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The Convergent Validity of Two Burnout Instruments

A Multitrait–Multimethod Analysis

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Summary: This study examined the factorial and convergent validity of the **OL**denburg **B**urnout **I**nventory (OLBI) and the Maslach Burnout Inventory – General Survey (MBI-GS) among 232 Greek employees from different occupational groups (e. g., banking and insurance, chemical industry). Results of confirmatory factor analyses supported the proposed factor structure for both instruments. In addition, the convergent and discriminant validity of the OLBI and MBI-GS was supported by the results of multitrait-multimethod analysis. Since the OLBI subscales contain both positively and negatively phrased items, it is suggested to increase the psychometric properties of the MBI-GS by including the positively phrased items of the OLBI.

Over the past two decades, the assessment of burnout has attracted the interest of many researchers, particularly those who study the syndrome in the human services sector. Researchers who want to assess burnout outside this occupational domain are faced with a problem since the most popular instrument for the measurement of burnout, the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1981a, 1981b, 1986; Maslach, Jackson, & Leiter, 1996), was developed exclusively for use in human services professions. Accordingly, the three subscales of the MBI – Emotional exhaustion, Depersonalization, and Personal accomplishment – are applicable only to employees who work with people. Hence, when studying burnout outside the human services, either the MBI has to be adapted or an entirely new instrument has to be developed.

The *central* goal of the present study is to introduce and test a new instrument for the measurement of burnout – the **OL**denburg **B**urnout **I**nventory (OLBI; Demerouti, 1999; Demerouti & Nachreiner, 1998). We examine the convergent and discriminant validity of the OLBI vis-à-vis the Maslach Burnout Inventory – General Survey (MBI-GS; Schaufeli, Leiter, Maslach & Jackson, 1996). The MBI-GS is an adaptation of the MBI-Human Services Survey, in that it assesses burnout in a generic sense. The OLBI is an entirely new instrument that can be used in virtually every occupational context. This instrument aims to overcome one major psychometric shortcoming of the MBI and the MBI-GS, namely, the one-sided wording of the items.

Whereas the MBI-GS was initially developed for English-speaking populations, the OLBI was developed in Germany. In the current study, we administer both instruments to a Greek sample after translating the original items of both burnout instruments. Thus, our *second* goal was to investigate the psychometric quality of both instruments in Greece, a country where employees' burnout has not received much research attention in the past. It is important to note that the factorial validity of the MBI is not completely beyond question as some studies have reported fewer or more factors than the three proposed (Schaufeli, Enzmann, & Girault, 1993). In addition, validation of the factor structure of the MBI-GS and the OLBI in other cultures is still needed.

Instruments for the Measurement of Burnout

Several adaptations of the MBI have been proposed in order to enable its application outside the human services. Among other changes, Golembiewski and colleagues (e. g., Golembiewski, Boudreau, Munzenrider, & Luo, 1996; Golembiewski, Munzenrider, & Carter, 1983) substituted the term "co-worker" for "recipient." Accordingly, "depersonalization" and "personal accomplishment" were assessed in terms of how participants felt toward *work colleagues* instead of recipients. This substitution wrongly assumes that the two types of relationships – service provider and recipient resp. worker and co-worker – are conceptually equivalent, which is unlikely to be the case (Garden, 1987). Interpersonal relations with recipients are essential in the human services because they are the main vehicles for achieving professional goals, whereas relations with co-workers have a different meaning and are indeed qualitatively different. Other researchers have substituted "recipients" in MBI-items with "subordinates" or "teachers" when studying burnout among managers (Lee & Ashforth, 1990, 1993) or students (Fimian, Fastenau, Tashner, & Cross, 1989; Powers & Gose, 1986), respectively. Not surprisingly, the internal consistency, particularly of the rephrased depersonalization subscale, is rather modest (i. e., Cronbach's α is about .60). Moreover, Evans and Fisher (1993) tested the equivalence of the original MBI and an adapted co-worker version and found, as predicted by Garden (1987), that depersonalization did not form a coherent or meaningful factor in a sample of information technology employees, whereas the three-factor solution of the MBI was replicated among public-school teachers. This result casts doubts on the elaborate work of Golembiewski and colleagues, which hinges on the generality of the depersonalization and personal accomplishment dimension across occupational fields. Thus, adapting the MBI for use outside the human services by simply substituting other terms for "recipients" does not seem to be an encouraging solution.

Recently, Schaufeli et al. (1996) developed the Maslach Burnout Inventory – General Survey (MBI-GS). Based on the notion that emotional exhaustion, depersonalization, and personal accomplishment can be broadened beyond the interpersonal domain characteristic to the human services, they included three more generic burnout dimensions, labeled exhaustion, cynicism, and professional efficacy. Clearly, these MBI-GS subscales parallel those of the original MBI. However, contrary to the earlier slight adaptations in the wording of items, the MBI-GS includes different items that refer to more general, nonsocial aspects of the job. Studies in Canada (Leiter & Schaufeli, 1996) and in The Netherlands (Bakker, Demerouti, & Schaufeli, in press) supported the invariance of the MBI-GS's factor structure across various occupational groups, including maintenance workers, nurses, software engineers, and managers. Also, its factorial structure seems to be invariant across workers from the same company who are employed in three different countries – The Netherlands, Sweden, and Finland (Schutte, Toppinen, Kalimo, & Schaufeli, 2000). Moreover, initial studies with the MBI-GS suggest that the phenomenon and process of burnout takes the same form in occupations within and outside human service professions (Leiter & Harvie, 1998; Leiter, Harvie, & Frizzell, 1998; Leiter & Schaufeli, 1996).

However, the MBI-GS did not overcome one important psychometric shortcoming of the original version of the MBI, namely, that the items in each subscale are all framed in the same direction. Accordingly, all exhaustion and cynicism items are phrased negatively, whereas all professional efficacy items are phrased positively. From a psychometric point of view, such one-sided scales are inferior to scales that include both positively and negatively worded items (cf. Anastasi, 1988). It can, for instance, lead to artificial factor solutions in which positively and negatively worded items are likely to cluster (cf. Doty & Glick, 1998). Indeed, some authors (Demerouti & Nachreiner, 1996; Lee & Ashforth, 1990) have criticized the MBI on this point. For instance, Lee and Ashforth (1990) argued that the item wording can be seen as a problem since it offers an alternative explanation for the strong associations of exhaustion and depersonalization with psychological strain (generally negatively worded) and of personal accomplishment with perceptions of performance (generally positively worded).

Besides the MBI-GS, a handful of researchers have developed an entirely new instrument to measure burnout in other than human service occupations. Although this approach seems most promising at first glance, results thus far have been rather disappointing. For instance, Sonnentag, Brodbeck, Heinbokel, and Stolte (1994) investigated burnout among software developers and came up with two burnout scales, which they labeled "Lack of identification" and "Perceived pressure." Although they claim that these scales correspond with Personal accomplishment and Emotional exhaustion in the MBI, inspection of the items reveals that this is not the case. For instance, Lack of identification is contaminated with items that are usually found in organizational commitment inventories (e. g., "I like to stay at my workplace"). In a similar vein, Perceived pressure is confounded with cognitive representations of the working conditions and does not refer to feelings of exhaustion.

Thus, the construct validity of the scale is questionable. Likewise, Ford, Murphy, and Edwards (1983) formulated 15 items that were supposed to measure burnout across various occupational settings. Unfortunately, the factorial validity of their measure was poor since different factors emerged in their corporate sector sample and their human services sample. Thus, to date, newly developed alternative burnout instruments continue to lack construct or factorial validity.

In the current research, we use an alternative measure of burnout constructed and validated in Germany among different occupational groups (Demerouti, 1999; Demerouti & Nachreiner, 1998). This new instrument, called the OLdenburg Burnout Inventory (OLBI), includes two dimensions: *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. This conceptualization corresponds to other definitions of exhaustion (e. g., Aronson, Pines, & Kafry, 1983; Lee & Ashforth, 1993; Shirom, 1989). Contrary to exhaustion as operationalized in the original MBI or MBI-GS, the OLBI covers not only affective aspects of exhaustion, but also physical and cognitive aspects. This facilitates the application of the instrument to those workers who perform physical work and those whose job is mainly about processing information.

Whereas depersonalization in the original MBI refers to distancing oneself emotionally from service recipients, disengagement in the OLBI refers to distancing oneself from one's work and experiencing negative attitudes toward the work object, work content, or one's work in general. While the depersonalization scale includes emotions that have a direct reference to recipients (e. g., becoming impersonal, callous, hardening), the disengagement scale refers to emotions toward the work task (e. g., uninteresting, no longer challenging, but also "disgusting") as well as to a devaluation and mechanical execution of work. Moreover, disengagement items concern the relationship between employees and their job, particularly with respect to their engagement, identification, and willingness to continue the same occupation. Taken together, the scales differ in their content and the objects to be valued and – in our conceptualization – depersonalization is only one form of disengagement. More similarities exist between the cynicism and disengagement scale. However, the cynicism items are more restricted in their content than the disengagement items and refer mainly to the (lack of) interest in the job and job meaningfulness.

Professional efficacy is not considered here as a separate burnout dimension for several reasons (compare also De Rijk, Le Blanc, Schaufeli, & De Jonge, 1998). Leiter (1993) argued and showed that emotional exhaus-

tion leads to depersonalization, whereas feelings of reduced personal accomplishment – that parallel professional efficacy – develop independently. Similarly, it has been argued that whereas emotional exhaustion and depersonalization constitute the core dimensions of burnout (Green, Walkey & Taylor, 1991; Shirom, 1989), feelings of reduced personal accomplishment may also be interpreted as a possible consequence of burnout (Koeske & Koeske, 1989; Shirom, 1989). A meta-analysis of the correlates of the burnout dimensions confirms the independent role of personal accomplishment (Lee & Ashforth, 1996). It has also been suggested that personal accomplishment reflects a personality characteristic similar to self-efficacy (Cordes & Dougherty, 1993). Added to the fact that personal accomplishment is the weakest burnout dimension in terms of significant relationships with other variables (cf. Lee & Ashforth, 1996; Schaufeli & Enzmann, 1998), this is another indication of the exceptional status of this particular burnout dimension.

A distinctive feature of the OLBI compared to the MBI-GS (and the original MBI) is that the OLBI includes both negatively and positively worded items, so that not only one end of the continuum, but both ends are represented. In other words, the exhaustion and disengagement subscales include items that refer to its opposite – to vigor or energy and to drive or engagement, respectively – which have to be reverse coded.

Objectives of the Study and Strategy of Analysis

Since the MBI-GS and the OLBI have not been administered in Greece before, the *first* objective of our study was to validate both instruments in a Greek population. Specifically, we examined the suitability of individual items in the scales and the reliability of the scales with a sample of Greek employees. The study of Kantas and Vassilaki (1997) with the MBI among Greek teachers showed that the factorial structure of the MBI was not influenced by the specific culture of the country. However, individual items had double loadings on a second factor and the depersonalization scale had only a moderate reliability ($\alpha = .60$).

Moreover, in the present study, the factor structure of each instrument is tested by means of confirmatory factor analysis (CFA). Specifically, for each instrument separately, competing models are tested to examine which model most closely fits the data. The proposed model for the MBI-GS includes three correlated latent factors: exhaustion, cynicism, and professional efficacy. This model is tested against the two-factor model, in which ex-
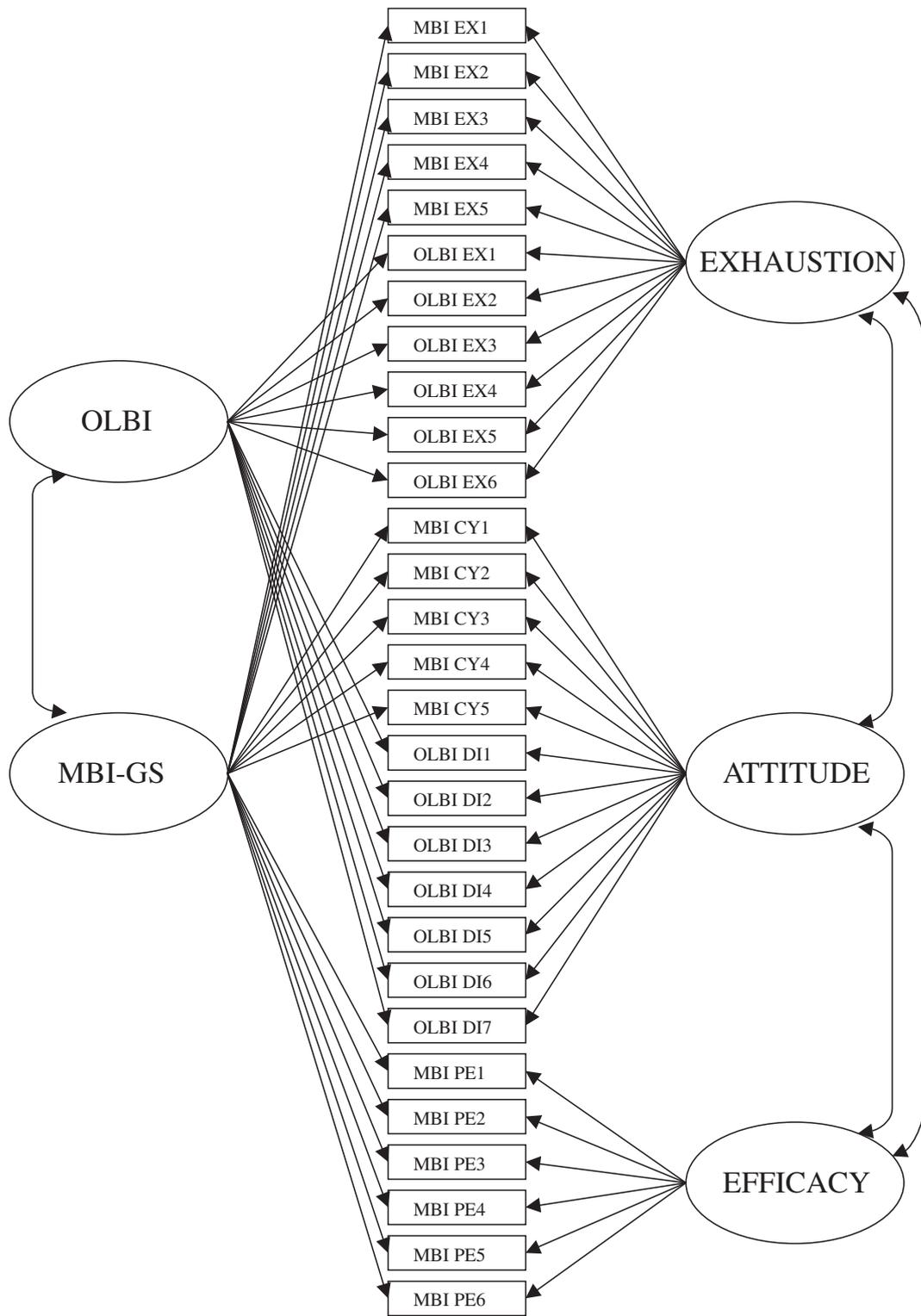
Figure 1. Graphical presentation of the MTMM model, including two method factors (OLBI and MBI-GS) and three trait factors (Exhaustion, Attitudes, Efficacy).
Note:
MBI EE1: item 1 of the exhaustion subscale of the MBI-GS
MBI CY1: item 1 of the cynicism subscale of the MBI-GS
MBI PE1: item 1 of the professional efficacy subscale of the MBI-GS
OLBI EE1: item 1 of the exhaustion subscale of the OLBI
OLBI DI1: item 1 of the disengagement subscale of the OLBI

haustion and cynicism collapse in one latent factor (the core dimensions of burnout) and professional efficacy forms the second factor. The third model includes only one latent factor (i. e., burnout) and assumes a one-dimensional structure of the MBI-GS. In a similar vein, the proposed structure of the OLBI includes two correlated latent factors, exhaustion and disengagement. A second model, called the wording model, includes two correlated latent factors: a factor operationalized by all negatively phrased items and a factor operationalized by all positively phrased items (independent of whether the items belong to the exhaustion or disengagement subscale). With this model, we are able to examine the extent to which the factor structure is an artifact of the scale construction. Finally, the one-factor model assumes a one-dimensional structure of the OLBI, by including only one latent factor.

The *second* objective of the study was to investigate whether both instruments measure the same burnout construct. Since the exhaustion and cynicism dimensions of the more established instrument (MBI-GS) are more restricted in their content than the exhaustion and disengagement dimensions of the OLBI, and include only one-sided phrased items, it is of theoretical and practical interest to see whether the MBI-GS dimensions can be expanded by including items of the OLBI. To meet this objective, simultaneous confirmatory factor analyses for both instruments were conducted.

Specifically, CFA was used to test the hypothesis that the responses on these items underlie the burnout components, namely, exhaustion, negative attitudes (i. e., depersonalization and disengagement), and professional efficacy, as well as the two instruments. This relies on the criteria of Campbell and Fiske (1959) for multitrait-multimethod matrices and corresponds to the methodology proposed by Bagozzi (1993). Specifically, we tested the trait model, which hypothesizes that the variation in the items can be explained fully by the underlying traits (the burnout components) plus errors – without any differentiation among instruments. The burnout items were included as observed variables and the burnout components as correlated latent factors. Exhaustion was operationalized by five MBI and six OLBI items, negative attitudes by five cynicism and seven disengagement items, and professional efficacy by six separate items.

The method or instruments model rests on the assumption that the structure is determined not by the burnout components, but by the two instruments. This model does not take into consideration the different burnout components. It includes the 29 burnout items and two correlated latent method factors. Sixteen items measured the MBI-GS, whereas the OLBI was operationalized by 13 items. The third model represents the multitrait-multimethod (MTMM) model or the correlated trait/correlated method model (Eid, 2000). This model is displayed in Figure 1 and combines both previous models. It includes again all burnout items and two categories of latent factors: (a) the three burnout components (traits) that are correlated and (b) the two instruments (methods), which also correlate with each other. Accordingly, correlations between burnout components and methods were not included. Each item has therefore two loadings: one on a burnout dimension and one on a method factor. Similar to Bagozzi's (1993) approach, we tested whether the two instruments have discriminant validity. This was done by constraining the correlations among the instruments in the MTMM model to 1 and by comparing this model with the original MTMM model (using the χ^2 difference test).

The MTMM model assumes that the method effects can be explained by a single latent method factor, which is a rather strong assumption. Moreover, among the shortcomings of the model (see Eid, 2000) is that it frequently leads to overfitting and ill-defined solutions (Bagozzi, 1993). To avoid these problems, Marsch and Grayson (1995) proposed the CFA model with correlated traits and a correlated uniquenesses model or multitrait-correlated-uniqueness model (MTCU). This model includes the three traits (burnout dimensions) as correlated latent factors. The effects of methods under the MTCU are represented as correlations among error terms of the items that are measured by the same method-instrument instead of method factors (cf. Marsh & Grayson, 1995). This permits one to capture differential influence of each method instrument on the items corresponding to that instrument, leading in most cases to well-defined solutions. The comparison between the MTMM model and the MTCU model tests the unidimensionality of method effects (i. e., whether the method effects associated with each method instrument form a single latent method factor).

Finally, we examined the influence of demographic variables on burnout as measured with both instruments, since such effects have been found in other countries than Greece (for an overview, see Schaufeli & Enzmann, 1998). In this analysis, we concentrate on the relationship between burnout on the one hand, and gender, age, educational level, work experience, and organizational tenure on the other hand.

Method

Participants and Procedure

In March 1999, the third author distributed a questionnaire among a sample of 350 Greek employees, including clerical staff (secretaries, operators), managerial staff (financial managers, human resource managers), but

also bankers, chemists, veterinarians, biologists, pharmacists, insurance employees, lawyers, economists, and statisticians. Eight organizations were approached, two large organizations from the public sector and six small organizations from the private sector. Participants were recruited at their workplace, after informative meetings with representatives of the management and personnel departments of the organizations involved. Specifically, employees who were at their workplace during the day of the study execution were approached and kindly requested to fill out the questionnaire in private. Afterwards they could post it in a special box at the workplace. The confidentiality and anonymity of the answers was emphasized. A total of 232 useful questionnaires were returned (response rate 66%). Of the participants, 45% were employed in the private sector and 55% worked in comparable jobs in the public sector. The final sample includes 137 females (59%) and 95 males (41%). Half of the sample (52%) was older than 40 years. Most participants were married (62%), and 39% had a university degree. Our sample is therefore more highly educated, somewhat older, and includes more women than the total Greek workforce. The mean work experience was 16 years ($SD = 8.72$), and mean organizational tenure was 11 years ($SD = 8.44$).

Measures

Both questionnaires were translated into Greek and backtranslated to the language in which they had originally been developed. Specifically, two Greek psychologists living in the United Kingdom translated the MBI-GS, and two Greek psychologists living in Germany translated the OLBI, independent from each other. The translations of both persons for each instrument were checked for accuracy by the research team. They were highly similar and resulted in the original items when backtranslated.

The MBI-GS

The MBI-GS (Schaufeli et al., 1996) assesses burnout with three subscales, namely, Exhaustion, Cynicism and Professional competence. *Exhaustion* was measured with five items, such as: "I feel emotionally drained from my work." The second burnout dimension, *Cynicism*, was also assessed with five items, including "I have become less enthusiastic about my work." Finally, *Professional efficacy* was assessed with six items, including "I

can effectively solve the problems that arise in my work" (Cronbach's α = .78). All items were scored on a seven-point rating scale, ranging from (0) "never" to (6) "every day." High scores on exhaustion and cynicism and a low score on professional efficacy are indicative of burnout. In the present study, exhaustion correlates positively with cynicism ($r = .29$, $p < .001$) and negatively with professional efficacy ($r = -.15$, $p < .05$). The correlation between cynicism and efficacy was $r = -.33$ ($p < .001$).

The OLBI

The OLdenburg Burnout Inventory (OLBI) was originally developed in German and measures burnout with two dimensions: Exhaustion and Disengagement. The six items of the *Exhaustion* subscale are generic and refer to general feelings of emptiness, overtaxing from work, a strong need for rest, and a state of physical exhaustion. Example items are "After my work, I regularly feel worn out and weary," and "After my work, I regularly feel totally fit for my leisure activities" (reversed) (1 = totally disagree, 4 = totally agree). Two of the exhaustion items are reversed coded. *Disengagement* refers to distancing oneself from the object and the content of one's work and to negative, cynical attitudes and behaviors toward one's work in general. This subscale comprises seven items, including "I frequently talk about my work in a negative way," and "I get more and more engaged in my work" (reversed). Similar answering categories as for exhaustion were used. Four of the seven disengagement items are reversed coded. The correlation between the two OLBI subscales was .44 ($p < .001$).*

The OLBI was constructed and validated in an independent study among 293 German employees from various occupational fields, including human service professionals and blue-collar workers (Demerouti & Nachreiner, 1999). Exploratory and confirmatory factor analysis confirmed its two-dimensional factor structure. Discriminant and convergent validity was examined by relating the OLBI to the BMS questionnaire (in German: *Belastung, Monotonie, Sättigung*; Plath & Richter, 1984), a reliable and valid instrument measuring short-term effects of strain at work such as satiation, monotony, stress, and mental fatigue. Results of a series of first- and second-order factor analyses supported the OLBI's *discriminant validity*: Both burnout dimensions could, for example, be discriminated from measures of mental fatigue (i. e., reduced performance efficiency), and satiation (i. e., a state of irritability and reluctance to continue work tasks). More specifically, it was found that the

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*   The questionnaire and correlation matrices are available from the first author on request. The original version of the OLBI includes 15 items or eight disengagement and seven exhaustion items (see Demerouti, 1999; Demerouti & Nachreiner, 1998). Because of lack of space in the present study two items were excluded: "I cannot imagine another occupation for myself" (disengagement, reversed); "There are days that I feel already tired before I go to work" (exhaustion).

Table 1. Descriptives, Cronbach's αs, and product-moment correlations of all the scales in the study (*N* = 232).

	Mean	*SD*	α	1	2	3	4
MBI-GS							
1. Exhaustion	2.67	1.34	.80				
2. Cynicism	2.38	1.45	.71	.29**			
3. Professional efficacy	4.99	.95	.79	−.15*	−.33**		
OLBI							
4. Exhaustion	2.32	.58	.73	.60**	.25**	−.16*	
5. Disengagement	2.23	.68	.83	.46**	.60**	−.40**	.44**

Note. ** *p* < .01; * *p* < .05.

Table 2. Indices of overall fit for alternative factor structures of the MBI-GS and the OLBI separately (*N* = 232).

Model	χ^2	df	*p*	GFI	RMSEA	PCLOSE	NFI	CFI	IFI
MBI-GS									
Proposed	250.38	101	.001	.88	.08	.001	.79	.86	.86
Two-factor	516.62	103	.001	.75	.13	.001	.61	.65	.65
One-factor	725.55	104	.001	.65	.16	.001	.45	.48	.49
Revised	174.38	91	.001	.92	.06	.063	.87	.93	.93
Null	1312.32	120	–	.49	.21	–	–	–	–
OLBI									
Proposed	217.04	64	.001	.87	.10	.001	.78	.83	.84
Wording	323.70	64	.001	.79	.13	.001	.68	.72	.72
One-factor	328.02	65	.001	.79	.13	.001	.67	.71	.72
Revised	102.42	54	.001	.94	.062	.131	.90	.95	.95
Null	994.82	78	–	.46	.23	–	–	–	–

Note. χ^2 = chi-square. df = degrees of freedom. *p* = significance level. GFI = goodness-of-fit index; RMSEA = root mean square error of approximation; PCLOSE = significance level for RMSEA; NFI = normed fit index; CFI = comparative fit index; IFI = incremental fit index.

items of both burnout subscales loaded on the intended separate factors, whereas the items of the BMS subscales loaded on other factors. Furthermore, the study supported the *convergent validity* of the OLBI, by showing that both burnout dimensions were related only to the conceptually most relevant constructs. Exhaustion was significantly related to mental fatigue (*r* = .52, *p* < .05), but not to satiation (*r* = .00), whereas disengagement was significantly related to satiation (*r* = .53, *p* < .05), but not to mental fatigue (*r* = −.10, n.s.).

Results

All CFAs were conducted using the AMOS computer program (Arbuckle, 1997). The maximum likelihood method was used to examine the covariance matrix of the items. The analysis assessed the factor structures with the goodness of fit index (GFI), the root mean square error of approximation (RMSEA) and its significance level (PCLOSE), the normed fit index (NFI), the comparative

fit index (CFI) and the incremental fit index (IFI; Bollen, 1989). The latter three fit indices are less sensitive to sample size. In general, models with fit indices ≥ .90 and an RMSEA ≤ .05 indicate an acceptable fit. Furthermore, it should be noted that the measurement errors of the items were required to be uncorrelated in all models (unless other indicated) in order to rule out extraneous factors inducing systematic covariance between items, except for the hypothesized latent factors (Gerbing & Anderson, 1984).

Intercorrelations of the MBI–GS and OLBI Scales

Table 1 presents reliability estimates and intercorrelations of the MBI-GS and OLBI scales. All scales of both instruments exhibited reliabilities greater than .70. The highest interscale correlation resulted between the parallel scales of both instruments, namely: (1) the two scales of Exhaustion and (2) Cynicism and Disengagement. Furthermore, the OLBI scales Exhaustion and Disen-

gagement correlate somewhat higher with each other than Exhaustion and Cynicism as measured by MBI-GS.

Factorial Structure of the MBI–GS and OLBI

Table 2 displays the results of the CFA of the several plausible models for each instrument separately. Both models yielded a significant χ^2 value, indicating that neither model fitted the data. Furthermore, results indicated that neither model met the criterion of .90, although the values of the proposed model approach this value for both instruments.

Examining item loadings for the MBI-GS revealed that all items had significant loadings on the intended factors, except item 3 of the Cynicism subscale of the MBI-GS ("I just want to do my work and not be bothered"). This latter finding is consistent with other studies with the MBI-GS (Schaufeli & Van Dierendonck, 2000). In addition, four of the MBI-GS items yielded significant modification indices ($p < .05$) for loading on one other factor (meaning that the fit would improve significantly if the item were allowed to load on that factor; see Sörbom, 1975), and two more items yielded significant indices on two other factors. This reflects ambiguity in these items, which do not specify the content that was mentally rehearsed. In contrast, all OLBI items loaded significantly on the intended factor and only three items yielded significant modification indices for another factor.

In addition, the χ^2 difference test revealed that the proposed models for both instruments were significantly better than any other alternative model. For example, for the MBI-GS, the three-factor structure was better than a two-factor structure ($\Delta \chi^2$ (2) = 266.30, $p < .001$) or a one-factor structure ($\Delta \chi^2$ (3) = 475.23, $p < .001$). In a similar vein, the proposed two-factor structure for the OLBI including the dimensions of exhaustion and disengagement was better than the wording model (its χ^2 value is 106.66 points higher than that of the proposed model

with equal degrees of freedom) or the one-factor model ($\Delta \chi^2$ (1) = 110.98, $p < .001$).

Finally, the estimated correlation between exhaustion and cynicism was .33 and between cynicism and professional efficacy –.42. The estimated correlation between exhaustion and professional efficacy was not significant ($r = -.16$, n. s.). The OLBI subscales exhaustion and disengagement had an estimated correlation of .52.

Improving Model Fit

AMOS provides information about how to improve the rather poor fit of the original proposed three-factorial and two-factorial model for the MBI-GS and the OLBI, respectively. An inspection of the modification indices reveals that both models would improve if correlations among the uniquenesses were included. By modification indices greater than 5 we allowed correlated uniquenesses only within each dimension, since items that belong to the same dimension and have been rated with the same response format might be influence by similar measurement errors (Byrne, 1989). These models (labeled revised model in Table 2) were significantly better than the proposed models, and for both instruments almost all fit indices were above the criterion .90, while the RMSEA was .06.

Convergent Validity of the Burnout Instruments

Table 3 displays the overall fit indices of the competing models for the MTMM analysis. In general, all models have large χ^2 in relation to the degrees of freedom, indicating a poor fit. This is not unexpected, given that the model includes no less than 29 observed variables. According to Bentler and Chou (1987), for models with more than 20 variables it is very unlikely to find a well-fitting model. Therefore, we will concentrate on the χ^2 difference test.

Table 3. Indices of overall fit for alternative factor structures of MBI-GS and OLBI simultaneously ($N = 232$).

Model	χ^2	df	p	GFI	RMSEA	PCLOSE	NFI	CFI	IFI
Instruments	1471.64	376	.001	.62	.11	.001	.49	.56	.56
Traits	1027.71	375	.001	.77	.09	.001	.64	.74	.74
MTMM	829.94	345	.001	.81	.07	.001	.72	.81	.81
MTMM constrained	844.05	346	.001	.81	.07	.001	.71	.80	.80
Revised MTCU	532.77	319	.001	.87	.05	.210	.82	.92	.92
Null	2886.57	406	–	.34	.16	–	–	–	–

Note. χ^{22} = chi-square. df = degrees of freedom. *p* = significance level. GFI = goodness-of-fit index; RMSEA = root mean square error of approximation; PCLOSE = significance level for RMSEA; NFI = normed fit index; CFI = comparative fit index; IFI = incremental fit index.

The MTMM model proved to be superior to both the trait and the instruments model, $\Delta \chi^2 (30) = 197.77$, $p < .001$ and $\Delta \chi^2 (31) = 641.70$, $p < .001$, respectively. Thus both content- and instrument-related differentiation seems to be substantial. Furthermore, the model that assumes no discriminant validity for the instruments (MTMM Constrained) was also significantly worse than the MTMM model. This means that the correlation between the instruments is not unified. In fact, the MTMM model provided an estimated correlation between the MBI-GS and OLBI of .74 ($p < .001$).

The MTMM model revealed acceptable values for parameter estimates, another indication of the plausibility of the model. All items loaded significantly on the trait factors except for item 3 of the Cynicism subscale (MBI-GS). In general, the loadings on the trait factors (i. e., burnout dimensions) were higher than the loadings on the instrument factors. The estimated correlation between exhaustion and attitudes was $r = .42$, ($p < .001$), and between attitudes and professional efficacy $r = -.26$ ($p < .001$). Exhaustion and Professional efficacy were not significantly correlated.

Because of computation problems the MTCU could not be calculated, probably because the minimum recommendations of traits = 4, methods = 3 and $N > 250$ (see Marsh & Grayson, 1995) could not be achieved (cf. traits = 3, methods = 2, $N = 232$). Additionally, one of the traits, Professional efficacy, was measured by only one method (MBI-GS). Instead of including all correlations among the uniquenesses of one method we included only those that were proposed by the modification indices (> 5). This model (called revised MTCU, Table 3) resulted in a satisfactory fit and was significantly better than the more restricted MTMM model ($\Delta \chi^2 (26) = 297.17$, $p < .001$), indicating that the method-instrument effects are not unidimensional. The estimated correlations were: .71 ($p < .05$) between attitudes (i. e., Disengagement/Cynicism) and Exhaustion (as measured by both instruments), $-.34$ ($p < .05$) between Professional efficacy and Exhaustion, and $-.54$ ($p < .05$) between Professional efficacy and Attitudes. The highest correlation among the error terms of the OLBI items was .36 ($p < .05$), while for the MBI-GS items this was .71 ($p < .05$).

In conclusion, results of the CFA show that the MBI-GS and the OLBI have high convergent validity, although they are not identical. Moreover, all items of Exhaustion (of both instruments) loaded significantly on an Exhaustion factor, while the items of Cynicism and of Disengagement had significant loadings on an Attitudes factor. This means that the subscales measuring exhaustion as well as the subscales measuring "negative attitudes toward work" of both instruments can be collapsed. This is supported by an additional principal axis factoring analysis with the items of both instruments.

Three factors resulted from this analysis according to the scree-plot criterion with eigenvalues $\lambda_1 = 7.78$, $\lambda_2 = 3.25$, and $\lambda_3 = 2.11$. These factors explained together 45.27% of the total variance. The first factor included all items measuring attitudes (Cynicism and Disengagement), the second factor included all items measuring exhaustion, and the third factor included all efficacy items.

Demographic Variables and Burnout

Finally, a one-way analysis of variance (ANOVA) showed that participants employed in the public sector ($N = 128$) had significantly higher levels of exhaustion as measured by the OLBI ($F (1, 226) = 7.41$, $p < .01$), disengagement ($F (1, 227) = 5.15$, $p < .05$), and cynicism ($F (1, 224) = 13.63$, $p < .001$) as well as lower levels of professional efficacy ($F (1, 221) = 4.24$, $p < .05$) than participants employed in the private sector ($N = 104$). Only regarding exhaustion as measured by the MBI-GS were no significant differences between the sectors found. Because of the significant differences in burnout scores between the sectors, the effects of the other demographic variables on burnout were examined after controlling for the work sector. After adding the working sector as a covariate in an analysis of variance, no significant effects of the demographic variables could be found on any of the burnout subscales.

Discussion

The present study examines the factorial and convergent validity of a Greek version of two recently developed burnout instruments that measure burnout independent of the occupational context. Results provide evidence for the three-factor structure of the Maslach Burnout Inventory – General Survey (MBI-GS) across various occupations in Greece. Although a study by Kantas and Vasilaki (1997) supported the factorial validity of the human services version of the MBI (Maslach & Jackson, 1986), information regarding the factorial validity of MBI-*GS* was still missing in the Greek population. Moreover, the study replicated the two-factor structure of the OLdenburg Burnout Inventory (OLBI), with exhaustion and disengagement as separate but interrelated factors. Both instruments conceptualize and measure burnout independent of the occupational context and underscore the general tendency and validity of expanding burnout to occupations outside the human services. Burned-out human service professionals may feel exhausted by the emotionally demanding contacts with their patients or clients and treat them in a depersonalized way. In other

occupations, burnout includes the same basic elements, yet its manifestation differs (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Demerouti & Nachreiner, 1998) and more generic symptoms occur (exhaustion and cynicism/disengagement). Thus, for example, employees in the chemical industry may get exhausted as well and become cynical about the contribution they are making to their organization's performance.

Results of the CFA indicate that both instruments have some problems, which mainly concern the high, shared content by certain items. This might have inflated the goodness-of-fit of the alternative models and resulted in significant χ^2 values. Dropping the flawed items and retaining the best items from each subscale might be a way to improve the psychometric properties of the instruments. However, special attention should be given to cynicism scale of the MBI-GS, which has only satisfactory internal consistency ($\alpha = .71$). This reminds us of the low internal consistency of depersonalization (the parallel scale of cynicism) in the study of Kantas and Vassilaki (1997) among Greek teachers. The same applies to a lesser extent also to the exhaustion scale as measured by the OLBI.

Results of multitrait-multimethod analysis including both the OLBI and MBI-GS scales showed that both types of factors, namely, the burnout components and the instruments, could explain the responses to the various items. However, the estimated correlation between the factors "MBI-GS" and "OLBI" was .74, which supports the convergent validity of the two instruments. The convergent validity of the instruments is strengthened by two further results. First, the bivariate correlations between the exhaustion subscales and between the cynicism and disengagement subscales were .60 ($p < .001$). Second, exploratory factor analysis showed that the exhaustion items of both scales loaded only on one factor, and that the cynicism and disengagement items form another single factor. However, constraining the correlation between the two instruments to unity resulted in a worse model indicating that the instruments have some differences. This result is not surprising since the OLBI is broader in its scope than the MBI-GS, and each measurement instrument has different answer categories (a 4-point scale for the OLBI and a 7-point scale for the MBI-GS) that may have suppressed the correlations between the items of the MBI-GS and the OLBI.

The present study makes two important contributions. First, the simultaneous administration of two corresponding burnout instruments provides information regarding whether it would be meaningful to expand the more commonly used MBI-GS. Since the MBI-GS and the OLBI are substantially invariant, their parallel subscales can be used to pool the better items regarding their theoretical and psychometrical contribution. Because the

MBI-GS includes only one-sided formulated items, for psychometrical reasons it is advisable to enrich the scale by adding items measuring the opposite of each dimension. This can be achieved by adding the positively worded items of both OLBI subscales, exhaustion and disengagement, to the corresponding subscales of MBI-GS. Moreover, such a revision would result in an increase in the reliability coefficient of the cynicism subscale ($\alpha = .75$), which could have been even higher if both instruments had the same answer categories.

A second contribution of this study is the investigation of a heterogeneous Greek population regarding job burnout. Since the item to factor assignment for the Greek sample was identical to that of other cultures, the validity of the burnout construct (as measured by both instruments) was confirmed. Moreover, by using the Dutch norm scores (Schaufeli & Van Dierendonck, 2000) to classify the Greek respondents in low, medium, high, and very high levels on the three MBI-GS dimensions, we found one-third to half of the sample experiencing high or very high levels of each dimension. This might be an artifact of our sampling method since our sample is not representative of the Greek population; or it might be due to a lower difficulty level of the translated MBI-GS items in Greek (than in Dutch). Nevertheless, our study generally supports the relevance of the burnout syndrome for Greek employees. Further studies including more representative samples are necessary to examine the external validity of our findings and to clarify the reasons behind the relatively high levels of burnout in Greece (as compared to The Netherlands).

A final interesting finding is the significant differences in burnout levels between the private and public sector, which is consistent with recent Dutch findings (Bakker, Schaufeli & Van Dierendonck, 2000). The fact that employees from the public sector reported higher scores on all burnout subscales may be explained by the different conditions that prevail in each sector. In general, whereas the Greek public sector offers life-long job security, the private sector offers more flexibility, better financial rewards and promotion possibilities, but exposes the employees to higher job demands and requires more engagement, skills and competition. These differences regarding the specific working conditions may have contributed to the differences in experienced burnout in the private and public sector.

A limitation of the present research is that our sample has not been randomly selected from the entire population of the universes of jobs. Basically, this calls into question the generalizability of the present findings. The present study has to be considered as one of the first attempts to investigate burnout independent of the type of occupation, and offers suggestions for a further improvement of the MBI-GS.

In conclusion, this study is one of the first attempts to conceptualize and measure burnout as one end of a continuum that ranges from engagement to burnout. This research direction has recently been proposed by Schaufeli and Bakker (2001; Schaufeli, Salanova, González-Romá & Bakker, in press) and by the authors of the MBI-GS (Maslach et al., 1996; Maslach & Leiter, 1997). The present study shows that the inclusion of positively phrased items can indeed improve the psychometric properties of burnout measurement instruments and reduce method artifacts due to one-sided questionnaires (Doty & Glick, 1998).

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