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Validation of the Maslach Burnout Inventory – General Survey:

An Internet Study across Occupations

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Abstract

This study examined the factorial validity of the Maslach Burnout Inventory - General Survey (MBI-GS; Schaufeli et al., 1996) in eight different occupational groups of employees ($N = 2919$), who were recruited through the Internet. Results of multi-group confirmatory factor analyses favored the proposed Three-Factor Model over alternative Two-Factor and One-Factor Models. Exhaustion, cynicism, and professional efficacy were identified as separate burnout dimensions for the sample as a whole, as well as for each occupational group separately. This means that the factor structure of the MBI-GS is similar across a wide variety of occupations (including human services and technical professions), although there are differences between occupations regarding factor loadings, path coefficients, and error variances. In addition, MANOVAs produced significant gender x age, and gender x working experience interaction effects on burnout. Across occupations, females reported higher levels of burnout than males, particularly when they were relatively young or had relatively little working experience.

Keywords: Burnout, Gender, MBI-GS, Validation.

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The Maslach Burnout Inventory (MBI; Maslach & Jackson, 1986; Maslach, Jackson & Leiter, 1996) was developed to measure burnout as a specific kind of occupational stress reaction among human service professionals. In the pioneer phase of burnout research, researchers chose to study employees in health care professions, because of the chronically taxing emotional demands they supposedly experienced in their jobs. This research was later extended to other occupational groups within the human services, including teachers, social workers, and police officers (Schaufeli & Enzmann, 1998). Work in each of these occupations is considered to be ‘people work’, and “...working with other people (...) was at the heart of the burnout phenomenon” (Maslach, 1993, p. 23).

Unfortunately, the MBI’s explicit focus on emotional demands arising from personal relationships with service recipients restricts the scale’s applicability to burnout in human service occupations. The emotional exhaustion scale measures the depletion of emotional resources, as distinct from physical exhaustion or mental fatigue (Enzmann, 1994). The scale emphasizes the emotionally demanding nature of human service work with items such as: “Working with people all day is really a strain for me”. The second scale, depersonalization, measures the development of negative, cynical attitudes toward the recipients of one’s services. Such excessive distancing may be detrimental to the quality of service or care (Bakker, Schaufeli, Sixma, Bosveld, & Van Dierendonck, 2000). Moreover, empathic concern is an essential quality of many helping relationships, and it is mandated by the ethical codes of human service professions (Leiter & Schaufeli, 1996). Finally, the reduced personal accomplishment scale measures the tendency to evaluate one’s own work with recipients negatively. This lowered sense of efficacy has been linked to feelings of insufficiency and poor self-esteem (Schaufeli & Buunk, 1996).

During the past decade, the concept of burnout has been extended beyond the traditional borders of the human services. For example, researchers have used (modified versions of) the MBI with civil servants (Golembiewski & Munzenrider, 1988), computer programmers (Lee & Ashforth, 1993), military (Leiter, Clark & Durup, 1994), and managers (Lee & Ashforth, 1993). Results of these studies showed that the factor structure for the MBI was not maintained across other occupational groups (Leiter & Schaufeli, 1996). In particular, the depersonalization and emotional exhaustion subscales tended to collapse into one factor when groups other than human service providers completed the MBI. The MBI, however, has a stable factor structure within human service occupations across cultures. The scale's factor structure was maintained with a clear differentiation between depersonalization and emotional exhaustion when translated versions of the MBI were administered to European human service workers (Enzmann, Schaufeli & Girault, 1995; Richardsen, Burke & Leiter, 1992; Schaufeli & Janczur, 1992).

The apparent need for a burnout scale that is independent of vocational aspects, and that can be used in non-service professions prompted the development of the Maslach Burnout Inventory - General Survey (MBI-GS; Schaufeli, Leiter, Maslach & Jackson, 1996). The MBI-GS has three subscales that parallel the MBI: exhaustion, cynicism, and professional efficacy. The exhaustion items are generic, without the MBI's emphasis on emotions and without direct reference to service recipients. The subscale that differs to the greatest extent from the original MBI is cynicism instead of depersonalization. Whereas depersonalization refers to distancing oneself emotionally from service recipients and to the development of cynical attitudes toward them, cynicism refers to distancing oneself from work itself and to the development of negative attitudes toward work in general. The cynicism construct does neither directly refer to personal relationships at work, nor does it exclude such a reference (Schaufeli et al., 1996). It encompasses items expressing

disengagement from work and lack of enthusiasm, such as: “I have become more cynical about whether my work contributes anything”. Finally, the professional efficacy construct is highly similar to personal accomplishment as measured by the MBI. However, in addition to its broader focus, encompassing both social and nonsocial aspects of occupational accomplishments, the scale focuses more directly than the MBI on efficacy expectations (Bandura, 1977) with items such as: “At my work, I am confident that I am effective at getting things done”.

It is important to make a distinction between the three burnout dimensions, since the empirical evidence shows that they have different causes and consequences (see Lee & Ashforth, 1996, for an overview). Whereas exhaustion is most clearly the result of job demands (including workload, emotional demands, unfavorable physical working environment), cynicism and professional efficacy are most strongly related to (lack of) job resources (including autonomy, social support, performance feedback) (Demerouti, Bakker, Nachreiner & Schaufeli, 2001). In addition, exhaustion seems to be the most important predictor of absenteeism (particularly absence duration), whereas depersonalization and efficacy are more often found to predict personnel turnover and client satisfaction (see Schaufeli & Enzmann, 1998).

Although cynicism is the MBI-GS subscale that is most different from its counterpart in the MBI, it serves the same function in a model of burnout. In the original model underlying the MBI (Leiter & Maslach, 1988; Maslach & Jackson, 1986), depersonalization was considered as a dysfunctional mode of coping with the emotional demands of service provision by distancing oneself emotionally from recipients. In a similar vein, in the model underlying the MBI-GS, cynicism represents a form of mental distancing from work in response to exhausting, discouraging aspects of work itself (cf. Leiter & Schaufeli, 1996; see also Demerouti, Bakker, De Jonge, Janssen & Schaufeli, in press). The model underlying

general burnout assumes that employees develop indifference and cynicism about their work in order to gain distance from its exhausting demands. Moore (1998) found evidence for this contention in a study among 270 information systems professionals working in various organizations throughout the United States. Specifically, her findings showed that professionals who were exhausted by their work were most likely to experience reduced job satisfaction and heightened cynicism, independent of the attribution regarding the cause of the exhaustion. Such a cynical reaction is expected to be dysfunctional in that cynicism reduces the energy available for performing work and for developing creative solutions to work related problems. Thus, cynicism also diminishes the job's potential for achieving professional efficacy. To conclude then, cynicism is expected to increase with increasing feelings of exhaustion (positive relationship), and professional efficacy is expected to decrease with increasing cynicism (negative relationship).

The Present Internet Study

Little is known yet about the factorial validity of the MBI-GS. Leiter and Schaufeli (1996) found support for the invariance of the MBI-GS's three-factor structure across various occupational groups within health care settings. Their study suggests that the phenomenon and process of burnout takes a similar form in occupations within and outside human service professions. The central aim of the present research is to expand these findings by examining the MBI-GS's factor structure in eight different occupational groups in The Netherlands. Whereas the participants in Leiter and Schaufeli's study were all employed in a human service context (i.e., clerical and maintenance workers, nurses, technical personnel and managers in a tertiary care medical hospital and a psychiatric center), participants in the current study have been recruited from a wide range of organizations where they work with people, objects, or information. Specifically, data were collected through the Internet, and employees within and outside the service sector were asked to fill out a computerized version

of the MBI-GS. It is predicted that this study will confirm the three-factor structure of the MBI-GS across all occupational groups (Hypothesis 1). As argued before, we expect a positive relationship between exhaustion and cynicism, and a negative relationship between cynicism and professional efficacy.

Schmidt (1997) has outlined the benefits of conducting survey research on the Internet and argues that the Web presents survey researchers with an unprecedented tool for the collection of data. An apparent advantage of this research procedure is that it enhances the probability of collecting data across a wide range of occupations. In addition, the costs in terms of both time and money for publishing a survey on the Web are low compared with costs associated with conventional surveying methods. Furthermore, the data entry stage is eliminated for the survey administrator, and software can ensure that the data acquired from participants is free from common entry errors.

An additional aim of the present research is to explore the relationships between biographic characteristics -- i.e., gender, age, and working experience -- and occupational burnout. Insight in such relationships may increase our understanding of the nature and development of the syndrome. To date little has been known about such relationships. In his MBI-GS-study among civil servants ($N = 1018$), Schaufeli (1995) found no evidence for relationships between biographical characteristics and burnout, except for a small, but significant positive relationship between working experience and cynicism ($r = .15$; $p < .001$). However, studies with the human services version of the MBI have produced some noteworthy findings. Of all biographic characteristics, age is most consistently related to burnout (e.g., Birch, Marchant & Smith, 1986; Mor & Laliberte, 1984; Poulin & Walter, 1993; Vredenburg, Carlozzi & Stein, 1999). Among younger employees, burnout is observed more often than among those aged over 30 or 40 years. This is in line with the observation that burnout is negatively related to work experience. Job burnout seems to occur

rather at the beginning of the career. Some authors interpret the greater incidence of burnout among the younger and less experienced in terms of “reality shock” (Künzel & Schulte, 1986), or as “early career burnout” (Cherniss, 1980) representing an identity crisis due to unsuccessful occupational socialization. The MBI-manual (Maslach et al., 1996) shows the decline of burnout levels with growing age or working experience for all three dimensions, but most clearly for emotional exhaustion and depersonalization. Therefore, we predict a negative relationship between age and working experience on the one hand, and the three burnout dimensions (exhaustion, cynicism, reduced professional efficacy) on the other hand (Hypothesis 2).

The relationship of burnout with gender is not so clear-cut. Although there are some studies showing that burnout occurs more often among females than among males (e.g., Maslach & Jackson, 1981; Poulin & Walter, 1993), the opposite is found as well (e.g., Burke, Greenglass, & Schwarzer, 1996; Price & Spence, 1994; Van Horn, Schaufeli, Greenglass & Burke, 1997). On balance, females tend to score slightly higher on emotional exhaustion, whereas males score higher on depersonalization (e.g., Vredenburgh et al., 1999; see Schaufeli & Enzmann, 1998, for an overview). This can partly be explained by gender role dependent stereotypes. For instance, it has been argued that men hold instrumental attitudes, whereas women are more emotionally responsive, and seem to disclose emotions and health problems more easily (Ogus, Greenglass, & Burke, 1990). Another explanation may be that due to additional responsibilities at home, working females experience higher overall workloads compared to working males (cf. Merllié & Paoli, 2001). Workload, in its turn, is positively related to burnout -- particularly to emotional exhaustion (Schaufeli & Enzmann, 1998). In line with earlier findings with the MBI-HSS, we predict that females score higher than males on exhaustion, and lower than males on cynicism (Hypothesis 3).

Method

Participants

Participants in this study were Dutch employees from a wide range of companies and occupations, who reacted to a survey on the Internet. The total sample of 2919 persons included 2225 males (76.2%) and 694 females (23.8%). For the Dutch workforce as a whole, the estimated percentage of males is 61% (Roessingh, 2001). This means that our Internet sample includes a relatively high percentage of males. The mean age of the sample was 35.63 years ($sd = 8.09$), and the mean working experience was 6.26 years ($sd = 6.03$). For the Dutch workforce, these figures are quite comparable, with an estimated average age of 33 years and a mean working experience of 9 years (Van der Werf, 2000). Participants were employed in one of eight, post-hoc classified occupations (see Table 1). This classification provides the best description of the participants in this study. Importantly, a gender x occupation breakdown showed that males and females were equally represented in the different occupations, $\chi^2(7) = 5.37$, n.s. The clearest difference between our Internet sample and the Dutch workforce is that employees working in the Distribution and Culture sector, and Public Officers are almost not represented in our Internet sample (Central Bureau for the Statistics, 1993).

Insert Table 1 about here

Procedure

Between November 1997 and March 1998, a Dutch version of the MBI-GS (Schaufeli, 1995; Schaufeli et al., 1996) was published on a Web site of a Dutch weekly online magazine that focuses on work-related issues. Visitors of its homepage were invited to learn more about their levels of burnout by filling out a 20-item questionnaire including the MBI-GS (16 items) and four background variables, namely gender, age, occupation (open

question), and working experience. The confidentiality and anonymity of the data was emphasized. Those who agreed to participate were instructed to visit a next Web page with the questionnaire. After filling out the questionnaire, participants were informed about their burnout-scores (calculated on-line by the computer), and they received feedback that was automatically customized to their own burnout scores. They were then given the opportunity to read a short background article about burnout (600 words) by clicking to a connected Web page. The data were automatically written to an external file. Because participants could only proceed to the next page (with information about their level of burnout) if they had responded to each of the 20 questions, there was no missing data. A total of 3088 persons responded during the study period. The data of 169 persons (5%) were excluded from the analyses, because: (1) a closer look at the time of questionnaire completion, gender, age, profession, and the response pattern suggested that they had filled out the questionnaire twice, or (2) their job description could not be classified in one of eight categories (see above). Thus, the present study reports about the data of 2919 individuals.

Measures

The MBI-GS (Schaufeli et al., 1996) can be used in any occupational context and includes three subscales (i.e., exhaustion, cynicism, and professional efficacy) that parallel those of the original MBI, except that items do not explicitly refer to working with people. Exhaustion is measured with five items, including “I feel burned out from my work”, and “I feel tired when I get up in the morning and have to face another day on the job”. Cynicism is also measured with five items. Example-items are: “I have become less enthusiastic about my work”, and “I have become more cynical about whether my work contributes anything”. Finally, professional efficacy is measured with six items, including “I feel I am making an effective contribution to what this organization does”, and “In my opinion, I am good at my job”. Leiter and Schaufeli (1996) have shown that the internal consistency of each of these

scales is satisfactory. They found Cronbach alpha coefficients ranging from .84 to .90 for exhaustion, .74 to .84 for cynicism, and from .70 to .78 for professional efficacy.

Analysis Strategy

The data were examined with confirmatory factor analyses using AMOS (Arbuckle, 1997). The fit of different factor models to the data was assessed with the goodness-of-fit index (GFI) and the root mean square error of approximation (RMSEA; Steiger, 1990). For the GFI, values of .90 or higher indicate a close fit. Cudeck and Browne (1993) have suggested that RMSEA values up to .08 represent reasonable errors of approximation in the population. Three other fit indices were utilized: the incremental fit index (IFI; Bollen, 1989), the normed fit index (NFI; Bentler & Bonnet, 1980), and the comparative fit index (CFI; Bentler, 1990). For each of these statistics, values of .90 or higher are generally considered acceptable. For each burnout factor separately, we freed some measurement errors that were correlated. Such correlations are often found among items with identical rating scales, since such scales evoke similar errors in responses (Byrne, 1989). They were freed in order to provide a more adequate assessment of differences in overall fit among competing models.

Results

Confirmatory Factor Analyses of the MBI-GS

The initial factor structure was tested for all eight occupational groups simultaneously. An advantage of such a multi-group analysis is that it provides a test for the significance of any differences found between the groups (Arbuckle, 1997). In addition, multi-group analysis provides more efficient parameter estimates than single-group models. The simultaneous confirmatory factor analysis found that in each occupational group all items loaded well beyond the $t = 1.96$ criterion on the predicted factors. The proposed Three-Factor model with no cross loadings, with paths between exhaustion and cynicism, and between cynicism and professional efficacy was found to provide an adequate fit to the data,

as indicated by the goodness of fit analysis in Table 2. However, the modification indices proposed also a direct path from exhaustion to professional efficacy (see also Bakker et al., 2000). Because these two models are nested in relation to one another, the chi-square difference test can directly test the improvement in fit provided by this additional path (Bentler & Bonnet, 1980). Although the improvement in model fit provided by the addition of the path was not significant, Delta $\chi^2(8) = 9$, n.s., it was decided to accept this revised model, because the coefficient of the path from exhaustion to professional efficacy was significant for almost all groups. For the eight different samples, the coefficients of the three structural paths had the following range: exhaustion \rightarrow cynicism: $.61 < \gamma < .77$; cynicism \rightarrow professional efficacy: $.25 < \gamma < .85$; exhaustion \rightarrow professional efficacy: $-.35 < \gamma < .04$.

As can be seen from Table 2, the Three-Factor model with direct and indirect relationships between the latent factors was a substantial improvement over the One-Factor Model assuming that burnout is a unitary construct, Delta $\chi^2(24) = 1535$, $p < .001$. Further, a Two-Factor Model, collapsing exhaustion and cynicism into a single factor with a path to professional efficacy, also provided a less satisfactory fit, Delta $\chi^2(16) = 682$, $p < .001$. A Four-Factor Model was not tested in our SEM-analyses, because principal component analysis in SPSS, with varimax rotation on the 16 MBI-GS items for the whole sample, yielded three factors with eigenvalues larger than one. The factor structure was similar to the one reported by Schaufeli et al. (1996). The analysis showed that only two items had a second loading on another factor. The three factors extracted accounted for 59% of the variance. Taken together, these results confirm Hypothesis 1. Our findings are consistent with Leiter and Schaufeli (1996), and provide evidence for a Three-Factor structure of the MBI-GS across a wide range of occupational groups in The Netherlands.¹

Insert Table 2 about here

We repeated the multi-group factor analysis for the Three-Factor model, and investigated to what extent the factor loadings, the paths between the latent factors, and the error-variances of the MBI-GS items were invariant across the eight occupational groups. The fit indices for each of these competing models are summarized in Table 2. As can be seen, the data showed a significant worsening in fit when the factor loadings were assumed to be equal for all occupational groups, $\Delta \chi^2 (92) = 165, p < .01$. This means that each occupational group has unique factor loadings. In a similar vein, the data showed a significant worsening in fit when the path coefficients were assumed to be invariant across all groups, $\Delta \chi^2 (91) = 144, p < .01$, and when the error variances were assumed to be equal for all groups, $\Delta \chi^2 (112) = 172, p < .01$. In sum, these analyses show that the pattern of the factor structure of the MBI-GS is similar across a variety of disciplines, including service providers and individuals performing non-people work, although each group has unique factor loadings, path coefficients, and error variances.

Insert Table 2 about here

Biographic Variables and Burnout

To examine the extent to which burnout levels varied as a function of gender, age, and working experience, we conducted two separate multivariate analyses of variance (MANOVAs). Because of the dependency between age and working experience ($r = .59, p < .001$), these two variables were not included as separate independent variables in one MANOVA.

Hypothesis 2 predicted a negative relationship between age and the three burnout dimensions (exhaustion, cynicism, reduced professional efficacy). To test this hypothesis, we

conducted a MANOVA using gender as the independent variable, age as a covariate (continuous variable), and exhaustion, cynicism, and professional efficacy as the dependent variables. Age had a multivariate main effect on the three burnout dimensions, $F(3, 2913) = 5.32, p < .001$, suggesting that burnout levels increased with increasing age. However, the univariate effect of age was only significant for professional efficacy, $F(1, 2915) = 7.74, p < .01$. In conclusion, Hypothesis 2 was clearly rejected.

In addition, results showed a multivariate significant main effect of gender, $F(3, 2913) = 5.82, p < .001$. Consistent with Hypothesis 3, univariate F-tests revealed that female employees reported higher levels of exhaustion ($M = 2.22$) than males ($M = 1.96$), $F(1, 2915) = 11.62, p < .001$. However, Hypothesis 3 was not confirmed regarding the relationship between gender and depersonalization: females showed also more distancing attitudes toward work ($M = 2.23$) than males ($M = 2.06$), $F(1, 2915) = 12.93, p < .001$, and a lower level of professional efficacy (Females $M = 3.75$ vs. Males $M = 3.93$), $F(1, 2915) = 11.45, p < .001$.

Importantly, the abovementioned effects were qualified by a multivariate significant gender x age interaction effect on the burnout dimensions, $F(3, 2913) = 3.01, p < .05$. Univariate F-tests showed that this interaction was significant for exhaustion, $F(1, 2915) = 4.71, p < .05$, for cynicism, $F(1, 2915) = 7.70, p < .01$, and for professional efficacy, $F(1, 2915) = 5.77, p < .05$. To get a better insight in the direction of these interaction effects, the scores on the continuous variable “age” were partitioned in five equal parts (20% intervals), and the gender x age analysis of variance was repeated for each of the burnout dimensions separately. The mean burnout scores on exhaustion, cynicism, and professional efficacy as a function of gender and age are graphically depicted in the Figures 1, 2 and 3, respectively. Each of these figures shows that the differences in burnout scores between females and males are largest among relatively young employees (i.e., younger than 33 years of age). The same pattern of results was found when working experience (continuous variable) was included in

a MANOVA with gender as the independent variable, and the three burnout dimensions as the dependent variables: Particularly inexperienced females scored higher on exhaustion and cynicism than males, and lower on professional efficacy.

Insert Figure 1, 2, and 3 about here

Discussion

The main purpose of this Internet study was to examine the factor structure of the Maslach Burnout Inventory – General Survey (MBI-GS; Schaufeli et al., 1996) -- among people employed in service and non-service occupations. The confirmation of a three-factor structure for the MBI-GS, that parallels that of the original MBI (Maslach & Jackson, 1986), provides evidence for the multi-faceted nature of the burnout construct. Moreover, results of a series of confirmatory factor analyses confirmed the three-factor structure for eight different occupations, including such diverse professions as managers, software engineers, technicians, and human service professionals. The Three-Factor model fits the data for each of the eight groups equally well, suggesting that exhaustion, cynicism, and professional efficacy constitute three independent dimensions of burnout, independent of vocational aspects. These findings indicate that the MBI-GS is a measure of burnout that can be used in any occupational context.

Previous analyses of the MBI-HSS factor structure found that its emotional exhaustion and depersonalization subscales tended to be reduced to a single factor when the MBI was used for populations outside of human service professions (e.g., Golembiewski & Munzenrider, 1988; Lee & Ashforth, 1993). The confirmation of a three-factor structure for the MBI-GS over a two-factor structure for all occupations included in this study permits the extension of the full complexity of the burnout model to wider occupational groups. The

present study replicates Leiter and Schaufeli's (1996) findings by providing evidence for the invariance of the MBI-GS's factor structure among human service providers and people who work with objects or information. It expands their findings by showing that the factor loadings, path coefficients, and error-variances of the MBI-GS items are unique for each occupational group. In addition, the internal consistency of each of the MBI-GS's subscales was equally high in each of the eight occupations included in the present study.

In the model underlying the MBI-GS, it is assumed that employees develop indifference and cynicism about their work in order to gain distance from its exhausting demands. This reaction is expected to be dysfunctional in that cynicism reduces the energy available for performing work and for solving work-related problems. Thus, cynicism also diminishes the job's potential for building professional efficacy. Results of this study provide some evidence for this pattern of relationships between the three burnout components: Exhaustion was positively related to cynicism, and cynicism -- in its turn -- was negatively related to professional efficacy. However, exhaustion also had a small direct relationship with professional efficacy. This means that the impact of exhaustion on professional efficacy is largely, but not totally mediated by cynicism. Note, however, that the cross-sectional character of our study does not permit causal inferences about burnout processes.

Interestingly, while earlier studies typically showed that females scored higher than males on (emotional) exhaustion, but not on negative attitudes (depersonalization), the present study shows that females scored higher on both exhaustion and negative attitudes (cynicism). The reason for this may be that depersonalizing people goes strongly against females' natural response, whereas this is not evident for cynicism. Higher scores on depersonalization among men are usually explained by prescriptions of the masculine gender role (Greenglass, Burke, & Ondrack, 1990). It should also be noted that the majority of the women participating in the present study were occupied in occupations that are dominated by

males. In our sample, females and males were equally represented in all different occupations, and this is clearly not the case in the Dutch workforce as a whole. More women than men have jobs that require less education, partly because these jobs have more possibilities for part-time work (Keuzenkamp & Hooghiemstra, 2000). It can be argued that females in occupations that require a relatively high educational background have to prove themselves more than their male colleagues (cf. Schaufeli & Enzmann, 1998). This may result in increased strain, and -- consequently -- increased burnout scores. Finally, females' higher scores on exhaustion and (resulting) cynicism may be due to a high probability of work-home interference in the occupations included in the present study, such as that of managers and software-engineers (Merllié & Paoli, 2001).

A multivariate significant gender x age interaction effect on the burnout dimensions showed that the differences in burnout scores between females and males are greatest among younger employees, and among employees with only a few years working experience. Especially at the beginning of their careers, females (in contrast to males) may encounter problems of organizational socialization, perhaps most notably in professions that are dominated by males (cf. Keuzenkamp & Hooghiemstra, 2000). Young females may have to prove themselves more than young males, because they are member of a minority. It is conceivable that females have to put more effort in their jobs than males, and run a higher risk of burning out in such a work context (see also Schaufeli & Enzmann, 1998).

A unique feature of the present research was that the Internet was used as a research tool. This can be considered as the strength and the weakness of this study. In general, one problem with this new type of research is that Internet users or those who respond to Web surveys are more likely to be younger and male than a typical employee or someone contacted through a mail or telephone survey (Schmidt, 1997). Indeed, a comparison of the present sample with the general Dutch population showed that our study included a relatively

high percentage of males, although the sample was not younger than the average worker. In addition, the socioeconomic and educational status of the average Web user is usually above that of the general population (but see Smith & Leigh, 1997). Thus, self-selection was a clear limitation of the present study. On the positive side, whereas many stress studies are biased towards a specific group or occupation, the present research included employees from a wide range of different occupations across a wide range of organizations.

Another limitation of the present research was that we were restricted in time and page space by our data collection over a commercial Web site. It was therefore not possible to simultaneously assess for example task characteristics and chronic stress responses other than burnout (e.g., depression, anxiety). This precluded an estimation of the convergent and discriminant validity of the MBI-GS. More research to examine these psychometric qualities is needed.

The central assumption in the earliest burnout studies was that the syndrome results from the demanding and emotionally charged relationships between service professionals and their recipients. What, then, are the causes of burnout among employees in other occupations? A tentative answer to this question is given by a recent study (Demerouti et al., 2001). In this study, burnout was measured independent of vocational aspects, with a measurement instrument that is highly similar to the MBI-GS. Three different occupational groups were studied, namely human service professionals, production workers, and air traffic controllers. In addition, two independent observers, using a job analysis instrument, assessed employees' working conditions. Results of a series of structural equation modeling analyses indicated that human service professionals' burnout was primarily caused by high levels of responsibility and lack of supervisor support, whereas production workers' burnout was primarily caused by high job demands (e.g., time pressure and workload), low quality of environmental conditions, lack of task variety, and lack of control. These findings are

consistent with contemporary theories of burnout, that perceive the syndrome as a result of a misfit between a worker's job demands and resources (Demerouti et al., 2001; Maslach & Leiter, 1997). These recent studies and the current study show that burnout is not limited to human service professions, and suggest that each occupational field has its own demands and resources.

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Footnote

¹ The internal consistencies of the exhaustion, cynicism, and professional efficacy subscales were satisfactory for each of the occupational groups (all alpha coefficients > .76). To explore differences between occupations, we conducted a MANOVA with occupation as the independent variable and the three burnout components as the dependent variables. This analysis showed small, but significant differences between occupations, $F(21, 8733) = 5.55$, $p < .001$. The univariate results revealed that the effect of occupation was significant for each of the three burnout dimensions (i.e., for exhaustion, cynicism, and professional efficacy). In a relative sense, the greatest differences were found for the professional efficacy dimension of burnout. General managers and CEOs reported efficacy expectations that were higher than those of all other groups. However, it should be noted that there were no clear differences in mean burnout scores between human service providers and individuals performing non-people work. For example, financial managers and administrators reported levels of exhaustion, cynicism and efficacy that were not statistically different from human service professionals' levels of burnout. It indicates once more that human service burnout, with its focus on the service providing relationship is one form of a general phenomenon (Leiter & Schaufeli, 1996).

Table 1

Gender x Occupation Breakdown

Category	Males		Females		Total Sample	
	N	%	N	%	N	%
1. General managers and CEOs	278	12.5	90	13.0	368	12.6
2. Personnel Officers and Consultants	273	12.3	82	11.8	355	12.2
3. Software Engineers	293	13.2	103	14.8	396	13.6
4. Marketing managers and Sales officers	321	14.4	95	13.7	416	14.3
5. Technologists and Technicians	324	14.6	112	16.1	436	14.9
6. Scientists	213	9.6	53	7.6	266	9.1
7. Financial managers and Administrators	447	20.1	136	19.6	583	20.0
8. Human Service Professionals	76	3.4	23	3.3	99	3.4

Table 2

Comparisons Between Different Factor Structures for the MBI-GS by Using Simultaneous Factor Analyses for Eight Different Occupational Groups, N = 2919

	χ^2	df	GFI	IFI	NFI	CFI	RMSEA
Proposed, Indirect Model	1400	640	.945	.962	.932	.961	.020
Direct + Indirect Effects Model	1391	632	.946	.962	.933	.961	.020
Two-Factor Model	2073	648	.917	.929	.900	.928	.028
One-Factor Model	2926	656	.882	.886	.858	.885	.035
Null Model	20635	960	.331	--	--	--	.084

Note. χ^2 = chi-square; DF = degrees of freedom; GFI = goodness-of-fit index; IFI = incremental fit index; NFI = normed fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation.

Table 3

Testing the Equality of the Factor Loadings, the Paths Between the Latent Factors, and the Error Variances of the Proposed MBI-GS Model for Eight Different Occupational Groups, N = 2919

	χ^2	df	GFI	IFI	NFI	CFI	RMSEA
Free Parameters	1400	640	.945	.962	.932	.961	.020
Equal Factor Loadings	1464	655	.943	.959	.929	.959	.021
Equal Path Coefficients	1544	731	.940	.959	.925	.959	.020
Equal Error Variances	1557	752	.939	.960	.925	.959	.019

Note. χ^2 = chi-square; DF = degrees of freedom; GFI = goodness-of-fit index; IFI = incremental fit index; NFI = normed fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation.

Figure Captions

Figure 1. Mean Exhaustion Scores as a Function of Age and Gender.

Figure 2. Mean Cynicism Scores as a Function of Age and Gender.

Figure 3. Mean Professional Efficacy Scores as a Function of Age and Gender.



