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Burnout–Depression Overlap: Exploratory Structural Equation Modeling Bifactor Analysis and Network Analysis

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Abstract

Burnout has been viewed as a work-induced condition combining exhaustion, cynicism, and professional inefficacy. Using correlational analyses, an exploratory structural equation modeling bifactor analysis, structural regression analyses, and a network analysis, we examined the claim that burnout should not be mistaken for a depressive syndrome. The study involved 1,258 educational staff members. Burnout was assessed with the Maslach Burnout Inventory–General Survey and depression with the Patient Health Questionnaire–9 and the Hospital Anxiety and Depression Scale. Illegitimate work tasks and work–nonwork interferences were additionally measured. We notably found that (a) on average, exhaustion, cynicism, and professional inefficacy correlated less strongly with each other than with depression; (b) exhaustion—burnout's core—was more strongly associated with depression than with either cynicism or professional inefficacy; (c) the Patient Health Questionnaire–9 did not correlate more strongly with the Hospital Anxiety and Depression Scale than with exhaustion; (d) exhaustion and depression loaded primarily on a general distress/dysphoria factor in the exploratory structural equation modeling bifactor analysis; (e) on average, burnout and depression were related to job stressors in a similar manner; (f) work–nonwork interferences were strongly linked to distress/dysphoria. Overall, burnout showed no syndromal unity and lacked discriminant validity. Clinicians should systematically assess depressive symptoms in individuals presenting with a complaint of "burnout."

Keywords

bifactor analysis, burnout, construct validity, depression, fatigue, job stress, network analysis

Burnout has been generally defined as a syndrome of exhaustion, cynicism, and professional inefficacy developing in response to prolonged, unmanageable job stress (Maslach et al., 1996; Maslach et al., 2001). Exhaustion refers to the feeling of being stressed out and drained of one's energy; it constitutes "the central quality of burnout" (Maslach et al., 2001, p. 402). Cynicism reflects a state of resentful detachment from one's work (Maslach et al., 1996; Maslach et al., 2001). Professional inefficacy involves a reduced sense of competence and accomplishment in the job (Maslach et al., 2001). Thus defined, burnout is assessed with the Maslach Burnout Inventory–General Survey (MBI-GS), a self-administered questionnaire viewed as a measure of reference in burnout research (Maslach et al., 1996). The phenomenon of burnout has elicited growing interest among occupational health specialists in the fields of both psychology and medicine (Neckel et al., 2017; Rotenstein et al., 2018; Schonfeld & Chang, 2017). However, there is no commonly shared, clinically valid diagnosis for burnout to date (Bianchi et al., 2019; Mirkovic & Bianchi, 2019). Currently, burnout is not a nosological category (American Psychiatric Association, 2013).

Over the last few years, evidence has mounted that the burnout syndrome may reflect a depressive condition rather than a distinct entity (e.g., Ahola et al., 2014; for recent reviews, see Bianchi, Schonfeld, & Laurent, 2018, and Bianchi et al., 2019). Depressive symptoms constitute basic responses to unresolvable stress—also thought to be the cause of burnout—in human beings (Pryce et al., 2011;

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Willner et al., 2013), an observation underlining fundamental similarities between burnout and depression at an etiological level. Great emphasis has been put on the idea that burnout results from *prolonged*, unmanageable job stress (Schaufeli & Enzmann, 1998). Depressive symptoms have been found to be more strongly predicted by *chronic* stress than by *acute* stress (e.g., McGonagle & Kessler, 1990). As underscored by Pizzagalli (2014), "chronic stressors . . . appear to be particularly depressogenic" (p. 406). Job stress, specifically, has been identified as a predictor of both burnout and depression (Melchior et al., 2007; Niedhammer et al., 2015; Schaufeli et al., 2009). In a recent study, Bianchi and Brisson (2019) found that burnout and depressive symptoms were causally attributed to work to a similar extent by affected respondents (see also Bianchi, Rolland, & Salgado, 2018). Maslach and Leiter (2016) noted that "the initial concern about burnout emerged from caregiving occupations, such as health care and human services" (p. 104). There is a well-established link between the burden of caregiving and the development of depression (Dura et al., 1990; Livingston et al., 2014; Oswin, 1978).

Furthermore, the use of antidepressant medication is not uncommon among workers showing signs of "severe burnout" (Ahola et al., 2007; Leiter et al., 2013). Consistent with these observations, Bianchi et al. (2014) found that about 90% of the individuals experiencing burnout symptoms on a weekly basis met criteria for a provisional diagnosis of depression. In a three-wave, 7-year study, burnout and depressive symptoms were found to coexist in a virtually inextricable manner (Ahola et al., 2014). Across studies, depressive symptoms have been found to correlate strongly with exhaustion—the core dimension of burnout (Koutsimani et al., 2019; Schonfeld et al., 2019). Burnout has also been associated with both an individual and a familial history of depression (Nyklíček & Pop, 2005; Rössler et al., 2015) as well as with neuroticism, a dispositional risk factor for major depressive disorder (Jeronimus et al., 2016). In a meta-analysis, Swider and Zimmerman (2010) found a true score correlation as high as .52 between neuroticism and the exhaustion component of burnout. The overlap of burnout with depression, however, remains a matter of debate (Bianchi et al., 2015; Maslach & Leiter, 2016; Taris, 2006).

An argument employed to distinguish burnout from depression has consisted in contrasting the so-called *social focus* of burnout research with a supposedly *individual focus* of depression research (e.g., Maslach et al., 2001; Pines & Aronson, 1988). Despite its popularity among burnout researchers, this argument is invalid (Bianchi, Schonfeld, & Laurent, 2018). Indeed, depression has been investigated within a social approach in countless studies and associated with a variety of social-level determinants and outcomes (Berkman et al., 2000; Dohrenwend et al., 1992; Lund et al., 2018; Rosenquist et al., 2011). More fundamentally, it has been underlined that a difference in the perspectives adopted on given syndromes (e.g., individual versus social) should not be confused with a difference between the syndromes themselves (Bianchi et al., 2017).

The issue of burnout–depression overlap has also been obscured by the tendency of some burnout researchers to mistakenly reduce depression to its *clinical* stage[1] (Iacovides et al., 2003; Messias & Flynn, 2018). There is robust evidence that depression is best conceived of as a dimensional variable (Bianchi, Schonfeld, & Laurent, 2018; Haslam et al., 2012; Liu, 2016; Pickles & Angold, 2003; Wichers, 2014). Clinical depression (i.e., depression as a nosological category) only reflects a section of the depressive continuum—its high end. Therefore, limiting depression to its clinical stage constitutes an abridgement of the depression phenomenon. Such a partial approach to depression has resulted in inconsistent comparisons between burnout and depression. The assertion that burnout differs from depression because the symptoms of burnout are, in the early stages of the burnout process, rather circumscribed to work whereas the symptoms of clinical depression are pervasive (see Schaufeli & Enzmann, 1998, p. 39; see also Pines & Aronson, 1988, p. 53) is an instance of such inconsistent comparisons. Indeed, when comparing the *early stages* of the burnout process with *clinical* depression, burnout researchers contrast the early stages of the burnout process with the *late stages* of the depressive process—while remaining silent on what is supposed to distinguish full-blown burnout from clinical depression (see Bianchi, Schonfeld, & Laurent, 2018). The claim that burnout may constitute a phase in the development of a depressive disorder (e.g., Ahola et al., 2005) similarly relies on a reduction of depression to its clinical stage.

In this study, we further addressed the issue of burnout–depression overlap by examining the view that burnout is *not* a depressive syndrome (Maslach et al., 1996; Maslach & Leiter, 2016; Melnick et al., 2017). Burnout was assessed with the MBI-GS, a measure of reference in burnout research, and depressive symptoms with the Patient Health Questionnaire–9 (PHQ-9) and the Hospital Anxiety and Depression Scale (HADS-D), two widely used measures of depression. We additionally measured illegitimate work tasks and work–nonwork interferences to examine their relationships with burnout and depression (Nohe et al., 2015; Semmer et al., 2015). We conducted correlational analyses, an exploratory structural equation modeling (ESEM) bifactor analysis, structural regressions, and a network analysis to address our research questions. While ESEM is deemed "exploratory" due to its use of rotation after factor extraction rather than parameters that are constrained to be exactly 0 as in confirmatory factor analysis (CFA), we note that our use of it is much closer to a confirmatory process because we used theoretically specified target rotations.

Relying on the definition that a syndrome is *a combination of co-occurring symptoms*[2] (American Psychiatric Association, 2013; Schaufeli & De Witte, 2017; Shirom, 2005), we focused on three minimal conditions that could be expected to be met if burnout is a distinct entity. These conditions correspond to basic requirements for discriminant validity and syndromal unity (Le et al., 2010; Shirom, 2005; Spector, 2013). While the overlap of burnout with depression has been investigated extensively, the issue has rarely been addressed through the prism of the syndromal unity of burnout.

Condition 1

Measures of exhaustion, cynicism, and professional inefficacy—the three putative components of the burnout syndrome—should correlate on average more strongly with each other than with measures of depression. Put differently, if burnout is a symptom complex characterized by exhaustion, cynicism, and professional inefficacy and *not* by depression, then exhaustion, cynicism, and professional inefficacy should combine with each other rather than with depression (Shirom, 2005). In ESEM bifactor analytic terms, if burnout is a syndrome consisting of symptoms of exhaustion, cynicism, and professional inefficacy, then the items from the corresponding measures should load highly on a general Burnout factor and less strongly on their bifactors. In a related manner, if depressive symptoms are not part of the burnout syndrome, then the items from the depression measures should have relatively lower loadings on the general Burnout factor and higher loadings on their bifactors. That exhaustion, cynicism, and professional inefficacy be more strongly associated with each other than with depression has been considered crucial to establishing burnout's discriminant validity (Maslach et al., 1996, p. 16). The state of the art led us to formulate three operational hypotheses in relation to Condition 1. These hypotheses reflect the view that Condition 1 will not be met:

Hypothesis 1: The mean correlation among burnout's components will be smaller than the mean correlation of burnout's components with depression.

Hypothesis 2: Exhaustion, the stress dimension and core symptom of burnout (Maslach et al., 2001, will correlate more strongly with depression than with either cynicism or professional inefficacy—the two other putative components of the burnout syndrome.

Hypothesis 3: In ESEM bifactor analysis, the exhaustion items will align more closely with the depression items than with the cynicism and professional (in)efficacy items. Based on the idea that the exhaustion and depression items reflect the same underlying construct (Bianchi & Schonfeld, 2018; Schonfeld et al., 2019), we hypothesized that the depression and exhaustion items would load similarly highly on a general Distress/Dysphoria factor and less strongly on their bifactors. Because we also anticipated that cynicism and professional inefficacy do *not* form a syndrome with exhaustion, we hypothesized that cynicism and professional (in)efficacy items would load less strongly on the general Distress/Dysphoria factor and more strongly on their bifactors.

Condition 2

The measure of exhaustion (burnout's core) should be less strongly associated with the measures of depression than the measures of depression are associated with one another. As indicated by Spector (2013), discriminant validity requires that "measures of different constructs should not be highly related or at least should not be as highly related as measures of the same constructs" (p. 173). The state of the art led us to formulate one operational hypothesis in relation to Condition 2. This hypothesis reflects the view that Condition 2 will not be met:

Hypothesis 4: The correlation between exhaustion and the PHQ-9 (our first measure of depression) will be equivalent to the correlation between the PHQ-9 and the HADS-D (our second measure of depression).

Condition 3

The nomological network of burnout measures should be dissimilar from the nomological network of depression measures. As noted by Le et al. (2010), two distinct constructs "should not have the same patterns of relationships with other variables" (p. 113). The state of the art led us to formulate two operational hypotheses in relation to Condition 3. These hypotheses reflect the view that Condition 3 will not be met:

Hypothesis 5: The correlations of burnout with job stressors—illegitimate work tasks and work–nonwork interferences—will closely parallel the correlations of depression with these job stressors.

To amplify our nomological network analysis, we conducted a structural regression analysis that also incorporated an ESEM bifactor analytic component. We conducted this latter analysis to better understand the relationship of job stressors to burnout and depression:

Hypothesis 6: A general Job Stressors factor and the related bifactors will be significant predictors of the general Distress/Dysphoria factor and related bifactors.

In addition, we capitalized on the structural regression to evaluate the extent to which work–nonwork interferences explained variance in the general Distress/Dysphoria factor and related bifactors.

Finally, we conducted a psychometric network analysis—a relatively new kind of analysis first proposed by Cramer et al. (2010) that makes use of tools drawn from social network analysis. Much of the literature on network analysis is grounded in a particular interpretation that posits that symptoms are connected by networks of causal relationships. Our primary purpose was as an adjunct to the theoretically—driven ESEM bifactor analysis to provide a less model-dependent way of understanding how the measured items relate to each other. In particular, we used it in the spirit McDonald (1999) advocated for an unrestricted exploratory factor analysis (EFA) after a CFA, as a way to check for missed empirical regularities. While EFA can, of course, be used in this manner, we believe that network analysis is better suited due to its focus on particular items as well as its strength as a visualization method:

> **Hypothesis 7:** The network analysis will reveal no notable additional systematic structure beyond that of the (sub)scales.

Clarifying the extent to which burnout is satisfactorily defined as a syndrome of exhaustion, cynicism, and professional inefficacy that excludes (or does not primarily include) classical depressive symptoms is of general importance to efforts to protect worker health. If burnout reflects a depressive condition, then this reality should be fully taken into account; otherwise affected workers will be subject to misguided assessment and intervention strategies. Such clarification is also important in terms of conceptual parsimony and transdisciplinary knowledge integration, in a context in which there is growing evidence that "general factors of psychopathology, personality disorder, and personality are likely to entail a common individual differences continuum" (Oltmanns et al., 2018, p. 581).

Method

Study Sample and Recruitment Procedure

We focused on educational staff members. There is evidence that educational staff members experience daily hassles at work and are exposed to chronic forms of job stress (e.g., Friedman, 2002; Schonfeld, 2001). A little more than 6,000 schools, based in three different French school districts, were contacted electronically in November and December 2017. School administrators were invited to complete an Internet survey and asked to transmit our cover e-mail to the other educational staff working in their schools to give them the opportunity to respond as well. Our Internet survey included measures of depression, burnout, illegitimate work tasks, and work–nonwork interferences as well as a sociodemographic questionnaire. Participation was voluntary and could be canceled at any moment and for any reason. No financial compensation was offered.

A total of 1,258 educational staff members eventually completed the Internet survey (M_{AGE} = 42.71 years, standard deviation [SD_{AGE}] = 9.91; 85% female). The sex ratio and mean age in our sample were close to the sex ratio and mean age in the population of reference (Ministère de l'Éducation nationale, 2017). Participants were employed on average for 15.08 years (SD = 9.87). A vast majority of participants (84%) were involved in a conjugal/romantic relationship. Nearly three of four participants had at least one child. The study was conducted in accordance with the ethical standards of the institutional review board of the University of Neuchâtel and the provisions of the World Medical Association Declaration of Helsinki (World Medical Association, 2013). This sample has not been previously studied.

Because we had information on the number of contacted schools, but not on the number of educational staff members who got access to our Internet survey, we could not estimate the response rate. However, we note that sample representativeness, as important as it can be in descriptive studies (e.g., disorder prevalence studies), is not a primary concern in an analytic study such as ours; what matters most in analytic studies is the *variation of exposure*, as long understood in the epidemiology of occupational medicine (see Kristensen, 1995; see also Richiardi et al., 2013).

Furthermore, the implementation of methods promoting sample representativeness such as random sampling is very costly and frequently unfeasible in practice (e.g., because the population of interest cannot be accurately circumscribed or exhaustively contacted). Unsurprisingly, such methods have been seldom used in occupational health psychology and, more specifically, in burnout research (Schaufeli & Enzmann, 1998; Sinclair et al., 2013).

For the sake of clarity, we compared the size of our study sample (N = 1,258) with the sizes of the samples used in the 67 cross-sectional studies identified by Bianchi et al. (2015) in their review of burnout–depression overlap. The size of our study sample is larger than the sizes of 79% of the samples used in the reviewed studies (median sample size: 300).

We conducted a post hoc statistical power analysis with G*Power (Faul et al., 2009). Results showed that our sample size allowed us to detect correlations as small as .08 based on a statistical power threshold of 80%.

Measures

Our primary measure of depressive symptoms was the PHQ-9 (Arthurs et al., 2012; Kroenke et al., 2001; sample item: "Feeling bad about yourself—or that you are a failure or have let yourself or your family down."). The PHQ-9 relies on a 4-point rating scale, from 0 for *not at all*, to 3 for *nearly every day*. Participants were asked to indicate how they felt over the previous 2 weeks. A strength of the PHQ-9

is that it references the nine core diagnostic criteria for major depressive disorder found in the *DSM-5* (American Psychiatric Association, 2013), and thus, tends to cover depressive symptoms in their variety (Kroenke et al., 2001). The PHQ-9 can be subdivided into an affective–cognitive symptom subscale (Items 1 [anhedonia], 2 [depressed mood], 6 [guilt/worthlessness], and 9 [suicidal/self-injurious thoughts]) and a somatic symptom subscale (Items 3 [sleep disturbance], 4 [fatigue/loss of energy], 5 [appetite alteration], 7 [concentration impairment], and 8 [psychomotor malfunction]). Anhedonia and depressed mood are the two central manifestations of major depression (American Psychiatric Association, 2013; Bianchi, Schonfeld, & Laurent, 2018). Suicidal/self-injurious thoughts constitute a criterion of particularly high value in the diagnosis of major depression (Beck & Alford, 2009; Kroenke et al., 2001).

Burnout symptoms were assessed with the MBI-GS (Maslach et al., 1996; Papineau et al., 2018). The MBI-GS comprises three subscales: exhaustion (five items; e.g., "I feel burned out from my work."), cynicism (five items; e.g., "I doubt the significance of my work."), and professional (in)efficacy (six items; e.g., "At my work, I feel confident that I am effective at getting things done."). Each item was rated using a 4-point scale (from 0 for *not at all* to 3 for *nearly every day*). The MBI has been, by far, the most widely used measure of burnout and has played a referential role in burnout research (see Bianchi et al., 2015).

The seven-item Depression subscale of HADS-D (Bocéréan & Dupret, 2014; Zigmond & Snaith, 1983; sample item: "I still enjoy the things I used to enjoy") was employed as a complementary measure of depression, for the purpose of examining Condition 2. Participants responded using a 5-point rating scale, from 1 for *strongly disagree* to 5 for *strongly agree*. Symptoms were assessed over the past 2 weeks. The HADS-D performs well in assessing the symptom severity and occurrence of depressive disorders in the general population (Bjelland et al., 2002).

For the purpose of our nomological network analysis, we focused on illegitimate work tasks, a recently described job stressor (Eatough et al., 2016), and work–nonwork interferences (Bergs et al., 2018; Nohe et al., 2015). Work–nonwork interferences were assessed with a single-item measure (Bowling, 2005): "Do the demands in your work affect your personal life in a negative way?" (from 1 for *no, not at all* to 7 for *yes, very clearly*). Work–nonwork interferences have been identified as a serious problem in educational staff members (Cinamon & Rich, 2005). Illegitimate work tasks were assessed with the Bern Illegitimate Tasks Scale (Semmer et al., 2015). The Bern Illegitimate Tasks Scale consists of two subscales, one dedicated to unreasonable work tasks (four items; e.g., "Do you have work tasks to take care of, which you believe should be done by someone else?"), the other dedicated to unnecessary work tasks (four items; e.g., "Do you have work tasks to take care of, which keep you wondering if they make sense at all?"). Each item was rated from 1 (*very rarely*) to 5 (*very often*). The increasing administrative, clerical, and committee duties experienced by educational staff members make the assessment of illegitimate work tasks relevant to these professionals (King, 2002).

Data Analyses

Data were analyzed using IBM SPSS Statistics 20 and Mplus 8.3 (Muthén & Muthén, 1998-2019). As previously mentioned, we examined burnout–depression overlap based on correlational analyses, an ESEM bifactor analysis, structural regressions, and a psychometric network analysis.

In ESEM bifactor analysis, we relied on the weighted least squares—mean and variance adjusted—estimator because the items are ordinal and have varying response formats (Li, 2016). We used partially specified target rotation (PSTR). The key to PSTR is to formulate the targets. The logic is very similar to that of CFA and is thus more confirmatory than other rotations (e.g., bi-geomin). In PSTR, we choose the number of factors and then which loadings will have zero targets (see below); all other loadings remain unconstrained. After extraction, the resulting loadings are rotated to the target using a least squares criterion. In this sense, PSTR parallels CFA but *instead of forcing loadings to equal zero and then estimating all others conditional on that constraint*, it extracts factors and then attempts to match the target as well as possible. The particular specification that we use targets a structure that has the following two features: (a) all items are allowed to load on the general factor and (b) each item loads on a bifactor that is specific to the scale or subscale to which the item belongs. For instance, an Exhaustion item from the MBI-GS will load on the general factor as well as on an Exhaustion bifactor. In all, because we have five scales or subscales (the HADS-D, the PHQ-9, and the three MBI-GS subscales), we allowed for five bifactors in addition to the general factor.

This specification makes the bifactors orthogonal to the general factor but not to each other. The fact that the bifactors can correlate is important because it tends to reduce the amount by which items cross-load on the bifactors. In our experience with this model, however, bifactor correlations tend to be quite small, particularly when the bifactors themselves are overidentified, as they are here.

Of course, a PSTR model will fit better than the corresponding CFA model due to the fact that it has more parameters, but this can be assessed by fit measures that penalize for the number of parameters, such as the root mean square error of approximation (RMSEA). In addition, it is often valuable to use a less constrained method such as a purely exploratory bifactor rotation (e.g., bi-geomin) against which to compare the PSTR. This model will fit just as well

because fit is constructed based on the extracted exploratory factor analysis model, not the rotation, but if the resulting configuration of loadings differs markedly, it is a sign that the target is wrong. We did this and noticed no major discrepancies.

One of the foci of bifactor modeling is to consider the extent to which items have specific variance. Rodriguez et al. (2016) reviewed many measures associated with the bifactor model. For our particular question, we relied on the item explained common variance (*IECV*) measure, which relates the proportion of common variance accounted for by the general factor by each item. Given that ESEM loadings are standardized, this is simply equal to

$$IECV = \frac{\lambda_g^2}{C^2},$$

where C^2 is the communality and $\lambda_g{}^2$ is the squared loading. As a summary, we also computed each scale or subscale's average. *IECV* benchmarks suggest that an item with an $IECV > .80$ is essentially unidimensional, meaning that the majority of its common variance is accounted for by the general factor (Rodriguez et al., 2016). By contrast, items that have less than .50 are notably multidimensional. It is also important to examine the communality itself to consider whether items are well fit by the factor model at all.

We prepared for the structural regressions by first organizing the key constructs within a framework of bifactor analyses with target rotations. Regarding the dependent variables in the structural regressions, the PHQ-9, HADS-D, exhaustion, cynicism, and professional efficacy items (all treated as ordinal) were again allowed to load on the general Distress/Dysphoria factor. In addition to extracting a general factor, five bifactors representing what was unique to each set of scale items were extracted.

Regarding the independent variables, we allowed the items from the Bern Illegitimate Tasks Scale as well as the single work–nonwork interferences item to load on a general Job Stressors factor. All items were treated as ordinal. We extracted a general Job Stressors factor and we allowed for two bifactors, one for unnecessary work tasks items and one for unreasonable work tasks items. We allowed the work–nonwork interferences item to load on both the unnecessary work tasks and unreasonable work tasks bifactors, assuming that the item was related to both.

In addition to the ESEM PSTR bifactor and structural regression analyses, we used network analysis (Cramer et al., 2010). As previously mentioned, much of the literature on network analysis is grounded in a particular interpretation of analysis that posits that symptoms are connected by causal relationships. By contrast, our use of network analysis is very much in the spirit of McDonald (1999), who advocated the use of unconstrained EFA following on a theoretically driven CFA to check for important regularities being missed. Our decision was made in part because our data are cross-sectional and thus do not meet reasonable standards for identifying causal relationships. However, we believe that these items largely, if not completely, meet McDonald's standard that upholds the interpretation of a reflective model, namely, a model in which other, similar items could be substituted for the current items without dramatically affecting the interrelationships. Nevertheless, we believe that network analysis provides novel measures and visualization tools to help better understand the interrelationships among an observed set of items without fitting a formal factor model and is thus better able to serve McDonald's task than an unconstrained EFA. We used the R packages qgraph Version 1.2.2. and bootnet Version 1.2.2 running in R 3.6.0 to perform this analysis (Epskamp et al., 2017; R Core Team, 2019). We recoded positively worded items opposite to the way in which they are worded such that all items had the same valence. Our R code and the estimated polychoric correlation matrix are available on request from the first author.

Network analysis considers the reported symptoms from the general perspective of being connected in a network. In particular, this is defined by considering the *concentration matrix*, which is the restandardized inverse of the correlation matrix,

$$K = D_R R^{-1} D_R,$$

where $D_R = \text{diag}\left(\sqrt{1/R^{-1}}\right)$, the diagonal matrix with standard deviations of the inverse of R. The K_{lm}, are partial correlations between (l, m) pairs of items having removed all other items. Because these items are ordinal, the analysis proceeds based on the polychoric correlations, which need to be estimated first. While this can, in theory, generate a nonpositive definite R, the estimated R for these items was positive definite and, therefore, so is K. However, it should be noted that K is only an approximation of the true partial correlations. In network analysis, these partial correlations are studied to determine if there is any additional structure remaining after removing the common variation.

Because the number of partial correlations is quite large (for these data there are 820 partial correlations), once the concentration matrix is estimated, network analysis regularizes K in an attempt to find a simpler representation of it. An EBICLASSO regularization is chosen because it pushes small partial correlations that are near 0 to 0 and thus regularizes for sparsity. While it is not ordinarily thought of as a regularization method, factor analysis can be viewed in this light as well given that the goal of a factor analysis is to account for the observed *covariation* by a much lower dimensional set of latent variables, with the unique variances operating as a ridge to ensure that the predicted

Table 1. Means (*M*), Standard Deviations (*SD*), Skewness and Kurtosis Statistics, Score Ranges, Cronbach's Alphas (α), and Zero-Order Correlations Among the Main Study Variables.

	M	*SD*	Skewness	Kurtosis	Score range	α	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. PHQ-9 (0-3)	0.96	0.66	0.59	−0.44	0.00-3.00	.87	.90	.95	.70	.76	.59	.47	.44	.38	.51
2. Affective–cognitive depression (0-3)	0.76	0.67	0.91	0.32	0.00-3.00	.78	—	.71	.69	.69	.64	.50	.41	.35	.47
3. Somatic depression (0-3)	1.13	0.75	0.50	−0.64	0.00-3.00	.81		—	.62	.72	.47	.39	.41	.35	.47
4. HADS-D (1-5)	2.48	0.75	0.27	−0.42	1.00-4.86	.79			—	.60	.52	.52	.39	.35	.48
5. Exhaustion (0-3)	1.31	0.85	0.41	−0.89	0.00-3.00	.90				—	.59	.43	.50	.40	.56
6. Cynicism (0-3)	0.79	0.71	1.02	0.44	0.00-3.00	.84					—	.53	.41	.41	.40
7. Professional inefficacy (0-3)	1.45	0.75	−0.04	−0.75	0.00-3.00	.91						—	.28	.27	.36
8. Unreasonable work tasks (1-5)	3.18	0.93	−0.10	−0.50	1.00-5.00	.87							—	.62	.48
9. Unnecessary work tasks (1-5)	3.38	0.86	−0.42	0.06	1.00-5.00	.80								—	.35
10. Work–nonwork interferences (1-7)	4.44	1.95	−0.32	−1.12	1.00-7.00	N/A									—

Note. PHQ-9 = Patient Health Questionnaire–9; HADS-D = seven-item Depression subscale of the Hospital Anxiety and Depression Scale; *M* = mean; *SD* = standard deviation. *N* = 1,258.
All correlations are statistically significant at $p < .001$.

covariance matrix is invertible. Thus, network analysis and factor analysis are similar, if not the same.

Results

Findings Bearing on Conditions 1 and 2

Zero-order correlations among the main study variables, as well as descriptive statistics (means, standard deviations, skewness and kurtosis statistics, score ranges, and Cronbach's alphas), are displayed in Table 1.[3] The mean correlation among the three subscales of the MBI-GS was .52. The mean correlation of the HADS-D with the three subscales of the MBI-GS was .55. The mean correlation of the PHQ-9 with the three subscales of the MBI-GS was .61.

Expectedly, the PHQ-9 correlated strongly with the HADS-D, $r = .70$, $p < .001$. Interestingly, the PHQ-9 correlated even more strongly with exhaustion, $r = .76$, $p < .001$, than with the HADS-D, z-score = 3.97, $p < .001$. Exhaustion correlated more strongly with the PHQ-9 than with either cynicism (.59), z-score = 10.15, $p < .001$, or professional inefficacy (.43), z-score = 16.25, $p < .001$. Once corrected for attenuation (McDonald, 1999), the correlation of the PHQ-9 with exhaustion reached .86. Exhaustion was found to be strongly associated with both the affective–cognitive ($r = .69$, $p < .001$) and somatic ($r = .72$, $p < .001$) aspects of depression. Although the difference between the two correlations was statistically significant due to the power provided by our large sample, z-score = 2.13, $p < .05$, the two correlations fell in the same range.

A close-up look at the relationships between each of the nine symptom items of the PHQ-9 and burnout (Table 2) revealed that exhaustion was primarily related to fatigue/loss of energy ($r = .69$, $p < .001$) and depressed mood ($r = .65$, $p < .001$); cynicism, to anhedonia ($r = .64$, $p < .001$) and depressed mood ($r = .57$, $p < .001$); and professional inefficacy, to anhedonia ($r = .45$, $p < .001$) and guilt-worthlessness ($r = .43$, $p < .001$). The three components of burnout correlated with all symptoms of depression, ps $< .001$. It is of note that the item of the PHQ-9 that assesses suicidal/self-injurious thoughts did not correlate more highly with the HADS-D than with exhaustion and cynicism.

Table 3 shows results of the ESEM bifactor analysis—the rotated loadings and *IECV* values obtained. The model fit quite well, and we therefore found no need for any modifications (e.g., correlated unique variances for doublets). The fit statistics were as follows: $\chi^2(319) = 1364.28$, RMSEA = .05, comparative fit index (CFI) = .98, Tucker–Lewis index (TLI) = .97, standardized root mean square residual (SRMR) = .02.

The loadings on the general Distress/Dysphoria factor were all substantial with signs consistent with item wording. An examination of the bifactors and *IECV* measures showed useful patterns of results. In particular, while there were some differences, *IECV*s were highest for the PHQ-9, HADS-D, and Exhaustion items. There was a notable drop for Cynicism items and, especially, for Professional Efficacy items. This drop suggests that, while these items measure distress/dysphoria, they also reflect additional systematic variance.

The interpretation of bifactors can be tricky, however. In one sense, the bifactors may reflect essentially "method" variance due to the fact that the wording of the items or response sets induce a certain amount of excess similarity

Table 2. Zero-Order Correlations Among the Nine Items of the PHQ-9 and Exhaustion, Cynicism, Professional Inefficacy, and the HADS-D.

	Exhaustion	Cynicism	Professional inefficacy	HADS-D
PHQ-9 Item 1—Anhedonia	.59	.64	.45	.60
PHQ-9 Item 2—Depressed mood	.65	.57	.42	.64
PHQ-9 Item 3—Sleep disturbance	.55	.40	.32	.48
PHQ-9 Item 4—Fatigue/loss of energy	.69	.41	.35	.54
PHQ-9 Item 5—Appetite alteration	.52	.35	.29	.46
PHQ-9 Item 6—Guilt/worthlessness	.53	.45	.43	.55
PHQ-9 Item 7—Concentration impairment	.53	.34	.29	.48
PHQ-9 Item 8—Psychomotor malfunction	.42	.30	.20	.38
PHQ-9 Item 9—Suicidal/self-injurious thoughts	.32	.31	.19	.31

Note. HADS-D = seven-item Depression subscale of the Hospital Anxiety and Depression Scale; PHQ-9 = Patient Health Questionnaire–9. N = 1,258. All correlations are statistically significant at $p < .001$.

Table 3. Summary of the Exploratory Structural Equation Modeling Bifactor Analysis.

				Bifactors							
Scale	Subscale	Item	General factor	HADS-D	PHQ-9	EX	PE	CY	Communality	*IECV*	Subscale *IECV*
PHQ-9	—	1	.77	*−.10*	*−.01*	*.01*	*.04*	*.29*	.70	.85	.79
		2	.80	*−.16*	*.23*	*.07*	*.04*	*.14*	.75	.85	
		3	.69	*.03*	*.22*	*.09*	*.04*	*−.03*	.54	.88	
		4	.74	*.03*	*.13*	.30	*.01*	*−.10*	.67	.82	
		5	.65	*.06*	.30	*.07*	*.03*	*−.05*	.54	.79	
		6	.70	*−.07*	.43	*−.06*	*−.09*	*.05*	.68	.71	
		7	.72	*.15*	*.26*	*−.04*	*.05*	*−.08*	.63	.82	
		8	.61	*.09*	.31	*−.05*	*.10*	*−.02*	.49	.76	
		9	.59	*−.06*	.42	*−.07*	*.06*	*.15*	.53	.65	
HADS-D	—	1	−.66	.33	*.10*	*.08*	*−.04*	*−.06*	.57	.76	.71
		2	−.63	.65	*−.01*	*−.01*	*.02*	*.06*	.80	.49	
		3	−.67	.66	*−.04*	*−.05*	*−.01*	*.01*	.88	.51	
		4	.47	*−.07*	*.12*	*.08*	*−.05*	*.01*	.26	.87	
		5	.42	*−.03*	*.14*	*−.10*	*−.07*	*−.10*	.22	.81	
		6	−.67	*.20*	*.15*	*.15*	*.02*	*.07*	.54	.82	
		7	−.58	*.05*	*.08*	*.21*	*−.01*	*.22*	.45	.73	
MBI-GS	EX	1	.69	*−.03*	*.09*	.48	*−.04*	*.01*	.73	.65	.69
		2	.65	*.04*	*.03*	.60	*−.04*	*−.10*	.78	.55	
		3	.76	*.05*	*−.09*	.44	*.02*	*.00*	.77	.76	
		4	.75	*.07*	*−.12*	.47	*.04*	*.09*	.81	.70	
		5	.79	*.00*	*.06*	.37	*.05*	*.07*	.78	.79	
	CY	1	.50	*.00*	*−.12*	*.01*	*.03*	.56	.58	.43	.47
		2	.51	*.05*	*.14*	*−.09*	*−.11*	.74	.83	.31	
		3	.65	*−.02*	*−.14*	*.06*	*−.04*	.57	.80	.52	
		4	.57	*.05*	*.15*	*−.06*	*−.09*	.67	.80	.41	
		5	.53	*−.12*	*.11*	*.17*	*−.01*	*.19*	.40	.70	
	PE	1	−.45	*.02*	*−.14*	*−.06*	.67	*.02*	.68	.30	.34
		2	−.42	*−.01*	*−.12*	*−.03*	.73	*.02*	.72	.25	
		3	−.48	*.00*	*−.07*	*−.01*	.75	*.03*	.79	.30	
		4	−.58	*.05*	*.25*	*−.01*	.57	*−.03*	.75	.44	
		5	−.58	*−.03*	*.27*	*.07*	.61	*−.15*	.85	.39	
		6	−.54	*−.03*	*.06*	*.05*	.66	*−.03*	.74	.39	

Note. N = 1,258. Factor loadings < .30 are italicized. PHQ-9 = Patient Health Questionnaire–9; HADS-D = seven-item Depression subscale of the Hospital Anxiety and Depression Scale; MBI-GS = Maslach Burnout Inventory–General Survey; EX = Exhaustion subscale of the MBI-GS; CY = Cynicism subscale of the MBI-GS; PE = Professional Efficacy subscale of the MBI-GS; *IECV* = item explained common variance.

Table 4. Comparisons of the Correlations of Burnout and Depression With the Job Stressor Variables.

	Burnout	Depression	Between-correlation difference
Unreasonable work tasks	.40	.42	.02^{ns}
Unnecessary work tasks	.36	.37	.01^{ns}
Work–nonwork interferences	.44	.50	.06**

Note. $N = 1{,}258$. *ns* = nonsignificant. The burnout-related correlations are the mean correlations of the three burnout subscales (Exhaustion, Cynicism, and Professional Inefficacy) with the job stressor variables; the depression-related correlations are the mean correlations of the two depression scales (PHQ-9 and HADS-D) with the job stressor variables.
$^{**}p < .01$.

(or local dependence). In another, the bifactors may reflect the notion that the items contain substantively interesting variation.

In addition to considering item content, one way to assess these findings is to examine the size of the bifactor loadings relative to the general factor. When an item's bifactor loading is small (<.30 in magnitude) and the item has a strong loading on the general factor, the item is a relatively pure measure of the general factor, which will also be indicated by its *IECV* value. If all loadings on a bifactor are small, the bifactor itself essentially collapses. This did not happen here. Each bifactor had relatively strong items. However, it is fairly clear that the loadings for, say, the PHQ-9 items were systematically higher on the general factor than on their bifactor. Thus, the PHQ-9 items' bifactor likely measures wording similarities more than anything substantive. This was also true for the Exhaustion items and, for the most part, the HADS-D items. However, the items of the Professional Efficacy and Cynicism subscales of the MBI-GS did not share this pattern. They were not completely distinct from distress/dysphoria but were more strongly associated with their bifactors.

Findings Bearing on Condition 3

As can be seen from Table 4, on average, burnout and depression each correlated similarly with unreasonable work tasks and unnecessary work tasks. Remarkably, depression correlated more largely than burnout with work–nonwork interferences, although the two correlations fell in the same range.

In the structural regression analysis, we regressed each of the six dependent variables, that is, the general Distress/Dysphoria factor and the five concomitant bifactors, on the three independent variables, the general Job Stressors factor and the two illegitimate work tasks bifactors. Table 5 shows the results. The fit of the model was satisfactory: $\chi^2(601) = 1.760.37$ (baseline $\chi^2[820] = 65.061.35$); RMSEA = 0.04; CFI = 0.98; TLI = 0.98; SRMR = 0.02.

The results of the structural regression indicated that the general Job Stressors factor predicted distress/dysphoria as well as four of the five dependent bifactors: HADS-D, PHQ-9, Exhaustion, and Cynicism. The Unnecessary Work Tasks bifactor predicted distress/dysphoria and all five of the dependent bifactors. The Unreasonable Work Tasks bifactor predicted two dependent bifactors, Exhaustion and Cynicism, and not distress/dysphoria. The relationships among bifactors are likely due to similarities in wording. In particular, the Exhaustion items contain the terms *work* or *job* as, obviously, do the Job Stressors items. We re-ran the model but omitted the Work–Nonwork Interferences item in constructing the general Job Stressors factor and the two illegitimate Work Tasks bifactors. As shown in Table 5, the change in almost every R^2 was dramatic when the Work–Nonwork Interferences item was omitted from the model.

Network Analysis

Our psychometric network analysis is summarized in Figure 1. The regularized network showed that the residual ties largely, though not completely, aligned with the subscales or common item content across subscales. For instance, the illegitimate work tasks items (UC1-UC4, UR1-UR4) retained stronger residual association, as did the various MBI-GS subscales. By contrast, for the most part the PHQ-9 and HADS-D items had only weaker and less coherent residual associations, though they were not completely absent. PHQ-9 items 7 (concentration impairment) and 8 (psychomotor malfunction) appeared to be doublets, as were HADS-D items 6 ("I look forward with enjoyment to things") and 7 ("I can enjoy a good book or radio or TV program"). This is not unusual in light of the analysis of the posttraumatic stress disorder data found in Epskamp et al. (2017), where strong residual associations largely align with groups of items sharing similar wording. We find the notion of a "true" causal relationship among these items less plausible than the presence of a third variable reflecting the underlying meaning of the items having similar wording, which is a pervasive issue with these sorts of data more broadly and reflects common scale construction practice.

We also examined the centrality measures of the items as well as their mutual information and compared them with the communalities estimated from an eight-factor unconstrained EFA. It should be noted that all these measures are positively correlated, although with notable nonlinearity, leading us to use Kendall's τ_B. In particular, the mutual

Table 5. Summary of the Results of the Structural Regressions.

	General Distress/ Dysphoria factor		HADS-D bifactor		PHQ-9 bifactor		Exhaustion bifactor		Cynicism bifactor		Professional Efficacy bifactor	
Work–nonwork interferences item included												
Predictors	β	*p*	β	*p*	β	*p*	β	*p*	β	*p*	β	*p*
General Job Stressors factor	.390	.000	.266	.000	.197	.004	.423	.000	.251	.000	.078	.170
Unnecessary Work Tasks bifactor	.592	.000	.539	.000	.477	.000	.613	.000	.179	.043	.353	.000
Unreasonable Work Tasks bifactor	.040	.428	−.086	.117	−.083	.115	−.124	.028	.176	.000	.018	.671
	R^2	*p*	R^2	*p*	R^2	*p*	R^2	*p*	R^2	*p*	R^2	*p*
Full model	.522	.000	.331	.000	.241	.016	.507	.000	.151	.002	.136	.014
Work–nonwork Interferences item excluded												
Predictors	β	*p*	β	*p*	β	*p*	β	*p*	β	*p*	β	*p*
General Job Stressors factor	.393	.000	.091	.098	.063	.183	.346	.000	.222	.000	−.014	.769
Unnecessary Work Tasks bifactor	.352	.000	.255	.000	.078	.170	.144	.050	.111	.024	.165	.001
Unreasonable Work Tasks bifactor	.145	.000	.017	.644	.011	.803	−.004	.922	.234	.000	.082	.017
	R^2	*p*	R^2	*p*	R^2	*p*	R^2	*p*	R^2	*P*	R^2	*p*
Full model	.332	.000	.077	.008	.011	.324	.140	.000	.133	.000	.043	.025

Note. The single Work–Nonwork Interferences item was loaded onto the general Job Stressors factor and both the Unreasonable Work Tasks and Unnecessary Work Tasks bifactors.

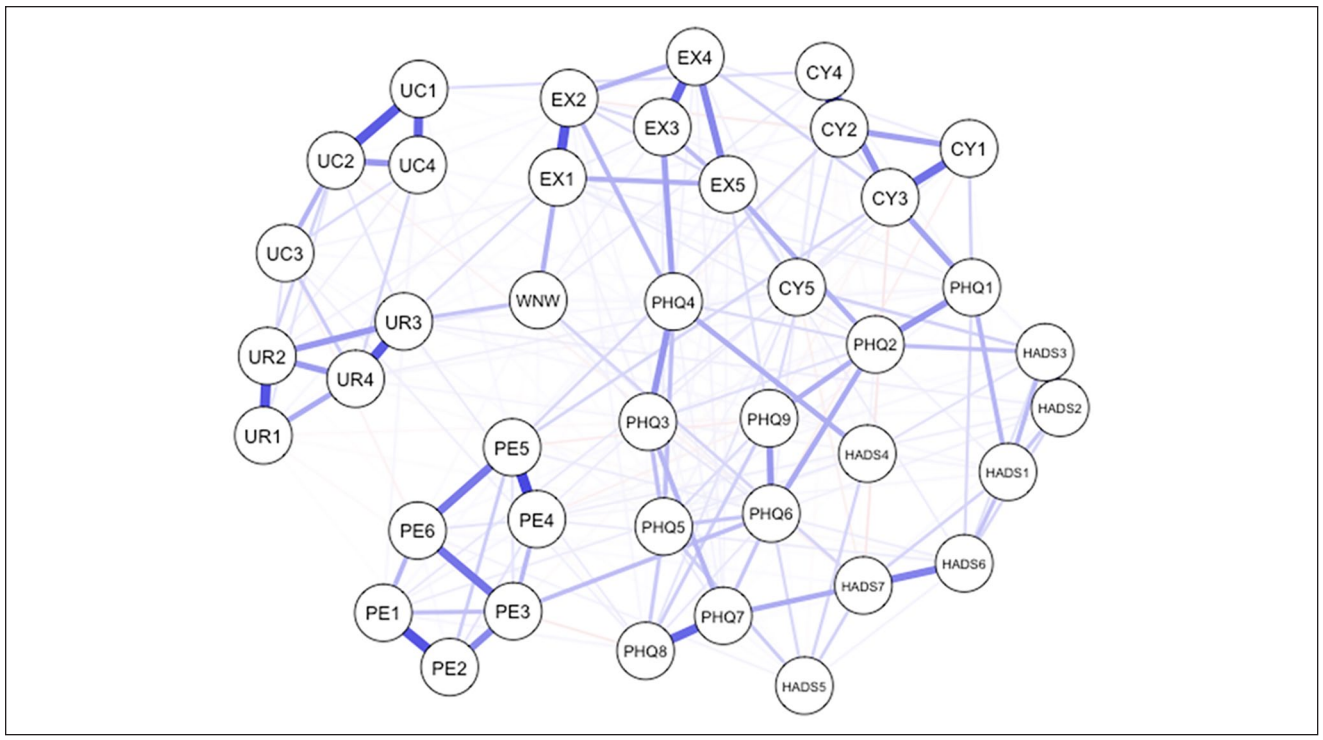

Figure 1. EBICLASSO regularized network of the HADS-D, PHQ-9, MBI-GS, and Job Stressors items.
Note. Items are positioned in the graph according to their rough proximity via the Fruchterman–Reingold algorithm with strength of residual ties indicated by weight of the connecting edge. EX1 to EX5: Exhaustion items; CY1 to CY5: Cynicism items; PE1 to PE6: Professional Efficacy items; PHQ1 to PHQ9: items of the Patient Health Questionnaire–9; HADS1 to HADS7: items of the Depression subscale of the Hospital Anxiety and Depression Scale; UR1 to UR4: Unreasonable Work Tasks items; UC1 to UC4: Unnecessary Work Tasks items; WNW: Work–Nonwork Interferences item.

information appears to align quite closely to the ESEM bifactor analysis communalities (Kendall's $\tau_B = .85$, Sidak-adjusted p value $< .001$). Strength centrality and expected influence are also strongly related to these measures, with Kendall's $\tau_B > .60$ for all measures (Sidak-adjusted p values $< .001$). Consistent with good practice, we also examined the stability of the network via the case deletion bootstrap methods. It appears to be adequate according to the guidelines found in Epskamp et al.'s (2017) article, which is unsurprising given the relatively large sample size. The fact that these centrality measures are all relatively related to mutual information and communality is notable, although in the case of mutual information and communality, not especially surprising. Betweenness and Closeness measures appear to be much less consistently related to the other measures.

Discussion

Burnout has been defined as "a state of exhaustion in which one is cynical about the value of one's occupation and doubtful of one's capacity to perform" (Maslach et al., 1996, p. 20). It has been claimed that burnout should not be mistaken for a depressive condition (e.g., Maslach & Leiter, 2016; Melnick et al., 2017). In the present study, we examined three basic conditions expected to be met if burnout does constitute a syndrome distinct from depression. None of the requirements for burnout's distinctiveness and syndromal unity was satisfied.

Condition 1

Hypothesis 1 was supported. We found that symptoms of exhaustion, cynicism, and professional inefficacy were, on average, *less* strongly associated with each other than with symptoms of depression. Exhaustion, the core component of burnout, correlated strongly with depression, particularly when depression was assessed with the PHQ-9—a scale that comprehensively covers *DSM-5*'s diagnostic criteria for major depression (American Psychiatric Association, 2013; Kroenke et al., 2001). With a raw correlation of .76 and a disattenuated correlation of .86, the amount of variance shared by exhaustion and the PHQ-9 suggests that the exhaustion subscale of the MBI-GS lacks discriminant validity (Ong & van Duimen, 2007).

These findings cast doubt on the idea that burnout is a syndrome primarily defined by exhaustion, cynicism, and professional inefficacy. Our results rather suggest that burnout is a depressive syndrome in which fatigue/loss of energy occupies an important place, consistent with the observation that burnout resembles depression *with atypical features*[4] (Bianchi et al., 2014), a subtype of depression marked by exhaustion and hypocortisolism (American Psychiatric Association, 2013; Gold & Chrousos, 2002). Importantly, the correlations that we observed among the three subscales of the MBI-GS are comparable to those reported in past research. Judging from the manual of the MBI, exhaustion usually shares 19% to 37% of its variance with cynicism, and 0% to 12% with professional inefficacy; cynicism usually shares 12% to 32% of its variance with professional inefficacy (Maslach et al., 1996). Thus, our results cannot be imputed to weaker-than-usual correlations among the subscales of the MBI-GS.

Hypothesis 2 was supported. Exhaustion correlated more highly with the PHQ-9 than with either cynicism or professional inefficacy. Maslach and Leiter (2008) suggested that exhaustion and cynicism "go together" based on an average correlation estimated at .55 in the research literature (p. 501). These authors viewed such a correlation as evidence for the existence of a *strong* and *robust* link between the two variables. In the present study, correlations between exhaustion and depression clearly exceeded .55, with raw coefficients ranging from .60 to .76 (see also Hätinen et al., 2004; Lindblom et al., 2006). Following Maslach and Leiter's (2008) line of reasoning, exhaustion and depression could thus be thought to go together even more tightly than exhaustion and cynicism. Because the link between professional inefficacy and exhaustion is typically weaker than the link between exhaustion and cynicism (Maslach et al., 1996; McManus et al., 2002), the case of professional inefficacy only reinforces the doubts raised regarding the coherence of burnout's definition (see also Schaufeli & De Witte, 2017). We note in passing that in Maslach and Leiter's (2008) study, the correlations between professional inefficacy and exhaustion were very small (.06 and .03 [corrected for sign] at two different time points) and statistically nonsignificant. In light of such findings, and without neglecting the fact that comparisons of effect sizes across studies must take into account heterogeneity in measurement reliability and score range (Field, 2003), the claim that burnout includes cynicism and professional inefficacy but excludes classical depressive symptoms is untenable.

Our results also indicated that exhaustion is strongly associated with both the affective–cognitive and the somatic subscale of the PHQ-9. These results are consistent with the finding that burnout involves a depressive cognitive style (Bianchi & da Silva Nogueira, 2019; Bianchi & Laurent, 2015; Bianchi, Laurent, Schonfeld, Bietti, & Mayor, 2020; Bianchi, Laurent, Schonfeld, Verkuilen, & Berna, 2018; Golkar et al., 2014). On a different note, our results question Maslach and Leiter's (2016) argument that the "high correspondence of burnout and depression" is driven by between-scale overlap at the level of fatigue-related items (p. 107). Indeed, the fatigue-related items of the PHQ-9 (e.g., sleep disturbance, fatigue/loss of energy) are contained in the *somatic* subscale of the PHQ-9. As previously mentioned, we found that the exhaustion subscale of the MBI-GS

strongly correlated with *both* the affective–cognitive and the somatic subscale of the PHQ-9.

Hypothesis 3 was supported. Our ESEM bifactor analysis indicated that depression and exhaustion items aligned on the general Distress/Dysphoria factor. The cynicism and professional efficacy items were less closely related to the general factor, as reflected in the lower communalities and *IECV* values. In other words, our ESEM bifactor analysis suggested that exhaustion and depression were inextricably linked through their connection to the general factor and essentially reflected the same construct, distress/dysphoria, when cynicism and professional efficacy had off-center positions. The ESEM bifactor analytic findings are thus consistent with the correlational findings.

Condition 2

Hypothesis 4 was supported. We found that the PHQ-9 (our primary measure of depression) did not correlate more strongly with the HADS-D (our secondary measure of depression) than with exhaustion. These findings are consistent with the results bearing on Condition 1. Our results suggest that the magnitude of the burnout–depression association is problematically large from the standpoint of discriminant validity. A requirement for discriminant validity is that measures of different constructs should not be strongly related or, at least, should not be as strongly related as measures of the same constructs (Spector, 2013). It is worth noting that the correlation that we observed between the PHQ-9 and the HADS-D is comparable to the correlations commonly obtained when measures of depressive symptoms are correlated with each other (for an overview, see Bianchi, Rolland, & Salgado, 2018; see also Dobson, 1985, for earlier findings).

Interestingly, correlations between the exhaustion subscale of the MBI-GS and the exhaustion subscale of the Oldenburg Burnout Inventory—an alternative measure of burnout symptoms—were found to range between .60 and .72 in past studies (Demerouti et al., 2003; Halbesleben & Demerouti, 2005). In a study involving two different worker samples, Shirom and Melamed (2006) found correlations between the MBI-GS and the Shirom-Melamed Burnout Measure—yet another measure of burnout symptoms—ranging from .74 to .79. Such correlations appear to be similar to the correlations observed here between the PHQ-9 and exhaustion (.76).

Condition 3

Hypothesis 5 was supported. We found that burnout and depression were linked to work–nonwork interferences and illegitimate work tasks in a largely similar manner. In other words, burnout and depression were not found to differ meaningfully in terms of nomological networks. Our findings are consistent with those of previous studies indicating that burnout and depression are associated with job satisfaction, job adversity, and workplace social support to a comparable extent (Faragher et al., 2005; Schonfeld & Bianchi, 2016).

Hypothesis 6 was supported. Our structural regressions indicated that job stressor factors were highly related to Distress/Dysphoria and the scale-related bifactors. The findings thus underline the view that job stressors are powerful predictors of distress/dysphoria.

The regression findings underline the problem of work–nonwork interferences. Work–nonwork interferences constitute a particularly powerful predictor of distress/dysphoria. The R^2s were substantially reduced when the single Work–Nonwork Interferences item was removed from the model. The R^2 for the general Distress/Dysphoria factor was reduced by 36% when that single item was omitted from the model. For specific bifactors such as the bifactors for HADS-D, PHQ-9, Exhaustion, and Professional Efficacy, the reductions were even more substantial. Only for the Cynicism bifactor was the reduction virtually nonexistent. Work–nonwork interferences thus appeared to constitute a powerful stressor (Nohe et al., 2015).

The findings related to Condition 3 are also worth discussing from the perspective of the basic links between burnout and organizational- and occupational-level factors. Indeed, the nomological network of the burnout construct may not be as "work-specific" as generally presumed. Leiter and Maslach (2004), for instance, found an average correlation of only .26 (N = 6,815) between the MBI-GS and the Areas of Worklife Scale, an instrument designed to measure "the major organizational antecedents of burnout" (Maslach et al., 2001, p. 414). In a meta-analysis, true score correlations of .27 between burnout and job demands and −.27 between burnout and job resources were obtained by Crawford et al. (2010); overall, job-related demands and resources explained 15% of the variance in burnout. Comparatively, a meta-analysis conducted by Swider and Zimmerman (2010) revealed true score correlations near and above .50 between the three dimensions of burnout and the personality traits of the Five-Factor Model (neuroticism, extraversion, agreeableness, conscientiousness, and openness). Remarkably, in a study that relied on relative weight analysis (N = 1,759), neuroticism was found to account for more variance in burnout than job-related effort-reward imbalance and social support at work combined (Bianchi, 2018). Such results suggest that the variance in burnout symptoms may not be primarily explained by organizational- and occupational-level factors.

It should be noted that the investigation of the nomological networks of burnout and depression has not resulted in fully consistent findings to date (Bianchi et al., 2015). This state of affairs is likely due to (a) the heterogeneity of the conceptualizations and operationalizations of burnout used in past research, (b) the assessment of burnout and

depressive symptoms within highly different time windows in a vast majority of studies, and (c) the "triviality trap" (i.e., the problem of content overlap between independent and dependent variables; Kasl, 1978, pp. 13-14), which has biased findings from burnout research (Schaufeli & Enzmann, 1998).

Network Analysis

We used network analysis primarily as a means to check for any missed systematic relationships. Hypothesis 7 appeared to be supported. The regularized partial correlation matrix's structure almost completely lines up with the known structure of (sub)scales. While network analyses in the literature do not focus much on what is removed by partialing, we believe it is interesting to consider what partialing tells us. The results are consistent with the ESEM bifactor analysis, namely, that what these items primarily have in common across all subscales—that is, what ends up being removed by partialing—is distress/dysphoria. This aligns well with the fact that the most central items are PHQ1 (anhedonia), PHQ2 (depressed mood), PHQ6 (guilt/worthlessness), and PHQ9 (suicidal/self-injurious thoughts). Our feeling is that much of the residual association is driven by commonality of wording in subscales, for example, the use of the words "work" and "job" in MBI-GS subscales, which is in line with broader points made by Podsakoff, MacKenzie, Lee, and Podsakoff (2003).

Limitations

The present work has several strengths, such as the relatively large size of the study sample or the use of advanced analytic techniques. However, our work also has limitations. First, we focused on only one occupational domain, education, and our sample included mostly women. These features potentially limit the external validity of our study (Simons et al., 2017). This being mentioned, we note that (a) the predominance of women in our sample is consistent with the fact that women are in the majority in the French education system and (b) the mean age in our sample is comparable to the mean age in the population of reference (Ministère de l'Éducation nationale, 2017). We additionally note that, from a theoretical standpoint, the patterns of associations between burnout and depressive symptoms are *not* expected to vary significantly as a function of occupational domains (Bianchi & Schonfeld, 2018). Many empirical findings support such a view (Ahola et al., 2014; Bianchi & Brisson, 2019; Wurm et al., 2016; see also Leiter & Schaufeli, 1996, and Toppinen-Tanner et al., 2002). Second, we conducted our nomological network analysis based on only three indicators, unreasonable work tasks, unnecessary work tasks, and work–nonwork interferences. It would have been useful to examine a wider array of burnout's correlates. Third, due to the very nature of our recruitment procedure, the response rate to our study could not be estimated. Fourth, we relied on the MBI-GS to assess burnout symptoms, and on the PHQ-9 and the HADS-D to assess depressive symptoms. Although these three measures are considered measures of reference in the areas of burnout and depression research (Bjelland et al., 2002; Kroenke et al., 2010; Maslach et al., 2001), replication studies employing other measures of burnout and/or depression could be informative.

Because our study involved cross-sectional self-report methodology, it may be argued that our study is susceptible to monomethod bias. We think that such an argument is questionable. Aside from the general observation that the problem of common method variance has been overstated in psychological research (Spector, 2006), it is worth underscoring that our study largely relied on *comparative* correlational analyses. Because there is no reason to think that the action of common method variance would more strongly affect some correlations than others in our study (e.g., the correlations between burnout and depression compared with the correlations between exhaustion, cynicism, and professional inefficacy), the conclusions derived from our comparative correlation analyses are unlikely to be vulnerable to monomethod bias. Finally, we point out that our use of a cross-sectional design was justified by our very aim of investigating the *co-occurrence* of burnout and depressive symptoms.

It might be claimed that our reliance on a cross-sectional design is nevertheless problematic because it did not allow us to examine potential cause–effect relationships between burnout and depression. Although the conduct of longitudinal and experimental studies allowing for causal inferences should undoubtedly be encouraged, such a claim is in our estimation ill-founded in the present case. Indeed, before testing the hypothesis that burnout causes depression (or vice versa), the discriminant validity of the burnout construct and unity of the burnout syndrome would have to first be established. In line with a growing body of evidence (e.g., Ahola et al., 2014; Schonfeld et al., 2019), our study indicates that such prerequisites are not met. Moreover, because burnout overlaps with depression, not only in terms of symptoms but also of etiological pathways (e.g., through insurmountable [job] stress), a clear rationale for the prediction that one entity causes the other is lacking (Bianchi, Schonfeld, & Laurent, 2018).

Concluding Remarks

The present study suggests that there may be no such thing as a syndrome of exhaustion, cynicism, and professional inefficacy that excludes—or does not primarily include—classical depressive symptoms. In view of its popularity among the public, burnout may have become a common

presenting complaint in depressed professionals who seek care. We recommend that clinicians systematically assess classical depressive symptoms in individuals presenting with a complaint of "burnout."

The origins of the burnout construct probably explain many of the problems encountered in burnout research for more than 40 years (e.g., the inability to establish a consensual [differential] diagnosis). Indeed, seminal accounts of burnout (e.g., Freudenberger, 1974; Maslach, 1976) were marked by speculation and storytelling-based rhetoric rather than sound theorizing and thorough comparative investigations (Friberg, 2009; Schaufeli & Enzmann, 1998). No systematic review of the literature dedicated to already-described stress-related conditions (such as depression) accompanied the release of the burnout construct. The originality of the burnout phenomenon was taken for granted rather than demonstrated. The "bricolage" that characterized the development of the burnout construct (see Friberg, 2009, p. 542) was also reflected in the arbitrariness that marked the selection of the symptom items that eventually formed the MBI—the measure of reference in burnout research (see Schaufeli & Enzmann, 1998, p. 188, and Bianchi et al., 2015, p. 35). All in all, the approach adopted by pioneers of burnout research was ill-equipped to integrate existing knowledge and promote construct clarity.

To close this article, we recommend that future research focus more intensively on *occupational* depressive syndromes. In the pursuit of this objective, measures allowing us to assess the depressive symptoms that individuals causally attribute to their job could be useful. By enabling us to assess symptoms such as job-related suicidal thoughts, such measures may help us detect professionals requiring urgent interventions much more effectively. Such measures may also help us identify depressogenic organizations or working conditions (e.g., depressogenic managerial methods). On a related note, such measures could permit us to better estimate the general impact of job stress on health, bearing in mind that burnout is *not* diagnosable whereas depression is.

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Notes

1. The stage at which a *depressive disorder* can be diagnosed.
2. The very etymology of the term *syndrome* refers to the idea of going or running together (https://en.oxforddictionaries.com).
3. We note that Spearman correlation analysis led to results that were nearly identical to the results obtained with Pearson correlation analysis. For instance, the PHQ-9 correlated .75 with global burnout when analyzed using Pearson correlation, and .76 when analyzed using Spearman correlation. Regarding the 55 correlation coefficients reported in Table 1, the mean difference between Spearman's ρs and Pearson's *r*s was .01 ($SD = 0.01$).
4. As specified in the *DSM-5*, the term *atypical* has historical significance and "does not connote an uncommon or unusual clinical presentation" (American Psychiatric Association, 2013, p. 152).

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