

The Dimensionality of the Maslach Burnout Inventory across Small Business Owners and Educators

By: [James S. Boles](#), Dwane H. Dean, Joe M. Ricks, Jeremy C. Short, and Guangping Wang

Boles, James S., Dwayne H. Dean, Joe M. Ricks, Jeremy C. Short and Guangping Wang, "The Dimensionality of the Maslach Burnout Inventory across Small Business Owners and Educators." *Journal of Vocational Behavior* 56 (1, 2000), 12-34.

<https://doi.org/10.1006/jvbe.1999.1689>



© 2000 Academic Press. This work is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](#). Made available courtesy of Elsevier.

Abstract:

This study tested the dimensionality of the Maslach Burnout Inventory (MBI) by comparing three factor structures (i.e., a one-factor structure, a three-factor structure, and a higher order factor structure) in two diverse samples. The comparison of the LISREL measurement models was extended by a series of measurement invariance tests. Additionally, constructs related to burnout had a pattern of correlations to the three MBI dimensions that was similar across the two samples. In aggregate, the analyses suggested that the three-factor structure of the MBI is the most plausible model. By using a sample of small business owners, the current research contributed to existing knowledge on the MBI by establishing the dimensionality and generalizability of the MBI beyond human service occupations.

Keywords: Maslach Burnout Inventory (MBI) | burnout | small business owners

Article:

Job-related burnout may lead to physical and emotional illness, increased job turnover, absenteeism, and reduced productivity (e.g., Cordes & Dougherty, 1993). Burnout is most commonly conceptualized as a reaction to chronic role stress which takes the form of emotional exhaustion, depersonalization of others, and lack of felt personal accomplishment in working with others (Maslach, 1982). Emotional exhaustion (EE) involves feelings of being depleted of energy and drained of sensation due to excessive psychological demands. Depersonalization (DP) denotes the tendency to deindividuate and dehumanize others through cynical, callous, and uncaring attitudes and behaviors. Reduced personal accomplishment (PA) involves repeated efforts that fail to produce results, leading to an attitude of inefficacy and reduced motivation. Although other conceptualizations of burnout exist (Perlman & Hartman, 1982), Maslach's tripartite model of burnout is the most widely cited (Lee & Ashforth, 1996). Consistent with this acceptance, the most widely used measure of the burnout construct has been the Maslach Burnout Inventory (MBI) (Maslach & Jackson, 1981, 1986).

Though the MBI has displayed high internal consistency and test–retest reliability in use, the dimensionality of the instrument has been questioned (Lee & Ashforth, 1990) because of the high reported correlation between the EE and DP dimensions (Cordes & Dougherty, 1993). Specifically, Lee and Ashforth (1996) reported a metacorrelation of .64 between EE and DP, and some authors have indicated that these two dimensions load on a single factor (Brookings, Bolton, Brown, & McEvoy, 1985; Dignan, Barrera, & West, 1986). Alternatively, other studies have reported a three-factor solution (Maslach & Jackson, 1981; Lee & Ashforth, 1990; Byrne, 1993). The question of dimensionality is important, relating directly to construct definition and the interpretation of scale scores. Accordingly, the first goal of this study was to compare several models of burnout dimensionality through confirmatory factor analysis, seeking the most parsimonious and explanatory model.

The second goal of this study was to examine the generalizability of the MBI to populations other than human service workers. This issue was addressed by comparing two samples from very different occupations, educators and small business owners, using simultaneous analysis of the data and relating the burnout dimensions to a set of stress-related variables identified in the literature. The conceptual development of the burnout construct, as well as the MBI scale, has been based primarily on studies of participants in the human service occupations (e.g., nurses, teachers, policemen, and social service workers). Because individuals in these occupations tend to have relatively higher levels of contact with people (clients) than do workers in other types of employment (Perlman & Hartman, 1982; Cordes & Dougherty, 1993), the MBI may not be generalizable to types of employment other than human service occupations.

To accomplish these two goals, we first review the relevant literature on the burnout concept, the factor structure of the MBI, and the relationships between the MBI dimensions and some stress variables associated with burnout in previous research. Based on this review, we develop two hypotheses related to the MBI factor structure and the correlation patterns of the MBI dimensions with other variables. We then report our research results with survey data collected from educators and small business owners. Confirmatory factor analysis was conducted on the two samples to examine the measurement model fit and obtain the proper dimensionality of the MBI. Through measurement invariance tests, we attempted to test the generalizability of the structural equivalence across the two different samples. We also conducted differential correlation tests for further establishing the generalizability of the MBI. Finally, we discuss our findings, study limitations, and future research directions.

LITERATURE REVIEW

The Burnout Construct

A process model specifying the developmental sequence of the three dimensions has been proposed by Leiter and Maslach (1988). They suggest that EE should appear first as chronic excessive work demands drain an individual's emotional resources. As a coping strategy, individuals limit their involvement with others and distance themselves psychologically (DP). Finally, individuals recognize the discrepancy between their original optimistic attitude and their current attitude, thereby experiencing a feeling of inadequacy in relating to people and performing their job (diminished PA). Although there is some dispute as to the proper temporal

sequence of dimensions in the development of burnout (Cordes & Dougherty, 1993), the present study is concerned with the measurement of burnout dimensions rather than their exact sequence in the process of burnout.

Literature suggests that burnout relates to stress, although the distinction between burnout and stress does not seem to be clear (Cordes & Dougherty, 1993). Schuler (1980) defines stress as a dynamic condition in which an individual is confronted with an opportunity/constraint/demand on being/having/doing what one desires and for which resolution is perceived to have uncertainty but which will lead to important outcomes. This definition appears to subsume burnout and characterize it as a particular type of job stress. When viewed as a type of stress, burnout may then be related to other stress variables. The literature has identified such variables as role conflict, role ambiguity, workload, job satisfaction, turnover intention, and organizational commitment (Bacharach, Bamberger, & Conley, 1991; Boles, Johnston, & Hair, 1997; Cordes & Dougherty, 1993; Lee & Ashforth, 1996) as associated with the burnout construct.

The rationale for this study to relate burnout dimensions to these stress-related variables is twofold. First, there appears to be a general pattern of differential correlation between the burnout dimensions and the stress-related variables (Lee & Ashforth 1996), meaning that these variables are generally more strongly associated with one particular burnout dimension than others. Specific metacorrelations reported by Lee and Ashforth (1996) between the stress-related variables and the burnout dimensions (in the order of EE, DP, and PA) are as follows: role conflict (.53, .37, 2.21), role ambiguity (.21, .34, .11), workload (.65, .34, 2.09), job satisfaction (2.31, 2.44, .29), turnover intention (.44, .31, 2.16), and organizational commitment (2.43, 2.42, 2.02). It seems that these variables generally relate to EE more strongly than to DP or PA and that PA seems to have the lowest correlation with these variables (Lee & Ashford, 1996). Metacorrelations of EE with DP and PA are .64 and 2.22, respectively, whereas the PA–DP correlation is reported to be 2.34. Thus, correlations between MBI dimensions and various constructs, to the extent they confirm this general pattern, may provide some supportive evidence for establishing distinct burnout dimensions.

Second, if we expect that burnout is also experienced by employees in occupations outside of human services and that the MBI can be used to measure their levels of burnout, the pattern of differential correlations between samples from the two populations would also be expected to hold. In other words, examination of the differential correlation patterns may help to establish the generalizability of the MBI.

Dimensional Structure of the MBI

While most previous studies on human service professionals yielded three burnout factors representing EE, DP, and PA (e.g., Byrne, 1991; Green & Walkey, 1988; Maslach & Jackson, 1981), some researchers have reported a two-factor structure with EE and DP loaded on a single factor (Brookings, Bolton, Brown, & McEvoy, 1985; Dignan, Barrera, & West, 1986). Other research reports a four-factor structure (Firth, McIntee, McKeown, & Britton, 1985; Iwanicki & Schwab, 1981). Thus, one issue revealed by previous research is the number of distinct MBI dimensions when respondents are from the typical human contact professions.

A second issue related to burnout dimensionality arises when the MBI is applied to nontraditional respondent samples. In one of the few attempts to generalize the burnout construct beyond human service occupations, Garden (1987) collected data from a sample of graduate business students and found that the depersonalization dimension failed to emerge, although factors corresponding to EE and PA were present. The author speculates that personality type moderates the reaction to role stress with the result that burnout measures that include DP may not be able to measure burnout in some occupations. It should be noted that Garden (1987) did not use the MBI as a data collection instrument. Instead, a 210-item stress questionnaire with some items similar to those in the MBI was used. Thus, failure to reproduce the DP factor may have been due to nonequivalence of domain content rather than a true absence of the MBI's depersonalization factor in the sample. Additionally, it could easily be argued that job demands (stressors) for Garden's sample differed from the usual stressors in human service occupations, which resulted in a different response profile. Thus, the results may not be due to a response difference, but rather to a difference in input (different stressors).

On balance, while some studies report fewer than three-factors (e.g., Brookings et al., 1985; Dignan et al., 1986), most of the evidence supports the three-factor dimensionality of the MBI originally reported by Maslach and Jackson (1981). Additionally, there is, as yet, insufficient evidence to suggest that the MBI can be generalized across widely different occupations. Nevertheless, we expect the three-factor structure to emerge in both our samples. The above discussion leads to the following hypotheses:

H1: A model with three separate, yet correlated, dimensions fits the MBI better than models using a single or a higher order dimension.

H2: The three dimensions of the MBI correlate to the stress-related variables similarly for educators and small business owners.

METHODS

Participants

The study used two samples. In the first sample, 183 elementary and high school teachers and administrators from a small southeastern U.S. city participated. Of these, 128 were female. Median age for the sample was 43. Fifty percent of the respondents had children living at home and 86% were married. For the purposes of this study, since both teachers and administrators work in a human service context, their responses were aggregated (Burke & Greenglass, 1995), and the sample is thus referred to as the educator sample.

The second sample was composed of 162 small business owners from a large southeastern city. In this study, small business refers to a firm with fewer than 100 employees. Median age of these respondents was 45. Ninety-six (96) respondents were male. Eighty (80) percent were married and 40% had children living at home. Listwise deletion due to missing data resulted in sample sizes of $N = 182$ and $N = 157$ for the educators and small business owners, respectively.

Measures

The three dimensions of burnout were measured with the 22-item MBI (Maslach & Jackson, 1981, 1986). Because the MBI was designed for human-service workers, the wording of several items on the depersonalization and personal accomplishment subscales was modified to reflect interaction with employees and students for the respective samples (Jackson, Schwab, & Schuler, 1986). Respondents used a 7-point scale where greater values indicated that the respondent experienced those feelings in question with increasing frequency. Coefficient alphas of the EE, DP, and PA dimensions for the educators/ business owners were .89/.90, .80/.70, and .76/.78, respectively.

For the educator sample, *role conflict* was measured with the 8-item scale developed by Rizzo, House, and Lirtzman (1970). Respondents replied to each item on a 7-point scale where larger numbers indicated greater role conflict. Coefficient alpha of the measure was .85 for the educators. Since the business owner is the chief policy maker for his/her firm, these individuals would not be expected to experience role conflict as it is defined by this measure. Therefore, this measure was not used with business owners.

Work-family conflict was measured with the five-item WFC scale developed by Netemeyer, Boles, and McMurrian (1996). Responses were made on a 7-point scale ranging from “strongly disagree” to “strongly agree.” Larger numbers indicate that the respondent experiences greater work-family conflict. Reliability of this measure was .88 and .89 for educators and business owners, respectively.

Job tension was measured with seven items from the anxiety stress scale developed by House and Rizzo (1972). This measure also used a 7-point response scale with larger numbers indicating higher levels of job tension. The reliability of this scale was .84 for educators and .82 for business owners.

Job satisfaction was measured with five items that tap global satisfaction with the job (Netemeyer et al., 1996). Responses were made on 7-point scales ranging from “strongly disagree” to “strongly agree” where larger numbers indicate that the respondent is more satisfied with the job. Reliability for this scale was .94 for business owners and .93 for teachers.

Life satisfaction was measured with a 15-item scale developed by Quinn and Staines (1979) that assesses general happiness with life. Responses were reported on 7-point scales anchored by “strongly disagree” and “strongly agree.” Reliability of this measure was .85 for educators. For business owners, the scale had a reliability of .86.

Propensity to leave was assessed with a five-item scale used in previous research (Bluedorn, 1982; Hendrix, Nestor, & Troxler, 1985). These items also were on a 7-point response scale where higher numbers indicate an increased likelihood of leaving the current job or occupation. Coefficient alpha for this measure was .98 for educators and .94 for business owners.

In addition to all of the scales used for the educator sample (with the exception of role conflict), two more scales were included in the business owners survey. These measures were added in an

attempt to provide an additional test of the validity of the MBI in an entrepreneurial/managerial environment.

Physical symptomology (negative physical symptoms) was assessed with the 54-item checklist (i.e., the Pennebaker Inventory of Limbic Languidness, or PILL) developed by Pennebaker (1982; Pennebaker, Burnam, Schaeffer, & Harper, 1977). Responses were made on a 7-point “strongly disagree”/“strongly agree” scale with larger numbers indicating that the respondent experiences higher levels of the physical symptoms described in the study. Coefficient alpha for this measure was .94.

Depression was measured with the 30-item Automatic Thoughts Questionnaire (ATQ) (Hollon & Kendall, 1980). Respondent perceptions were made on a 7-point “strongly disagree”/“strongly agree” response scale. Larger numbers indicate that the respondent experienced greater levels of depressive thoughts and the accompanying behaviors. Reliability of this measure was .94.

Procedures

The data were collected as part of a larger study of work–family conflict (Netemeyer et al., 1996). In the educator sample, participants from a small southeastern U.S. city were surveyed. Surveys were delivered by courier to schools where the administrators had agreed to participate. The survey was distributed at faculty meetings and respondents completed the survey at a later time. They then mailed completed surveys directly back to the authors (response rate was 81%).

The second sample consisted of small business owners from a large southeastern city. These individuals operated businesses with less than 100 employees. Names and mailing addresses for this survey were obtained from Chamber of Commerce records. Surveys to the business owners were administered by mail. The response rate was 54%.

In both samples, a return mail envelope was provided and respondents were assured of the anonymity and confidentiality of their responses via a cover letter. Survey items contained in the two surveys were somewhat different between the two groups and the ordering was not the same on the two surveys. Within each study, items were in the same order for all respondents.

Table 1 shows the means and standard deviations along with the skewness and kurtosis statistics of all the measures included in this study. Overall, the means and standard deviations of each variable do not differ considerably across the two samples. An examination of the univariate skewness and kurtosis statistics indicates the absence of substantial deviation from univariate normality for most variables (Hair, Anderson, Tatham, & Black, 1995). Further, it has been suggested that maximum likelihood estimation is relatively robust with regard to nonnormal distribution (Bollen, 1989).

Table 1. Descriptive Statistics for All Measures

Variables	Educators				Small business owners			
	Mean	<i>SD</i>	Skewness	Kurtosis	Mean	<i>SD</i>	Skewness	Kurtosis
EE	3.08	1.10	0.57	0.18	2.58	1.07	0.65	-0.16
DP	2.27	1.07	1.12	0.97	2.38	1.10	0.67	-0.33
PA	5.36	0.73	-0.30	0.13	4.79	1.05	-0.31	-0.29
Job tension	2.94	1.16	0.59	-0.16	3.10	1.30	0.53	-0.12
Role conflict	3.42	1.32	0.49	0.71	N/A	N/A	N/A	N/A
Work-family conflict	3.03	1.46	0.69	0.03	3.43	1.64	0.27	-0.91
Job satisfaction	5.84	1.04	-1.07	0.82	5.80	1.15	-1.31	1.87
Life satisfaction	5.29	0.78	-0.43	-0.30	5.21	0.85	-0.24	-0.48
Propensity to leave	1.61	0.88	2.96	14.17	1.52	0.88	1.78	2.20
Depression	N/A	N/A	N/A	N/A	1.39	0.37	1.84	4.82
Physical symptomology	N/A	N/A	N/A	N/A	1.72	0.48	1.00	0.61

ANALYSES AND RESULTS

Overview

Given our goal of examining the factor structure and validity of the MBI in an employment setting that did not involve human services, we first examined the dimensionality of burnout through confirmatory factor analysis (CFA) with LISREL VIII (Joreskog & Sorbom, 1996). The CFA allows for comparisons of differing factor structures for a given set of data and is becoming increasingly accepted as a method for both developing and refining measurement instruments (Bagozzi & Heatherton, 1994; Floyd & Widaman, 1995). Hypothesis 1 was tested through examining and comparing three models with different factor structures. A by-product of this analysis was the deletion of three items from the original MBI based on previous research, their measurement properties, and the authors' judgment with regard to their content validity. The reduced-item MBI and obtained factor structure were then generalized through a series of measurement invariance tests. Finally, we report the differential correlations between each of the three burnout dimensions and the selected stress-related variables for testing Hypothesis 2.

Factor Structure Comparisons with 22-Item MBI

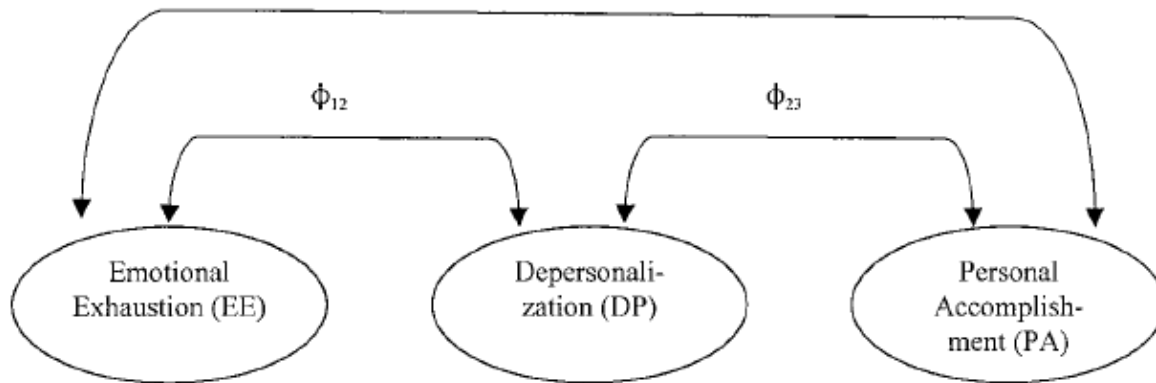
To obtain a factor structure that best represents the MBI, three plausible models were estimated and compared using the variance-covariance matrices as input data and maximum likelihood (ML) as the estimation method. In the first model, all 22 MBI items were specified to load together on one factor (i.e., a single-factor, unidimensional structure for the MBI). The second model specified EE, DP, and PA components as three correlated first-order factors. In the final model, the EE, DP, and PA factors were specified to a higher order factor structure where EE, DP, and PA were modeled as subdimensions of an overall burnout construct. The three-factor model and the higher order factor are presented in Fig. 1. Tables 2 and 3 reproduce the correlation matrices for the 22-item MBI obtained from the educator and small business owner samples, respectively. The top portion of Table 4 lists the fit indices for all models analyzed in this study for both samples.

Table 2. Correlation Matrix—The Educator Sample ($N = 182$)

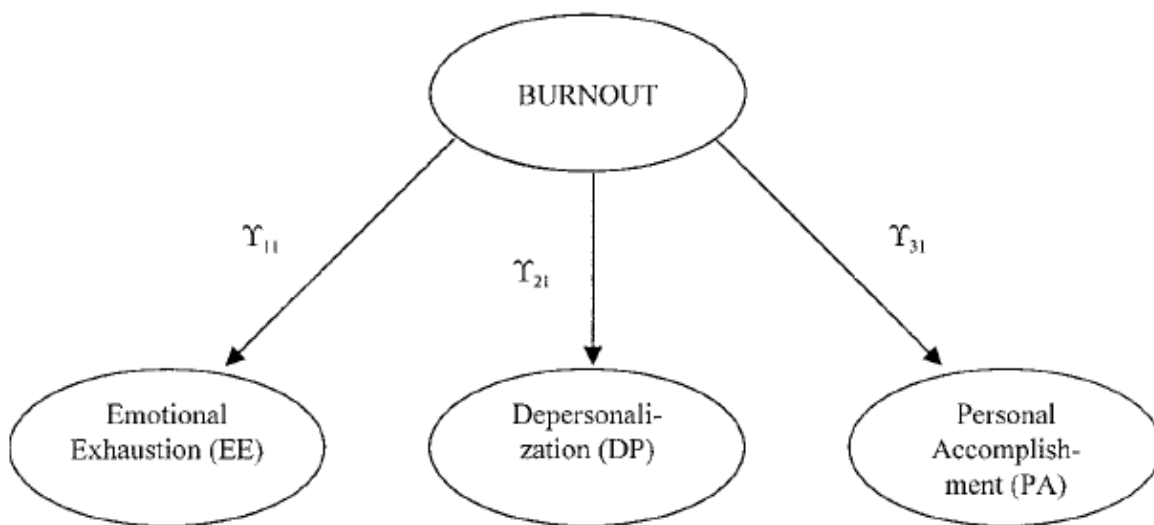
	Mean	SD	BO1	BO2	BO3	BO4	BO5	BO6	BO7	BO8	BO9	BO10	BO11	BO12	BO13	BO14	BO15	BO16	BO17	BO18	BO19	BO20	BO21	BO22	
BO1	4.09	1.55	1.00																						
BO2	4.18	1.62	0.86	1.00																					
BO3	2.94	1.54	0.58	0.60	1.00																				
BO4	5.34	1.20	0.14	0.08	0.04	1.00																			
BO5	2.09	1.28	0.21	0.25	0.24	-0.25	1.00																		
BO6	2.35	1.37	0.37	0.39	0.47	0.00	0.37	1.00																	
BO7	5.30	1.20	0.13	0.08	-0.07	0.40	-0.29	-0.06	1.00																
BO8	2.91	1.57	0.55	0.59	0.70	-0.03	0.39	0.51	-0.05	1.00															
BO9	5.89	1.02	0.20	0.13	-0.05	0.46	-0.21	-0.14	0.49	-0.03	1.00														
BO10	2.44	1.47	0.32	0.37	0.33	-0.07	0.47	0.41	-0.14	0.45	-0.11	1.00													
BO11	2.43	1.57	0.40	0.44	0.41	-0.15	0.48	0.44	-0.17	0.54	-0.12	0.72	1.00												
BO12	4.68	1.45	-0.49	-0.48	-0.61	-0.01	-0.27	-0.33	0.13	-0.56	0.17	-0.31	-0.31	1.00											
BO13	3.01	1.53	0.50	0.55	0.54	-0.10	0.36	0.38	-0.08	0.63	-0.03	0.46	0.56	-0.38	1.00										
BO14	3.87	1.62	0.53	0.56	0.47	0.03	0.23	0.25	0.06	0.45	0.21	0.27	0.37	-0.33	0.50	1.00									
BO15	1.62	1.04	0.14	0.19	0.24	-0.17	0.40	0.29	-0.17	0.23	-0.22	0.34	0.41	-0.11	0.33	0.13	1.00								
BO16	2.29	1.32	0.39	0.38	0.47	-0.06	0.35	0.52	-0.15	0.43	-0.12	0.35	0.53	-0.38	0.48	0.37	0.36	1.00							
BO17	5.59	1.20	-0.02	-0.08	-0.17	0.34	-0.32	-0.17	0.43	-0.19	0.32	-0.20	-0.27	0.19	-0.20	-0.03	-0.22	-0.22	1.00						
BO18	5.23	1.27	-0.04	-0.10	-0.17	0.07	-0.11	-0.13	0.24	-0.25	0.23	-0.09	-0.15	0.28	-0.16	-0.04	-0.17	-0.16	0.44	1.00					
BO19	5.81	1.03	0.01	-0.01	-0.14	0.13	-0.17	-0.14	0.24	-0.16	0.35	-0.14	-0.13	0.22	-0.13	0.12	-0.20	-0.18	0.37	0.51	1.00				
BO20	2.02	1.12	0.40	0.42	0.52	-0.08	0.28	0.39	-0.01	0.53	-0.11	0.42	0.49	-0.46	0.44	0.30	0.36	0.46	-0.16	-0.17	-0.21	1.00			
BO21	5.15	1.39	0.01	-0.02	-0.02	0.17	-0.12	0.00	0.36	-0.05	0.14	-0.06	-0.11	0.06	0.01	-0.07	-0.16	-0.01	0.28	0.25	0.29	0.02	1.00		
BO22	2.68	1.57	0.30	0.31	0.23	-0.26	0.48	0.25	-0.19	0.34	-0.16	0.34	0.40	-0.21	0.35	0.18	0.33	0.38	-0.29	-0.04	-0.12	0.25	-0.08	1.00	

Table 3. Correlation Matrix—The Small Business Owner Sample ($N = 157$)

	Mean	SD	BO1	BO2	BO3	BO4	BO5	BO6	BO7	BO8	BO9	BO10	BO11	BO12	BO13	BO14	BO15	BO16	BO17	BO18	BO19	BO20	BO21	BO22	
BO1	3.16	1.55	1.00																						
BO2	3.55	1.75	0.75	1.00																					
BO3	2.41	1.43	0.57	0.62	1.00																				
BO4	4.68	1.63	0.00	0.04	0.06	1.00																			
BO5	1.87	1.22	0.34	0.28	0.27	0.01	1.00																		
BO6	2.14	1.27	0.42	0.35	0.41	0.04	0.28	1.00																	
BO7	4.59	1.76	-0.12	-0.11	-0.04	0.36	-0.02	0.00	1.00																
BO8	2.50	1.64	0.67	0.57	0.62	0.01	0.26	0.54	-0.09	1.00															
BO9	5.09	1.67	-0.01	0.08	-0.09	0.34	-0.07	-0.11	0.31	-0.18	1.00														
BO10	2.73	1.75	0.34	0.32	0.32	0.04	0.26	0.37	0.03	0.39	-0.04	1.00													
BO11	2.76	1.81	0.53	0.43	0.42	0.06	0.28	0.39	0.06	0.51	0.01	0.70	1.00												
BO12	4.54	1.50	-0.27	-0.25	-0.39	0.18	-0.17	-0.28	0.21	-0.40	0.30	-0.17	-0.12	1.00											
BO13	2.69	1.46	0.56	0.41	0.48	-0.03	0.37	0.42	-0.05	0.66	-0.22	0.46	0.53	-0.29	1.00										
BO14	3.27	1.92	0.52	0.53	0.41	0.02	0.21	0.29	-0.05	0.45	0.04	0.22	0.32	-0.07	0.48	1.00									
BO15	1.73	1.31	0.16	0.17	0.19	-0.12	0.29	0.37	0.02	0.19	-0.07	0.21	0.21	-0.15	0.15	0.02	1.00								
BO16	2.10	1.28	0.41	0.39	0.44	0.04	0.13	0.63	0.01	0.63	-0.06	0.30	0.44	-0.26	0.45	0.37	0.30	1.00							
BO17	5.05	1.68	-0.10	-0.08	-0.14	0.33	-0.20	-0.05	0.33	-0.11	0.32	0.01	0.00	0.33	-0.27	-0.05	-0.14	-0.07	1.00						
BO18	4.48	1.50	-0.15	-0.07	-0.20	0.29	-0.15	-0.06	0.18	-0.22	0.28	-0.07	-0.11	0.36	-0.31	-0.10	-0.11	-0.19	0.50	1.00					
BO19	5.43	1.44	-0.03	0.01	-0.13	0.12	-0.07	-0.10	0.28	-0.15	0.57	-0.09	-0.06	0.28	-0.25	-0.02	0.00	-0.12	0.40	0.37	1.00				
BO20	1.85	1.29	0.54	0.47	0.66	0.02	0.33	0.30	-0.10	0.62	-0.09	0.30	0.37	-0.31	0.55	0.43	0.17	0.42	-0.12	-0.26	-0.12	1.00			
BO21	4.55	1.65	-0.06	-0.11	-0.11	0.19	-0.01	-0.12	0.22	-0.08	0.34	-0.02	0.02	0.23	-0.09	0.02	-0.15	-0.13	0.52	0.20	0.37	-0.02	1.00		
BO22	2.69	1.60	0.36	0.38	0.36	-0.04	0.43	0.22	-0.01	0.32	-0.05	0.35	0.34	-0.21	0.40	0.31	0.10	0.23	-0.13	-0.22	-0.10	0.37	-0.07	1.00	



A. First-Order Three-Factor Model



B. Higher-Order Factor Model

Figure 1. Two of the alternative models of the Malsach Burnout Inventory.

Several indices of fit were used to evaluate the models: the goodness of fit index (GFI) and adjusted goodness of fit index (AGFI); Bentler's (1990) Comparative Fit Index (CFI); and the Tucker Lewis Index or the Non-Normed Fit Index (NNFI). Though levels of .90 have been advocated for these indices, it has been noted that GFI and AGFI may be subject to inconsistencies from sampling characteristics (Hoyle & Panter, 1994; Hu & Bentler, 1995). The CFI and NNFI seem to be less affected by such characteristics; thus they are included here. Another useful measure of fit is the root mean square error of approximation (RMSEA), which assesses fit per degree of freedom, and values between .05 and .08 have been deemed as acceptable levels of fit (Browne & Cudeck, 1993; Hair et al., 1995).

Table 4. Factor Structure Comparisons for the 22-Item MBI

Model	χ^2	<i>df</i>	AGFI	GFI	NNFI	CFI	RMSEA
Educator sample							
1. One-factor	864.71	209	.54	.62	.58	.62	.13
2. Correlated first-order three-factor	604.99	206	.71	.76	.74	.77	.10
3. Higher order factor model	604.99	206	.71	.76	.74	.77	.10
Small business owner sample							
1. One-factor	704.95	209	.60	.67	.60	.64	.12
2. Correlated first-order three-factor	449.23	206	.74	.79	.80	.82	.087
3. Higher order factor	449.23	206	.74	.79	.80	.82	.087
Three-factor model for the 19-item MBI							
Educator sample							
First-order	307.70	149	.80	.84	.85	.87	.077
Small business owner sample							
First-order	275.84	149	.80	.85	.86	.88	.074

Note. Listwise deletion of missing data on the MBI items yielded sample sizes of $N = 182$ and $N = 157$ for the educator and small business owner samples, respectively, for all models.

As the top half of Table 4 shows, the one-factor model where all 22 MBI items are specified to a single construct fits the data poorly across all indices. Furthermore, an inspection of completely standardized factor loadings (and t values) showed 9 low loadings (i.e., below .50) in the educator sample and 11 in the small business owner sample. As such, the one-factor model of burnout is not supported for either sample.

Given the same set of data and number of parameters estimated, the three correlated first-order factor model and the higher order factor model exhibit identical fit indices. Both of these models evidenced a significantly better fit ($p < .01$) than the one-factor model ($\chi^2_{diff(3)} = 259.72$ and 255.72 for educator and small business owner samples, respectively). To determine which of these two models better represented the data, we conducted several analyses. First, we examined the magnitude of the first-order factor loadings (i.e., gamma paths to the higher order factor). It has been suggested that the first-order factors should load on the higher order factor similarly in both direction and magnitude if the higher order factor model is to be supported (Bagozzi & Heatherton, 1994). Our results do not support such a premise. There was a great deal of variation among the completely standardized factor loadings (i.e., the gamma paths) for both samples. In the educator sample the loadings were EE (γ_{11}) = .60, PA (γ_{31}) = .97, and DP (γ_{21}) = .62. For the small business owner sample the loadings were EE (γ_{11}) = 1.40, PA (γ_{31}) = .50, and DP (γ_{21}) = .19. (Note the out-of-range standardized value of 1.40 and the rather low value of .19 that are indicative of an ill-fitting model.)

Second, we conducted tests of discriminant validity among the factors in the three correlated first-order factor model. For the educator sample, the correlations among factors ranged from .10 to .71. For the small business sample, the correlations among factors ranged from .07 to .71. Two tests of discriminant validity were conducted. The first criterion states that if the parameter estimate (ϕ) between a pair of factors is less than 1 (i.e., a 95% confidence interval around the maximum likelihood ϕ estimate does not contain a value of 1), discriminant validity is supported. This test was supported for all possible pairs of MBI components.

As a second test of discriminant validity, we also compared the three-factor model with a two-factor model where the EE and DP dimensions were combined into one factor since these two dimensions exhibited the highest correlations across the two samples. For both samples, the hypothesized three-factor structure better fit the data than the two-factor model ($\chi^2_{\text{diff}(2)} = 108.30$ and 49.82 for the educator sample and the small business owner sample, respectively; $p < .001$). In sum, for these two samples, the data strongly suggest that the three-factor model with EE, PA, and DP as separate but correlated constructs best represents the data.

Post Hoc Scale Reduction

In examining the factor structures, some undesirable psychometric characteristics were found to be associated with several items in the MBI. Items 12 and 16 showed high standardized residual errors across the samples. Additionally, item 12 had the highest modification index for cross-factor loadings. It was also noticed that items 1 and 2 had high within-factor correlated measurement errors in both samples. These measurement problems were not unique to this study. Indeed, a number of previous investigations have found several problematic items including items 1, 2, 12, and 16 (see Byrne, 1993 for a review). The authors were thus prompted to examine the content validity of the items. Item 12, which stated “I feel very energetic,” was originally designed to measure the PA dimension. The authors felt that this item did not correspond to the conceptual domain of this dimension and seemed to represent more of the EE dimension. Item 16, “Working with people directly puts too much stress on me,” was supposed to represent the EE dimension, but seemed to correspond more, but not exactly, to DP. Based on their measurement properties and these construct validity considerations, items 12 and 16 were eliminated. This decision to delete the two items is consistent with Byrne’s (1993) recent work on the MBI.

To solve the problem related to items 1 and 2, Byrne (1993) allows the items to have correlated errors in the model specification. However, correlated measurement errors may impose interpretation problems because as correlated error terms are added to the model, the correspondence between the posited construct of interest and the empirically defined factor becomes unclear (Gerbing & Anderson, 1984). Again, we looked at the content validity of the items. In fact, items 1 and 2 were quite similar in wording. We judged item 1, “I feel emotionally drained from my work,” to be a better representation of EE than item 2, which stated, “I feel used up at the end of the workday.” We thus eliminated item 2 rather than specifying a correlated measurement error between items 1 and 2.

Since the MBI as an established scale has been used extensively, our post hoc decision to eliminate these items was made cautiously. The decision was based on both empirical data and conceptual considerations of their content validity. Further, as mentioned earlier, the measurement problems with these items, which appeared in both of our samples, have been documented extensively in the literature. Thus, our decision is not inconsistent with the extant research on the MBI scale. In addition, we took steps to ensure the content domains of the scale remained intact and the scale’s overall measurement properties were unaffected. Toward this end, we conducted two types of analysis as detailed below.

First, the same factor structure comparisons were conducted for the reduced-item MBI as for the full 22-item scale. That is, we compared the three-factor first-order model, the one-factor model, and the higher order factor model. The three-factor first-order model was again found to fit the data better than the one-factor model for both samples.

Table 5. Completely Standardized Factor Loadings for the 19-Item MBI

Items	EE	DP	PA
1. I feel emotionally drained from my work.	.69 (.77)		
3. I feel fatigued when I get up in the morning and have to face another day on the job.	.79 (.73)		
6. Working with people all day is really a strain for me.	.58 (.57)		
8. I feel burned out from my work.	.84 (.86)		
13. I feel frustrated by my job.	.74 (.76)		
14. I feel I am working too hard on my job.	.58 (.57)		
20. I feel like I am at the end of my rope.	.63 (.73)		
5. I feel I treat some students (employees) as if they were impersonal objects.	.62 (.40)		
10. I've become more callous toward people since I took this job.	.78 (.77)		
11. I worry that this job is hardening me emotionally.	.87 (.86)		
15. I don't really care what happens to some students (employees).	.50 (.28)		
22. I feel students (employees) blame me for some of their problems.	.52 (.47)		
4. I can easily understand how my students (employees) feel about things.			.51 (.43)
7. I deal very effectively with the problems of my students (employees).			.67 (.46)
9. I feel I am positively influencing other peoples lives through my work.			.61 (.62)
17. I can easily create a relaxed atmosphere with my students (employees).			.67 (.72)
18. I feel exhilarated after working closely with my students (employees).			.50 (.56)
19. I have accomplished many worthwhile things in this job.			.53 (.64)
21. In my work I deal with emotional problems very calmly.			.43 (.57)

Note. All loadings are significant at the .01 level; $N = 182$ (157). Cronbach's alphas for EE, DP, and PA are .86 (.87), .80 (.70), and .78 (.77) for the educator and (small business owner) samples, respectively.

Fit statistics for the three-factor model of the reduced scale are shown in the bottom portion of Table 4. The reduced-item MBI shows improved fit over the original scale as reflected in virtually all indices. In examining the higher order factor model, we again found wide fluctuation in the gamma loadings of the three first-order factors on the higher order factor, which was also in favor of the three-factor model. Discriminant validity tests further showed the three factors to be distinct, supporting the first-order three-factor model. In sum, the three correlated first-order factor model was shown to be superior to the other two models with the reduced-item MBI, as in the case of the original 22-item MBI. Table 5 shows the completely standardized factor loadings and internal consistency estimates for each dimension in the reduced-item MBI. All loadings are significant and coefficient alpha levels are satisfactory (Nunnally & Bernstein, 1994).

We then examined the correlations (ϕ estimates in the LISREL measurement model) between the MBI dimensions, which did not reveal any appreciable change from those of the original scale. For the educator sample, the correlations between EE and DP (ϕ_{12}), EE and diminished PA (ϕ_{13}), and DP and diminished PA (ϕ_{23}) were .70, .18, and .41, respectively, with the full 22-item scale, and .71, .16, and .39, respectively, with the reduced scale. For the small business owner sample, the correlations were .71, .27, and .10, respectively, with the original scale, and .71, .25, and .07, respectively, with the reduced scale.

In summary, the post hoc elimination of the three items from the original MBI was based on previous research, the content validity of the items, and cross-sample measurement problems associated with these items. The analyses described above suggest that the reduced-item MBI fit the data better and did not substantially alter the relationships between the dimensions as evidenced in both samples. Although further cross-validation is called for, we tentatively conclude that the reduced-item MBI has better psychometric measurement properties than the original scale. In the next section, we report the results of the invariance tests with the reduced-item scale.

Measurement Invariance Tests

To further test Hypothesis 1, multiple-group measurement invariance tests with LISREL VIII were performed on the reduced-item MBI. When parallel data exist across groups, multiple-group analysis offers a powerful test of the equivalence of factor solutions across samples because it rigorously assesses measurement properties (Bagozzi & Heatherton, 1994; Marsh, 1994).

In general, models of invariance are tested hierarchically, where the hierarchy begins with the least restrictive model and builds toward progressively more restrictive models across groups. Although there is no consensus on the ordering of the subsequent models of invariance, the following hierarchy for measurement models has been recommended: (a) a model specifying invariant factor loadings across groups; (b) a model specifying invariant factor loadings, invariant factor variances, and correlations across groups; and (c) a model specifying invariant factor loadings, invariant factor correlations, and invariant measurement error variances across groups (Marsh, 1994).

With the reduced-item MBI, parameter specifications for both samples were compared simultaneously. First, a baseline model with no invariance constraints specified across samples was estimated. This model served as a comparison standard for the remaining models in the hierarchy. The fit indices for the baseline model were $\chi^2 = 583.55$ ($df = 298$), RMSEA = .053, GFI = .84, NNFI = .86, and CFI = .88. The model with the factor loadings constrained to be invariant across groups was then estimated. The chi-square difference between this model and the baseline model was not significant ($\chi^2_{diff(16)} = 24.7$, $p > .05$), indicating that the factor loadings are not statistically different across groups. Adequate fit was also found for the factor loadings invariant model across indices (RMSEA = .053, GFI = .84, NNFI = .86). Only the CFI changed from .88 in the baseline model to .87 in the factor loadings invariant model. In sum, adequate evidence of invariant factor loadings exists for the two samples.

We then estimated the model that constrained the factor loadings, factor variances, and factor correlations invariant across groups. The difference in chi-square statistic between this model and the baseline model was significant ($\chi^2_{diff(22)} = 48.49$, $p < .05$). However, some authors suggest that reasonable fit indices may suggest the models are not appreciably different (see Marsh, 1994). In other words, fit indices should also be used to assess invariance. The fit indices for the factor loadings, factor variances, and correlations invariant model did not change dramatically from the baseline model (RMSEA = .054, GFI = .83, NNFI = .85, CFI = .86). This suggests reasonable evidence for the parameter invariance between the two models.

The last model estimated was the one that constrained the factor loadings, factor variances and correlations, and measurement error variances invariant across groups. This model was again compared with the baseline model. The difference in fit between the two models was significant ($\chi^2_{diff(41)} = 205.16, p < .05$), and the fit indices for this model were appreciably different from those of the baseline model (RMSEA = .063, GFI = .80, NNFI = .80, CFI = .80). As such, evidence of invariant measurement error variance did not seem to exist. Overall, strong evidence for factor loadings invariance was found, which is considered by some as the most important level of measurement invariance across samples (Marsh, 1994).

Differential Correlations

Hypothesis 2 is related to the correlation pattern between the MBI dimensions and several stress-related variables that have been identified in previous research. Hypothesis 2 posits that the correlation pattern will be similar across the educators and small business owners. To provide a rigorous test for H2, Pearson correlations were computed and significance tests of differential correlations as proposed by Cohen and Cohen (1983, pp. 56–57) were performed. Each stress-related variable was examined for its pattern of correlations with the MBI dimensions. For example, the EE–job tension correlation was compared with the DA–job tension and PA–job tension correlations.

Table 6. Differential Correlations between Burnout Dimensions and Related Variables

Variables	EE (1)	DP (2)	PA (3)
Educators sample			
Job tension	.707 ^{2,3}	.436 ^{1,3}	.105 ^{1,2}
Role conflict	.466 ³	.433 ³	.135 ^{1,2}
Work–family conflict	.566 ^{2,3}	.356 ^{1,3}	.199 ^{1,2}
Job satisfaction	–.536 ^{2,3}	–.405 ¹	–.346 ¹
Life satisfaction	–.452 ¹	–.335 ²	–.380
Propensity to leave	.381 ³	.374 ³	.143 ^{1,2}
Small business owner sample			
Variables	EE (1)	DP (2)	PA (3)
Job tensions	.676 ^{2,3}	.384 ^{1,3}	.141 ^{1,2}
Work–family conflict	.504 ³	.395 ³	.053 ^{1,2}
Job satisfaction	–.374	–.293	–.298
Life satisfaction	–.636 ^{2,3}	–.388 ¹	–.317 ¹
Propensity to leave	.293	.159	.138
Depression	.592 ³	.479 ³	.214 ^{1,2}
Physical symptoms	.493 ^{2,3}	.254 ¹	.136 ¹

Note. The superscripted numbers 1, 2, and 3 represent dimensions of the MBI for emotional exhaustion, depersonalization, and personal accomplishment, respectively. The PA items have been reverse-coded so that all three dimensions are positively correlated. For each construct, the superscripts indicate the dimensions for which the subscales differ on the basis of a *t* test at the .05 significance level. For example, for the Educator sample, the job satisfaction correlation with emotional exhaustion is significantly different than the job satisfaction correlation with depersonalization.

The Pearson correlations between the MBI dimensions and some related constructs identified in previous studies are presented in Table 6. Also shown are the results of the differential

correlation tests, indicated by the superscripts. For any selected variable, the superscripts indicate on which dimensions the correlations are different at the .05 significance level. For instance, in the educator sample, job tension has a correlation of .707 with EE. This correlation is significantly different from the correlations between job tension and DP (indicated by the superscript 2) and between job tension and PA (indicated by the superscript 3).

The correlations between job tension and the individual MBI dimensions are all significantly different with an identical pattern across the two samples. This pattern indicates that job tension is more strongly related to EE than to the other two burnout dimensions, and the relationship between job tension and PA seems to be the weakest. Work–family conflict exhibited similar correlation pattern across the two samples, although the difference between its correlations with EE and DP were significant in the educator sample while nonsignificant in the small business owner sample. Overall, results of the dependent correlation *t* tests showed that most of these differences (24 out of 39, i.e., 61.5%) were statistically significant. More important than the statistical significance may be the overall, cross-sample pattern in the magnitude of the correlations between the selected variables and each of the MBI dimensions. With the exceptions of life satisfaction in the educator sample and job satisfaction in the small business owner sample, all the selected variables exhibited highest correlations with EE, lowest with PA, with the correlations with DP in between. Therefore, it is concluded that Hypothesis 2 is generally supported.

DISCUSSION

The inability of this study to support the higher order factor structure of burnout lends evidence to the idea that EE, DP, and PA are conceptually, statistically, and practically distinct components of burnout (Green & Walkey, 1988; Maslach & Jackson, 1981). This suggests that future researchers should be careful not to aggregate MBI subscales, since this may result in a loss of diagnostic information and compromise intervention and monitoring of therapeutic progress. In other words, unique treatment may be required for individuals with varied levels of EE, DP, and diminished PA.

Based on both conceptual and empirical ground, we eliminated three items in the original MBI, resulting in a 19-item scale. The new scale better fits the data from both samples and exhibited correlations between the subscales that are similar to those of the original MBI. Although this elimination was post hoc in this study, and further validation is absolutely needed, the deletion is consistent with previous research on the MBI and should not be regarded as model specification for the sole purpose of data fitting. We expect future research to confirm the 19-item scale to be a better representation of workplace burnout.

Our results support the generalization of the MBI to occupational groups other than human-service workers. Burnout has been defined and studied primarily as a pattern of responses to stressors at work (Cordes & Dougherty, 1993). Given the divergent occupations of our two samples, one would expect the stressors encountered in the two occupations also to be dissimilar. From this viewpoint, our results are noteworthy for the general similarity in responses of the two samples. That is, both the mean level of responses on the burnout dimensions and related variables (see Table 1) and the pattern of correlations between the three dimensions and related

constructs (see Table 6) are rather similar. This suggests that dissimilar stressors (inputs) may result in similar human responses among different occupations. If this suggested relationship is true, it implies that the MBI may be generalized over other divergent work settings.

The measurement invariance tests established the statistically equivalent factor loadings of the shortened MBI scale items across the two samples in this study. The analyses suggest that the burnout phenomenon may be equally pervasive in occupations other than human services and that the relative magnitude of each dimension may be very similar across samples. The invariance tests thus offered some initial evidence that the MBI and its dimensionality can be generalized from the traditional human service workers to workers outside that field. The differential correlation tests, to which we now turn, further indicate the generalizability of the MBI.

The differential correlations found among the three burnout dimensions resemble those found by other recent studies and reviews (Lee & Ashforth, 1996; Cordes & Dougherty, 1993). Overall, we found that stress-related variables were typically more strongly correlated with EE than DP or PA for both samples. This also suggests that potentially interesting and valuable information may get lost when the three MBI dimensions are aggregated.

Perhaps more noteworthy than simply the magnitude and direction of the differential correlations found in this study is that our results generally held for both educators and small business owners alike. By using such diverse samples, this study responds to calls for generalizability of the MBI outside of human service occupations (e.g., Lee & Ashforth, 1996). Thus, burnout may be a phenomenon common to many different occupations and contexts, where three correlated, but distinct, types of burnout require assessment. Our findings indicate that managing a business, as opposed to interacting with clients or students, also can lead to feelings of burnout. Further, burnout in occupations other than those directly providing human services can be measured with the MBI.

The differential correlations between the MBI dimensions and job tension and work–family conflict seem particularly interesting. While results relating to job tension and work–family conflict were generally consistent between the two samples, it is noted that work–family conflict had a stronger relationship with reduced PA for educators than for business owners, whereas job tension had a stronger relationship with that dimension among business owners. Perhaps the nature of the two positions can help explain this difference. Dealing with students all day, when combined with conflict between one’s job and family situation, can result in educators feeling that they are not accomplishing much in the way of providing education. If an educator is already feeling some level of stress, any problem at school probably seems greater than it really is. This type of reasoning may lead the individual to attribute their negative feelings to his/her inability to successfully reach students. Even though this may not be the case, he/she thinks nothing worthwhile has been accomplished. For business owners, it is fairly easy to understand how directly the tension involved in meeting a payroll and dealing with the day-to-day headaches of running a business could be translated into feelings that nothing worthwhile is really being accomplished.

Although the two samples have much in common in the general patterns of differential correlations, there are at least two differences between the two samples that are noteworthy. First, the MBI dimensions are more strongly related to job satisfaction among educators than business owners. This may be a result of the higher levels of personal interaction with larger numbers of individuals that working in public education requires and the relatively greater role this interaction plays in the educators' overall job situation. Further, it appears that burnout is more highly correlated with propensity to leave among educators than it is for business owners. Perhaps educators do not see any career alternatives short of leaving the position. Business owners, on the other hand, may be able to convince themselves that they will get through the stressed times when increased sales and business growth are realized.

Finally, we found that EE and DP were highly correlated with feelings of depression and physical symptoms among business owners. Operating a business takes a toll on individuals, physically and mentally. As feelings of burnout increase, perhaps this mental stress can affect the individual physically and psychologically. Conversely, since owning a business can require long work hours, perhaps the physical breakdown of the owner occurs concurrently with burnout, resulting in even more physical problems and greater levels of burnout.

Limitations and Future Research

While the findings of the current research are significant and generally support the hypotheses, there are several limitations. First, the findings are based on one sample of educators and one sample of small business owners. Further, we did not send a second survey to nonrespondents. Thus, we are unable to determine if those individuals were statistically different from the respondents. Initial response rates, however, are at least comparable with many others found in studies of individual behavior in organizations. The use of a cross-sectional study design also represents a limitation. Longitudinal data would allow for better understanding the true nature of the relationship between burnout and the stress-related variables included in the study. While previous research has identified these constructs conceptually or empirically, our data do not permit a definite statement to be made regarding causation. A third limitation involves the relatively small sample sizes used in the studies relative to the number of items being analyzed. Larger samples might provide increased confidence that study findings would be consistent across other similar groups.

Additional research is needed to further determine other occupations, beyond human services, where the MBI can be used as a relevant and useful measure. These could include factory workers as well as their managers. While the current study examined business owners, these individuals may differ from mid-level managers. Additional research is required to determine if these managers experience EE, DP, or reduced PA. While a manager's personal contacts may not be with clients/students/customers, the job can still involve a substantial amount of stressful, personal interaction with employees. It is possible that these types of high-interaction environments are also related to increased perceptions of EE, DP, and lower levels of PA among managers. Further research in this area is important since today's stressful, team-oriented work settings may breed feelings of burnout among employees of a firm, even if they do not interact directly with clients.

Another area for future research concerning MBI correlates involves conducting longitudinal research to better understand whether role conflict and work–family conflict constructs, typically viewed as demand variables (e.g., Bacharach et al., 1991; Boles et al., 1997), are indeed antecedents of burnout or merely correlates of that construct. Without conducting longitudinal studies, these relationships cannot be adequately determined. The same also is true for possible outcome variables such as job satisfaction and propensity to leave. Only a longitudinal design can address these issues.

REFERENCES

- Bacharach, S. B., Bamberger, P., & Conley, S. (1991). Work-home conflict among nurses and engineers: Mediating the impact of role stress on burnout and satisfaction at work. *Journal of Organizational Behavior*, **12**, 39–53.
- Bagozzi, R. P., & Heatherton, T. F. (1994). A general approach to representing multifaceted personality constructs: Application to state self-esteem. *Structural Equation Modeling*, **1**, 35–67.
- Bentler, P. M. (1990). Comparative fit indices in structural equation modeling. *Psychological Bulletin*, **107**, 238–246.
- Bluedorn, A. C. (1982). A unified model of turnover from organizations. *Human Relations*, **35**, 135–153.
- Boles, J. S., Johnston, M. W., & Hair, J. F. (1997). Role stress, work–family conflict and emotional exhaustion: Inter-relationships and effects on some work-related consequences. *Journal of Personal Selling and Sales Management*, **17**, 17–28.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.
- Brookings, J. B., Bolton, B., Brown, C. E., & McEvoy, A. (1985). Self-reported job burnout among female human service professionals. *Journal of Occupational Behavior*, **6**, 143–150.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & I. S. Long (Eds.), *Testing structural equation models*. Newbury Park, CA: Sage.
- Burke, R. J., & Greenglass, E. (1995). A longitudinal study of psychological burnout in teachers. *Human Relations*, **48**, 187–202.
- Byrne, B. M. (1991). The Maslach Burnout Inventory: Validating factorial structure and invariance across intermediate, secondary, and university educators. *Multivariate Behavioural Research*, **26**, 477–499.
- Byrne, B. M. (1993). The Maslach Burnout Inventory: Testing for factorial validity and invariance across elementary, intermediate and secondary teachers. *Journal of Occupational and Organizational Psychology*, **66**, 197–212.
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral science*. Hillsdale, NJ: Erlbaum.

- Cordes, C. L., & Dougherty, T. W. (1993). A review and an integration of research on job burnout. *Academy of Management Review*, **18**, 621–656.
- Dignam, J. T., Barrera, M., Jr., & West, S. G. (1986). Occupational stress, social support, and burnout among correctional officers. *American Journal of Community Psychology*, **14**, 177–193.
- Firth, H., McIntee, J., McKeown, P., & Britton, P. G. (1985). Maslach Burnout Inventory: Factor structure and norms for British nursing staff. *Psychological Reports*, **57**, 147–150.
- Floyd, F., & Widaman, K. (1995). Factor analysis in the development and refinement of clinical assessment instruments. Special issue: Methodological issues in psychological research. *Psychological-Assessment*, **7**, 286–299.
- Garden, A. (1987). Depersonalization: A valid dimension of burnout? *Human Relations*, **40**, 545–560.
- Gerbing, D. W., & Anderson, J. C. (1984). On the meaning of within-factor correlated measurement errors. *Journal of Consumer Research*, **11**, 572–580.
- Green, D. E., & Walkey, F. H. (1988). A confirmation of the three-factor structure of the Maslach Burnout Inventory. *Educational and Psychological Measurement*, **48**, 579–585.
- Hair, J. H., Anderson, R. E., Tatham, R. L., & Black, W. C. (1995). *Multivariate data analysis* (4th ed.). Englewood Cliffs, NJ: Prentice–Hall.
- Hendrix, W. H., Nestor, K. O., & Troxler, R. G. (1985). Behavior and psychological consequences of stress and its antecedent factors. *Journal of Applied Psychology*, **70**, 560–568.
- Hollon, S. D., & Kendall, P. C. (1980). Cognitive self-statements in depression: Development of an automatic thoughts questionnaire. *Cognitive Therapy and Research*, **4**, 383–395.
- House, R. J., & Rizzo, J. R. (1972). Role conflict and ambiguity as critical variables in a model of organizational behavior. *Organizational Behavior and Human Performance*, **7**, 467–505.
- Hoyle, R. H., & Panter, A. (1994). Writing about structural equation models. In R.H. Hoyle (Ed.), *Structural equation modeling concepts, issues, and applications* (pp. 158–176). Newbury Park, CA: Sage.
- Hu, L., & Bentler, P. M. (1995). Evaluating model fit. In R.H. Hoyle (Eds.), *Structural equation modeling: Concepts, issues, and applications*. Thousand Oaks, CA: Sage.
- Iwanicki, E. F., & Schwab, R. L. (1981). A cross validation study of the Maslach Burnout Inventory. *Educational and Psychological Measurement*, **41**, 1167–1174.
- Jackson, S. E., Schwab, R. L., & Schuler, R. S. (1986). Toward an understanding of the burnout phenomenon. *Journal of Applied Psychology*, **71**, 630–640.
- Joreskog, K. G., & Sorbom, D. (1996). *LISREL VIII: User's reference guide*. Chicago: Scientific Software International.

- Lee, R. T., & Ashforth, B. E. (1990). On the meaning of Maslach's three dimensions of burnout. *Journal of Applied Psychology*, **75**, 743–747.
- Lee, R. T., & Ashforth, B. E. (1996). A meta-analytic examination of the correlates of the three dimensions of job burnout. *Journal of Applied Psychology*, **81**, 123–133.
- Leiter, M. P., & Maslach, C. (1988). The impact of interpersonal environment on burnout and organizational commitment. *Journal of Organizational Behavior*, **9**, 297–308.
- Marsh, H. W. (1994). Confirmatory factor analysis models of factorial invariance: A multifaceted approach. *Structural Equation Modeling*, **1**, 5–34.
- Maslach, C. (1982). *Burnout: The cost of caring*. New York: Prentice–Hall.
- Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Occupational Behaviour*, **2**, 99–113.
- Maslach, C., & Jackson, S. E. (1986). *Maslach Burnout Inventory manual* (2nd ed.). Palo Alto, CA: Consulting Psychologists Press.
- Netemeyer, R. G., Boles, J. S., & McMurrian, R. (1996). Development and validation of work–family conflict and family-work conflict scales. *Journal of Applied Psychology*, **81**, 1–11.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw–Hill.
- Perlman, B., & Hartman, E. A. (1982). Burnout: Summary and future research. *Human Relations*, **33**, 283–305.
- Pennebaker, J. W. (1982). *The psychology of physical symptoms*. New York: Springer-Verlag.
- Pennebaker, J. W., Burnam, M. A., Schaeffer, M. A., & Harper, D. C. (1977). Lack of control as a determinant of perceived physical symptoms. *Journal of Personality and Social Psychology*, **35**, 167–174.
- Quinn, R. P., & Staines, G. L. (1979). *The 1977 quality of employment survey*. Ann Arbor, MI: Institute for Social Research, University of Michigan.
- Rizzo, J., House, R. J., & Lirtzman, S. I. (1970). Role conflict and ambiguity in complex organizations. *Administrative Science Quarterly*, **15**, 150–163.
- Schuler, R. S. (1980). Definition and conceptualization of stress in organizations. *Organization Behavior and Human Performance*, **18**, 60–74.