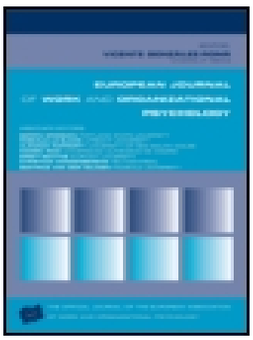

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Profiling development of burnout over eight years: relation with job demands and resources

Anne Mäkikangas[a], Michael P. Leiter[b], Ulla Kinnunen[a] and Taru Feldt[c]

[a]Faculty of Social Sciences (Psychology), Tampere University, Tampere, Finland; [b]School of Psychology, Deakin University, Geelong, Australia; [c]Department of Psychology, University of Jyväskylä, Jyvaskyla, Finland

ABSTRACT

The aim of the present study was twofold: First, to profile the long-term development of burnout symptoms (exhaustion, cynicism and reduced professional efficacy), and second, to investigate the associations of developmental burnout profiles with job demands and resources. The study focused on Finnish white-collar professionals ($N = 169$) who participated in a survey five times during eight years (in 2006, 2008, 2010, 2012, and 2014). At each measurement time, the participants filled in the same scales of burnout, job demands and job resources. Using Latent Profile Analysis (LPA), three developmental profiles of burnout symptoms were identified: 1) *Stable, low burnout* (78%), 2) *Exhaustion instigated, increasing burnout* (12%), and 3) *Cynicism and reduced professional efficacy dominated, inverted U-shaped burnout* (10%). *Exhaustion instigated, increasing burnout* profile displayed the highest levels of job demands, whereas *Cynicism and reduced professional efficacy dominated, inverted U-shaped burnout* profile reported the lowest levels of job resources compared to members in other profiles. Recognizing the existence of the multiple sequential development of burnout symptoms and different patterns of job demands and the job resources behind them, this study suggests that burnout development does not follow a uniform shape, which reconciles previously inconsistent findings of variable-centred burnout research.

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KEYWORDS
Burnout; longitudinal development; person-centred approach; job demands; job resources

Introduction

Burnout has been studied intensively since it was first introduced in the occupational health psychology literature over thirty years ago (Freudenberger, 1974; Maslach, 1976). Despite the relatively long history of burnout research, the developmental aspects of burnout remain controversial; it is unclear in which order the symptoms of burnout – exhaustion, cynicism and reduced professional efficacy – evolve and how they relate to each other (Schaufeli et al., 2011). Most scholars have so far adopted a variable-centred approach to burnout, i.e., examined the development of burnout using various regression-based methods on the assumption that correlations between burnout symptoms or development of burnout is similar across the whole study population (for reviews, see Mäkikangas & Kinnunen, 2016; Mäkikangas et al., 2016). This line of research has made a valuable contribution to what is known about the overall stability of burnout symptoms and their long-term effects on each other. However, at the same time, it ignores the various types of burnout (i.e., different profiles of burnout symptoms) and the possibility that the sequential development of burnout symptoms may follow different trajectories. To attain a more profound understanding of the development of burnout over time, the present study investigates the relation between burnout symptoms using a person-centred approach which captures the three symptoms of burnout simultaneously within the individual over time (Mäkikangas & Kinnunen, 2016).

The person-centred approach offers an important complement to variable-oriented studies as multi-faceted and more detailed information is needed at the level of burnout theory and burnout treatment. Specifically, the current person-centred study makes four key contributions to the burnout literature. *First*, via unique eight-year longitudinal data with five measurements, we enhance understanding of longitudinal development of burnout by taking into account the possibility that burnout process is not the same for all but has the potential to follow different sequential orders of the burnout symptoms. *Second*, we are able to investigate the long-term relations between the three symptoms of burnout and thus contribute to the theoretical discussion about the independency vs. dependency of these symptoms on each other (Maslach et al., 2001; Shirom et al., 2005) more accurately than before due to our intra-individual level inspection. *Third*, we contribute to the theoretical debate on the existing developmental models of burnout. A least three prominent models currently describe the underlying causal process reflecting the sequential development of the three symptoms of burnout (Golembiewski et al., 1986; Lee & Ashforth, 1993; Leiter, 1993; Leiter & Maslach, 1988). By utilizing data of young employees beginning their work careers when the study started, we have an excellent opportunity to enhance the understanding of the underlying causal processes between burnout symptoms. Adopting a person-centred approach enables us to investigate whether different causal models are suitable for describing the

CONTACT Anne Mäkikangas anne.makikangas@tuni.fi

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different developmental trajectories identified, as opposed to a single process captured by variable-centred research. *Fourth*, we focus on unfavourable job characteristics (high job demands and low resources) known to be the primary reasons for burnout (see Maslach et al., 2001; Schaufeli & Enzmann, 1998). Our study has the potential to produce diverse information about the linkages between job demands and job resources with burnout as their role in different developmental phases and symptom combinations of burnout is investigated.

Multidimensionality and development of burnout

Although several definitions have been proposed for job burnout, the definition by Maslach and her colleagues (Maslach et al., 1996) is most often used and widely accepted in the occupational health literature. According to this three-dimensional definition, burnout is considered a syndrome characterized by exhaustion, cynicism and reduced professional efficacy. Exhaustion refers to feelings of overstrain, tiredness, or chronic fatigue resulting from work overload. Cynicism refers to a negative attitude towards work, losing one's interest in it and the conception of the meaning of work. Due to the human sector emphasis on burnout phenomenon, cynicism was previously labelled as depersonalization, referring specifically to psychological withdrawal from relationships and the development of a callous attitude towards work and the people affected (Maslach & Jackson, 1981). Reduced professional efficacy is described as losing one's competence and productivity and feeling of achievement in one's work. This definition, following the wording of the MBI-General Scale (Leiter & Schaufeli, 1996) was acknowledged by the World Health Organization (2019) in its announcement of including burnout as an occupational phenomenon in its upcoming International Classification of Diseases 11th Revision (ICD-11).

Although the three symptoms have largely been accepted to describe the burnout syndrome, their independency vs. dependency on each other has been discussed (see Maslach et al., 2001; Shirom et al., 2005). Variable-centred studies have demonstrated that exhaustion and cynicism are more strongly associated with each other than with reduced professional efficacy (for reviews, see Kim & Ji, 2009; Worley et al., 2008). This weaker association of reduced professional efficacy with the other two symptoms has even given rise to doubts whether reduced professional efficacy is indeed a decisive symptom of burnout (e.g., Halbesleben & Demerouti, 2005). For this reason, exhaustion and cynicism are often seen as core symptoms of job burnout. Schaufeli and Salanova (2007) have suggested that differences in the wording of the items on the scale may explain these relations, i.e., exhaustion and cynicism are formulated negatively and reduced professional efficacy positively in the Maslach Burnout Inventory (MBI; Maslach et al., 1996). In the present study we are able to overcome this scaling issue, as we measure burnout with the Bergen Burnout Indicator (BBI; Näätänen et al., 2003) which is based on the same definition of job burnout as the MBI, but the direction of the wording on all dimensions is similar.

However, it is plausible that the different associations between the three symptoms of burnout may reflect the diverse development phase and sequence of burnout symptoms (see Taris et al., 2005). Theoretically, three prominent models describe the process of burnout symptoms, namely; the process model of Leiter and Maslach (Leiter, 1993; Leiter & Maslach, 1988); the phase model of Golembiewski and colleagues (Golembiewski et al., 1986) and the combined model of Lee and Ashforth (1993). The process model by Leiter and Maslach (Leiter, 1993; Leiter & Maslach, 1988) states that sustained exhaustion is the first and primary burnout symptom, which develops due to high job demands. Exhaustion is claimed to reduce involvement through impaired ability to sustain attention or emotional connection, thereby leading to increased cynicism. When the feelings of cynicism persist, employees are unlikely to feel they have accomplished something when completing tasks and feelings of reduced personal efficacy may develop. Thus, the process model states that sustained exhaustion contributes to cynicism which, in turn, impairs professional efficacy.

The phase model by Golembiewski et al. (1986) presents the burnout symptoms in the opposite order. Accordingly, burnout development follows several sequences of phases, but the major starting point of the burnout process is cynicism. Feelings of cynicism impair performance and identification with people and processes at work thus affecting one's perception of accomplishment. In this model, the development of exhaustion is considered the final phase in response to increased cynicism and decreased professional efficacy. Thus, in this model burnout is considered to follow the causal order of cynicism, reduced professional efficacy and exhaustion.

Finally, Lee and Ashforth (1993) proposed a combination of the two models based on their exploratory analysis. Similarly to the process model (Leiter, 1993; Leiter & Maslach, 1988), they consider cynicism to develop from exhaustion. However, they additionally considered that reduced personal efficacy develops independently from cynicism. In fact, Lee and Ashforth (1993) state that reduced personal sense of accomplishment is directly evoked by exhaustion. The model thus comprises two theoretical assumptions about the causal order of burnout symptoms: the effect of exhaustion on both cynicism and reduced personal efficacy.

The causal order of burnout symptoms has so far been intensively investigated using longitudinal regression-based analysis. These variable-centred results have yielded rather inconsistent accounts of the longitudinal process of burnout. In fact, as reviewed by Taris et al. (2005), none of these theoretical models was completely supported by empirical studies. In their own multi-sample study design utilizing two- and three-wave longitudinal data, a combination of Leiter and Maslach (1988) and Lee and Ashforth (1993) models gained most empirical support (Taris et al., 2005). More specifically, exhaustion was found to facilitate depersonalization/cynicism over time, but depersonalization/cynicism also triggered *both* reduced professional efficacy and exhaustion. However, the lagged effects identified were rather small and therefore the authors concluded that it would be incorrect to state that the findings represent the existent causal order of the burnout symptoms in practice.

One reason for these inconsistent or negligible lagged effect findings may be that in the same dataset there are employees

following different sequential processes of burnout. In their systematic review of person-centred burnout studies, Mäkikangas and Kinnunen (2016) summarized that both the burnout types (i.e., combinations of burnout symptoms at the intra-individual level) as well as long-term trajectories supporting change in burnout (either increasing, decreasing or curvilinear) among employee subgroups do indeed exist. However, only very few studies have investigated different job burnout developmental profiles *per se*. It is typical of earlier person-centred studies that they have focused on investigating the development of job burnout based on 1) total score of burnout (Evolahti et al., 2013; Hultell et al., 2013; Rudman & Gustavsson, 2011; 2) a single symptom of burnout, typically exhaustion or cynicism (Mäkikangas et al., 2012; 3) the inclusion of other well-being indicators besides burnout, such as depression (Ahola et al., 2014) or work engagement (Mäkikangas et al., 2017). Moreover, earlier studies have typically utilized relatively short follow-ups (e.g., one or two years) thereby offering a somewhat limited course to burnout development (for reviews, see Mäkikangas & Kinnunen, 2016; Mäkikangas et al., 2016).

The present study aimed to fill the gaps in previous person-centred burnout research and contributes to the burnout literature in three crucial ways. First, we investigate burnout development at an intra-individual level by considering all the three burnout symptoms simultaneously. Second, we utilize extensive eight-year longitudinal data with five measurements, thus very likely covering a long enough period to capture possible variety in burnout development. Third, our data are age-homogeneous and consist of young employees at baseline, thus age is not a confounding factor as is the case with the heterogenous employee datasets typically used in burnout research (for a review, see Mäkikangas et al., 2016). Fourth, contrary to previous person-centred research, our study is theory-driven, as hypotheses are drawn from the theoretical models of burnout development (Golembiewski et al., 1986; Lee & Ashforth, 1993; Leiter, 1993; Leiter & Maslach, 1988).

Specifically, we expect to find three burnout profiles. As previous person-centred studies (for a review, see Mäkikangas & Kinnunen, 2016) together with Finnish statistics (Suvisaari et al., 2012) demonstrate, the majority of employees do not suffer from burnout symptoms. Therefore, we expect to find a profile with stable low levels of burnout symptoms across time. Besides that, we also expect to find two burnout profiles whose symptom development will follow the theoretical models presented above (Golembiewski et al., 1986; Lee & Ashforth, 1993; Leiter, 1993; Leiter & Maslach, 1988). Specifically, our first hypothesis is:

Hypothesis 1. A stable low burnout profile and two burnout development profiles will emerge describing different sequential orders of burnout symptoms. Accordingly, the first developmental profile will include high exhaustion, which will lead to increased levels of cynicism and/or reduced professional efficacy (Lee & Ashforth, 1993; Leiter, 1993; Leiter & Maslach, 1988). The second developmental profile of high levels of cynicism will contribute to increased subsequent levels of reduced professional efficacy and exhaustion (Golembiewski et al., 1986).

Job-related predictors of burnout

As antecedents of burnout the following three topics are frequently mentioned (see Maslach et al., 2001; Schaufeli & Enzmann, 1998: 1) unfavourable working conditions, 2) decidedly motivated employees with high internal expectations regarding work and 3) insufficient coping strategies and unsuccessful management of work stress. In this study, we focus on the first, i.e., *unfavourable working conditions*, which are considered a primary reason for burnout according to the World Health Organization's (WHO) recent ICD-11 classification launched in 2019 (World Health Organization, 2019).

A vast body of research has shown that burnout begins to develop in working conditions where job demands (e.g., workload, time pressures) are high and job resources (e.g., support and feedback from managers and colleagues) are negligible (Maslach et al., 2001). In our study, we take account of both high job demands and low job resources. *Firstly*, we focus on job demands operationalized via quantitative and qualitative effort required by the job (Siegrist et al., 2004) which has a long-established relation with burnout, especially with the exhaustion dimension of burnout syndrome (Maslach et al., 2001). *Second*, the focus is on job resources, namely low job control and low workplace support (for meta-analyses, see Aronsson et al., 2017; Lee & Ashforth, 1996).

A heavy workload is considered to be the primary risk factor identified in the burnout definition (Leiter & Maslach, 1988). Also, the JD-R theory (Bakker & Demerouti, 2017) – utilized in this study – assumes that burnout results from high job demands, quantitative (time pressures) or qualitative (emotional, cognitive). By definition, job demands are aspects of a job that require cognitive or emotional effort (Bakker & Demerouti, 2017). Our study focused on efforts required by the job. More specifically, we use a job demands survey developed by Siegrist et al. (2004) in where most of the items measure subjective experience of workload.

The existing meta-analyses and systematic reviews by and large support the notion that burnout is a response to workload. Alarcon (2011) showed in his meta-analysis that high workload was positively related to all the burnout symptoms; exhaustion (Mean ρ .49 in 86 samples), cynicism (Mean ρ .31 in 58 samples) and reduced professional efficacy (Mean ρ .11 in 42 samples). Aronsson et al. (2017) and Seidler et al. (2014) demonstrated the role of high workload in relation to subsequent burnout. More specifically, Seidler et al. (2014) concluded in their qualitative review of longitudinal studies that high workload was a risk factor for burnout development, especially for exhaustion. Aronsson et al. (2017) further established this relation in their meta-analysis and showed that high workload best predicted exhaustion longitudinally, but some evidence for a positive relation with cynicism was also detected. As perceived job demands are most strongly associated with exhaustion, the following hypothesis was formulated:

Hypothesis 2. Employees experiencing high subjective job demands will more likely belong to the burnout development profile originating from high exhaustion.

Besides the presence of high job demands, the burnout research so far has consistently shown evidence that lack of job resources is related to burnout. The link from low job resources to high burnout is also theoretically presented in the revised version of the JD-R model (Schaufeli & Bakker, 2004). According to the JD-R model, job resources are aspects of the job that help the person to cope with job demands, increase learning and work motivation and are advantageous in accomplishing work-related goals (Bakker & Demerouti, 2017; Demerouti et al., 2001). In the absence of adequate job resources, employees are not able to protect themselves against the negative consequences of workload and other job demands. Here, job control and supportive organizational climate were considered job resources lack of which constitutes a risk factor for burnout. Job control refers to both autonomy (i.e., the individual's control over scheduling and tasks) and to participation in the decision-making process (i.e., control over the organizational decision-making process) (Spector, 1998). Supportive organizational climate is defined as an individual's perceptions of social support in his/her workplace and as a generally supportive work environment (see Mäkikangas et al., 2007).

There is substantial empirical evidence that both lack of job control and workplace support are linked to increased levels of burnout and its dimensions. Lee and Ashforth (1996) already showed in their meta-analysis that both participation and skill utilization, i.e., facets of job control, were negatively associated with all three burnout symptoms. Similarly, lack of social support and its various sources (e.g., co-worker and supervisory support) were most closely linked to exhaustion and depersonalization/cynicism. Also, Aronsson et al. (2017) identified low co-worker and workplace support as well as low job control as facilitators of detrimental long-term development of exhaustion and cynicism. Although these meta-analyses revealed that low job resources are fairly equally associated with exhaustion and cynicism, in the studies in which the variables are simultaneously modelled, low job resources have been found to be specifically associated with high cynicism (Demerouti et al., 2001) or with cynicism and diminished professional efficacy (Bakker et al., 2004). Therefore, it is plausible that low job resources are not primarily conducive to an exhaustion dominated burnout process, but instead have a stronger effect on cynicism and professional efficacy. Thus, the following hypothesis was formulated:

Hypothesis 3. Employees experiencing low job resources (i.e., low job control and unsupportive organizational climate) will more likely belong to the burnout development profile that originates from high cynicism.

Method

Participants and procedure

The present longitudinal study was conducted with five measurement points at two-year intervals in 2006 (T1), 2008 (T2), 2010 (T3), 2012 (T4) and 2014 (T5). The baseline sample was selected from the membership registers of two Finnish national trade unions (Trade Union Pro and the Union of Professional Engineers). The original sample contained 1,904 union members, all of whom were below age 36 and whose professional titles suggested a managerial or leadership position. The initial target of the research project was to investigate young managers' occupational well-being in the early stages of their careers. Questionnaires were sent to participants' home addresses at each measurement time. Of the 1,904 sent questionnaires, 933 were returned and of these, 186 non-employees (e.g., students, unemployed people) were excluded from the final sample resulting in 747 participants at T1. Their average age was 31 years (SD = 3.2, range 24–36) and 85% of them were male. The response rate was 43.4% at T1 (for more details and attrition analyses, see Feldt et al., 2016; Hyvönen et al., 2009).

At T2, questionnaires were sent to 621 of the 747 participants who had participated at T1. The remaining 126 participants had indicated at T1 that they wished to withdraw from the study and were therefore excluded from the T2 follow-up. At T2, 433 questionnaires were returned, yielding a response rate of 69.7% of the available sample and 58.0% of the initial T1 sample (N = 747). At T3, questionnaires were sent to 595 participants, since at T2 a further 26 participants had declined to continue in the study. At T3, 380 responded, yielding a response rate of 63.9% of the available sample and 50.8% of the initial sample. At T4, questionnaires were sent to 575 participants since a further 20 participants had indicated at T3 that they no longer wished to be contacted. At T4, 333 responded, yielding a response rate of 57.9% of the available sample and 44.6% of the initial sample. At T5, the questionnaire was sent to 562 participants, which took into account the further 13 participants who had indicated at T4 that they no longer wished to be contacted. At T5, 289 participants responded, yielding a response rate of 51.4% and 38.7% of the initial sample.

The present participants (n = 169; 84.6% men) include all those respondents who were employed and responded to the burnout scale at each of the five measurement times. Participants were on average 31.1 years old (range 25–36 years; SD = 3.2 years) when the study started at T1. At T1, the majority (67%) had a lower university degree in engineering, a full-time job (99%) and a permanent employment contract (95%). They had on average worked 1.9 years (SD = 1.5) in their current positions at baseline (T1). Of the participants, 54% were in middle management, 39% in lower management and 7% were in top management at T1. At T5, 69.2% of the participants reported continuing to work in a managerial or leadership position.

Measures

All the scales used have been previously used in Finland and their construct validity has been tested and found to be good. A correlation table is available from the first author on request.

Burnout was measured using the 9-item Bergen Burnout Indicator (BBI-9; Salmela-Aro et al., 2011; see also Feldt et al., 2014; Näätänen et al., 2003). Like the MBI General Survey (MBI-GS; Maslach et al., 1996), the BBI was originally developed to measure burnout in all occupations and was based on the same theoretical three-dimensional definition as MBI-GS. The main difference between the BBI-9 and the MBI-GS is the wording of the professional efficacy items: The BBI-9 measures low

professional efficacy at work (i.e., negative item wordings), whereas the MBI-GS measures the frequency of positive experiences of professional efficacy (reversed items in the burnout score). The BBI-9 consists of three subscales; exhaustion (three items; e.g., "I am snowed under with work"), cynicism (three items; e.g., "I feel that I have gradually less to give") and reduced professional efficacy (three items; e.g., "My expectations of my job and to my performance have diminished"). Responses were rated on a six-point response scale ranging from 1 (*completely disagree*) to 6 (*completely agree*) (see Salmela-Aro et al., 2011). The construct validity of the BBI-9 has been supported cross-sectionally across various occupational groups and longitudinally across time establishing factorial invariance (Feldt et al., 2014). The Cronbach's alphas were as follows for exhaustion .70–.77, cynicism .82–.85 and reduced professional efficacy .71–.85 across measurements.

Job demands were measured at each measurement point by the effort scale of the effort-reward imbalance questionnaire developed by Siegrist et al. (2004). The effort scale includes five items that refer to demanding aspects of the work (e.g., "I have constant time pressure due to a heavy work load", "Over the past few years, my job has become more and more demanding") which were rated on a five-point response scale (1 = *disagree*, 5 = *agree and I am very stressed*). Previously, the construct validity of the scale, i.e., factor structure and its invariance across time has been supported (Rantanen et al., 2013). Reliabilities for the scale varied between .87 and .89.

Job control was measured with four items (e.g., "Can you decide yourself how you execute your work?") (Feldt et al., 2004; including factor structure and factorial invariance evidence; see also; Mäkikangas et al., 2007). Responses were given on a 5-point scale (1 = *not at all*, 5 = *very much*). The Cronbach's alphas for the scale varied between .79 and .86 across measurements.

Supportive organizational climate was assessed with four items concerning support from colleagues and the general social atmosphere in the organization (e.g., "In difficult tasks I can call on the assistance of my co-workers") (Lehto, 1991; see also Feldt et al., 2004). Participants were asked to answer each item according to a 5-point scale (1 = *completely disagree*, 5 = *completely agree*). Factorial invariance across time has been supported indicating a good construct validity for the scale (Mäkikangas et al., 2007). The Cronbach's alphas for the scale varied between .85 and .88.

Gender (1 = male, 2 = female), age (a continuous variable), education (1 = no professional training, 8 = higher university degree), management level (1 = lower management, 3 = top management), and working hours per week (a continuous variable) were used as a background variables.

Attrition analyses

At the baseline, there were no differences in terms of gender or age between the participants and the non-respondents (see Hyvönen et al., 2009). The present study participants (n = 169) were compared to the participants who did not complete all the questionnaires (n = 579) in background variables and main study variables at T1. No significant differences were observed between the present sample and the non-responders in gender distribution, $\chi^2(1) = 0.04$, $p = .84$, or age, $t(747) = 0.88$, $p = .38$. Nor were any differences found in burnout: exhaustion, $t(740) = 0.05$, $p = .96$, cynicism, $t(740) = 0.68$, $p = .49$, or reduced professional efficacy, $t(740) = 0.66$, $p = .51$. Furthermore, no differences were evident in job demands, $t(741) = 0.01$, $p = .99$, job control $t(740) = 1.59$, $p = .11$, or supportive organizational climate, $t(740) = 0.18$, $p = .86$. Thus, it can be concluded that no systematic attrition occurred in terms of the background or main study variables.

Statistical analysis

Latent profile analysis (LPA) was used to investigate profiles based on the levels of and changes in all burnout dimensions from Time 1 to Time 5. LPA identifies latent profiles from the observed data and estimates the parameters for these profiles (Muthén & Muthén, 1998–2017). The parameters of the profile solutions were estimated using maximum likelihood estimation with robust standard errors (MLR) (Muthén & Muthén, 1998–2017). In modelling the profiles, the means of the profile indicators (i.e., burnout symptoms) were allowed to be freely estimated across the profiles, but variances were constrained to be equal across the profiles. This analytic decision was taken due to the convergence issues of the more complicated model with the variances freely estimated (see Bauer & Curran, 2003). The LPAs were performed using Mplus (version 7.4) (Muthén & Muthén, 1998–2017).

As LPA presents an inductive approach in which the number of profiles is not known *a priori*, we increased a number of latent profiles until there was no improvement in model fit according to the model fit indices. We used various criteria to determine the adequate number of latent profiles (Nylund et al., 2007): a) Log Likelihood (LL), b) the Akaike Information Criterion (AIC), c) the Bayesian Information Criterion (BIC) and d) the Bootstrap Likelihood Ratio Test (BLRT). The model with the smallest AIC and BIC values is considered to be superior. Compared with alternative solutions, the best-fitting solution should have lower AIC and BIC values compared to other profile solutions. The BLRT test examines whether the k profile solution has a better fit ($p < .05$) than the k-1 profile solution. Furthermore, the distinctiveness of the profiles was assessed using entropy and average latent class posterior probabilities (AvePP). Entropy illustrates the classification accuracy and AvePP evaluates the certainty of placing an observation in a particular profile using posterior probabilities (Celeux & Soromenho, 1996; Jung & Wickrama, 2008). When determining the number of profiles, a theoretically parsimonious profile solution was selected, i.e., the theoretical interpretability and redundant profiles of the solution were also included among the selection criteria. ANOVA for repeated measures was used to analyse statistical significance of mean levels changes on each burnout profile separately.

The differences in antecedents between the burnout profiles were examined using cross-tabulation with the χ^2 test and adjusted residuals, as well as univariate analysis of variance. General Linear Model (GLM) for repeated measures was used as a principal method of analysis to test whether the burnout profiles differed in job demands and resources across time. In these analyses the profile solution of burnout was treated as a

fixed factor and time as a repeated measure. χ^2/*F* tests, GLM and ANOVA for repeated measures analyses were conducted using IBM SPSS Statistics 25 program.

Results

Developmental profiles of burnout

Table 1 presents the results of the profile enumeration. As shown in Table, the three-profile solution was supported by the BIC value, which has proven to be the most consistent goodness-of-fit indicator of latent profiles (Nylund et al., 2007). In addition, the entropy value of the three-profile solution was high, illustrating the distinctiveness of the profiles. The profile solution was also justifiable in a theoretical sense and no redundant profiles emerged. The three-profile solution was therefore retained.

Table 1. Enumeration of fit statistics for latent burnout profiles.

Number of profiles	LL	FP	AIC	BIC	BLRT (*p*)	Entropy	Latent profile proportions %
1	−3045.2	135	6360.5	6783.0	-	-	100
2	−2997.8	151	6297.6	6770.3	.001	.990	89/11
3	−2953.6	167	6241.3	6764.0	.001	.985	78/12/10
4	−2920.1	183	6206.3	6779.1	.001	.989	78/11/9/2

LL = log-likelihood; FP = free parameters; AIC = Akaike information criterion; BIC = Bayesian information criterion; BLRT = Bootstrapped likelihood ratio test.

The three quantitively and qualitatively different developmental profiles of burnout are illustrated in Figure 1. The most numerous profile contained 78% of the participants (AvePP 996%) and was characterized by low levels of all burnout symptoms, which remained constantly low. This profile was labelled "*Stable, low burnout*". The profile with the second largest membership (12%; AvePP 995%) exhibited the highest level of exhaustion at the baseline (T1), whereas the other two symptoms of burnout were low. All burnout symptoms increased markedly and statistically significantly at T2: Exhaustion, $F(1, 19) = 7.15$, $p < .05$), cynicism $F(1, 19) = 14.83$, $p < .01$), and reduced professional efficacy, $F(1, 19) = 24.72$, $p < .001$). Although reduced professional efficacy slightly decreased between T2 and T3 ($F(1, 19) = 12.26$, $p < .01$), burnout symptoms remained at relatively high levels from T3 to T5. A statistically significant increase for exhaustion $F(1, 19) = 6.43$, $p < .05$) and cynicism $F(1, 19) = 5.78$, $p < .05$) was evident again between T4 and T5. This profile was labelled "*Exhaustion instigated, increasing burnout*". The third and smallest profile included the remaining 10% of the participants (AvePP = 991%). Participants in this profile were characterized by the curvilinear development of cynicism and reduced professional efficacy. That is, both of these symptoms were at a relatively high level at baseline (T1), increased significantly by T2 (cynicism, $F(1, 16) = 6.14$, $p < .05$, and reduced professional efficacy, $F(1, 16) = 14.10$, $p < .01$), after which their levels showed a steady significant decrease by T5 (cynicism $F(1, 16) = 23.89$, $p < .001$, and reduced professional efficacy $F(1, 16) = 15.67$, $p < .01$). However, exhaustion remained moderately low and stable throughout the eight-year study period. This profile was labelled "*Cynicism and reduced professional efficacy dominated, inverted U-shaped burnout*".

In light of these results, our first hypothesis was partly supported. To summarize, three burnout developmental profiles were identified. Besides the assumed profile with low burnout symptoms across an eight-year period, we were able to identify the burnout profile characterized by a high initial level of exhaustion drawing two other symptoms of burnout along over time. However, we were unable to identify the burnout profile that would follow the sequential order presented in the phase model (Golembiewski et al., 1986).

Differences in demographics between developmental profiles of burnout

According to the χ^2 and *F* tests, there were no statistically significant differences in the distribution of background characteristics drawn from T1: gender, $\chi^2(2, N = 169) = 5.23$, $p = .07$, age, $F(2, 164) = 8.05$, $p = .49$, education, $\chi^2(16, N = 168) = 12.31$, $p = .72$, or management level, $\chi^2(4, N = 165) = 2.42$, $p = .66$, between the three burnout profiles. However, the three profiles differed in weekly working hours at T1–T3 and T5 ($p < .05$). Bonferroni pairwise comparisons revealed that those in the "*Exhaustion instigated, increasing burnout*" profile reported longer working hours at T2 than those in the "*Stable, low burnout*" profile, although the order was other way around at T1. In addition, those in the "*Cynicism and reduced professional efficacy dominated, inverted U-shaped burnout*" profile reported shorter working hours at T2, T3 and T5 than did those in the "*Stable, low burnout*" profile.

Differences in job demands and resources between developmental profiles of burnout

The results of the General Linear Model (GLM) for repeated measures for job demands and resources (i.e., job control, supportive organizational climate) are presented in Table 2. As the burnout profiles differed from each other in terms of working hours, this was controlled for in the GLM analyses. The sample sizes of the burnout profiles were not equal; special attention was therefore paid to the homogeneity of covariance assumption in order to avoid misinterpretations of the results.

The results of the GLM analyses for *job demands* (i.e., effort demanded by the job; Siegrist et al., 2004) are presented in Table 2. Box's *M* test was nonsignificant, $F(30, 6349.49) = .94$, $p = .55$, and thus the equality of the covariance matrices across the profiles of burnout was supported. The results revealed that neither the interaction effect between burnout profiles and time, nor the time effect was significant (see Table 2). However, the burnout profiles differed significantly in job demands at the overall mean level and at each measurement point: "*Exhaustion instigated, increasing burnout*" profile reported higher job demands than the other profiles. Hence, our second hypothesis was supported.

The homogeneity of the covariance matrices for *job control* was not met according to the Box *M* test, $F(30, 6329.13) = 1.66$, $p < .05$. As a larger variance was evident in the smaller burnout

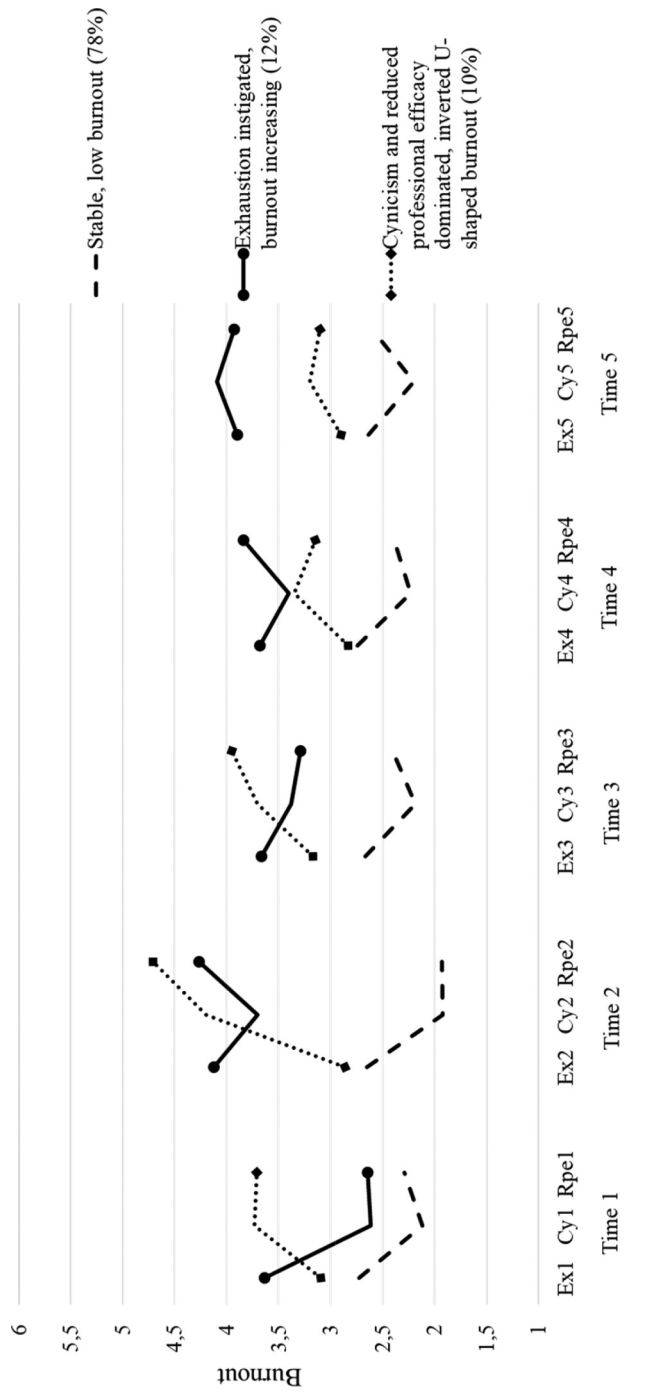

Figure 1. Latent profiles of burnout development. The y axis refers to participants' level of each of the burnout symptoms (1 = completely disagree, 6 = completely agree).

profiles, the significance level was increased (from .01 to .001 and from .05 to .01) to overcome the problem (see Hair et al., 2010). As shown in Table 2, the interaction effect between burnout profile and time was nonsignificant, that is development of job control did not vary between the profiles. However, there were significant profile differences in the level of job control, showing that those in the "*Stable, low burnout*" profile had a higher level of job control across all measurements than did those in the "*Cynicism and reduced professional efficacy dominated, inverted U-shaped burnout*".

Table 2. Changes in job demands and resources according to the developmental profiles of burnout: GLM for repeated measures.

Burnout Profiles	*T1* *M (S.E.)*	*T2* *M (S.E.)*	*T3* *M (S.E.)*	*T4* *M (S.E.)*	*T5* *M (S.E.)*	*Profile Effect F*	*Time Effect F*	*Profile × Time Effect F*
		Job demands						
1. Stable, low burnout	3.06 (0.08)	3.02 (0.08)	3.02 (0.08)	2.88 (0.08)	2.68 (0.08)	5.13**	1.52 *ns.*	1.32 *ns.*
2. Ex instigated, increasing burnout	3.32 (0.22)	3.82 (0.23)	3.60 (0.22)	3.36 (0.22)	3.33 (0.22)	< 2**		
3. Cy and rpe, inverted U-shaped burnout	3.10 (0.24)	3.01 (0.24)	2.94 (0.23)	3.01 (0.23)	3.02 (0.23)	> 1**, 3**		
		Job control				< 2**		
1. Stable, low burnout	4.04 (0.06)	4.04 (0.05)	4.07 (0.06)	4.11 (0.06)	4.11 (0.07)	4.79***	0.80 *ns.*	1.83 *ns.*
2. Ex instigated, increasing burnout	3.99 (0.15)	3.80 (0.14)	4.04 (0.15)	3.89 (0.17)	3.81 (0.17)	> 3**		
3. Cy and rpe, inverted U-shaped burnout	3.63 (0.16)	3.67 (0.14)	3.65 (0.16)	3.73 (0.18)	3.76 (0.18)			
		Supportive organizational climate				< 1**		
1. Stable, low burnout	3.56 (0.07)	3.72 (0.07)	3.55 (0.07)	3.52 (0.08)	3.52 (0.07)	11.26***	4.81**	5.02***
2. Ex instigated, increasing burnout	3.50 (0.17)	3.00 (0.16)	3.25 (0.18)	2.88 (0.21)	2.88 (0.21)	> 2**, 3***		
3. Cy and rpe, inverted U-shaped burnout	3.17 (0.18)	2.42 (0.18)	3.05 (0.20)	3.19 (0.23)	3.19 (0.23)	< 1**		
						< 1***		

Weekly working hours were controlled for. Pairwise comparisons made by Bonferroni post hoc tests. ** $p < .01$, *** $p < .001$.
Ex = exhaustion; cy = cynicism; rpe = reduced professional efficacy

For *supportive organizational climate*, the homogeneity of the covariance matrices was met according to Box *M* test, $F(30, 6582.71) = 1.12$, $p = .30$. The interaction effect between burnout profile and time was significant (see Table 2), suggesting different changes across time regarding supportive organizational climate between the profiles. Among employees in the "*Stable, low burnout*" profile supportive organizational climate showed an increasing trend between T1 and T2 and a decreasing trend between T2 and T3. The opposite development was evident among the employees in the two other profiles as their perceptions first decreased (T1-T2) and thereafter increased (T2-T4). Moreover, the profile differences revealed that the "*Stable, low burnout*" profile had a higher level of supportive organizational climate across all measurements than did the other two profiles. The lowest levels were evident between T1 and T3 among those in the "*Cynicism and reduced professional efficacy dominated, inverted U-shaped burnout*".

To conclude, as no profile with only high initial levels of cynicism was identified (i.e., reduced professional efficacy just as severe as cynicism in the profile "*Cynicism and reduced professional efficacy dominated, inverted U-shaped burnout*"), low job resources were likewise associated with high initial levels of reduced professional efficacy. Consequently, our third hypothesis was only partly supported.

Discussion

Our study investigated the within-person developmental profiles of burnout symptoms and whether these profiles can be differentiated on the bases of their relations with job demands and job resources. By adopting a person-centred approach, we were able to show that there emerged two development profiles of burnout with meaningful differences, demonstrating that burnout dynamics and the temporal sequence of burnout symptoms varied between employees. In addition, job demands and job resources differentiated the change profiles of burnout in meaningful ways. That is, the role of high job demands was evident in the process originating from high exhaustion, whereas low job resources exacerbated the burnout process characterized by high levels of cynicism and reduced professional efficacy. Below, these contributions are discussed in more detail.

Two burnout processes – differential role of job demands and resources

The present study used a longitudinal person-centred design to test and compare the theoretical models depicting diverse sequential orders in the presentation of burnout symptoms (Golembiewski et al., 1986; Lee & Ashforth, 1993; Leiter, 1993; Leiter & Maslach, 1988). Besides the profile with low burnout symptoms across an eight-year period, our results yielded two different burnout profiles advancing the understanding of experiencing burnout as a dynamic process with varying symptom combinations and their temporal order. The proportion of those identified to be suffering from burnout symptoms at least to some extent was approximately at the same level as the prevalence of burnout (23–24%) among Finnish employees (Suvisaari et al., 2012).

Lending support to our first hypothesis, we were able to identify the burnout profile consisting of 12% of the participants characterized by a high initial level of exhaustion drawing two other symptoms of burnout along over time. This process manifested between the first and second measurements, after which all burnout symptoms remained at relatively high levels. The severity of burnout symptoms was mainly moderate, but severe at second measurement according to the cut-off values of the BBI (Näätänen et al., 2003). The persistent profile of high exhaustion reflects the Overextended profile (Leiter & Maslach, 2016) and resembles the process model by Leiter and Maslach (Leiter, 1993; Leiter & Maslach, 1988) according to which sustained exhaustion is the first and primary symptom of the burnout process. However, exhaustion did not lead subsequently to high levels of cynicism alone, as depicted in the process model, but also, and even more strongly, to impairment of professional efficacy. The processes from high exhaustion to both cynicism and reduced professional efficacy theoretically resemble the model proposed by Lee and Ashforth (1993), but it remains unresolved whether the symptom sequence describes one progressive order of symptoms or two different causal processes. Whatever the developmental dynamics between cynicism and reduced professional efficacy in this process is, it can be concluded that the exhaustion-initiated burnout process seemed to be the most typical sequential order identified in the study.

However, our findings also revealed a different burnout process which is quite rare considering the results of previous variable-centred cross-lagged studies (see Taris et al., 2005), but the burnout profile itself has been identified in earlier cross-sectional studies (for a review, see Mäkikangas & Kinnunen, 2016). Specifically, the second development profile of burnout manifested itself as an inverted U-shaped form in which both cynicism and reduced professional efficacy first increased between T1 and T2, but then slowly decreased between T2 and T5. The level of exhaustion remained low over the follow up of eight years. According to the cut-off values of the BBI, cynicism and reduced professional efficacy symptoms varied from moderate to severe and back, ending up with a mild level at the last measurement (Näätänen et al., 2003). The process identified in the profile "*Cynicism and reduced professional efficacy dominated, inverted U-shaped burnout*" partly supports our expectations on the basis of the phase model by Golembiewski et al. (1986) stating that cynicism exacerbates reduced professional efficacy, and these are the two first symptoms of burnout. However, the major difference compared to the expectations presented in the phase model is that the initial level of reduced professional efficacy was equally high as cynicism and the most prominent symptom at T2, whereas exhaustion remained low throughout the study.

This study adds to what is known about the impact of job demands and resources on the burnout process. Our results largely concur with the JD-R theory (Bakker & Demerouti, 2017; Schaufeli & Bakker, 2004), suggesting that both job demands and low job resources are conducive to burnout. Previous meta-analyses based on a variable-oriented approach have revealed somewhat similar relations between job characteristics (high job demands and low resources) and burnout symptoms (see Alarcon, 2011; Aronsson et al., 2017; Lee & Ashforth,

1996). However, our study contributed to the burnout literature by showing that particularly high job demands are risk factors for exhaustion and low job resources for cynicism and reduced professional efficacy.

Specifically, our findings highlight that high job demands are the primary correlate for the exhaustion-initiated burnout process, thereby lending support to our second hypothesis and in line with previous person-centred burnout results (see Leiter & Maslach, 2016). Those in the profile "*Exhaustion instigated, increasing burnout*" reported throughout the eight years higher levels of job demands than those belonging to the other two profiles. Interestingly, those in the "*Cynicism and reduced professional efficacy dominated, inverted U-shaped burnout*" profile did not differ in their level of job demands from those in the "*Stable, low burnout*" profile, highlighting the crucial role that job demands play, particularly in depleting employee energy.

Moreover, the role of low job resources was evident in the profile "*Cynicism and reduced professional efficacy dominated, inverted U-shaped burnout*". Although the level of supportive organizational climate was low among employees in this profile, the low levels of job control were prominent in comparison to their occurrence in the other profiles. A combination of high cynicism and reduced professional efficacy represents a state of demotivation, low confidence on one's capability to perform work and perceiving little meaning in work, which are triggered and maintained by low levels of job control. Although supportive organizational climate could be argued to be an equally important job resource for both burnout development profiles identified, inability to set one's own goals, decide how to accomplish tasks and prioritize work seemed to be a primary trigger and maintenance factor of employees' feelings of demotivation and lack of accomplishment. This is not surprising; the role of job control has been highlighted in many influential job stress models (Hackman & Oldham, 1976; Karasek, 1979) and it is one of the basic needs at work (see Van den Broeck et al., 2010).

Implications

Identifying profiles of burnout has important practical and theoretical implications. Our findings illustrate that even slightly elevated, but prolonged, exhaustion can lead to increased experiences of cynicism and reduced professional efficacy. The results similarly highlighted the crucial role that job demands play in this exhaustion-initiated burnout process. As burnout interventions and rehabilitation are not always efficient in treating severe, chronic burnout (Hätinen et al., 2009; Maricuțoiu et al., 2016), much more emphasis needs to be placed on taking proactive measures to prevent burnout, for example, by enforcing reasonable work hours, assessing employees' workload and fostering opportunities for recovery. On the other hand, stress interventions intended to improve job control may be particularly beneficial for treating low cynicism and high reduced professional efficacy. Earlier research has shown that changes in job control lead to several positive outcomes, such as increased levels of vigour (Mauno et al., 2016), which would be a desirable prevention and intervention target for demotivated employees.

The results also show that the reduced professional efficacy dimension is a more decisive symptom of burnout, co-occurring with exhaustion and cynicism in the long run, than has been suggested in the literature. In fact, cynicism and reduced professional efficacy seemed to co-occur incidentally in both development profiles identified. This result could be an outcome of the burnout measure used (i.e., BBI), but on the other hand, it has been demonstrated using the MBI that reduced professional efficacy correlates more strongly with the other two symptoms among burned-out than non-burned-out individuals (Mäkikangas et al., 2011). Therefore, this symptom should also be seen as an important part of the burnout syndrome and be included in future burnout theorizing and measurement.

Limitations and future directions

Although this study had indisputable strengths, that is, it was the first to study all symptoms of burnout and their common developmental dynamics over eight years, thereby demonstrating the intra-individual variation in burnout development, it also has its limitations. *First*, all the information was collected via self-reports from the same source and therefore common method bias may have affected the results, although the longitudinal design of the study and differences in the time references of measures and scale anchors may have reduced this risk (Podsakoff et al., 2003). However, future work could also examine how burnout profiles are related to more objective indicators (e.g., heart rate variability) or colleague or supervisors' ratings. *Second*, although job burnout is defined as a job-related syndrome (World Health Organization, 2019), it is known that various personality characteristics are associated with burnout (for a meta-analysis, see Alarcon et al., 2009). Therefore, future research could also explore how various risk and protective characteristics of personality are linked with burnout profiles. *Third*, the extension of the investigation of various job demands and job resources is necessary, as is also their possible interaction in line with the JD-R theory (Bakker & Demerouti, 2017).

Fourth, the time-lags between the measurements were not theoretically determined. Although two-year time lags are commonly used in burnout research (for reviews, see Mäkikangas & Kinnunen, 2016; Mäkikangas et al., 2016), it is unknown whether they are suitable to describe the burnout process. Overall, not much is known about the temporal aspects of burnout, i.e., how fast or how slowly burnout develops, although qualitative retrospective burnout recovery studies suggest that burnout symptoms accumulate and develop over a long period of time (Bernier, 1998; Salminen et al., 2017). Also, the results of our study point towards slow and persistent development of and recovery from burnout symptoms. Nevertheless, future work is needed to ascertain the temporal aspects of burnout also utilizing so-called "shortitudinal" designs (see Dormann & Griffin, 2015).

Fifth, our dataset consisted of male-dominated, fairly highly educated, white-collar employees, who were mainly employed in managerial positions. Consequently, we cannot be sure that the same developmental profiles of burnout would emerge in

other types of samples, thus, replication of profiles is much needed in the future. As the sample size is known to affect the number of profiles identified, i.e., in small datasets it is difficult to identify small profiles (Meyer & Morin, 2016; Vargha et al., 2016), further profile investigation is needed with larger samples.

Sixth, as is typical in employee samples, the majority of participants were healthy workers with low burnout symptoms. Besides, the people with two developmental profiles identified suffered mainly from moderate burnout, but severe symptoms at T2 (for cut-off values, see Näätänen et al., 2003). Consequently, our sample consisted of employees who were fit for work throughout the eight-year study period. However, the cut-off values of the BBI have not been clinically validated so the burnout categorization based on them should be treated with caution. To study clinically burned-out employees, there is a need to create clinically validated cut-off values for existing scales (for the MBI such do already exist in some countries; see e.g., Schaufeli et al., 2009). Besides that, a different data collection approach is needed in future studies. That is, to follow-up those who do not respond at every measurement (e.g., due to sick leave), one would need to collect datasets with the help of occupational health services of subjects with higher prevalence of burnout, or collect samples from countries with higher burnout risk than Finland, which has been classified to be among the low burnout countries (Schaufeli, 2018).

Likewise related to the sample properties, our *seventh* limitation is the study of employees who had just embarked on their working careers. Although this is simultaneously a strength of the study, it raises a question of whether the profiles describe the adaptation process of young employees. It is known that the first couple of years after entering work-life are quite turbulent times with potentially major changes occurring in levels of well-being and attitudes to work (see Mäkikangas et al., 2016). In the present dataset, too, the most marked profile changes were observed between the first two measurements. Longitudinal burnout studies that have previously investigated young employees using only two or three measurements have yielded a huge amount of different burnout profiles (Evolahti et al., 2013; Hultell et al., 2013; Mäkikangas et al., 2012; Rudman & Gustavsson, 2011), which may have contributed to overly complicated picture of within-person burnout development. Therefore, in the case of young employees, longer follow-ups are needed to avoid capturing only the first two years of their careers. Finally, the burnout profiles found in this study also need to be tested and replicated using burnout measurement tools other than the BBI and in other contexts, as during the study period crucial labour market-related changes also occurred. For example, the Eurozone crisis had a strong impact on the Finnish economy in 2009 (i.e., Finnish GDP collapsed 8.5%) and the recession subsequently still intensified.

Conclusions

To conclude, our study supports the usefulness of the person-centred approach in understanding the burnout process, as it highlighted two within-person burnout processes that would have missed with a variable-centred approach. Therefore, the present study is a necessary pioneering attempt to understand different sequential developments of burnout symptoms and their relation to job demands and resources. Based on these results it is obvious that there is no universal theory of burnout that would cover the burnout processes of all employees. Consequently, our results underscore the importance of continuing person-centred research to achieve greater insight into the complexity of employees' burnout processes in practice.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

Ahola, K., Hakanen, J., Perhoniemi, R., & Mutanen, P. (2014). Relationship between burnout and depressive symptoms: A study using the person-centred approach. *Burnout Research*, *1*(1), 29–37. https://doi.org/10.1016/j.burn.2014.03.003

Alarcon, G. (2011). A meta-analysis of burnout with job demands, resources, and attitudes. *Journal of Vocational Behavior*, *79*(2), 549–562. https://doi.org/10.1016/j.jvb.2011.03.007

Alarcon, G., Eschleman, K. J., & Bowling, N. A. (2009). Relationships between personality variables and burnout: A meta-analysis. *Work and Stress*, *23*(3), 244–263. https://doi.org/10.1080/02678370903282600

Aronsson, G., Theorell, T., Grape, T., Hammarström, A., Hogstedt, C., Marteinsdottir, I., Skoog, I., Träskman-Bendz, & Hall, C. (2017). A systematic review including meta-analysis of work environment and burnout symptoms. *BMC Public Health*, *17*(1), 264. https://doi.org/10.1186/s12889-017-4153-7

Bakker, A. B., & Demerouti, E. (2017). Job demands-resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, *22*(3), 273–285. https://doi.org/10.1037/ocp0000056

Bakker, A. B., Demerouti, E., & Verbeke, W. (2004). Using the job demands-resources model to predict burnout and performance. *Human Resource Management*, *43*(1), 83–104. https://doi.org/10.1002/hrm.20004

Bauer, D. J., & Curran, P. J. (2003). Distributional assumptions of growth mixture models: Implications for overextraction of latent trajectory classes. *Psychological Methods*, *8*(3), 338–363. https://doi.org/10.1037/1082-989X.8.3.338

Bernier, D. (1998). A study of coping: Successful recovery from severe burnout and other reactions to severe work-related stress. *Work and Stress*, *12*(1), 50–56. https://doi.org/10.1080/02678379808256848

Celeux, G., & Soromenho, G. (1996). An entropy criterion for assessing the number of clusters in a mixture model. *Journal of Classification*, *13*(2), 195–212. https://doi.org/10.1007/BF01246098

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, *86*(3), 499–512. https://doi.org/10.1037/0021-9010.86.3.499

Dormann, D., & Griffin, M. S. (2015). Optimal time lags in panel studies. *Psychological Methods*, *20*(4), 489–505. https://doi.org/10.1037/met0000041

Evolahti, A., Hultell, D., & Collins, A. (2013). Development of burnout in middle-aged working women: A longitudinal study. *Journal of Women's Health*, *22*(1), 94–103. https://doi.org/10.1089/jwh.2012.3507

Feldt, T., Hyvönen, K., Mäkikangas, A., Rantanen, J., Huhtala, M., & Kinnunen, U. (2016). Overcommitment as a predictor of effort–reward imbalance: Evidence from an 8-year follow-up study. *Scandinavian Journal of Work, Environment & Health*, *42*(4), 309–319. https://doi.org/10.5271/sjweh.3575

Feldt, T., Kivimäki, M., Rantala, A., & Tolvanen, A. (2004). Sense of coherence and work characteristics: A cross-lagged structural equation model among managers. *Journal of Occupational and Organizational Psychology*, *77*(3), 323–342. https://doi.org/10.1348/0963179041752655

Feldt, T., Rantanen, J., Hyvönen, K., Mäkikangas, A., Huhtala, M., Pihlajasaari, P., & Kinnunen, U. (2014). The 9-item Bergen burnout inventory: Factorial validity across organizations and measurements of longitudinal data. *Industrial Health*, *52*(2), 102–112. https://doi.org/10.2486/indhealth.2013-0059

Freudenberger, H. J. (1974). Staff burnout. *Journal of Social Issues*, *30*(1), 159–165. https://doi.org/10.1111/j.1540-4560.1974.tb00706.x

Golembiewski, R. T., Munzenrieder, R., & Stevenson, J. G. (1986). *Stress in organizations: Toward a phase model of burnout*. Praeger.

Hackman, J., & Oldham, G. (1976). Motivation through design of work: Test of a theory. *Organizational Behaviour and Human Performance*, *16*(2), 250–279. https://doi.org/10.1016/0030-5073(76)90016-7

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Prentice Hall.

Halbesleben, J. R., & Demerouti, E. (2005). The construct validity of an alternative measure of burnout: Investigating the English translation of the Oldenburg Burnout Inventory. *Work and Stress*, *19*(3), 208–220. https://doi.org/10.1080/02678370500340728

Hätinen, M., Kinnunen, U., Mäkikangas, A., Kalimo, R., Tolvanen, A., & Pekkonen, M. (2009). Burnout during a long-term rehabilitation: Comparing low burnout, high burnout -benefited, and high burnout -not benefited trajectories. *Anxiety, Stress, and Coping*, *22*(3), 341–360. https://doi.org/10.1080/10615800802567023

Hultell, D., Melin, B., & Gustavsson, J. P. (2013). Getting personal with teacher burnout: A longitudinal study on the development of burnout using a person-based approach. *Teaching and Teacher Education*, *32*, 75–86. https://doi.org/10.1016/j.tate.2013.01.007

Hyvönen, K., Feldt, T., Salmela-Aro, K., Kinnunen, U., & Mäkikangas, A. (2009). Young managers' drive to thrive: A personal work goal approach to work engagement and burnout. *Journal of Vocational Behavior*, *75*(2), 183–196. https://doi.org/10.1016/j.jvb.2009.04.002

Jung, T., & Wickrama, K. A. S. (2008). An introduction to latent class growth analysis and growth mixture modeling. *Social and Personality Psychology Compass*, *2*(1), 302–317. https://doi.org/10.1111/j.1751-9004.2007.00054.x

Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, *24*(2), 285–308. https://doi.org/10.2307/2392498

Kim, H., & Ji, J. (2009). Factor structure and longitudinal invariance of the Maslach Burnout Inventory. *Research on Social Work Practice*, *19*(3), 325–339. https://doi.org/10.1177/1049731508318550

Lee, R. T., & Ashforth, B. (1993). A further examination of managerial burnout: Toward an integrated model. *Journal of Organizational Behavior*, *14*(1), 3–20. https://doi.org/10.1002/job.4030140103

Lee, R. T., & Ashforth, B. E. (1996). A meta-analytic examination of the correlates of the three dimensions of job burnout. *Journal of Applied Psychology*, *81*(2), 123–133. https://doi.org/10.1037/0021-9010.81.2.123

Lehto, A.-M. (1991). *Työelämän laatu ja tasa-arvo. Naisten ja miesten työolojen muutoksia 1977-1990 [Quality and equality at work. Changes in men's and women's working conditions]*. työolokomitean lisäselvitys. Komiteamietintö 1991: 39. Tilastokeskuksen tutkimuksia, 189. Valtion painatuskeskus.

Leiter, M. P. (1993). Burnout as a developmental process: Consideration of models. In W. B. Schaufeli, C. Maslach, & T. Marek (Eds.), *Professional burnout: Recent developments in theory and research* (pp. 237–250). Taylor & Francis.

Leiter, M. P., & Maslach, C. (1988). The impact of interpersonal environment on burnout and organizational commitment. *Journal of Organizational Behavior*, *9*(4), 297–308. https://doi.org/10.1002/job.4030090402

Leiter, M. P., & Maslach, C. (2016). Latent burnout profiles: A new approach to understanding the burnout experience. *Burnout Research*, *3*(4), 89–100. https://doi.org/10.1016/j.burn.2016.09.001

Leiter, M. P., & Schaufeli, W. (1996). Consistency in the burnout construct across occupations. *Anxiety, Stress, and Coping*, *9*(3), 222–243. https://doi.org/10.1080/10615809608249404

Mäkikangas, A., Feldt, T., & Kinnunen, U. (2007). Warr's scale of job-related affective well-being: A longitudinal examination of its structure and relationships with work characteristics. *Work and Stress*, *21*(3), 197–219. https://doi.org/10.1080/02678370701662151

Mäkikangas, A., Feldt, T., Kinnunen, U., & Tolvanen, A. (2012). Do low burnout and high work engagement always go hand in hand? Investigation of the energy and identification dimensions in longitudinal data. *Anxiety, Stress, and Coping*, *25*(1), 93–116. https://doi.org/10.1080/10615806.2011.565411

Mäkikangas, A., Hätinen, M., Kinnunen, U., & Pekkonen, M. (2011). Longitudinal factorial invariance of the Maslach Burnout Inventory-General Survey (MBI-GS) among employees with job-related psychological health problems. *Stress & Health*, *27*(4), 347–352. https://doi.org/10.1002/smi.1381

Mäkikangas, A., Hyvönen, K., & Feldt, T. (2017). The energy and identification continua of burnout and work engagement: Developmental profiles over eight years. *Burnout Research*, *5*(june 2017), 44–54. https://doi.org/10.1016/j.burn.2017.04.002

Mäkikangas, A., & Kinnunen, U. (2016). The person-oriented approach to burnout: A systematic review. *Burnout Research*, *3*(1), 11–23. https://doi.org/10.1016/j.burn.2015.12.002

Mäkikangas, A., Kinnunen, U., Feldt, T., & Schaufeli, W. (2016). The longitudinal development of employee well-being: A systematic review. *Work and Stress*, *30*(1), 46–70. https://doi.org/10.1080/02678373.2015.1126870

Maricuțoiu, L. P., Sava, F. A., & Butta, O. (2016). The effectiveness of controlled interventions on employees' burnout: A meta-analysis. *Journal of Occupational and Organizational Psychology*, *89*(1), 1–27. https://doi.org/10.1111/joop.12099

Maslach, C. (1976). Burned-out. *Human Behavior*, *5*(9), 16–22.

Maslach, C., & Jackson, S. (1981). The measurement of experienced burnout. *Journal of Occupational Behaviour*, *2*(2), 99–113. https://doi.org/10.1002/job.4030020205

Maslach, C., Jackson, S. E., & Leiter, M. P. (1996). *Maslach Burnout Inventory manual* (3rd ed.). Consulting Psychologists Press.

Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, *52*(1), 397–422. https://doi.org/10.1146/annurev.psych.52.1.397

Mauno, S., Mäkikangas, A., & Kinnunen, U. (2016). A longitudinal person-centred approach to the job demands-control model. *European Journal of Work and Organizational Psychology*, *25*(6), 914–927. https://doi.org/10.1080/1359432X.2016.1187135

Meyer, J. P., & Morin, A. (2016). A person-centered approach to commitment research: Theory, research, and methodology. *Journal of Organizational Behavior*, *37*(4), 584–612. https://doi.org/10.1002/job.2085

Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus user's guide* (8th ed.). Muthén & Muthén.

Näätänen, P., Aro, A., Matthiensen, S. B., & Salmela-Aro, K. (2003). *Bergen burnout indicator 15*. Edita.

Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling*, *14*(4), 535–569. https://doi.org/10.1080/10705510701575396

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Rantanen, J., Feldt, T., Kinnunen, U., & Mäkikangas, A. (2013). Factorial validity of the effort-reward imbalance scale: Evidence from the multisample and three-wave follow-up studies. *International Archives of Occupational and Environmental Health*, *86*(6), 645–656. https://doi.org/10.1007/s00420-012-0798-9

Rudman, A., & Gustavsson, J. P. (2011). Early-career burnout among new graduate nurses: A prospective observational study of intra-individual change trajectories. *International Journal of Nursing Studies*, *48*(3), 292–306. https://doi.org/10.1016/j.ijnurstu.2012.03.010

Salmela-Aro, K., Rantanen, J., Hyvönen, K., Tilleman, K., & Feldt, T. (2011). Bergen Burnout Inventory (BBI): Reliability and validity among Finnish and Estonian managers. *International Archives of Occupational and Environmental Health*, *84*(6), 635–645. https://doi.org/10.1007/s00420-010-0594-3

Salminen, S., Andreou, E., Holma, J., Pekkonen, M., & Mäkikangas, A. (2017). Narratives of burnout and recovery from an agency perspective: A two-year longitudinal study. *Burnout Research*, *7*(december 2017), 1–9. https://doi.org/10.1016/j.burn.2017.08.001

Schaufeli, W., & Salanova, M. (2007). Efficacy or inefficacy, that's the question: Burnout and work engagement, and their relationships with efficacy beliefs. *Anxiety, Stress, and Coping*, *20*(2), 177–196. https://doi.org/10.1080/10615800701217878

Schaufeli, W. B. (2018). *Burnout in Europe: Relations with national economy, governance, and culture*. Research Unit Occupational & Organizational Psychology and Professional Learning (internal report). KU Leuven.

Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior*, *25*(3), 293–437. https://doi.org/10.1002/job.248

Schaufeli, W. B., & Enzmann, D. (1998). *The burnout companion to study and research: A critical analysis*. Taylor & Francis.

Schaufeli, W. B., Leiter, M. P., & Maslach, C. (2009). Burnout: 35 years of research and practice. *Career Development International*, *14*(3), 204–220. https://doi.org/10.1108/13620430910966406

Schaufeli, W. B., Maassen, G. H., Bakker, A. B., & Sixma, H. J. (2011). Stability and change in burnout: A 10-year follow-up study among primary care physicians. *Journal of Occupational and Organizational Psychology*, *84*(2), 248–267. https://doi.org/10.1111/j.2044-8325.2010.02013.x

Seidler, A., Thinschmidt, M., Deckert, S., Then, F., Hegewald, J., Nieuwenhuijsen, K., & Riedel-Heller, S. G. (2014). The role of psychosocial working conditions on burnout and its core component emotional exhaustion–a systematic review. *Journal of Occupational Medicine & Toxicology*, *9*(1), 10. https://doi.org/10.1186/1745-6673-9-10

Shirom, A., Melamed, S., Toker, S., Berliner, S., & Shapira, I. (2005). Burnout and health review: Current knowledge and future research directions. In G. P. Hodgkinson & J. K. Ford (Eds.), *International review of industrial and organizational psychology* (Vol. 20, pp. 269–309). John Wiley & Sons. https://doi.org/10.1002/0470029307.ch7

Siegrist, J., Starke, D., Chandola, T., Godin, I., Marmot, M., Niedhammer, I., & Peter, R. (2004). The measurement of effort–reward imbalance at work: European comparisons. *Social Sciences & Medicine*, *58*(8), 1483–1499. https://doi.org/10.1016/S0277-9536(03)00351-4

Spector, T. E. (1998). A control theory of the job stress process. In C. L. Cooper (Ed.), *Theories of organizational stress* (pp. 153–169). Oxford University Press.

Suvisaari, J., Ahola, K., Kiviruusu, O., Korkeila, J., Lindfors, O., Mattila, A., Markkula, N., Marttunen, M., Partonen, T., Peña, S., Pirkola, S., Saarni, S., Saarni, S., & Viertiö, S. (2012). Psyykkiset oireet ja mielenterveyden häiriöt. In S. Koskinen, A. Lundqvist, & N. Ristiluoma Eds., *Terveys, toimintakyky ja hyvinvointi Suomessa 2011*. (pp. 96–101). National Institute for Health and Welfare (THL). National Institute for Health and Welfare's reports 68.

Taris, T. W., Le Blanc, P. M., Schaufeli, W. B., & Schreurs, P. J. G. (2005). Are there causal relationships between the dimensions of the Maslach Burnout Inventory? A review and two longitudinal tests. *Work and Stress*, *19*(3), 238–255. https://doi.org/10.1080/02678370500270453

van den Broeck, A., Vansteenkiste, M., De Witte, H., Soenens, B., & Lens, W. (2010). Capturing autonomy, competence, and relatedness at work: Construction and initial validation of the work-related basic need satisfaction scale. *Journal of Occupational and Organizational Psychology*, *83*(4), 981–1002. https://doi.org/10.1348/096317909X481382

Vargha, A., Bergman, L. R., & Takács, S. (2016). Performing cluster analysis within a person-oriented context: Some methods for evaluating the quality of cluster solutions. *Journal of Person-Oriented Research*, *2*(1–2), 78–86. https://doi.org/10.17505/jpor.2016.08

World Health Organization (2019). *Burn-out an "occupational phenomenon": International classification of diseases*. https://www.who.int/mental_health/evidence/burn-out/en/

Worley, J., Vassar, M., Wheeler, D., & Barnes, L. (2008). Factor structure of scores from the Maslach Burnout Inventory. A review and meta-analysis of 45 exploratory and confirmatory factor-analytic studies. *Educational and Psychological Measurement*, *68*(5), 797–823. https://doi.org/10.1177/0013164408315268