Direct and Interaction Effects Among the Dimensions of the Maslach Burnout Inventory: Results From Two German Longitudinal Samples

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Inspired by the idea that the three dimensions of the Maslach Burnout Inventory (emotional exhaustion, depersonalization, and personal accomplishment) are causally related to each other, five models have been proposed in the literature to explain the main processes of burnout development. Latest empirical findings based on model comparisons suggest that emotional exhaustion exerts positive lagged effects on depersonalization and that depersonalization conceptualized as a coping strategy in turn leads to exhaustion and a low sense of personal accomplishment. The present study offers a more thorough test of various models of burnout development with longitudinal data from two German samples (total N = 643). The analyses, based on structural equation modeling, showed that exhaustion is longitudinally associated with depersonalization and that accomplishment is longitudinally predicted by depersonalization and exhaustion. Furthermore, and going beyond prior research, three moderator effects of depersonalization were identified in predicting all three burnout dimensions at a later point in time.

In recent years, the development of burnout has again been attracting increasing interest among both researchers and practitioners (Kitaoka-Higashiguchi, 2005; Neveu, 2007; Taris, LeBlanc, Schaufeli, & Schreurs, 2005). From a researcher's perspective, research on this issue will help to develop a process model explaining precisely how the various antecedents and outcomes are linked to burnout. From a practical point of view, under-

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standing the progression of burnout will facilitate early recognition of burn-out and thus improve its prevention and treatment in an early phase, before the symptoms become severe.

The Maslach Burnout Inventory (MBI; Maslach, Jackson, & Leiter, 1996) is the instrument used most frequently for measuring burnout. As is conceptualized by the MBI, *burnout* constitutes a specific syndrome of chronic psychological job strain with emotional exhaustion, depersonaliza-tion, and a decreased sense of personal accomplishment as the core dimen-sions (Maslach, Schaufeli, & Leiter, 2001). The *exhaustion* dimension refers to feelings of being overextended and drained of one's emotional and physical resources. *Depersonalization* is characterized by a detached, indif-ferent, and cynical attitude toward other persons with whom one has to interact at work, whereas a *low sense of personal accomplishment* is consid-ered as the tendency to evaluate one's achievement at work negatively and involves personal feelings of incompetence.

Immediately after the first version of MBI had been published in the early 1980s, some authors suggested causal dependencies among the dimen-sions of the MBI and that these relationships describe a developmental process. Subsequently, five models have been proposed to explain the spe-cific nature of burnout development with, in part, contradictory assumptions. One crucial aspect, in which the assumptions of the five models largely differ, is the role of emotional exhaustion. Whereas two of these models hold that exhaustion represents the final stage in the development of burnout (Golem-biewski, Munzenrider, & Stevenson, 1986; Van Dierendonck, Schaufeli, & Buunk, 2001a, 2001b), the three other models assume that exhaustion occurs first in the developmental process (Lee & Ashforth, 1993; Leiter & Maslach, 1988; Taris et al., 2005).

Only a few longitudinal studies have been conducted to explore causal relationships among the MBI dimensions, providing partially inconsistent find-ings. Drawing on two longitudinal samples, the present study seeks to broaden the knowledge on burnout development by comparing all five causal models. Going beyond prior research, the current study provides more insights into the role of depersonalization, which has often been interpreted as a maladaptive coping strategy (Golembiewski et al., 1986; Taris et al., 2005). Whereas only direct effects of depersonalization have been tested so far, we also examine moderator effects of depersonalization in the development of burnout.

CAUSAL MODELS OF BURNOUT DEVELOPMENT

Golembiewski et al. (1986) were the first to assume causal relationships among the MBI dimensions and initiated the discussion about the develop-

ment of burnout. According to their phase model, depersonalization as the first stage of developing burnout is hypothesized to negatively impact personal accomplishment. Feelings of ineffectiveness are expected to result in emotional exhaustion, which finalizes the development of burnout. Thus, Golembiewski et al.'s (1986) model assumes that depersonalization leads to low accomplishment, which in turn determines exhaustion. In support of this model, for example, Leiter (1990) reported negative lagged effects of personal accomplishment on emotional exhaustion among mental health workers. Van Dierendonck et al. (2001a, 2001b) have seized Golembiewski et al.'s (1986) suggestion that emotional exhaustion is likely to be the final stage of progressing burnout. However, they made different assumptions about prior stages in the development of burnout. Accordingly, low accomplishment as the first stage of developing burnout is hypothesized to trigger depersonalization, whereas depersonalization is predicted to cause exhaustion. Therefore, Van Dierendonck et al. (2001a, 2001b) suggested that decreased personal accomplishment determines depersonalization, which in turn leads to emotional exhaustion. Some support for this model is provided by Leiter and Durup (1996), who found lagged effects of accomplishment on depersonalization in a two-wave panel design among health care professionals.

By way of contrast, Leiter and Maslach (1988) have argued that in comparison with the other MBI dimensions, feelings of exhaustion are most likely to reflect the adverse impacts of job stress and thus may trigger the development of burnout (see also Lee & Ashforth, 1996). Drawing on this assumption, their model predicts a positive effect of exhaustion on depersonalization, whereas depersonalization, in turn, is expected to result in a low sense of accomplishment. This model received some empirical support from a series of mediational analyses by Neubach and Schmidt (2004) as well as by Neveu (2007). Lee and Ashforth's (1993) model also suggested that emotional exhaustion occurring first in developing burnout triggers depersonalization. In contrast to Leiter and Maslach's (1988) model, however, exhaustion is supposed to directly result in a reduced sense of accomplishment, rather than indirectly through depersonalization. Additionally, Lee and Ashforth's model also predicts that both low accomplishment and depersonalization develop independently. In a two-wave longitudinal study among teachers, Brouwers and Tomic (2000) provided some support for Lee and Ashforth's model. They reported significant lagged effects of emotional exhaustion on accomplishment as well as on depersonalization.

Finally, Taris et al. (2005) proposed a model of developing burnout that integrates the assumptions of Leiter and Maslach's (1988) model as well as those of Lee and Ashforth's (1993) model. Accordingly, emotional exhaustion is predicted to simultaneously trigger depersonalization and a low sense of personal accomplishment. In accentuating the role of depersonalization as a maladaptive coping strategy, Taris et al. (2005) predicted feedback effects

of depersonalization on both of the other MBI dimensions such that exhaustion increases and personal accomplishment decreases as a function of depersonalization at an earlier point in time. The hypothesized feedback effects of depersonalization on both of the other dimensions were partially confirmed in a longitudinal study among general practitioners (Bakker, Schaufeli, Sixma, Bosveld, & Van Dierendonck, 2000). Bakker et al. (2000) found that depersonalization was longitudinally related to emotional exhaustion five years later.

In summary, all five path models as are specified in our study are depicted in Figure 1.

TESTING AND COMPARING CAUSAL MODELS OF BURNOUT DEVELOPMENT

As was mentioned above, studies have found some empirical support for each of the five models. However, the majority of those did not compare different models of the development of burnout. In order to provide stronger evidence for causal effects among the MBI dimensions, studies are required that include both panel designs and contrasting analyses between the different models. A review of prior burnout research reveals at least three recent studies to meet both criteria. The first study, conducted by Van Dierendonck et al. (2001a), tested Golembiewski et al.'s (1986) model, Leiter and Maslach's (1988) model, and Van Dierendonck et al.'s (2001a, 2001b) model with multigroup analysis based on data of five longitudinal studies. Van Dierendonck et al.'s model reproduced the data of the five studies best. However, only cross-sectional analyses revealed mediational effects of depersonalization in the relationship between accomplishment and exhaustion; longitudinal paths failed to reach significance.

Toppinen-Tanner, Kalimo, and Mutanen (2002) replicated the model comparison of Van Dierendonck et al. (2001a) with two longitudinal samples of blue- and white-collar workers. Golembiewski et al.'s (1986) model failed to fit the data of both samples. The fit of Van Dierendonck et al.'s (2001a, 2001b) model was similar to that of Leiter and Maslach's (1988) model. However, the hypothesized relationships among the MBI dimensions were tested only cross-sectionally, that is, within the last wave. Again, no lagged effects were found.

The latest findings were reported in a longitudinal study by Taris et al. (2005). On the basis of two Dutch longitudinal samples of teachers and oncology care providers, the assumptions of Golembiewski et al. (1986), Leiter and Maslach (1988), Lee and Ashforth (1993), and Taris et al. (2005) were tested. Lagged effects of emotional exhaustion on depersonalization
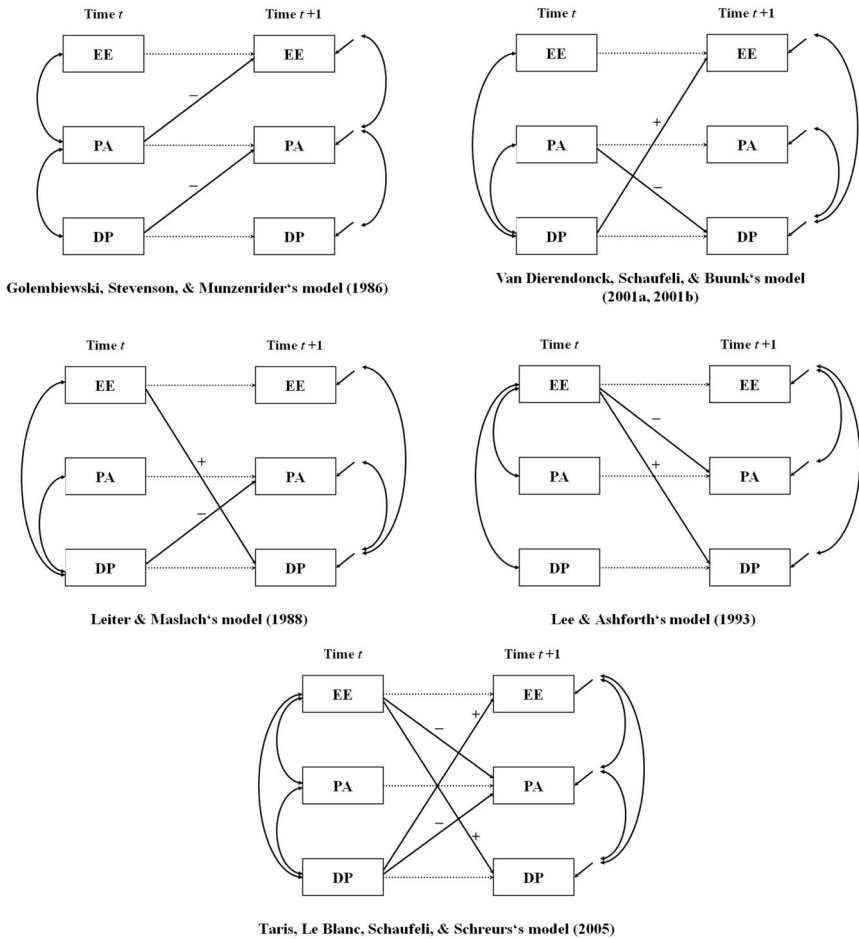
Figure 1. LISREL specification of the five causal models of burnout development. EE = emotional exhaustion; PA = personal accomplishment; DP = depersonalization; dotted lines = stability effects.

were reported. In line with the assumptions of Van Dierendonck et al. (2001a, 2001b) and of Taris et al. (2005), depersonalization was longitudinally related to exhaustion at a later point in time. Finally, negative lagged effects of depersonalization on personal accomplishment were found, supporting the ideas of Leiter and Maslach (1988) as well as those of Taris et al. (2005).

In summary, some crucial aspects concerning the specific process of developing burnout further remain unclear. First, although Taris et al. (2005) reported results in favor of the notion that exhaustion occurs first, the lagged effect of depersonalization on exhaustion found in their study left open the

question of which burnout dimension constitutes the first stage of developing burnout. Second, Van Dierendonck's (2001a, 2001b) model with its reasonable arguments against the notion that exhaustion occurs first has not been sufficiently tested so far. Previous studies evaluated only the global fit of this model and failed to analyze the hypothesized lagged effects. Therefore, further longitudinal examinations are needed to uncover the equivocalities about the relationships among the three MBI dimensions by conducting contrastive model comparisons.

THE MODERATING ROLE OF DEPERSONALIZATION

Most burnout researchers assign a specific function to depersonalization that differs from the causal role of both of the other dimensions in the development of burnout. More specifically, depersonalization has often been considered as a coping strategy to reduce feelings of burnout (Golembiewski et al., 1986; Jenaro, Flores, & Arias, 2007; Maslach et al., 2001; Taris et al., 2005). This conceptualization basically draws on the theory of conservation of resources (COR; Hobfoll, 1989; Hobfoll & Freedy, 1993), which states that depersonalization is not only a behavioral manifestation of burnout, but it also involves a loss-control strategy that is used to prevent further decreases in limited resources. COR predicts that, for a short time, such coping behavior may enhance an employee's ability to maintain adequate performance levels in stressful situations (see also Golembiewski et al., 1986). However, in the long run, depersonalization is expected to reduce the access to social support, and subsequently, depersonalized employees become increasingly isolated, resulting in further resource decrements. Hobfoll (1989) introduced the metaphor of a "loss spiral," describing the effect of repetitive resource losses caused by dysfunctional coping. Therefore, if employees become depersonalized in order to cope with stress, they will experience higher levels of burnout than those employees preventing themselves from behaving cynically and detached (see also De Lange, Taris, Kompier, Houtman, & Bongers, 2004). This line of reasoning suggests that besides main effects, depersonalization also exerts moderator effects in the development of burnout in that the relationships among the MBI dimensions vary as a function of depersonalization at an earlier point in time.

Drawing on this line of reasoning, we hypothesize four interactive effects between depersonalization and both of the other dimensions in developing burnout. More specifically, we expect that depersonalization and exhaustion interact in predicting high exhaustion (first interaction) and low accomplishment (second interaction) at a later point in time. This prediction draws on Taris et al.'s (2005, p. 243) argument that depersonalization is used to cope

with feelings of exhaustion but constitutes a maladaptive coping strategy undermining the effective use of external resources. In line with COR (Hobfoll & Freedy, 1993), Taris et al. (2005) concluded that depersonalization should strengthen the development of exhaustion and a low sense of accomplishment. Consequently, if at an earlier point in time, exhausted employees become cynical and detached, they will experience higher levels of exhaustion and lower levels of accomplishment at a later point in time than would those exhausted employees who prevent themselves from being depersonalized. Whereas this argument suggests a moderator effect of depersonalization, Taris et al. (2005) only reported direct lagged effects of depersonalization on exhaustion and accomplishment at a later point in time. Thus, the crucial implication of Taris et al.'s (2005) argument has not been empirically tested so far.

Furthermore, depersonalization is predicted to increase longitudinally as a function of exhaustion only when depersonalization is high at an earlier point in time (third interaction). This prediction draws on Wallace and Brinkerhoff's (1991) suggestion that depersonalization is the last resort to overcome feelings of exhaustion when other coping attempts do not seem to work any longer (see also Jenaro et al., 2007). In line with this suggestion, Cherniss (1980) argued that the onset of burnout primarily depends on the effectiveness of coping. Consequently, as Hobfoll and Freedy (1993, p. 122) concluded, if no other coping resources are perceived by exhausted persons and if depersonalization is used to reduce feelings of exhaustion, the likelihood of resource depletion will increase and—as the loss spiral develops and other coping options become obsolete—employees will amplify their cynical and detached attitude as exhaustion increases. Thus, we expect that exhaustion will exert stronger lagged effects on depersonalization when high levels of depersonalization are reported at an earlier point in time.

Finally, we predict that personal accomplishment interacts with depersonalization in predicting personal accomplishment at a later point in time such that persons reporting high accomplishment earlier will experience decreases in accomplishment when they feel depersonalized at an earlier point in time (fourth interaction). According to Van Dierendonck et al. (2001b), personal accomplishment is considered a core resource at work that encourages persons to meet job demands and to achieve work goals. Thus, high accomplishment might be perceived as a limited resource that can be threatened by high job demands (Hobfoll & Freedy, 1993). As Riolli and Savicki (2006) argued, if depersonalization is used to maintain accomplishment, resource depletion will become more likely, and accomplishment will be affected by the effects of dysfunctional coping (Golembiewski et al., 1986; Leiter & Maslach,1988; Taris et al., 2005). Consequently, employees who distance themselves emotionally from their work in order to maintain high accomplishment are expected to experience lower levels of accomplishment

at a later point in time than are those who prevent themselves from being depersonalized.

Overall, it appears theoretically reasonable to expect that depersonalization interacts with the other burnout dimensions in predicting burnout over time. Therefore, in line with the common assumption that depersonalization functions as a dysfunctional coping strategy, models of burnout development should be extended to include moderating effects of depersonalization on the development of all three burnout dimensions.

TESTING DIRECT AND INTERACTIVE EFFECTS AMONG THE MBI DIMENSIONS

Drawing on two longitudinal samples, our study follows two main goals. First, we test the different assumptions about the relationships among the MBI dimensions by comparing all five models of burnout development and analyzing lagged effects. Thereby we seek to clarify the questions of (a) whether emotional exhaustion occurs first in developing burnout and (b) which of the different hypothesized lagged effects describes the developmental process best. Second, and going beyond prior research, the present study tests the four assumed interactive effects described above. In order to examine these interactive effects, we extend Taris et al.'s (2005) model by integrating interactive terms. Taris et al.'s model allows differentiation between direct and moderating effects, precisely. Thus, on the basis of this model, we can test whether the hypothesized interactive effects between depersonalization and the other dimensions become manifest in elevated levels of burnout at a later point in time.

METHOD

Participants

The present research is based on two data sets. The first set involved a two-wave sample of 302 staff members of 16 German nursing homes for elderly people; the second set included data from a two-wave sample of 341 employees of a large civil service organization of a federal state in Germany. Questionnaires assessing burnout were administered to small groups of about 15 persons during normal working hours. During the group sessions, a member of the research team was present. The survey procedure lasted 30 min, including a brief explanation of the questionnaire. Completing the

questionnaire was voluntary. All participants were assured that their data would remain confidential.

Staff Members of Nursing Homes for Elderly People

Participants were geriatric nurses or other nursing personnel who were recruited through announcements at staff meetings and memos sent from the managers of the homes. The managers decided to ask only those employees who were engaged at their facilities for at least three years. In summary, on Wave 1, 491 employees and, on Wave 2, 448 employees were invited to participate in this survey. Because of sickness, lack of interest, and interfering appointments, 393 employees participated during the first wave (response rate: 80%). At Wave 2, 335 persons (response rate: 74.8%) participated 12 months later. All in all, 302 persons (76.8%) could be identified as having participated and completed the questionnaire on both measuring times. The drop-out rate of 23.2% was due to turnover, sickness, and vacation of the employees. Multivariate analysis of variance (MANOVA) confirmed that the mean scores for the variables (emotional exhaustion, depersonalization, and personal accomplishment) of those who did not participate on Wave 2 ($N = 91$) did not differ from those who remained in the study ($N = 302$; Wilks' $\lambda = 1.00$; $F(3, 389) = .25$, ns; $\eta^2 < .001$). The characteristics of the sample were as follows: The mean age of participants in Wave 1 was 40.12 years ($SD = 8.91$), and 85.4% of participants were women; 77.2% of participants worked on a full-time basis.

Administration Secretaries of a Civil Service Organization

Approval was gained from the management of the civil service organization to ask all employees of the organization to participate in the study. In summary, 748 employees were invited by a cover letter to participate in the survey, for Wave 1. Because of individual time problems, sickness, and lack of interest, 551 employees (73.66% response rate) completed the questionnaire on Wave 1. The second wave was conducted 24 months later and involved 429 employees (678 employees were asked; 63.27% response rate). Three hundred forty-one of the surveyed employees (61.89%) were identified as having filled out the questionnaire on both waves. As in the first sample, vacation, sickness, and turnover determined the drop-out rate of 38.11%. A MANOVA demonstrated that the mean scores for the study variables (exhaustion, depersonalization, and accomplishment) of those who dropped out of the study ($N = 210$) did not differ significantly from the scores of those

who participated 24 months later (N = 341; Wilks' λ = 1.00; F(3, 547) = .03, *ns*; η^2 < .001). Participants' mean age was 41.67 years (*SD* = 9.42) at Wave 1, and 54.5% of all participants were women. The sample comprised 89.7% full-time employees.

Measures and Instruments

The three dimensions of burnout were measured using the German version (Büssing & Perrar, 1992) of the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1986). All items are scored on a 6-point intensity rating scale in a Likert-based format ranging from 1 (*not at all*) to 6 (*very strong*). Examples of items for emotional exhaustion are "I feel emotionally drained from my work" and "At the end of a working day I feel exhausted." Typical items for depersonalization are, for example, "I have become more callous toward people since I took this job" and "I worry that this job is hardening me emotionally." Items such as "I have accomplished many worthwhile things in this job" and "I feel I'm positively influencing other people's lives through my work" measure personal accomplishment. Table 1 and Table 2 show the descriptive statistics, the internal consistencies (Cronbach's alpha), and correlations for the three MBI scales.

Statistical Analysis

On the basis of the theoretical discussion above, six path models were specified. Five of these refer to the assumptions of the five causal models of burnout development, whereas one model was specified to test the interaction effects. Parameter specification and estimation were conducted with LISREL

Table 1. Means, Standard Deviations, Internal Consistencies, and Correlations of All Study Variables for Nursing Home Sample

Variable	1	2	3	4	5	6
Time 1						
1. Emotional exhaustion	—					
2. Personal accomplishment	−.25	—				
3. Depersonalization	.41	−.23	—			
Time 2						
4. Emotional exhaustion	.67	−.19	.31	—		
5. Personal accomplishment	−.31	.51	−.31	−.28	—	
6. Depersonalization	.38	−.22	.59	.51	−.28	—
M	3.35	4.84	2.39	3.31	4.85	2.37
SD	0.95	0.73	1.05	1.04	0.75	1.04
α	.86	.73	.63	.89	.71	.66

Note.   α = Cronbach's alpha. All correlations are significant at p < .01. N = 302.

Table 2. Means, Standard Deviations, Internal Consistencies, and Correlations of All Study Variables for Civil Service Organization Sample

Variable	1	2	3	4	5	6
Time 1						
1. Emotional exhaustion	—					
2. Personal accomplishment	−.43	—				
3. Depersonalization	.56	−.32	—			
Time 2						
4. Emotional exhaustion	.64	−.35	.42	—		
5. Personal accomplishment	−.21	.62	−.20	−.34	—	
6. Depersonalization	.48	−.34	.74	.60	−.27	—
M	2.75	3.79	2.38	2.79	3.70	2.45
SD	0.94	0.75	0.92	0.98	0.78	0.93
α	.87	.77	.75	.89	.79	.77

Note. α = Cronbach's alpha. All correlations are significant at $p < .01$. $N = 341$.

8.80 (Jöreskog & Sörbom, 2006). We applied panel designs for testing the models (Dormann, Zapf, & Perels, 2009). Accordingly, in all six models, each of the three burnout variables was presumed to be longitudinally associated to itself in order to account for interindividual stability effects across the waves (see Figure 1). All path models were specified as semirecursive models with relationships between waves as well as within waves (see also Taris et al., 2005). As was hypothesized by the five models of burnout development, the lagged effects among the MBI dimensions were defined as substantive paths between both waves. The respective relationships within both waves were defined as correlations for the predictors and as correlated residual terms for the outcomes. For testing the four hypothesized interaction effects, Taris et al.'s (2005) model was extended by crossproducts of emotional exhaustion and depersonalization as well as those of personal accomplishment and depersonalization at Wave 1 (Baron & Kenny, 1986; Kline, 1998, pp. 283–286). Substantive paths were defined longitudinally from the interaction terms to the MBI dimensions at the next wave (see Figure 2). In order to reduce the severe effects of multicollinearity on parameter estimations, all variables were centered around their sample mean prior to calculating the cross-product terms (see Cohen, Cohen, West, & Aiken, 2003).

Because the distribution of the manifest variables deviated considerably from multivariate normality, the robust maximum likelihood method (χ^2_{RML}; Satorra, 2000; Satorra & Bentler, 1988) was used to calculate the standard error of the mean (SEM) parameters, providing stable estimations (see also Curran, West, & Finch, 1996; Nevitt & Hancock, 2000). The global model fit was assessed using root mean square error of approximation (RMSEA < .05; with a lower $CI_{90\%}$ bound of ≤.05 and a higher $CI_{90\%}$ bound of ≤.10, where CI = confidence interval; see Chen, Curran, Bollen, Kirby, & Paxton, 2008), standardized root mean residual (SRMR < .05; Hu & Bentler, 1999), gamma
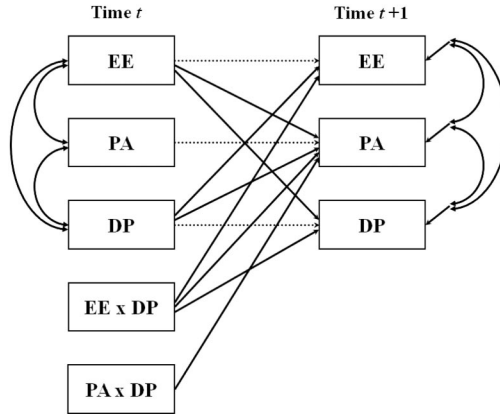
Figure 2. LISREL specification of the interaction model based on Taris et al.'s (2005) model. EE = emotional exhaustion; PA = personal accomplishment; DP = depersonalization; dotted lines = stability effects.

hat (>.95; Fan & Sivo, 2007), and comparative fit index (CFI > .97; Schermelleh-Engel, Moosbrugger, & Müller, 2003). In line with recent recommendations, these indices were not taken as "golden rules" but rather as descriptive information about the acceptability of the six models (Steiger, 2007).

RESULTS

Evaluation of Global Fit and Comparison of Models

Table 3 displays the fit for all path models. In line with prior longitudinal findings (Taris et al., 2005; Toppinen-Tanner et al., 2002; Van Dierendonck et al., 2001b), Golembiewski et al.'s (1986) model showed a poor fit in both samples, suggesting that the assumptions of this model do not reflect true relations among the MBI dimensions.

Considering the results in the nursing home sample, Van Dierendonck et al.'s (2001b) model also did not fit the data very well. The values of SRMR and RMSEA were too high. Leiter and Maslach's (1988) model, Lee and Ashforth's (1993) model, and Taris et al.'s (2005) model fitted the data of the nursing home sample considerably better. Their fit indices met the criteria for a good model fit, yielding the best fit for Taris et al.'s model. According to the results from the civil service organization, Van Dierendonck et al.'s model, Leiter and Maslach's model, and Taris et al.'s model reproduced the data equally well with too-high values of RMSEA. The other fit indices

Table 3. Goodness-of-Fit Measures for All Path Models

| Path model	χ^2_{RML}	df	RMSEA	$CI_{90\% (RMSEA)}$	CFI	SRMR	Gamma hat
	Nursing homes ($N = 302$)						
Golembiewski, Munzenrider, & Stevenson's (1986) model	62.89**	6	.178	.14–.22	.92	.093	.94
Van Dierendonck, Schaufeli, & Buunk's (2001a) model	28.38**	6	.112	.073–.15	.97	.088	.98
Leiter & Maslach's (1988) model	10.66†	6	.051	.000–.10	.99	.047	.94
Lee & Ashforth's (1993) model	9.79†	6	.046	.000–.096	.99	.043	.99
Taris, LeBlanc, Schaufeli, & Schreuers's (2005) model	1.77†	2	<.001	.000–.11	1.00	.015	1.00
Interaction model	1.32†	11	<.001	.000–<.001	1.00	.013	1.00
	Civil service organization ($N = 341$)						
Golembiewski et al.'s (1986) model	77.91**	6	.189	.15–.23	.93	.085	.93
Van Dierendonck et al.'s (2001a) model	21.84**	6	.089	.051–.13	.99	.049	.98
Leiter & Maslach's (1988) model	26.04**	6	.100	.062–.14	.98	.056	.98
Lee & Ashforth's (1993) model	13.00*	6	.059	.010–.10	.99	.048	.99
Taris et al.'s (2005) model	7.55*	2	.091	.029–.16	.99	.029	.99
Interaction model	4.12†	11	<.001	.000–<.001	1.00	.021	1.00

Note. RML = robust maximum likelihood; RMSEA = root mean square error of approximation; CI = confidence interval; CFI = comparative fit index; SRMR = standardized root mean residual.
$^* p < .05.$ $^{**} p < .01.$ † not significant.

suggested an acceptable fit for these models. However, Lee and Ashforth's model appears to be the best model without interaction effects.

Finally and theoretically important, the interaction model based on Taris et al.'s (2005) assumptions showed an excellent model fit in both samples. In comparison to the models without interaction effects, RMSEA as well as SRMR had the lowest values, and the values of CFI and gamma hat were the highest, supporting the notion of interactive effects between depersonalization and both of the other MBI variables.

Analysis of Lagged Effects

Figure 3 presents the estimated parameters of the best-fitting path model, including R^2 values and stability effects. In both samples, the temporal stabilities of all burnout dimensions were fairly high across the waves. According to the lagged effects, emotional exhaustion significantly predicted depersonalization at a later point in time (nursing homes: $\beta = .19$, $p < .01$; service organization: $\beta = .09$, $p < .05$). Because depersonalization was not longitudinally associated with emotional exhaustion in both samples (nursing homes: $\beta = .01$; service organization: $\beta = .08$; both effects, ns), our results provide support for the notion that emotional exhaustion occurs first in the
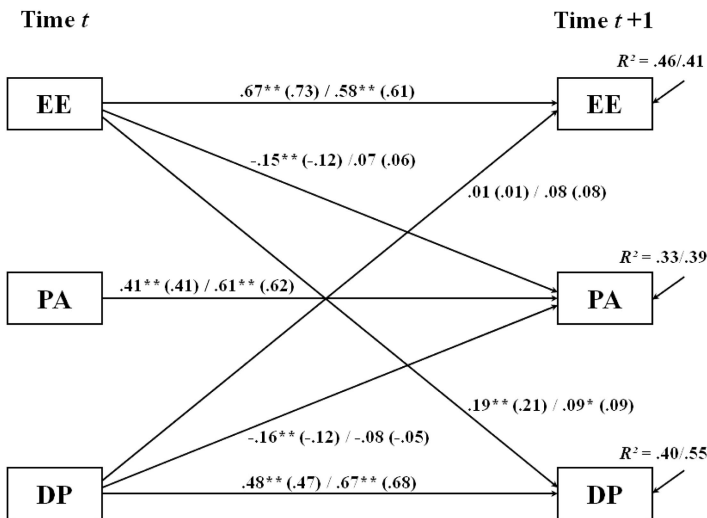
Figure 3. Estimated lagged effects among the three burnout dimensions (EE = emotional exhaustion; PA = personal accomplishment; DP = depersonalization) and R^2 values in the present study captured from the best-fitting model (interaction model). The first values are for the nursing home sample, and the second values are for the civil service organization. Unstandardized parameters are in parentheses. $^*p < .05$. $^{**}p < .01$.

developmental process. In support of the assumptions of Lee and Ashforth (1993) as well as those of Taris et al. (2005), a lagged effect of exhaustion on personal accomplishment with a negative sign was confirmed in the nursing home sample ($\beta = -.15$, $p < .01$). For the service organization sample, the path coefficient from exhaustion (Time 1) to accomplishment (Time 2) was not significant and had a positive sign ($\beta = .07$, *ns*). Regarding the underlying negative correlation ($r = -.21$, $p < .01$), this unexpected finding may be due to a suppressor effect. More specifically, the cross-sectional correlation between both variables at Wave 1 ($r = -.43$, $p < .01$) as well as the stability effect of accomplishment ($\beta = .61$, $p < .01$) were considerably high and thus partialed out the complete amount of common variance of exhaustion (Time 1) and accomplishment (Time 2). In line with the assumptions of Golembiewski et al.'s (1986) model, Leiter and Maslach's (1988) model, and Taris et al.'s model, depersonalization exerted significant negative lagged effects on personal accomplishment in the nursing home sample ($\beta = -.16$, $p < .01$). However, this lagged effect failed to reach significance in the service organization ($\beta = -.08$, *ns*).

Analysis of Interaction Effects

Table 4 shows the four interaction effects tested in each sample. Accordingly, three different significant interactive effects between depersonalization and both of the other MBI variables were found. In the nursing home sample, depersonalization significantly interacted with exhaustion on Time 1 in predicting exhaustion and depersonalization at a later point in time. However, both interaction effects did not emerge in the service organization. In both samples, a significant interaction effect between depersonalization and personal accomplishment was identified in the prediction of accomplishment at a later point in time.

Table 4. Estimated Interactive Effects

| Dependent variable	Emotional exhaustion at Time 2		Personal accomplishment at Time 2		Depersonalization at Time 2	
	Sample 1[a]	Sample 2[b]	Sample 1[a]	Sample 2[b]	Sample 1[a]	Sample 2[b]
1st interaction[c] at Time 1	.09** (.10)	.04 (.03)	.03 (.02)	−.08 (−.05)	.18** (.19)	.05 (.04)
2nd interaction[d] at Time 1	—	—	−.13* (−.13)	−.11* (−.11)	—	—

Note. Unstandardized parameters are in parentheses. [a] Nursing homes $N = 302$. [b] Civil service organization $N = 341$. [c] Cross-product of emotional exhaustion and depersonalization. [d] Cross-product of personal accomplishment and depersonalization.
* $p < .05$. ** $p < .01$.

The specific form of the significant interactions determined by the method by Aiken and West (1991) are depicted in Figure 4. Accordingly, depersonalization and exhaustion had a quite similar interactive influence on both dimensions at Wave 2: Depersonalization strengthened the increase of exhaustion over time. The results indicate that exhausted employees who behaved cynically and in a detached manner reported significantly higher scores on exhaustion (Wave 2) than did those exhausted employees who were less depersonalized on Time 1 (first hypothesized interaction). Furthermore, the same pattern was observed for the prediction of depersonalization (Wave 2). Depersonalization significantly increased between both waves as a function of exhaustion only when exhausted employees reported elevated levels of depersonalization on Time 1 (third hypothesized interaction). Finally, in both samples, depersonalization exerted moderator effects on the decline of personal accomplishment between both waves. Employees who reported high degrees of depersonalization on Time 1 scored significantly lower on personal accomplishment on Time 2 than did those who did not behave cynically and detached on Time 1 (fourth hypothesized interaction). In contrast, this decrease did not occur for those employees who reported low accomplishment on Wave 1.
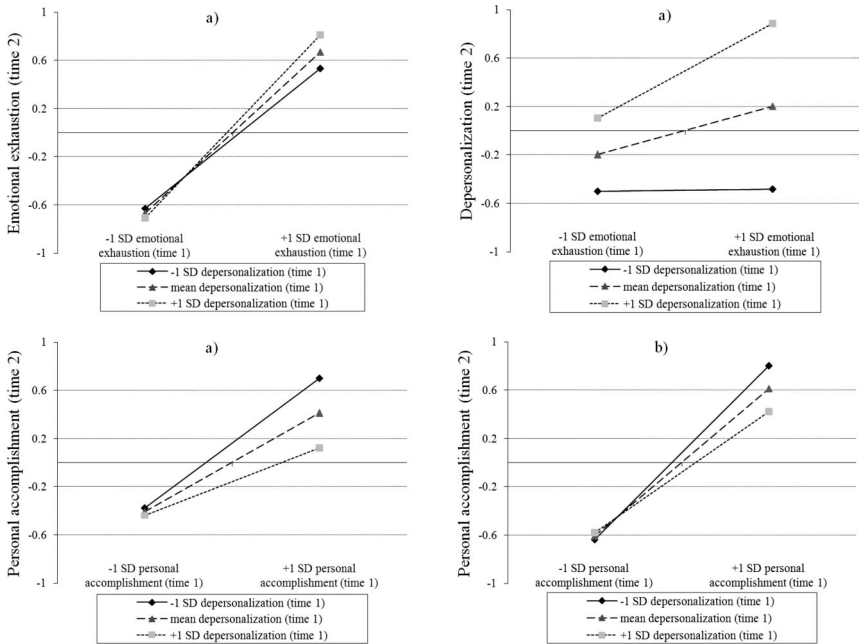
Figure 4. Visualized moderator effects of depersonalization. The panels labeled a) represent nursing homes ($N = 302$); the panel labeled b) represents the civil service organization ($N = 341$). SD = standard deviation.

DISCUSSION

The development of burnout has received much interest by researchers and practitioners during the past 20 years (Burisch, 2006; Taris et al., 2005). Although a large body of field studies and theories have addressed this issue (Toppinen-Tanner et al., 2002), important questions about the causal relationships among the three MBI dimensions remain unanswered. Drawing on two German longitudinal samples, the present study sought to enlarge the knowledge about developing burnout by testing main and interactive effects among the three MBI dimensions. In contrast to prior research, our results provide a more consistent picture about burnout development.

First, contrastive comparisons of different path models strongly supported the notion that exhaustion occurs first in developing burnout. Whereas Golembiewski et al.'s (1986) model and Van Dierendonck et al.'s (2001a, 2001b) model largely failed to fit the data of both samples, Leiter and Maslach's (1988) model, Lee and Ashforth's (1993) model, and Taris et al.'s (2005) model performed well in the nursing home sample. By way of comparison, only Lee and Ashforth's (1993) model received considerable support through the data from the service organization. Consistent with the notion of moderator effects of depersonalization in developing burnout, the interaction model based on Taris et al.'s (2005) assumptions reproduced the data of both samples best.

Second, examination of longitudinal associations revealed lagged effects of exhaustion on depersonalization at a later point in time in both samples. Because depersonalization failed to predict exhaustion longitudinally, reverse causality is rather unlikely. Thus, the panel design provides further support for the notion that exhaustion occurs first in developing burnout. As Golembiewski et al. (1986) and Taris et al. (2005) predicted, we found indications that depersonalization leads to decreased personal accomplishment. Finally and consistent with Taris et al.'s (2005) as well as Lee and Ashforth's (1993) assumptions, exhaustion exerted negative lagged effects on accomplishment in the nursing home sample.

Third, in line with the notion of depersonalization as a dysfunctional coping strategy, three interaction effects between depersonalization and both of the other MBI dimensions were revealed. High levels of depersonalization (Time 1) strengthened the increase of emotional exhaustion over time (only in the nursing home sample). This finding can be explained by two different mechanisms. On the one hand, depersonalization might evoke the perception of high job demands such that depersonalized employees experience higher workload because they feel themselves alienated from their job (Bakker et al., 2000). As a result, the perception of high job demands increases feelings of exhaustion. On the other hand, the moderating effect of depersonalization on the increase of exhaustion can also be determined by a lack of resources (Hobfoll & Freedy, 1993). Hence,

depersonalization is assumed to result in social isolation, which undermines the access to social support. Because the lack of social support constitutes a stressor, exhaustion develops more rapidly for those who behave cynically.

Moreover, depersonalization significantly interacted with exhaustion (Time 1) in predicting depersonalization at Wave 2 (only in the nursing home sample) such that exhausted employees reported an exaggerated increase of depersonalization over time when depersonalization was elevated at an earlier point in time. One explanation for this interaction effect is that exhausted employees may not recognize cynicism as a maladaptive strategy. As a result of withdrawal and alienation, other coping options are not considered and exhausted employees strengthen their detached attitude. According to COR theory, the increase in depersonalization could be alternatively explained by the loss spiral (Hobfoll, 1989). As is mentioned above, depersonalization undermines access to social support, which constitutes a core resource for coping with exhaustion. Thus, exhausted employees who behave cynically obstruct other more effective coping options and hence strengthen their cynicism as a last resort to cope with developing burnout (Wallace & Brinkerhoff, 1991).

Finally, in both samples, depersonalization significantly interacted with personal accomplishment at Time 1 in predicting accomplishment on Time 2 such that high depersonalization attenuated personal accomplishment over time for those who reported high accomplishment on Wave 1. This result pattern is consistent with the notion that depersonalization is strongly associated with losses of resources (Hobfoll, 1989). As Van Dierendonck et al. (2001b) conceptualized, personal accomplishment constitutes a core resource for goal achievement and job performance. Therefore, if employees behave cynically and hence encumber the access to external resources, goal achievement will become increasingly difficult and feelings of ineffectiveness will become more likely. In contrast, if personal accomplishment is already low, depersonalization will not lead to further decrements in personal accomplishment, suggesting that depersonalization is used to save these resources rather than to enlarge personal accomplishment.

Limitations and Avenues for Future Research

Some methodological as well as theoretical limitations should be considered in interpreting our findings. First, both longitudinal samples comprised only two waves. Thus, the causal models proposing several stages of burnout development could be tested only tentatively (Bollen & Curran, 2006). Second, it is likely that the particular time intervals used in this panel design (12 and 24 months) differ from the true causal interval, which reflects the influence of the causing variable on the effect variable. Considering the

lack of knowledge about the true causal interval, the use of 12 and 24 months is convenient for controlling seasonal influences (De Lange, Taris, Kompier, Houtman, & Bongers, 2003). Moreover, the magnitude of the lagged effects will be estimated conservatively if the true causal interval deviates from the interval used in a particular panel study.

Third, it might be criticized that the magnitudes of the interactive effects were rather low. However, Rogers (2002) argued that the likelihood of detecting interactive effects is often constrained and that effect sizes of 1% of explained variance can be considered important (Evans, 1985). Moreover, the coefficients of moderator effects typically range from .08 to .23 in field studies (McClelland & Judd, 1993). Thus, the interaction effects found in our study are not only statistically significant but also theoretically relevant.

Finally, future research should also consider moderating effects of other coping strategies. As far as we know, there is no evidence for strengthening or buffering effects of alternative efforts to cope with burnout. For example, Ben-Zur (2009) distinguished between two strategies for coping with burnout. Accordingly, problem-focused strategies imply action-orientated behavior, which involves effective efforts to solve the situation, whereas emotion-focused attempts are passively oriented and focus on venting emotions or on restraint coping. Accordingly, problem-focused strategies can be expected to exert buffering effects on the development of burnout, whereas emotion-focused strategies might increase the adverse effects of high exhaustion and low accomplishment.

Practical Implications

Our findings support the notion that emotional exhaustion occurs first in developing burnout. Consequently, measures of preventing burnout should focus on specific organizational and situational determinants that have been proven to influence exhaustion. For example, recognizing extra effort and rewarding good performance, demonstrating concern, providing assistance, and granting special favors as well as forgiving honest mistakes have been found to reduce exhaustion (Gilbreath & Benson, 2004; Lee & Ashforth, 1993).

Alternatively, Karasek's (1979) job demands control model emphasizes the role of job control. Accordingly, the effect of high work load on indicators of job strain, such as exhaustion, is hypothesized to be moderated by job control. Recent findings revealed that job control conceptualized as decision latitude in work methods and scheduling buffers the adverse effects of high job demands (Schmidt, 2004). Decision latitude provides the necessary scope for mediating the conflicting demands and interpreting ambiguous

signals, which are associated with emotional exhaustion (Lee & Ashforth, 1996).

Finally, the moderating role of depersonalization found in our study emphasizes the relevance of intervention programs that train effective coping strategies. Functional coping skills assisting workers in dealing with stress and exhaustion can be expected to prevent the use of depersonalization. A review of different approaches to preventing or treating burnout (Schaufeli & Enzmann, 1998) indicates that training in cognitive and behavioral strategies (i.e., stress inoculation training, cognitive rehearsal, and rational emotive therapy) seem to have the best potential for reducing high strain before burnout becomes chronic.

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