construction workers, construction industry.

The objectives of this study were to validate the Maslach Burnout Inventory – General Survey (MBI-GS) and the Oldenburg Burnout Inventory (OLBI), to determine the construct equivalence and item bias of these instruments for employees in an earthmoving equipment industry in South Africa of different language groups, to determine the correlation between the MBI-GS and the OLBI, and to investigate the relationship between burnout and various demographic characteristics. A random sample of 326 employees in an earthmoving equipment industry of eight provinces in South Africa was taken. The MBI-GS, the OLBI and a biographical questionnaire were used as measuring instruments. Cronbach alpha coefficients, inter-item correlation coefficients, Pearson product-moment correlation coefficients and exploratory factor analysis were used to analyse the data.

The results showed that three factors of the MBI-GS and two factors of the OLBI exist for different language groups. Exploratory factor analysis with target rotations confirmed the construct equivalence of the three factors of the MBI-GS and the two factors for the OLBI for different language groups. No evidence was found for uniform or nonuniform bias of the items of the MBI-GS or the OLBI for different language groups. Results indicated that no differences with respect to levels of burnout exist between various demographic characteristics.

Recommendations were made for further research.

# OPSOMMING

**Titel:** Die validering van die Maslach-Uitbrandingsvraelys – Algemene Opname en die Oldenburg-Uitbrandingsvraelys in die Suid-Afrikaanse Grondverskuiwings-toerustingindustrie

**Sleutelterme:** Uitbranding, Maslach-Uitbrandingsvraelys – Algemene Opname, Oldenburg-Uitbrandingsvraelys (OLBI), betroubaarheid, geldigheid, konstrukekwivalensie, itemsydigheid, grondverskuiwingstoerustingindustrie, konstruksiewerkers, konstruksie-industrie.

Die doelstellings van hierdie studie was om die Maslach-Uitbrandingsvraelys – Algemene Opname (MBI-GS) en die Oldenburg-Uitbrandingsvraelys (OLBI) te valideer vir werknemers in 'n grondverskuiwingstoerustingindustrie, om die konstrukekwivalensie en itemsydigheid daarvan vir verskillende taalgroepe te bepaal, die korrelasie tussen die MBI-GS en die OLBI te bepaal, asook om die verhouding tussen uitbranding en verskillende demografiese groepe te bepaal. 'n Ewekansige steekproef ($n$= 326) is geneem onder werknemers in 'n grondverskuiwingstoerustingindustrie in agt provinsies. Die MBI-GS, die OLBI en 'n biografiese vraelys is as meetinstrumente gebruik. Cronbach alfakoëffisiënte, interitem-korrelasiekoëffisiënte, Pearson-produkmoment-korrelasiekoëffisiënte en eksploratiewe faktoranalise is gebruik om die data te ontleed.

Die resultate het getoon dat drie faktore van die MBI-GS en twee faktore van die OLBI vir verskillende taalgroepe bestaan. Geen bewyse is gevind vir uniforme of nie-uniforme sydigheid van die items van die MBI-GS of van die OLBI vir verskillende taalgroepe nie. Bevindinge het getoon dat daar geen verskille ten opsigte van vlakke van uitbranding tussen verskillende demografiese groepe voorkom nie.

Aanbevelings vir toekomstige navorsing is aan die hand gedoen.

# CHAPTER 1

# INTRODUCTION

This mini-dissertation focuses on the validation of the Maslach Burnout Inventory – General Survey and the Oldenburg Burnout Inventory in a South African earthmoving equipment industry.

This chapter contains the problem statement and a discussion of the research objectives, in which the general objective and specific objectives are set out. The research method is explained and the division of chapters given.

## 1.1 PROBLEM STATEMENT

Burnout is recognised as a meaningful phenomenon of the modern age and the term began to appear frequently in the 1970s (Maslach, Schaufeli & Leiter, 2001). Maslach and Jackson (1986), defined burnout as a syndrome of emotional exhaustion, depersonalisation and reduced personal accomplishment, which can occur among individuals who do "people work" of some kind. However, a "working" definition of burnout was given by Schaufeli and Enzmann (1998, p. 36), in which the burnout phenomenon was described as "a persistent, negative, work-related state of mind in 'normal' individuals, which is primarily characterised by distress, a sense of reduced effectiveness, decreased motivation, and the development of dysfunctional attitudes and behaviours at work".

Many experts regard burnout as the final step of a range of unsuccessful attempts to cope with stressful conditions (Gold, 1984). According to Schaufeli and Enzmann (1998), burnout can be considered as a particular kind of prolonged stress. Thus, burnout can be seen as a final stage in a breakdown in adaptation, which results from the long-term imbalance of demands and resources and is accompanied by chronic malfunctioning at work (Lazarus & Folkman, 1984). The concept of burnout has been researched and studied in countries all over the world (Maslach et al., 2001). Burnout is also the subject of numerous books (e.g. Edelwich & Brodsky, 1980),

magazine and newspaper reports (e.g. Longcope, 1982), and professional articles (e.g. Thornton, 1992), indicating the importance of this phenomenon.

The initial work on burnout developed out of the occupational sector of human services and education (Maslach et al., 2001). Thereafter, burnout was studied in various occupational fields – both nationally and internationally. International research on burnout has been carried out in various occupations, including policing (Biggam, Power, MacDonald, Carcary & Moodie, 1997; Kop, Euwema & Schaufeli, 1999), human services (Anderson, 2000) and the teaching profession (Mearns & Cain, 2003; Weisberg & Sagie, 1999).

In South Africa, extensive research has been carried out on burnout of police officers (Storm, 2002), emergency workers (Naudé & Rothmann, 2004), pharmacists (Rothmann, Malan & Rothmann, 2001), psychiatric nurses (Levert, Lucas & Ortlepp, 2000), managers in the manufacturing industry (Jansen van Vuuren & Rothmann, 2002), pharmacist's assistance (Mostert, Van Rensburg & Rothmann, 2004), academic staff in Higher Education Institutions (Barkhuizen & Rothmann, 2004), student leaders in Higher Education Institutions (Sieberhagen & Pienaar, 2004) as well as tertiary students (Jackson, Mostert & Pienaar, 2004). However, it seems that not much research has been done into the experience of burnout of employees in the earthmoving equipment industry.

The earthmoving equipment industry includes the building of schools, office buildings, shopping centres, dams, bridges, sewer treatment facilities, industrial plants, roads and highways (Applebaum, 1981). This industry has also become progressively larger over the last four decades (Singh, 1997). Earthmoving plays an important role in industries such as construction and mining that are constantly under pressure to improve productivity, efficiency and safety (Singh, 1997). Furthermore, construction work can lead to physical fatigue, which, in turn, may lead to reduced productivity and motivation, as well as job dissatisfaction and safety risks, accidents and injuries (National, 2000). The construction industry is also a very demanding and stressful work environment and many job-related stressors are likely to be pertinent to the work of manager, supervisors and professionals engaged in the industry (Lingard, 2003; Smallwood, 1997). Many worksites are hazardous for humans – unstructured and outdoor environments,

poor visibility conditions and inclement weather conditions (Singh, 1997). According to Gold (1984), work-related stressors such as these can cause burnout.

It is important to use valid and reliable instruments when burnout is measured in the earthmoving equipment industry. In most of the research that has been done on burnout, the Maslach Burnout Inventory (MBI) (Maslach & Jackson, 1986) was used (Schaufeli & Enzmann, 1998). The MBI encompassed all three of the core dimensions of burnout (Maslach et al., 2001). However, with the growing body of empirical research, adaptive versions of the original MBI were developed. According to Maslach et al. (2001), the MBI – Human Services Survey (MBI-HSS) was developed for use by people working in the human services and health care. A second version was developed for use by people working in educational settings, namely the MBI – Educators Survey (MBI-ES). However, research showed that burnout is no longer restricted to the caring professions – it also exists outside the human services (Maslach & Leiter, 1997). The apparent need for an instrument that measures burnout in non-contactual professional context was met by the introduction of a third version of the MBI, the MBI – General Survey (Schaufeli, Leiter, Maslach & Jackson, 1996). The MBI-GS can be used in any occupational context and assesses parallel dimensions to those contained in the original MBI, except that the items do not explicitly refer to working with people (Schaufeli & Enzmann, 1998).

In the helping professions (including education), the three dimensions of burnout are distinguished as emotional exhaustion, depersonalisation and low personal accomplishment (Maslach, et al., 1996). Since the employees of the earthmoving equipment industry are functioning in a non-helping profession, the study will focus on exhaustion, cynicism and professional efficacy (as it is measured with the MBI-GS):

- **Exhaustion** refers to feelings of fatigue, without direct reference to people as the source of those feelings.
- **Cynicism** can been seen as an indifference or an aloof attitude towards one's work in general, where the items refer to work itself rather than to recipients of one's services or to personal relationships at work.
- **Professional Efficacy** encompasses both social and non-social accomplishments at work.

The three dimensions of the MBI-GS are interrelated. Cynicism is highly related to Exhaustion ($0,44 < r < 0,61$), and also strongly related to Professional Efficacy ($-0,38 < r < -0,57$) (Schaufeli et al., 1996). In light of the above, it appears that burnout can validly be measured across a range of different occupations, despite the difference between human service occupations and non-contactual professions.

The MBI-GS has evidenced satisfactory internal consistencies ranging from 0,73 (Cynicism) to 0,91 (Exhaustion) (Leiter & Schaufeli, 1996). Reliability analyses showed that the Exhaustion and Professional Efficacy subscales were sufficiently internally consistent, but that one Cynicism item should be removed in order to increase internal consistency beyond the criteria of 0,70 (Klopper & Mostert, 2004; Schutte, Toppinen, Kalimo & Schaufeli, 2000; Storm, 2002).

Various studies were found in South African samples where the MBI-GS was used. In a sample of senior managers in a manufacturing industry, Rothmann and Jansen van Vuuren (2002) found satisfactory alpha coefficients (Exhaustion = 0,79; Cynicism = 0,84 (after item 13 has been omitted); Professional Efficacy = 0,84). Rothmann and Malan (2003) reported higher alpha coefficients (Exhaustion = 0,89; Cynicism = 0,76; Professional Efficacy = 0,85), while Rothmann, Jackson and Kruger (2003) found lower alpha coefficients for Cynicism ($\alpha$ = *0,72, after item 13 has been omitted) and Professional Efficacy* ($\alpha$ = *0,69). Storm and Rothmann (2003) found alpha coefficients of 0,88 for Exhaustion, 0,78 for Cynicism and 0,79 for Professional Efficacy. With this taken into account, it can be expected that the MBI-GS will be sufficiently internally consistent.*

*Although the psychometric properties of the MBI-GS were tested in South African samples (e.g. police officers, Storm, 2002; and teachers, Jackson & Rothmann, 2004), the Maslach Burnout Inventory – General Survey (MBI-GS) is not yet validated for employees in a South African earthmoving industry. Consequently, it is also difficult to identify burnout at an early stage and, due to lack of South African norms for the MBI-GS, the implementation of intervention programmes is hampered.*

*Although the Maslach Burnout Inventory remains the most popular, and almost universally used, instrument to assess burnout (Schaufeli & Enzmann, 1998), an alternative measure of burnout that can be used is the Oldenburg Burnout Inventory (OLBI) (Demerouti, Bakker, Vardakou & Kantas, 2003). The OLBI was developed in Germany, whereas the MBI-GS was initially developed for English-speaking populations (Demerouti et al., 2003). The OLBI was constructed and validated among different occupational groups (Demerouti & Nachreiner, 1998) at the same time that the MBI-GS was developed. The OLBI is based on the theoretical work of Cherniss (1980) and Hall (1976) and can be used among occupations within and outside human service professions with consistent central elements of the burnout construct (Demerouti, Bakker, Nachreiner & Ebbinghaus, 2002).*

*The OLBI conceives burnout as a syndrome of work-related negative experiences, comprising two dimensions: feelings of exhaustion and disengagement from work (Demerouti et al., 2002, 2003). Exhaustion is defined as a consequence of prolonged and intense physical, affective and cognitive strain as the result of prolonged exposure to specific working conditions (or stressors). This conceptualisation corresponds to definitions of exhaustion as proposed by Aronson, Pines and Kafry (1983), Lee and Ashfort (1993), and Shirom (1989). In contrast to exhaustion as it is operationalised in the MBI-GS, the OLBI covers not only affective aspects (e.g. feelings of being emotionally drained), but also physical and cognitive aspects of exhaustion (e.g. the need for long resting time). This make the OLBI more applicable both to those workers who perform physical work and to those whose job is mainly about processing information, especially because there is something more related to feelings of exhaustion and not just emotions (Demerouti et al., 2002, 2003).*

*The OLBI's disengagement scale refers to distancing oneself from one's emotions regarding the work task (e.g. uninteresting, no longer challenging, "disgusting"), and to a devaluation and mechanical execution of one's work (Demerouti et al., 2002). Demerouti et al. (2003) refer to disengagement as distancing oneself from one's work and experiencing negative attitudes toward the work object, work content, or one's work in general, whereas depersonalisation in the original MBI refers to distancing oneself emotionally from service recipients. Furthermore, disengagement items concern the relationship between the employee and his or her job,*

*especially regarding engagement and identification (Demerouti et al., 2003). Thus, disengagement and depersonalisation differ in their content and the objects to be valued (Demerouti et al., 2003).*

*Professional Efficacy is not considered as a separate burnout dimension (Demerouti et al., 2003). According to Leiter (1993), emotional exhaustion leads to depersonalisation, whereas feelings of reduced personal accomplishment – that parallel professional efficacy – develop independently. Green, Walkey and Taylor (1991) argue that emotional exhaustion and depersonalisation constitute the core dimensions of burnout, whereas feelings of reduced personal accomplishments may also be interpreted as a possible consequence of burnout (Shirom, 1989). A meta-analysis of the correlates of the burnout dimensions confirms the independent role of professional efficacy (Lee & Ashfort, 1996).*

*From a psychometric point of view, Guilford (1954) argues that one-sided scales (such as the MBI-GS, where all the exhaustion and cynicism items are phrased negatively and all the professional efficacy items are phrased positively) are inferior to scales that include both positively and negatively worded items. The OLBI includes both negatively and positively worded items.*

*The OLBI has been constructed and validated in an independent study among 293 German employees from different occupational fields, including human services and blue-collar workers (Ebbinghaus, 1996). A factor analysis confirmed the two-factor structure of the burnout construct (Ebbinghaus, 1996). Discriminate and convergent validity for both scales were examined by assessing their relationships with the subscales of the BMS (in German: Belastung Monotonie Sättigung), a reliable and valid German questionnaire for measuring short-term stress reactions at work. Furthermore, a series of first and second order factor analyses supported the OLBI's discriminate validity. Ebbinghaus' (1996) study supported the convergent validity of the OLBI by showing that both burnout dimensions were only related to the conceptually most relevant constructs. Exhaustion was significantly related to psychological fatigue ($r = 0,53$, $p < 0,05$), but not to satisfaction ($r = 0,00$), whereas disengagement was significantly related to satisfaction ($r = 0,53$, $p < 0,05$), but not to psychological fatigue ($r = -0,10$).*

*Apart from a study in Greece (Demerouti et al., 2003), both burnout instruments (the MBI-GS and the OLBI) have not yet been validated on the same population. Also, no other studies were found in the literature where burnout was measured by means of the OLBI. The OLBI has not yet been validated in other countries or in an earthmoving equipment industry. This is therefore the first study in South Africa to validate the OLBI and to investigate whether both the MBI-GS and the OLBI measure the same burnout construct.*

*When burnout measures are applied to different cultural groups, issues of measurement equivalence and bias become important (Van de Vijver & Tanzer, 1997). Equivalence and bias of measuring instruments should be computed in all studies that take place in a multicultural or cross-cultural context (Van de Vijver & Leung, 1998).*

*Van de Vijver and Leung (1997) make a hierarchical distinction of three types of equivalence. The first type, namely construct equivalence, indicates the extent to which the same construct is measured across all cultural groups studied. When an instrument measures different constructs in different cultures, i.e. when cultural equivalence exists, no comparison can be made. The same construct is measured in case of construct equivalence (also labelled structural equivalence). The second type of equivalence is called measurement unit equivalence and can be obtained when metric measures have the same measurement unit but have different origins. The third type of equivalence is called scalar equivalence and can be obtained when two metric measures have the same measurement unit and the same origin. Equivalence cannot be assumed but should be established and reported in each study (Van de Vijver & Leung, 1997). Construct equivalence is the most frequently studied type of equivalence.*

*Item bias should also be computed. An item is an unbiased measure of a theoretical construct (for example burnout) if persons from different cultural groups who are equally burned out have the same average score on the item (Van de Vijver & Leung, 1997). Persons with an equal standing on the theoretical construct underlying the instrument should have the same expected score on the item, irrespective of group membership. The definition of bias does not stipulate that the averages of cultural groups should be identical, but only that these averages should be identical across cultural groups for persons who are equally burned out.*

*Item bias can be produced by sources such as incidental differences in appropriateness of the item content and inadequate item formulation. Bias will lower the equivalence of a measuring instrument. Two types of item bias are distinguished, namely uniform bias and nonuniform bias (Van de Vijver & Leung, 1997). Uniform bias refers to influences of bias on scores that are more or less the same for all score levels, whereas influences that are not identical for all score levels are referred to as nonuniform bias.*

*Finally, the influence of demographic variables on burnout is examined. The relationship between burnout on the one hand and gender, race, age, language, educational level, business unit and household situation on the other hand, is concentrated on in this study.*

*The following research questions emerge from the above-mentioned problem statement:*

- What are the reliability and validity of the MBI-GS for employees in the earthmoving equipment industry in South Africa?
- What are the reliability and validity of the OLBI for employees in the earthmoving equipment industry?
- What are the construct equivalence and item bias of the MBI-GS?
- What are the construct equivalence and item bias of the OLBI?
- How do the MBI-GS and the OLBI correlate?
- What is the relationship between burnout and various demographic characteristics?
- What recommendations could be made for future research?

## 1.2 RESEARCH OBJECTIVES

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

### 1.2.1 General objectives

The general objective of this research is to validate the MBI-GS and the OLBI and to determine the construct equivalence and item bias of these instruments for employees in an earthmoving equipment industry in South Africa.

### 1.2.2 Specific objectives

The specific objectives of the research are the following:

- To determine the reliability and validity of the MBI-GS for employees in the earthmoving equipment industry in South Africa.
- To determine the reliability and validity of the OLBI for employees in the earthmoving equipment industry in South Africa.
- To determine the construct equivalence and item bias of the MBI-GS.
- To determine the construct equivalence and item bias of the OLBI.
- To determine the correlation between the MBI-GS and the OLBI.
- To investigate the relationship between burnout and various demographic characteristics
- To make recommendations for future research.

## 1.3 RESEARCH METHOD

The research method consists of a literature review and an empirical study. The results obtained from the research will be presented in an article format. Because separate chapters were not targeted for literature reviews, this paragraph focuses on aspects relevant to the empirical study that was conducted. The reader should note that a brief literature review was compiled for the purpose of the article.

### 1.3.1 Research design

A cross-sectional survey design is used to reach the objectives of this research. Cross-sectional designs are used to examine groups of subjects in various stages of development simultaneously, while the survey describe a technique of date collection in which questionnaires are used to gather data about an identified population (Burns & Grove, 1993). This design is well suited to the descriptive and predictive functions associated with correctional research, whereby relationships between variables are examined (Shaughnessy & Zechmeister, 1997).

### 1.3.2 Participants

Random samples ($n$ = 326) were taken from earthmoving companies in Limpopo, Gauteng, Mpumalanga, Northern Cape, Western Cape, Eastern Cape, KwaZulu-Natal and North West.

The following formula proposed by Kerlinger and Lee (2000) is used to determine the sample size for this study:

$$n' = \frac{n}{1 + \frac{n}{N}}$$

and

$$n = z^2 \times \frac{SD^2}{d^2}$$

where $n'$ = estimated sample size; $n$ = the estimated sample size using the formula; $N$ = the size of the population; $z$ = standard score corresponding to the specified probability of risk; $SD$ = the standard deviation of the population, and $d$ = the specified deviation.

The values for $z$, $SD$ and $d$ were determined, based on previous studies of burnout in South Africa (Storm & Rothmann, 2003).

### 1.3.3 Measuring battery

Two questionnaires are used in the empirical study, namely the Maslach Burnout Inventory – General Survey (MBI-GS) (Schaufeli et al., 1996) and the Oldenburg Burnout Inventory (OLBI) (Demerouti et al., 2000).

- The *Maslach Burnout Inventory – General Survey* (MBI-GS) (Schaufeli et al., 1996) has three subscales: Exhaustion (Ex) (five items, e.g. "I feel used up at the end of the workday"), Cynicism (Cy) (five items, e.g. "I have become less enthusiastic about my work") and Professional Efficacy (PE) (six items, e.g. "In my opinion, I am good at my job"). Together, the subscales of the MBI-GS provide a three-dimensional perspective on burnout. Internal consistencies (Cronbach coefficient alphas) reported by Schaufeli et al. (1996) varied from 0,87 to 0,89 for Exhaustion, 0,73 to 0,84 for Cynicism and 0,76 to 0,84 for Professional Efficacy. Test-retest reliabilities after one year were 0,65 (Exhaustion), 0,60 (Cynicism) and 0,67 (Professional Efficacy) (Schaufeli et al., 1996). All items are scored on a 7-point frequency-rating scale, ranging from 0 to 6. High scores on Exhaustion and Cynicism, and low scores on Professional Efficacy are indicative of burnout. Storm (2002) confirmed the 3-factor structure of the MBI-GS in a sample of 2 396 members of the South African Police Service (SAPS), but recommended that Item 13 be dropped from the questionnaire. She confirmed the structural equivalence of the MBI-GS for different race groups in the SAPS. The following Cronbach alpha coefficients were obtained for the MBI-GS: Exhaustion: 0,88; Cynicism: 0,79; Professional Efficacy: 0,78 (Storm, 2002).

- The *Oldenburg Burnout Inventory* (OLBI) (Demerouti et al., 2000) was constructed and validated in an independent study among 293 employees from different occupational fields, including human services and blue-collar workers (Ebbinghaus, 1996). The inventory measures burnout independent of vocational aspects on two dimensions, namely exhaustion and disengagement. The seven items of the Exhaustion subscales are generic and refer to general feelings of emptiness, overtaxing from work, a strong need for rest, and a state of emotional exhaustion. Examples are: 'After my work, I regularly

feel worn out and weary', and 'After my work, I regularly feel totally fit for my free-time activities' (reversed). Disengagement refers to distancing oneself from one's work (work object and content), and to negative, cynical attitudes and behaviours towards one's work in general. This subscale encompasses eighteen items, including: 'I frequently talk about my work in a negative way', and 'I get more and more engaged in my work' (reversed).

Furthermore, a biographic questionnaire was developed to gather information about demographic characteristics. Information that was gathered included gender, race, age, language, educational level, business unit and household situation.

### 1.3.4 Statistical Analysis

The statistical analysis is carried out with the help of the SPSS Program (SPSS Inc., 2003) as well as the SAS Program (SAS Institute, 2000). Cronbach alpha coefficients and exploratory factor analyses are used to assess the reliability and validity of the measuring instruments (Clark & Watson, 1995). Descriptive statistics (e.g. means, standard deviations, skewness and kurtosis) are used to analyse the data.

*Item-level analysis (item-bias analysis)* is performed by using analysis of variance (ANOVA) for the instruments (yielding interval-level scores). An item is unbiased if persons from different language groups, with an equal standing on the theoretical construct underlying the instrument, have the same expected score on the item (e.g. Van de Vijver & Leung, 1997). Even though several statistical techniques are available for analysing item bias, analysis of variance has the advantage of computational simplicity, robustness and the possibility to study both uniform and nonuniform bias (Mellenbergh, 1982). Therefore, analysis of variance is used in this study. The dependent variable is the item score, while language and score levels are the independent variables. A significant main effect of language groups is taken to point to uniform bias and a significant interaction of score level and language groups points to nonuniform bias.

Construct equivalence of the instruments is also performed. According to Van de Vijver and Leung (1997), construct equivalence can be investigated with several techniques, such as factor

analysis, cluster analysis, and multidimensional scaling or other dimensionality-reducing techniques. The basic idea behind the application of these techniques is to obtain a structure in each culture – which can then be compared across all cultures involved. The most frequently employed technique for studying construct equivalence is factor analysis. Exploratory factor analysis is used to examine construct equivalence. A principal components analysis is conducted to determine the number of factors of the MBI-GS and the OLBI in the total sample. In order to determine the solution for each language group, a direct oblimin rotation is used. Factors obtained in each group are compared (after target rotation). The agreement is evaluated by a factor congruence coefficient, Tucker's phi (Van de Vijver & Leung, 1997). Values above 0,90 are taken to point to essential agreement between cultural groups, while values above 0,95 point to very good agreement. A high agreement implies that the factor loadings of the lower and higher level are equal up to a multiplying constant. The latter is needed to accommodate possible differences in eigenvalues of factors for the different language groups.

Multivariate analysis of variance (MANOVA) is used to determine the significance of differences between the burnout of demographic groups. MANOVA tests whether mean differences among groups on a combination of dependent variables are likely to have occurred by chance (Tabachnick & Fidell, 2001). In MANOVA a new dependent variable that maximises group differences is created from the set of dependent variables. One-way analysis is then performed on the newly created dependent variable. Wilk's lambda is used to test the likelihood of the data under the assumption of equal population mean vectors for all groups against the likelihood under the assumption that the population mean vectors are identical to those of the sample mean vectors for the different groups. When an effect is significant in MANOVA, one-way analysis of variance (ANOVA) is used to discover which dependent variables had been affected. Because multiple ANOVAs are used, a Bonferroni-type adjustment is made for inflated Type I error. Tukey tests are done to indicate which group differed significantly when ANOVAs are done.

T-tests are used to determine differences between the groups in the sample. Effect size (Cohen, 1998; Steyn, 1999) is used in addition to statistical significance to determine the significance of relationships. Effect sizes indicated whether obtained results are practically significant. A cut-

off point of 0,50 (medium effect) (Cohen, 1998) is set for the practical significance of differences between means.

## 1.4 OVERVIEW OF CHAPTERS

In Chapter 2, the Maslach Burnout Inventory – General Survey and the Oldenburg Burnout Inventory are discussed, as well as the differences of burnout between various groups. This chapter also deals with the empirical study. Chapter 3 deals with the discussion, limitations, and recommendations of this study.

## 1.5 CHAPTER SUMMARY

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

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# Chapter 2

## Research Article

# THE VALIDATION OF TWO BURNOUT MEASURES IN THE SOUTH AFRICAN EARTHMOVING EQUIPMENT INDUSTRY*

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## ABSTRACT

The objectives of this study were to validate the Maslach Burnout Inventory – General Survey (MBI-GS) and the Oldenburg Burnout Inventory (OLBI) for employees in an earthmoving equipment industry in South Africa, to determine the construct equivalence and bias for different language groups, and to investigate the relationship between burnout and various demographic characteristics. A cross-sectional survey design was used. Random samples ($n$ = 326) were taken of employees in an earthmoving equipment industry of eight provinces in South Africa. The MBI-GS, the OLBI and a biographical questionnaire were administered. Exploratory factor analysis with target rotations confirmed the construct equivalence of the three factors of the MBI-GS and the two factors for the OLBI for different language groups. No evidence was found for uniform or nonuniform bias of the items of the MBI-GS or the OLBI for different language groups. Results indicated that no differences with respect to levels of burnout exist between various demographic characteristics.

## OPSOMMING

Die doelstellings van hierdie studie was om die Maslach Uitbrandingsvraelys – Algemene Opname (MBI-GS) en die Oldenburg Uitbrandingsvraelys (OLBI) te valideer vir werknemers in 'n grondverskuiwingstoerustingindustrie, om die konstrukekwavilensie en sydigheid daarvan vir verskillende taalgroepe te bepaal, en om die verhouding tussen uitbranding en verskillende demografiese groepe te bepaal. 'n Dwarsdeursnee-ontwerp is gebruik. Gestratifiseerde ewekansige steekproewe ($n$ = 326) is geneem van werknemers in 'n grondverskuiwingstoerustingindustrie. Eksploratiewe faktoranalise met teikenrotasie het die konstrukekwivalensie van die drie faktore vir die MBI-GS en twee faktore vir die OLBI vir verskillende taalgroepe bevestig. Bewyse is nie gevind vir uniforme of nie-uniforme sydigheid van die items van die MBI-GS of van die OLBI vir verskillende taalgroepe nie. Bevindinge het getoon dat daar geen verskille ten opsigte van vlakke van uitbranding tussen verskillende demografiesekaraktertrekke voorkom nie.

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Burnout was originally almost exclusively studied as an occupational issue for people providing human services (Schaufeli & Enzmann, 1998). The concept of burnout was linked to human services such as health care, education and social work, where employees do "people work" of some kind (Maslach & Leiter, 1997). However, nearly a quarter of a century of research and practice made it clear that burnout also exists outside the human services. The need for an instrument that measures burnout in non-contactual professional contexts was met by the introduction of the Maslach Burnout Inventory – General Survey (MBI-GS) (Schaufeli, Leiter, Maslach & Jackson, 1996). The MBI-GS assesses parallel dimensions to those contained in the original Maslach Burnout Inventory, except that the items do not explicitly refer to working with people.

Although the Maslach Burnout Inventory remains the most popular, and almost universally used, instrument to assess burnout (Schaufeli & Enzmann, 1998), an alternative measure of burnout that can be used is the Oldenburg Burnout Inventory (OLBI) (Demerouti, Bakker, Nachreiner & Schaufeli, 2001). The OLBI was constructed and validated among different occupational groups (Demerouti & Nachreiner, 1998) at the same time that the MBI-GS was developed.

A great deal of research has been done on burnout in various occupational fields in South Africa (e.g. police officers, Storm, 2002; emergency workers, Naudé & Rothmann, 2004; pharmacists, Rothmann, Malan & Rothmann, 2001; academic staff in Higher Education Institutions, Barkhuizen & Rothmann, 2004; managers in the manufacturing industry, Jansen van Vuuren & Rothmann, 2002). However, it seems that not much research has been done into the experience of burnout of employees in the earthmoving equipment industry.

According to Applebaum (1981), the earthmoving equipment industry includes the building of schools, office buildings, shopping centres, dams, bridges, sewer treatment facilities, industrial plants, roads and highways. In industries such as construction and mining, earthmoving plays a fundamental role (Singh, 1997). The construction industry evolves around a very demanding and stressful work environment (Lingard, 2003). Many worksites are hazardous for humans – unstructured and outdoor environments, poor visibility conditions and inclement weather

conditions (Singh, 1997). According to Gold (1984), such work-related stress experienced by an individual could cause burnout.

Apart from a study done in Greece (Demerouti et al., 2003), both burnout instruments (the MBI-GS and the OLBI) have not yet been validated on the same population. Also, no other studies were found in the literature where burnout was measured by means of the OLBI. The OLBI has not yet been validated in other countries, or in the earthmoving equipment industry. This is therefore the first study in South Africa to validate the OLBI and to investigate whether both the MBI-GS and the OLBI measure the same burnout construct.

The objectives of this study are to validate the MBI-GS and the OLBI, to determine the construct equivalence and item bias of these instruments for employees in an earthmoving equipment industry in South Africa, to determine the correlation between the MBI-GS and the OLBI and to investigate the relationship between burnout and various demographic characteristics.

**Burnout and its different ways of measurement**

Herbert Freudenberger (1974) is generally considered to be the 'founding father' of the burnout syndrome. He described burnout as a state of chronic emotional fatigue. More recently, Schaufeli & Enzmann (1998, p. 36) defined burnout as "a persistent, negative, work-related state of mind in 'normal' individuals, which is primarily characterised by distress, a sense of reduced effectiveness, decreased motivation, and the development of dysfunctional attitudes and behaviours at work".

Initially research concentrated on caregiving and service occupations (Freudenberger, 1974; Maslach, 1976). However, Schaufeli, Martinez, Pinto, Salovana and Bakker (2002) explain that burnout is no longer restricted to the caring professions and that all types of professions and occupational groups can experience burnout. Thus, an adapted version of the Maslach Burnout Inventory (Maslach & Jackson, 1986) was developed, namely the Maslach Burnout Inventory – General Survey (Schaufeli et al., 1996). The MBI-GS assesses parallel dimensions to those contained in the original MBI, except that the items do not explicitly refer to working with

people (Schaufeli et al., 1996). The MBI-GS comprises three subscales: Exhaustion (EX), Cynicism (CY) and Professional Efficacy (PE). Exhaustion refers to fatigue, but without direct reference to people as the source of those feelings. Cynicism can been seen as an indifference or an aloof attitude towards one's work in general, where the items refer to work itself rather than to recipients of one's services or to personal relationships at work.

The three dimensions of the MBI-GS are interrelated: Cynicism is highly related to Exhaustion ($0,44 < r < 0,61$), and also strongly related to Professional Efficacy ($-0,38 < r < -0,57$) (Schaufeli et al., 1996). Thus it appears that burnout can be validly measured across a different range of occupations. Internal consistencies (Cronbach coefficient alphas) reported by Schaufeli et al. (1996) varied from 0,87 to 0,89 for Exhaustion, 0,73 to 0,84 for Cynicism and 0,76 to 0,84 for Professional Efficacy. Test-retest reliabilities after one year were 0,65 (Exhaustion), 0,60 (Cynicism) and 0,67 (Professional Efficacy) (Schaufeli et al., 1996).

Although the psychometric properties of the MBI-GS were tested in samples in South Africa, (police officers, Storm, 2002; teachers, Jackson & Rothmann, 2004), the Maslach Burnout Inventory – General Survey (MBI-GS) has not yet been validated for employees in a South African earthmoving industry.

The MBI-GS still suffers from one of the same methodological deficiencies as the original MBI: the items in each subscale are phrased in the same direction (Demerouti, Bakker, Nachreiner & Ebbinghaus, 2002). All Exhaustion and Cynicism items are phrased negatively, while all Professional Efficacy items are phrased positively. According to Guildord (1954), such one-sided scales are inferior to scales that include both positively and negatively phrased items.

An instrument that does include both positively and negatively worded items, as requested by conventional psychometric standards, is the Oldenburg Burnout Inventory (OLBI) (Demerouti et al., 2002). The OLBI conceives burnout as "a syndrome of work-related negative experiences, including feelings of exhaustion and disengagement at work" (Demerouti et al., 2002) and can be used among occupations within and outside human service professions. The OLBI includes two dimensions, namely exhaustion and disengagement from work. Exhaustion is defined as "a

consequence of intensive physical, affective and cognitive strain, i.e. as a long-term consequence of prolonged exposure to certain job demands" (Demerouti, Bakker, Vardakou & Kantas, 2003). According to Demerouti et al. (2003), the disengagement scale refers to distancing oneself from one's work and experiencing negative attitudes towards the work object, work content, or one's work in general.

The OLBI was constructed and validated in Germany among different occupational groups (Demerouti, 1999; Demerouti & Nachreiner, 1998). Exploratory and confirmatory factor analysis confirmed its two-dimensional factorial structure (Ebbinghaus, 1996). Demerouti et al., (2002) examined the factorial validity of burnout as measured by the OLBI. Results confirmed that burnout has a two factor structure, with exhaustion and disengagement as separate but correlated dimensions. This structure was also invariant across human services and industrial production work. This consistency of the factorial structure of the OLBI across different occupational groups confirms the generalisability of the burnout construct to other occupations and suggests that human service burnout represents only one specific manifestation of burnout (Demerouti & Nachreiner, 1998).

**Comparing the different measurements of burnout**

When looking at the two different means of measurement, it can be seen that the scales differ in content. The OLBI's exhaustion scale refers not only to affective aspects of exhaustion, as is the case with the MBI-GS, but includes physical and cognitive aspects as well (Demerouti et al., 2002, 2003). The OLBI's disengagement scale refers to emotions toward the work task as well as to devaluation and mechanical executions of one's work, while the MBI-GS's cynicism scale restricts itself to measuring mainly subjective job meaninglessness and the lack of interest employees have in their jobs (Demerouti et al., 2002).

The third dimension of burnout, feelings of reduced personal accomplishment – or professional efficacy – in more general terms are not considered as a separate burnout dimension, when using the OLBI. Several reasons are given for this argument. Firstly, Leiter (1993) argued and showed that emotional exhaustion leads to depersonalisation, whereas professional efficacy

develops independently. Secondly, the independent role of personal accomplishment has been confirmed through a meta-analysis of the correlates of the burnout dimensions (Lee & Ashfort, 1996), and thirdly, personal accomplishment is the weakest burnout dimension in terms of significant relationships with other variables (Lee & Ashfort, 1996; Schaufeli & Enzmann, 1998).

The convergent validity of the OLBI and the MBI-GS was confirmed in a study among 232 Greek employees from different occupations (Demerouti et al., 2003). Results of multitrait-multimethod analysis included both the OLBI and the MBI-GS and showed that the burnout components and the measurement instruments could explain the responses to the various items. The bivariate correlation between OLBI exhaustion and MBI-GS exhaustion was 0,60 and the same correlation was found between OLBI disengagement and the MBI-GS cynicism.

From an empirical point of view it is not only important to obtain a valid and reliable measurement of burnout but also to test measurement equivalence and bias in contexts where differences in scores could be attributed to cultural influences in terms of item meaning and understanding. Invalid conclusions regarding the constructs under study could be made if cultural influences are not accounted for.

Construct equivalence, according to Van de Vijver and Leung (1997), indicates the extent to which the same construct is measured across all cultural groups studied. No comparison can be made if an instrument measures different constructs in different cultures. Item bias concerns aspects of measurement validity in intercultural group comparison (Van de Vijver & Leung, 1997). An unbiased item would provide the same average score on an item if two people from different cultural groups are similar in terms of the construct measured by this item. Two types of item bias are distinguished, namely uniform bias (influences of bias on scores that are more or less the same for all score levels) and nonuniform bias (influences that are not identical for all score levels).

Finally, the influence of demographic variables on burnout, as measured with the MBI-GS and the OLBI, was examined. The relationship between burnout on the one hand and gender, race,

age, language, educational level, business unit and household situation on the other hand, will be concentrated on in this study.

The above discussion leads to the following hypotheses:

H1: Burnout, as measured by the MBI-GS, is a three-dimensional construct (consisting of Exhaustion, Cynicism and Professional Efficacy) and shows high internal consistency.

H2: Burnout, as measured by the OLBI, is a two-dimensional construct (consisting of Exhaustion and Disengagement) and shows high internal consistency.

H3: Burnout, as measured by the MBI-GS and the OLBI, is an equivalent and unbiased construct for different language groups within the earthmoving equipment industry.

H4: No differences exist between burnout and various demographic characteristics.

## METHOD

### Research design

A cross-sectional survey design was used to reach the objectives of this research. Cross-sectional designs are used to examine groups of subjects in various stages of development simultaneously, while the survey describes a technique of data collection in which questionnaires were used to gather data about an identified population (Burns & Grove, 1993). This design is well suited to the descriptive and predictive functions associated with correctional research, whereby relationships between variables are examined (Shaughnessy & Zechmeister, 1997).

### Study population

The participants used in the research were selected randomly from the population ($n$ = 326). Samples were taken from earthmoving companies in Limpopo, Gauteng, Mpumalanga, Northern Cape, Western Cape, Eastern Cape, KwaZulu-Natal and North West. Table 1 presents some of the characteristics of the participants.

Table 1

*Characteristics of the Participants*

| Item | Category | Percentage |
|---|---|---|
| Gender | Male | 74,8 |
| | Female | 23,0 |
| Race | White | 61,5 |
| | African | 21,8 |
| | Coloured | 11,5 |
| | Indian | 1,8 |
| | Other | 0,6 |
| Language | Afrikaans | 40,9 |
| | English | 38,5 |
| | Sepedi | 7,1 |
| | Sesotho | 2,1 |
| | Setswana | 1,8 |
| | Tshivenda | 0,9 |
| | isiNdebele | 1,2 |
| | isiXhosa | 2,1 |
| | isiZulu | 3,9 |
| | Other | 0,3 |
| Business unit | Construction | 52,7 |
| | Shared Services | 14,8 |
| | Mining | 20,3 |
| | Rental | 2,4 |
| | Handling | 4,8 |
| | Other | 1,2 |
| Education level | Grade 10 (Std 8) | 16,4 |
| | Grade 11 (Std 9) | 3,6 |
| | Grade 12 (Std 10) | 38,2 |
| | Technical College Diploma | 23,6 |
| | Technikon Diploma | 9,4 |
| | University Degree | 4,2 |
| | Postgraduate Degree | 2,4 |

According to Table 1, the participants were predominantly male (74,8%), and 61,5% was white. Just over half of the participants (52,7%) worked in the construction unit, while 20,3% worked in the mining unit. The majority of the participants spoke Afrikaans (40,9%) and English (38,5%). A total of 38,2% of the participants possessed a Grade 12 certificate while 23,6% of the participants possessed a Technical College Diploma.

**Measuring battery**

The following questionnaires were utilised in the empirical study:

- The *Maslach Burnout Inventory – General Survey* (MBI-GS) (Schaufeli et al., 1996) was used to measure burnout. The MBI-GS has three subscales: Exhaustion (Ex) (five items, e.g. "I feel used up at the end of the workday"), Cynicism (Cy) (five items, e.g. "I have become less enthusiastic about my work") and Professional Efficacy (PE) (six items, e.g. "In my opinion, I am good at my job"). Together, the subscales of the MBI-GS provide a three-dimensional perspective on burnout. Internal consistencies (Cronbach coefficient alphas) reported by Schaufeli et al. (1996) varied from 0,87 to 0,89 for Exhaustion, 0,73 to 0,84 for Cynicism, and 0,76 to 0,84 for Professional Efficacy. Test-retest reliabilities after one year were 0,65 (Exhaustion), 0,60 (Cynicism) and 0,67 (Professional Efficacy) (Schaufeli et al., 1996). All items are scored on a 7-point frequency-rating scale, ranging from 0 to 6. High scores on Exhaustion and Cynicism, and low scores on Professional Efficacy are indicative of burnout. Storm (2002) confirmed the 3-factor structure of the MBI-GS in a sample of 2 396 members of the South African Police Service (SAPS), but recommended that Item 13 be dropped from the questionnaire. She confirmed the structural equivalence of the MBI-GS for different race groups in the SAPS. The following Cronbach alpha coefficients were obtained for the MBI-GS: Exhaustion: 0,88; Cynicism: 0,79; Professional Efficacy: 0,78 (Storm, 2002).

- The *Oldenburg Burnout Inventory* (OLBI) (Demerouti et al., 2000) has been constructed and validated in an independent study among 293 employees from different occupational fields, including human services and blue-collar workers (Ebbinghaus, 1996). The

inventory measures burnout independent of vocational aspects on two dimensions, namely exhaustion and disengagement. The seven items of the Exhaustion subscales are generic and refer to general feelings of emptiness, overtaxing from work, a strong need for rest, and a state of emotional exhaustion. Examples are: 'After my work, I regularly feel worn out and weary', and 'After my work, I regularly feel totally fit for my free-time activities' (reversed). Disengagement refers to distancing oneself from one's work (work object and content), and to negative, cynical attitudes and behaviours towards one's work in general. This subscale encompasses eighteen items, including: 'I frequently talk about my work in a negative way', and 'I get more and more engaged in my work' (reversed).

Furthermore, a biographic questionnaire was developed to gather information about demographic characteristics. Information that was gathered included gender, race, age, language, educational level, business unit and household situation.

**Statistical analysis**

The statistical analysis was carried out with the help of the SPSS Program (SPSS Inc., 2003) as well as the SAS Program (SAS Institute, 2000). Cronbach alpha coefficients and exploratory factor analyses were used to assess the reliability and validity of the measuring instruments (Clark & Watson, 1995). Descriptive statistics (e.g. means, standard deviations, skewness and kurtosis) were used to analyse the data. Product-moment correlation was used to determine the correlation between the MBI-GS and the OLBI.

*Item-level analysis (item-bias analysis)* was performed by using analysis of variance (ANOVA) for the instruments (yielding interval-level scores). An item is unbiased if persons from different language groups, with an equal standing on the theoretical construct underlying the instrument, have the same expected score on the item (e.g. Van de Vijver & Leung, 1997). Even though several statistical techniques are available for analysing item bias, analysis of variance has the advantage of computational simplicity, robustness and the possibility to study both uniform and nonuniform bias (Mellenbergh, 1982). Therefore, analysis of variance was used in this study. The dependent variable is the item score, while language and score levels are the independent

variables. A significant main effect of language groups was taken to point to uniform bias and a significant interaction of score level and language groups point to nonuniform bias.

Construct equivalence of the instruments was also performed. According to Van de Vijver and Leung (1997), construct equivalence can be investigated with several techniques, such as factor analysis, cluster analysis, and multidimensional scaling or other dimensionality-reducing techniques. The basic idea behind the application of these techniques is to obtain a structure in each culture – which can then be compared across all cultures involved. The most frequently employed technique for studying construct equivalence is factor analysis. Exploratory factor analysis was used to examine construct equivalence. A principal components analysis was conducted to determine the number of factors of the MBI-GS and the OLBI in the total sample. In order to determine the solution for each language group, a direct oblimin rotation was used. Factors obtained in each group were compared (after target rotation). The agreement was evaluated by a factor congruence coefficient, Tucker's phi (Van de Vijver & Leung, 1997). Values above 0,90 were taken to point to essential agreement between cultural groups, while values above 0,95 point to very good agreement. A high agreement implies that the factor loadings of the lower and higher level are equal up to a multiplying constant. The latter was needed to accommodate possible differences in eigenvalues of factors for the different language groups.

Multivariate analysis of variance (MANOVA) was used to determine the significance of differences between the burnout of demographic groups. MANOVA tests whether mean differences among groups on a combination of dependent variables are likely to have occurred by chance (Tabachnick & Fidell, 2001). In MANOVA a new dependent variable that maximises group differences was created from the set of dependent variables. One-way analysis was then performed on the newly-created dependent variable. Wilk's lambda was used to test the likelihood of the data under the assumption of equal population mean vectors for all groups against the likelihood under the assumption that the population mean vectors were identical to those of the sample mean vectors for the different groups. When an effect was significant in MANOVA, one-way analysis of variance (ANOVA) was used to discover which dependent variables had been affected. Because multiple ANOVAs were used, a Bonferroni-type

adjustment was made for inflated Type I error. Tukey tests were done to indicate which group differed significantly when ANOVAs were done.

T-tests were used to determine differences between the groups in the sample. Effect size (Cohen, 1998; Steyn, 1999) was used in addition to statistical significance to determine the significance of relationships. Effect sizes indicated whether obtained results were practically significant. A cut-off point of 0,50 (medium effect) (Cohen, 1998) was set for the practical significance of differences between means.

## RESULTS

The composition of the sample was of such nature that it was decided to conduct the analysis in this study on language groups. The sample was divided into an African group (Afrikaans, Sepedi, Sesotho, Setswana, Tshivenda, isiNdebele, isiXhosa, isiZulu) and an English group.

Firstly, items that show uniform and nonuniform bias for the two language groups were identified through a bias analysis. Based on the total score of the MBI-GS and the OLBI, score groups were compiled. Two effects were tested for significance in the subsequent variance analysis, namely the main effects of culture (uniform bias) and the interaction effects of culture and score level (nonuniform bias). If both the main effects of culture and the interaction of culture and score level were found to be non-significant, the item was taken to be unbiased. The results of the individual item analysis of the variance for the 15-item[1] MBI-GS are presented in Table 2.

[1] Item 13 ("I just want to do my job and not be bothered") was eliminated from the original MBI-GS, resulting in a 15-item scale. The decision to eliminate this item is consistent with previous research (Schutte et al., 2000).

Table 2

*Item-bias analysis for the MBI-GS*

| Item | Uniform Bias | Nonuniform Bias |
|---|---|---|
| | *p* | *p* |
| MBI 1 | 0,85 | 0,31 |
| MBI 2 | 0,04 | 0,49 |
| MBI 3 | 0,09 | 0,70 |
| MBI 4 | 0,85 | 0,88 |
| MBI 5 | 0,00 | 0,31 |
| MBI 6 | 0,01 | 0,09 |
| MBI 7 | 0,74 | 0,78 |
| MBI 8 | 0,06 | 0,29 |
| MBI 9 | 0,36 | 0,07 |
| MBI 10 | 0,67 | 0,90 |
| MBI 11 | 0,09 | 0,49 |
| MBI 12 | 0,77 | 0,95 |
| MBI 14 | 0,48 | 0,75 |
| MBI 15 | 0,88 | 0,45 |
| MBI 16 | 0,52 | 0,71 |

* $\eta^2 > 0,06$ – Practically significant (medium effect)

According to Table 2, no significant eta square ($\eta^2$) value was obtained for any item of the MBI-GS, indicating that none of the items showed uniform or nonuniform bias.

The results for the individual item analysis of variance for the 16-item OLBI are represented in Table 3.

Table 3

*Item-bias analysis for the OLBI*

| Item | Uniform Bias | Nonuniform Bias |
|---|---|---|
| | *p* | *p* |
| OLBI 1 | 0,51 | 0,71 |
| OLBI 2 | 0,00 | 0,70 |
| OLBI 3 | 0,98 | 0,64 |
| OLBI 4 | 0,12 | 0,75 |
| OLBI 5 | 0,90 | 0,05 |
| OLBI 6 | 0,82 | 0,63 |
| OLBI 7 | 0,58 | 0,88 |
| OLBI 8 | 0,22 | 0,38 |
| OLBI 9 | 0,37 | 0,83 |
| OLBI 10 | 0,35 | 0,79 |
| OLBI 11 | 0,55 | 0,67 |
| OLBI 12 | 0,18 | 0,85 |
| OLBI 13 | 0,87 | 0,60 |
| OLBI 14 | 0,32 | 0,29 |
| OLBI 15 | 0,59 | 0,61 |
| OLBI 16 | 0,43 | 0,49 |

* $\eta^2 > 0,06$ – Practically significant (medium effect)

According to Table 3, no significant eta square ($\eta^2$) value was obtained for any item of the OLBI.

A simple principal components analysis was conducted on the 15 items of the MBI-GS on the total sample of employees in an earthmoving equipment industry. Analysis of the eigenvalues (larger than 1) and scree plot indicated that three factors could be extracted. Next, principal component analysis with a direct oblimin rotation was used in carrying out factor analysis per language group. The pattern matrices for the African group and the English group are reported in Table 4.

Table 4

*Pattern matrix of the 15-item MBI-GS for the African group and the English group*

| AFRICAN GROUP | | | | ENGLISH GROUP | | | |
|---|---|---|---|---|---|---|---|
| **Item** | **Factor 1** | **Factor 2** | **Factor 3** | **Item** | **Factor 1** | **Factor 2** | **Factor 3** |
| MBI 1 | -0,06 | 0,85 | 0,11 | MBI 1 | 0,01 | 0,90 | -0,07 |
| MBI 2 | -0,91 | 0,77 | 0,07 | MBI 2 | -0,00 | 0,82 | -0,20 |
| MBI 3 | 0,11 | 0,74 | -0,19 | MBI 3 | 0,52 | 0,77 | 0,05 |
| MBI 4 | 0,12 | 0,50 | -0,15 | MBI 4 | -1,11 | 0,72 | 0,26 |
| MBI 5 | -0,32 | 0,11 | 0,34 | MBI 5 | -1,14 | 0,02 | -0,65 |
| MBI 6 | 0,08 | 0,83 | 0,05 | MBI 6 | 0,13 | 0,83 | 0,05 |
| MBI 7 | -0,25 | 0,02 | 0,61 | MBI 7 | -0,35 | 0,05 | -0,51 |
| MBI 8 | 0,67 | 0,25 | 0,01 | MBI 8 | 0,46 | 0,15 | 0,16 |
| MBI 9 | 0,64 | 0,16 | -0,20 | MBI 9 | 0,60 | 0,29 | 0,15 |
| MBI 10 | 0,11 | 0,03 | 0,77 | MBI 10 | 0,39 | -0,12 | -0,80 |
| MBI 11 | -0,38 | 0,02 | 0,21 | MBI 11 | -0,04 | 0,02 | -0,79 |
| MBI 12 | 0,04 | -0,06 | 0,69 | MBI 12 | -0,15 | 0,08 | -0,69 |
| MBI 14 | 0,81 | -0,10 | 0,41 | MBI 14 | 0,81 | -0,05 | -0,03 |
| MBI 15 | 0,67 | 0,16 | -017 | MBI 15 | 0,49 | 0,31 | 0,29 |
| MBI 16 | -0,02 | -0,09 | 0,76 | MBI 16 | -0,15 | -0,11 | -,069 |

The pattern matrices of the three-factor solutions for the African group and the English group were then used as input for an exploratory factor analysis with target rotations. By rotating the one solution to the other, the three-factor structure was compared across groups. The following Tucker's phi coefficients were obtained after target rotation: Factor 1 = 0,92; Factor 2 = 0,98 and Factor 3 = 0,89. Factor 1 and 2 compared favourably with the guideline of 0,90. However, it is clear that Factor 3 showed a lower equivalence for the two language groups.

Inspection of Table 4 revealed that one item was complex and problematic. Item 11 ("I am enthusiastic about my job") loaded on different factors for the African group and the English group. This item loaded on Factor 1 and 3, while it loaded strongly (-0,79) on Factor 3 in the English group.

Another simple factor analysis was conducted after Item 11 was removed. The eigenvalue and scree plot showed three factors. The pattern matrices for the African group and the English group are reported in Table 5.

Table 5

*Pattern matrix of the 14-item MBI-GS for* the *African* group *and the English group*

| AFRICAN GROUP | | | | ENGLISH GROUP | | | |
|---|---|---|---|---|---|---|---|
| **Item** | **Factor 1** | **Factor 2** | **Factor 3** | **Item** | **Factor 1** | **Factor 2** | **Factor 3** |
| MBI 1 | -0,07 | **0,86** | 0,12 | MBI 1 | 0,01 | **0,90** | -0,07 |
| MBI 2 | -0,08 | **0,77** | 0,08 | MBI 2 | 0,02 | **0,83** | -0,23 |
| MBI 3 | 0,11 | **0,74** | -0,12 | MBI 3 | 0,06 | **0,77** | 0,05 |
| MBI 4 | 0,12 | **0,50** | -0,16 | MBI 4 | -0,14 | **0,71** | 0,30 |
| MBI 5 | -0,35 | 0,13 | **0,36** | MBI 5 | -0,09 | 0,04 | **-0,71** |
| MBI 6 | 0,11 | **0,82** | 0,04 | MBI 6 | 0,12 | **0,83** | 0,08 |
| MBI 7 | -0,25 | 0,03 | **0,63** | MBI 7 | -0,29 | 0,07 | **-0,60** |
| MBI 8 | **0,65** | 0,26 | -0,03 | MBI 8 | **0,48** | 0,15 | 0,15 |
| MBI 9 | **0,61** | 0,17 | -0,24 | MBI 9 | **0,57** | 0,27 | 0,22 |
| MBI 10 | 0,12 | 0,04 | **0,77** | MBI 10 | 0,39 | -0,12 | **-0,77** |
| MBI 12 | 0,09 | -0,07 | **0,69** | MBI 12 | -0,14 | 0,07 | **-0,66** |
| MBI 14 | **0,81** | -0,10 | 0,37 | MBI 14 | **0,83** | -0,04 | -0,04 |
| MBI 15 | **0,69** | 0,15 | -0,22 | MBI 15 | **0,45** | 0,30 | 0,35 |
| MBI 16 | -0,00 | -0,08 | **0,77** | MBI 16 | -0,14 | -0,11 | **-0,71** |

The three factors were labelled as: Factor 1: Cynicism, Factor 2: Exhaustion, and Factor 3: Professional Efficacy. Tucker's phi coefficients of 0,96 (Cynicism) 0,98 (Exhaustion) and 0,90 (Professional Efficacy) resulted after a target rotation was carried out. These coefficients can be regarded as acceptable.

Another simple principal components analysis was conducted on the 16 items of the OLBI on the total sample of employees in an earthmoving equipment industry. Analysis of the eigenvalues (larger than 1) and scree plot indicated that two factors could be extracted. Next, principal component analysis with a direct oblimin rotation was used in carrying out factor analysis per

language group. The pattern matrices for the African group and the English group are reported in Table 6.

Table 6

*Pattern matrix of the 16-item OLBI for the African group and the English group*

| AFRICAN GROUP | | | ENGLISH GROUP | | |
|---|---|---|---|---|---|
| **Item** | **Factor 1** | **Factor 2** | **Item** | **Factor 1** | **Factor 2** |
| OLBI 1 | -0, 61 | -0,14 | OLBI 1 | 0,65 | 0,10 |
| OLBI 2 | 0,12 | 0,67 | OLBI 2 | 0,05 | 0,75 |
| OLBI 3 | 0,08 | 0,58 | OLBI 3 | -0,24 | 0,46 |
| OLBI 4 | -0,13 | 0,65 | OLBI 4 | 0,13 | 0,80 |
| OLBI 5 | -0,61 | 0,20 | OLBI 5 | 0,23 | -0,08 |
| OLBI 6 | 0,19 | 0,66 | OLBI 6 | -0,21 | 0,58 |
| OLBI 7 | -0,67 | 0,01 | OLBI 7 | 0,60 | -0,10 |
| OLBI 8 | 0,27 | 0,55 | OLBI 8 | 0,11 | 0,76 |
| OLBI 9 | 0,07 | 0,70 | OLBI 9 | -0,20 | 0,60 |
| OLBI 10 | -0,51 | -0,09 | OLBI 10 | 0,09 | -0,55 |
| OLBI 11 | 0,38 | 0,48 | OLBI 11 | -0,18 | 0,60 |
| OLBI 12 | 0,25 | 0,51 | OLBI 12 | 0,12 | 0,81 |
| OLBI 13 | -0,37 | -0,00 | OLBI 13 | 0,44 | -0,14 |
| OBLI 14 | -0,51 | -0,15 | OBLI 14 | 0,54 | -0,17 |
| OLBI 15 | -0,71 | -0,06 | OLBI 15 | 0,87 | 0,12 |
| OLBI 16 | -0,70 | 0,01 | OLBI 16 | 0,80 | 0,10 |

The pattern matrices of the two-factor solutions for the African group and the English group were then used as input for an exploratory factor analysis with target rotations. By rotating the one solution to the other, the two-factor structure was compared across groups. The following Tucker's phi coefficients were obtained after target rotation: Factor 1 = 0,93 and Factor 2 = 0,85. Although Factor 1 compared favourably with the guideline of 0,90, it is clear that Factor 2 showed an unacceptable low equivalence for the two language groups.

Inspection of Table 6 revealed that one item was complex and problematic. Item 10 ("After my work, I usually feel still fit for my leisure activities"), loaded on different factors for the African group and the English group.

Another simple factor analysis was conducted after Item 10 was removed. The eigenvalue and scree plot showed two factors. The pattern matrices for the African group and the English group are reported in Table 7.

Table 7

*Pattern matrix of the 16-item OLBI for* the *African group and the English group*

| AFRICAN GROUP | | | ENGLISH GROUP | | |
|---|---|---|---|---|---|
| **Item** | **Factor 1** | **Factor 2** | **Item** | **Factor 1** | **Factor 2** |
| OLBI 1 | **0,64** | -0,14 | OLBI 1 | **0,65** | 0,09 |
| OLBI 2 | -0,09 | **0,69** | OLBI 2 | 0,35 | **0,75** |
| OLBI 3 | -0,13 | **0,55** | OLBI 3 | -0,24 | **0,50** |
| OLBI 4 | 0,15 | **0,64** | OLBI 4 | 0,12 | **0,80** |
| OLBI 5 | **0,52** | 0,11 | OLBI 5 | **0,23** | -0,08 |
| OLBI 6 | 0,21 | **0,65** | OLBI 6 | -0,21 | **0,58** |
| OLBI 7 | **0,71** | 0,00 | OLBI 7 | **0,59** | -0,11 |
| OLBI 8 | -0,17 | **0,61** | OLBI 8 | 0,10 | **0,76** |
| OLBI 9 | -0,08 | **0,66** | OLBI 9 | -0,20 | **0,63** |
| OLBI 11 | -0,38 | **0,50** | OLBI 11 | -0,18 | **0,61** |
| OLBI 12 | -0,13 | **0,58** | OLBI 12 | 0,10 | **0,80** |
| OLBI 13 | **0,43** | 0,02 | OLBI 13 | **0,44** | -0,14 |
| OBLI 14 | **0,45** | -0,21 | OBLI 14 | **0,56** | -0,14 |
| OLBI 15 | **0,71** | -0,09 | OLBI 15 | **0,87** | 0,13 |
| OLBI 16 | **0,69** | -0,01 | OLBI 16 | **0,80** | 0,10 |

The two factors were labelled as: Factor 1: Engagement (all the positive items clustered together) and Factor 2: Disengagement (all the negative items clustered together). Tucker's phi coefficients of 0,96 (Engagement) and 0,91 (Disengagement) resulted after a target rotation was carried out. These coefficients can be regarded as acceptable.

Above findings confirmed hypothesis 3, that Burnout, as measured by the MBI-GS and OLBI, is an equivalent and unbiased construct for different language groups within the earthmoving equipment industry.

The descriptive statistics and alpha coefficients of the three factors of the MBI-GS and the two factors of the OLBI are given in Table 8.

Table 8

*Descriptive Statistics and Alpha Coefficients of the MBI-GS and the OLBI (n = 326)*

| *Item* | **Mean** | ***SD*** | Skewness | Kurtosis | $\alpha$ |
|---|---|---|---|---|---|
| ***MBI-GS*** | | | | | |
| *Emotional Exhaustion* | *12,16* | *7,25* | *0,35* | *-0,72* | *0,84* |
| *Cynicism* | *6,35* | *5,45* | *0,77* | *-0,56* | *0,72* |
| *Professional Efficacy* | *25,42* | *4,60* | *-1,33** | *2,11** | *0,71* |
| ***OLBI*** | | | | | |
| *Engagement* | *12,97* | *3,53* | *0,34* | *-0,57* | *0,71* |
| *Disengagement* | *21,60* | *5,08* | *0,25* | *-0,64* | *0,82* |

* *High skewness and kurtosis*

*According to Table 8, the scores on the MBI-GS are normally distributed for Emotional Exhaustion and Cynicism. However, Professional Efficacy is not normally distributed. The scores and the OLBI are normally distributed for both subscales. The Cronbach alpha coefficients of the subscales of both measuring instruments are considered to be acceptable compared to the guideline of* $\alpha > 0{,}70$ (Nunnally & Bernstein, 1994).

Above findings confirm hypotheses 1 and 2.

The correlation coefficients between the MBI-GS and the OLBI are reported in Table 9.

Table 9

*Correlation Coefficients between the MBI-GS and the OLBI*

| Item | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 1. Exhaustion | - | - | - | - |
| 2. Cynicism | 0,46*+ | - | - | - |
| 3. Professional Efficacy | -0,29* | -0,55*++ | - | - |
| 4. Engagement | 0,39*+ | 0,52*++ | -0,53*++ | - |
| 5. Disengagement | -0,60*++ | -0,49*+ | -0,37*+ | -0,45*+ |

* Statistically significant correlation: $p > 0,05$

+Practically significant correlation: $r > 0,30$ (medium effect)

++Practically significant correlation: $r > 0,50$ (large effect)

Inspection of Table 9 shows that Cynicism is statistically and practically significantly related to Exhaustion. Professional Efficacy is statistically significantly related to Exhaustion and practically significantly (negatively) related to Cynicism (large effect). Engagement is practically significantly related to Exhaustion (medium effect), Cynicism (large effect) as well as negatively related to Professional Efficacy (large effect). Disengagement is negatively and practically significantly related to Exhaustion (large effect), Cynicism (medium effect) Professional Efficacy (medium effect), and Engagement (medium effect).

MANOVA analysis was conducted to determine the relationship between burnout and various demographic characteristics such as race, language, education level, working in different business units, and household situations. The results of these comparisons are reported in Table 10.

Table 10

*MANOVAs – Differences in Burnout Levels of Demographic Groups*

| Variable | Value | *F* | *Df* | *Den Df* | *p* |
|---|---|---|---|---|---|
| Race | 0,94 | 1,55 | 12 | 321,06 | 0,10 |
| Age | 0,89 | 1,35 | 27 | 882,64 | 0,11 |
| Language | 0,90 | 1,27 | 27 | 917,68 | 0,16 |
| Educational Level | 0,94 | 1,05 | 18 | 888,68 | 0,40 |
| Business unit | 0,95 | 1,11 | 15 | 856,17 | 0,35 |
| Household situation | 0,97 | 0,62 | 15 | 878,26 | 0,86 |

After conducting an analysis of Wilk's Lambda values, no statistical differences ($p < 0,01$) could be found regarding burnout levels of different race groups, language groups or education level. Also, no statistical significantly differences ($p < 0,01$) could be found regarding burnout levels of individuals at different business units or in different household situations.

Table 11 indicates the differences between employees in an earthmoving equipment industry, based on gender.

Table 11

*Differences between Employees in an Earthmoving Equipment Industry, based on Gender*

| Item | Male | | Female | | *p* | *d* |
|---|---|---|---|---|---|---|
| | Mean | *SD* | Mean | *SD* | | |
| **MBI-GS** | | | | | | |
| Exhaustion | 12,14 | 7,13 | 11,97 | 7,52 | 0,85 | - |
| Cynicism | 4,00 | -4,23 | 3,57 | 4,54 | 0,51 | - |
| Professional Efficacy | 30,07 | -5,45 | 31,28 | 5,00 | 0,0,7 | - |

As can be seen in Table 11, there are no statistically ($p < 0,05$) or practically ($d < 0,50$) significant differences with respect to the three dimensions of burnout and gender. These findings confirm hypothesis 4.

## DISCUSSION

The general aim of this research was to validate the Maslach Burnout Inventory – General Survey and the OLBI and to determine the construct equivalence and item bias of these instruments for employees in an earthmoving equipment industry in South Africa.

The first objective was to determine the item bias of the MBI-GS and the OLBI. Neither uniform nor nonuniform bias was found for the items of the MBI-GS. This confirms the findings of Storm and Rothmann (2003) who also found no uniform or nonuniform bias in a South African Police Service sample. Also, no evidence of uniform or nonuniform bias was found for the items of the OLBI.

Based on both empirical and conceptual grounds, item 13 was eliminated from the original adapted MBI-GS, resulting in a 15-item instrument. When testing the factorial validation of the MBI-GS, the deletion of item 13 ("I just want to do my job and not be bothered") is consistent with previous studies (e.g. Schutte et al., 2000; Storm & Rothmann, 2003). According to these authors, problems might be caused by the ambivalent nature of this item. On the one hand, a high score may indicate disengagement and social isolation by closing oneself off from contacts with others at work. It could, however, also be indicative of strong motivation and engagement. Although validation is needed in future studies and the deletion of item 13 was part of the post hoc analysis, the decision to eliminate this particular item is consistent with previous research (Schutte et al., 2000; Storm & Rothmann, 2003).

The second objective was to determine the construct equivalence of the MBI-GS. By using exploratory factor analysis, three factors were extracted from the 15-item MBI-GS, namely Exhaustion, Cynicism and Professional Efficacy. However, exploratory factor analysis with target rotations showed that the construct equivalence of the scales was not acceptable. Inspection of the factor loadings revealed that item 11 ("I am enthusiastic about my job") was problematic. Item 11 loaded on different factors for the African group and the English group. This item loaded on Professional Efficacy in the English group (as it should), but loaded on Cynicism in the African group. It is possible that people of different cultures add different

values to the word "enthusiastic". After the removal of Item 11 from the analysis, target rotation resulted in acceptable construct equivalence of the three factors for both language groups in the earthmoving equipment industry.

The third objective was to determine the construct equivalence of the OLBI. Two factors were extracted for the OLBI after conducting an exploratory factor analysis. These factors were labelled Engagement and Disengagement. Interestingly enough, all the positive items (Engagement) and all the negative items (Disengagement) clustered together and loaded on two factors respectively. This finding is in contrast with previous research (see Demerouti et al., 2003). According to Demerouti et al. (2003), both subscales, *Exhaustion* and *Disengagement*, include positively and negatively worded items that refer to their opposites – vigour or energy, and drive or engagement (which have to be reversed coded). These authors found that two of the six items on the *Exhaustion scale,* and four of the seven items on the *Disengagement scale,* loaded positively.

Furthermore, exploratory factor analysis with target rotations showed that the construct equivalence of the scales was not acceptable. Further inspection of the factor loadings revealed that item 10 was problematic. Item 10 ("After my work, I usually feel still fit for my leisure activities") loaded on different factors for the African group and the English group. This item loaded on Engagement in the African group (as it should), but loaded on Disengagement in the English group. It is possible that the item might have been misunderstood, although explanations of items were provided and there were people present during the conducting of the inventory whom the participants could have asked for explanations. It is also possible that the item is sample specific. If the OLBI is conducted on another sample the item might not be problematic. However, after the removal of Item 10 from the analysis, target rotation resulted in acceptable construct equivalence of the two factors for both language groups.

Another objective was to determine the relationship between the MBI-GS and the OLBI. A product-moment correlation was conducted. The results obtained indicated that the Engagement scale of the OLBI correlate negatively with all three subscales of the MBI-GS. The Disengagement scale correlated positively with all three subscales of the MBI-GS.

The last objective was to investigate the relationship between burnout and various demographic characteristics. The results indicated that no differences exist between levels of burnout and race, language, educational level, business unit, household situation and gender. This finding confirms the findings of Demerouti et al. (2003). These authors also found no significant effects between the demographic variables and any of the burnout scales.

In conclusion, based on the results obtained in this study it seems as if the MBI-GS is a valid, reliable and suitable instruments for measuring burnout of employees working in an earthmoving equipment industry. Therefore, the MBI-GS can be used to measure burnout in South Africa in other non-contactual occupations. The OLBI did not measure burnout as it was supposed to. A possible reason why all the positive items and all the negative items loaded together is that positive constructs are measured with positive items, while negative constructs are measured with negative items. Extended research need to be conducted in other samples in South Africa to determine the validity of the OLBI.

This study had various limitations. Firstly, the study relied on self-report measures. Validation studies that use self-report measures exclusively increase the likelihood that at least some part of the shared variance between measures can be attributed to method variance (Schaufeli & Enzmann, 1998). Secondly, only 38,5% of the participants spoke English as their home language. This could have contributed to misunderstanding of items and incorrect interpretations during the answering of the questionnaires. Thirdly, a cross-sectional design was used, and as a result no casual inferences could be drawn. The present study should be considered as one of the first attempts to investigate both burnout measures for a South African sample, and it offers suggestions for future improvements.

## RECOMMENDATIONS

Despite the limitations of this study, the present findings may have important implications for future research and practice. Based on the results of this study, it is recommended that the MBI-GS be used to assess burnout in the earthmoving equipment industry. However, item 13 and 11

should be left out when administering the MBI-GS. Further research is needed regarding the psychometric properties of the OLBI.

It is suggested that additional research be conducted to determine the validity and reliability of both instruments in other South African samples. Especially additional research into the OLBI is recommended, seeing as the factors clustered together as negative and positive factors. In future studies, larger samples should be used. Large sample sizes might provide increased confidence that study findings would be consistent across other similar groups.

Furthermore, the majority of the respondents have English as a second, or even third, language. Therefore translation of the questionnaires into a language other than English can be considered in future research.

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# CHAPTER 3

# CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

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

## 3.1 CONCLUSIONS

The first objective of this study was to determine the reliability and validity of the MBI-GS for employees in the earthmoving equipment industry in South Africa. Based on the results obtained in this study, it seems that the MBI-GS is a valid, reliable and suitable instrument for measuring burnout of employees working in an earthmoving equipment industry. Therefore the MBI-GS can be used to determine burnout in South Africa in other non-contactual occupations.

The second objective was to determine the reliability and validity of the OLBI for employees in the earthmoving equipment industry in South Africa. Based on the results obtained in this study, it seems that the OLBI did not measure burnout as it should have. The reason why all the positive items and all the negative items loaded together could be of a statistical nature. A possible reason could be that negative constructs *should* be measured with negative items, and vice versa. Extended research needs to be conducted in other samples in South Africa in order to determine the validity of the OLBI.

The third objective was to determine the construct equivalence and item bias of the MBI-GS. Based on both empirical and conceptual grounds, item 13 was eliminated from the original adapted MBI-GS, resulting in a 15-item instrument. It seems as if problems might be caused by the ambivalent nature of this item. On the one hand, a high score may indicate disengagement and social isolation by closing oneself off from contacts with others at work. It could, however, also be indicative of strong motivation and engagement: one concentrates on the task and does

not want to be interrupted. The deletion of item 13 ("I just want to do my job and not be bothered") is consistent with previous studies (e.g. Schutte, Toppinen, Kalimo & Schaufeli, 2000; Storm & Rothmann, 2003).

An item is unbiased if persons from different language groups, with an equal standing on the theoretical construct underlying the instrument, have the same expected score on the item (e.g. Van de Vijver & Leung, 1997). Neither uniform nor nonuniform bias was found for the items of the MBI-GS. This confirms the findings of Storm and Rothmann (2003) who also found no uniform or nonuniform bias in a South African Police Service sample.

By using exploratory factor analysis, three factors were extracted from the 15-item MBI-GS, namely Exhaustion, Cynicism and Professional Efficacy. The three-factor model represented the data quite well, albeit after removal of one unsound item (item 11). After the removal of this item from the analysis, target rotation resulted in acceptable construct equivalence of the three factors for both language groups in the earthmoving equipment industry.

The fourth objective was to determine the construct equivalence and item bias of the OLBI. No evidence of uniform or nonuniform bias was found for the items of the OLBI. Since this is the first study to measure burnout with the OLBI, extended research on other samples in South Africa is necessary to confirm the findings of the OLBI.

Two factors were extracted from the 15-item OLBI after conducting an exploratory factor analysis. These factors were labelled Engagement and Disengagement. All the positive items (labelled "Engagement") and all the negative items (labelled "Disengagement") clustered together and loaded on two factors respectively. This finding is in contrast to previous research (see Demerouti et al., 2003). According to these authors, both subscales, *Exhaustion* and *Disengagement*, include positively and negatively worded items that refers to its opposites – vigour or energy and drive or engagement (which have to be reversed coded). These authors found that two of the six items on the *Exhaustion scale,* and four of the seven items on the *Disengagement scale,* loaded positively.

The two-factor model represented the data quite well, albeit after removal of one unsound item (item 10). After the removal of this item from the analysis, target rotation resulted in acceptable construct equivalence of the three factors for both language groups in the earthmoving equipment industry.

It is believed that this confusing state of affairs does not necessarily reflect weaknesses inherent in the OLBI – that it could also be due to more general factors. Firstly, the OLBI is a recently constructed measuring instrument. Therefore relatively few studies have critically reviewed its psychometric properties. Secondly, the OLBI is an instrument that was originally constructed from data based on samples of individuals in Germany (Demerouti & Nachreiner, 1999). Hence, valid research that compares levels of work engagement in South Africa is lacking and a thorough psychometric evaluation of this instrument in our specific national context will be influenced by the specific culture of the country (or, more specifically, the culture of the earthmoving equipment industry).

The fifth objective was to determine the relationship between the MBI-GS and the OLBI. A product-moment correlation was conducted. The results obtained indicated that the Engagement scale of the OLBI correlated negatively with all three subscales of the MBI-GS. The Disengagement scale correlated positively with all three subscales of the MBI-GS.

The last objective was to investigate the relationship between burnout and various demographic characteristics. The results indicated that no differences with respect to levels of burnout exist between race, language, educational level, business unit, household situation and gender. This finding confirms the findings of Demerouti, Bakker, Vardakou & Kantas (2003). These authors also found no significant effects between the demographic variables and any of the burnout scales.

## 3.2 LIMITATIONS

The first limitation of this study is that the results were obtained solely by self-report questionnaires. According to Schaufeli and Enzmann (1998), this may lead to a problem called

"method-variance" or "nuisance". However, there are not a lot of alternative methodologies to deal with the use of self-report measures. Research into more objective measures is still needed. A suggestion was made that a logical way to capture the complex interactions between the numerous variables associated with burnout would be through a conceptually multivariate approach represented by a mosaic of individual traits and job/environmental factors (Dolan, 1995).

A second limitation of this study is that the majority of the participants did not speak English as their home language. This could have influenced the way in which the respondents answered the questionnaires, as a result of misunderstandings and incorrect interpretations.

Thirdly, the design used in this study was a cross-sectional design, and no causal inferences could be drawn. Therefore, the causal relationships between variables were interpreted rather than established, and more complex forms of non-recursive linkages could not be examined. To deal with the limitations set by using a cross-sectional design, prospective longitudinal studies and quasi-experimental research designs are needed to further validate the hypothesised causal relationships.

Another limitation is that the research was conducted in a homogeneous sample consisting of individuals of a specific profession, namely the earthmoving equipment industry. It should be noted that unique characteristics probably exist within this profession – such as the specific organisational culture, which could have influenced the participants' responses. The implication is that the results could not be generalised to other contexts or professions. Consequently, there is still the need for replication in other occupational groups and in heterogeneous samples.

## 3.3 RECOMMENDATIONS

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

### 3.3.1 Recommendations for the organisation

A clear and accurate understanding of burnout is necessary in order to implement effective individual, managerial and organisational practices to deal with burnout. All individuals working within the earthmoving equipment industry should become aware of the causes and symptoms of burnout in order to become aware of their own and other people's exhaustion, cynicism, and low professional efficacy. If they are aware of these symptoms, interventions can be conducted before the effects of burnout become too serious. It is also important for managers to know whether they are suffering from burnout, in view of the danger that they could spread it to their subordinates.

Prior to employees entering the earthmoving equipment industry, training programmes focusing on the identification of symptoms of burnout (with ongoing supervision and knowledge of effective stress management techniques) could reduce burnout. Employees currently in the industry should also be offered programmes where they can receive education on identifying the signs and symptoms of burnout, and on how to reverse the situation.

Planned interventions should be designed and implemented. According to Lee and Ashfort (1993), these interventions should be designed for the long term and should deal with the root cause rather than just the symptoms. Individual-based interventions to reduce burnout symptoms might be an avenue to pursue. These interventions include techniques such as self-monitoring, self-assessment, didactic stress management, promoting a healthy lifestyle and relaxation (see Schaufeli & Enzmann, 1998, pp. 146-168). Stress-management programmes that use a cognitive-behavioural approach are also effective in reducing stress reactions, including burnout. Organisational development interventions in general, as well as interventions to influence culture and values, should be implemented to contribute to healthier workplaces.

### 3.3.2 Recommendations for future research

Future research in South Africa needs to focus on the relative prevalence of burnout in various occupations. The differences in levels of burnout found between occupational groups may help

identify occupations that are most at risk of burnout. This will also enable researchers to determine the relationship between variables (so as to ascertain which variable causes burnout) as well as the relationship between this variable and the remaining variables.

Based on the results of this study, it is recommended that the MBI-GS be used to assess burnout in the earthmoving equipment industry. However, item 13 and 11 should be left out when administering the MBI-GS. Further research is needed regarding the OLBI.

It is suggested that additional research be done to determine the validity and reliability of both instruments in other South African samples. Especially additional research on the OLBI is recommended, seeing as the factors clustered together as negative and positive factors. In future studies, larger samples should be used. It is also recommended that larger samples with more powerful sampling methods be utilised to enable generalisation of the findings to other similar groups.

Furthermore, the majority of the respondents have English as a second, or even third, language. Therefore translation of the questionnaires into a language other than English (for example Afrikaans or Setswana) can be considered in future research.

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