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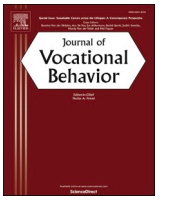

Bored and exhausted? Profiles of boredom and exhaustion at work and the role of job stressors

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ABSTRACT

Boredom at work is perceived to result from lacking job stressors as opposed to exhaustion that is a response to excessive job stressors. Employee boredom and exhaustion have thus been considered as antithetical states, and yet they are found to be positively related. It is therefore unclear how boredom and exhaustion manifest among workers. We build on research literature on boredom and challenge - hindrance stressor framework to argue that some employees may be both bored and exhausted depending on distinct job stressors. We employed latent profile analysis and Latent Transition Analysis across two studies to uncover these employee groups and examine if their experiences change over time. In Study 1, we used data from 301 employees to identify four profiles that we labelled "neither bored nor exhausted", "somewhat bored, somewhat exhausted", "exhausted and somewhat bored" and "bored and exhausted". In Study 2, where we used data from 2452 employees at two measurement points across 18 months, we replicated three of the four profiles. Challenge stressors were associated with exhaustion dominant profiles whereas hindrance stressors predicted membership in profiles characterized by both boredom and exhaustion. Profile membership was highly stable over the measurement period. Increases in challenge and hindrance stressors over the measurement period increased the likelihood of transitioning across profiles. This study extends literature on employee well-being by suggesting that boredom and exhaustion can occur in tandem. Further, we show that challenge and hindrance stressors can deteriorate well-being in different ways.

1. Introduction

Boredom at work is a poorly understood phenomenon in organizations. Some studies suggest that workplace boredom leads to perilous consequences for employees and organizations, such as turnover intentions and poorer employee health (e.g., Harju et al., 2014; van Hooff & van Hooft, 2014). Others, in contrast, argue that boredom may be beneficial by fostering employee creativity (e.g., Park et al., 2019) and prosocial intentions (van Tilburg & Igou, 2017). This debate implies that there may be different manifestations of boredom at the workplace that have distinct implications for employee well-being and performance. For example, studies have suggested that different types of boredom may exist according to the prevalence and persistence of the experience (Mael & Jex, 2015) or combinations with other negative experiences (Goetz et al., 2014; Westgate & Wilson, 2018). To date, however, studies have not examined whether boredom at work can manifest differently among employee populations, whether some configurations of boredom

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at work are more concerning than others and why these differences may occur.

In this study, our aim is to identify different profiles of boredom at work based on how often it occurs and how it combines with employee exhaustion. Boredom is a transient emotion, which means that it is often short-lived and passes once the boredom-inducing situation ends (Fisher, 1993). As an episodic experience, boredom is common and harmless, and may even inspire creative pursuits (Park et al., 2019). However, boredom may also reoccur and persist at the workplace if the factors driving the experience are encountered frequently (Daniels et al., 2004). While the nature of recurring boredom at work has not been empirically examined and is thus unknown, it is likely that such an experience will be accompanied by other unpleasant experiences (Daniels, 2000). In this study, we will argue that these frequent experiences of boredom combine with experiences of exhaustion that may have detrimental implications for employee health and well-being.

This argument may at first seem counterintuitive, as boredom at work is largely understood as an antithetical state to employee exhaustion. Specifically, while boredom at work is considered to result from lacking sufficient job demands that require individuals to exert effort (Daniels et al., 2004), exhaustion at work is known to result from excessive job demands that require individuals to overextend themselves (e.g., Demerouti et al., 2001). Job boredom and employee exhaustion are thus understood as orthogonal. Yet, some studies have indicated that they may be positively related (Harju et al., 2022; Reijseger et al., 2013; Sousa & Neves, 2021). It remains unclear, how boredom and exhaustion manifest in the working population. Anecdotal evidence implies that some employees suffer from boredom while others toil away exhausted, but can there also be employees who are both bored and exhausted?

In this study we address this question by integrating research literature on boredom (Daniels et al., 2004; Pekrun, 2006; Westgate & Wilson, 2018) and challenge – hindrance stressor framework (Cavanaugh et al., 2000; LePine et al., 2005) to argue that employee boredom and exhaustion may occur in tandem as a result of distinct job stressors. We use a person-centered approach across two studies to identify different combinations of boredom and exhaustion among employees and examine if and how these states change over time. In the first cross-sectional study, we employ latent profile analyses (LPA; Wang & Hanges, 2011) to distinguish groups of employees with different configural profiles of boredom and exhaustion at work. In the second study with two measurement occasions across 18 months, we use Latent Transition Analysis (LTA; Collins & Lanza, 2009; Nylund et al., 2007) to explore changes across the profiles over time. We also examine the role that different job stressors play in the emergence and transitions of boredom and exhaustion for different groups of employees.

This study makes several contributions to the literature on boredom at work and employee well-being more generally. First, by examining whether boredom at work may combine with exhaustion we advance understanding of different configurations of employee boredom. While previous research has associated experimentally induced, short-lived boredom with potentially beneficial outcomes (Park et al., 2019; van Tilburg & Igou, 2017), studies have not yet examined whether recurring experiences of boredom at work combine with other indicators of employee ill-being and whether such detrimental configurations persist over time. To examine the stability and change of these experiences, we will adopt a timeframe of 18-months in Study 2. This will advance research on boredom at work that has mostly used cross-sectional, experimental, or time-lagged designs to grasp evaluations of boredom at a one point in time (e.g., Reijseger et al., 2013; Sousa & Neves, 2020; van Hooff & van Hooft, 2014) or focused on how boredom fluctuates within the course of a week (van Hooff & van Hooft, 2017). Person-centered approach enables us to capture how these states that have thus far been considered as mutually exclusive can combine in different ways among employees (Laursen & Hoff, 2006; Marsh et al., 2009; Spurk et al., 2020). Our study complements variable-centered approaches that may establish relations between phenomena but cannot provide information on whether they manifest in the same way among all employees.

Second, our study expands the literature on employee well-being by distinguishing employee groups that report boredom at work only occasionally from those who experience it more frequently and examining the configural differences across these groups within and over time. This enables us to empirically examine the theoretical notion of different manifestations of boredom at work (Mael & Jex, 2015) that may have distinct implications for employee well-being and, by extension, performance. Our study points towards a need to clearly distinguish reoccurring boredom at work, which presents a risk for employee well-being, from the more spurious experience often gauged in experimental studies (e.g., Park et al., 2019; van Tilburg & Igou, 2017), which does not.

Third, in addition to examining whether boredom and exhaustion combine across employee groups, we seek to explain why these differences may occur. Previous studies have conceptualized boredom at work as a result from low job demands or challenges and thus positioned it as an antithetical condition to exhaustion (e.g., Reijseger et al., 2013; Sousa & Neves, 2021; Toscanelli et al., 2022). We build on research literature on boredom and challenge – hindrance stressor framework to distinguish between different types of stressors that may have a distinct impact on combinations of boredom and exhaustion at work. Incorporating this theoretical framework enables us to advance knowledge on the role of challenge and hindrance stressors in employee well-being. Specifically, challenging job stressors are often considered to have also positive effects on employee well-being while the impact of hindrance stressors is perceived to be negative (e.g., Crawford et al., 2010; O'Brien & Beehr, 2019). We extend this literature by examining how these stressors can also contribute to different configurations of employee ill-being. Our study argues that understanding boredom at work categorically as a marker on insufficient demands is problematic for both research and practice. Specifically, if researchers design studies without considering distinct drivers of boredom, they may end up reinforcing existing assumptions which does little to advance knowledge. From a practical viewpoint, understanding employee boredom as lacking job demands may lead managers to overlook other reasons why employees may be bored at the workplace. What may be worse, seeking to remedy boredom at work by increasing job demands may be ineffective and potentially harmful if it leads to increased exhaustion among employees.

In conclusion, boredom is suggested to prevail in modern workplaces (e.g., Loukidou et al., 2009), a trend that is likely to be further exacerbated by the organization of work during the COVID-19 pandemic (Danckert, 2022). Given that employee mental health is acknowledged as a key factor for sustainable careers (Barthauer et al., 2020) it is pertinent that we know more about how boredom emerges and evolves at workplaces. Our study contributes to organizational practice by helping managers to understand why

employees may be bored and exhausted instead of "merely" exhausted and thereby disentangle reasons for why employees may be suffering at the workplace. For example, some employees may be exhausted because they have too much work to do, while others may be bored and exhausted because they spend a large part of their working hours dealing with pointless tasks. The manifestations of these situations may seem alike on the surface, but the underlying causes and, hence, solutions differ. Broader understanding of these configurational differences will enable a more efficient diagnosis of threats to employee well-being.

1.1. Boredom and exhaustion at work

Boredom at work refers to an unpleasant state of passiveness that is characterized by lack of interest in and difficulties to maintain attention on a given activity that is not sufficiently stimulating (Daniels et al., 2004; Fisher, 1993; Mikulas & Vodanovich, 1993). Job boredom is found to be conceptually distinct albeit related to other concepts of psychological well-being. Specifically, previous studies have shown that job boredom is positively related to burnout (Harju et al., 2022; Reijseger et al., 2013), which is a state of extreme exhaustion that is characterized by disengagement and cognitive and emotional impairment (Schaufeli et al., 2020). Job boredom is also found to negatively relate to work engagement (Harju et al., 2016; Reijseger et al., 2013), which refers to a state of vigor, dedication and absorption (Schaufeli et al., 2002).

Boredom at work is distinguished from these other states by its relation to job demands and resources. Whereas work engagement is driven by plentiful job resources and the exhaustion component of burnout is known to be a response to job demands exceeding job resources (Demerouti et al., 2001), job boredom is associated with low job demands and low job resources (Reijseger et al., 2013). Particularly insufficient demands are considered to trigger boredom (Daniels et al., 2004). This conceptualization suggests an orthogonal relation between boredom and exhaustion at work. It is this argument that we wish to scrutinize by focusing specifically on boredom at work vis-à-vis exhaustion.

In addition to the mentioned differences between employee boredom and exhaustion, there is also conceptual overlap that merits consideration. Specifically, job boredom and exhaustion are both considered to be sub-optimal experiences at work that are characterized by low activation (i.e., passiveness vs. fatigue). Empirical, time-lagged, evidence also suggests that the two states are positively related (Sousa & Neves, 2021). Even though boredom and exhaustion may thus appear mutually exclusive, their commonalities invite further examination on their relations. In this study, we utilize person-centered methods to examine whether job boredom may occur together with exhaustion and whether and how the different configurational experiences of boredom and exhaustion at work change over time.

Although person-centered methods have not been used to study boredom at work, several studies have shed light on profiles of exhaustion, burnout and work engagement among employees. Most studies applying LPA have focused on the different patterns of stability and change in such states among workers. These studies have typically found that burnout and work engagement tend to develop inversely and in parallel, such as when high levels of burnout symptoms increase, work engagement decreases (Innanen et al., 2014; Mäkikangas et al., 2017; Upadyaya & Salmela-Aro, 2020). Two notable exceptions have found that engagement and burnout symptoms may also co-exist. Mäkikangas et al. (2014) found in a diary study that while most employees reported either high levels of vigor (i.e., energetic component of work engagement) or exhaustion (i.e., energetic component of burnout) over the course of a work week, some reported both vigor and exhaustion concurrently. Another study on a small sample of Finnish teachers found two profiles, one in which teachers reported high engagement and low burnout symptoms and another where the teachers reported both engagement and burnout symptoms (Salmela-Aro et al., 2019). The engaged profile was associated with higher control and the engaged-burnout profile was associated with higher job demands. These studies illustrate the advantage of person-centered approach that can sometime reveal combinations of phenomena that deviate from the norm and enables examining why such patterns may occur.

One person-centered study using an experience sampling design has focused on boredom among students (Goetz et al., 2014). In this study, different profiles of boredom were derived based on differences in reported levels of valence and arousal. The authors concluded that boredom may be accompanied with varying levels of (un-)pleasantness and activation, and that the type of boredom higher in negative valence and arousal was typically reported in achievement settings (i.e., non-leisure), supposedly because the students were not able to modify what they were doing. Based on this reasoning, it is plausible that boredom at work may also be accompanied by other negative experiences, i.e., exhaustion.

We draw theoretical rationale for this argument from research literature on boredom. Specifically, control-value theory (Pekrun, 2006) defines boredom as an achievement emotion that arises not just when the activity lacks challenge but also when the activity does not relate to achieving valued goals. Building on this work, Westgate and Wilson (2018) proposed that these two conditions may drive different configural profiles of boredom. On the one hand, they found that when the activity was not valued boredom was accompanied by frustration, agitation, and arousal. On the other hand, when the activity did not require or enable individuals to engage attention (i.e., lacking challenge) boredom did not combine with such markers. Their study implies that these different causes give rise to different configural profiles of boredom that can be distinguished by the stressfulness of the experience.

Although no studies have thus far investigated profiles of boredom at work in combination with other states of employee (un-)well-being, these studies point towards the possibility of boredom at work co-occurring with other states of employee distress, such as exhaustion. We expect to find such combinations particularly among employees who report boredom at work frequently. This is because, as previously elaborated, sporadic episodes of boredom at work should be distinguished from more prevalent states of workplace boredom, and the consequences of the latter are likely to be more harmful for the individual (Mael & Jex, 2015). Supporting this argument, Daniels (2000) notes that the more recurring boredom at work is the more likely it is to be accompanied by more intense distress and discomfort (also van Hooff & van Hooft, 2017), which we expect to manifest in exhaustion. Drawing from this reasoning,

we present our first hypothesis:

Hypothesis 1. Employee groups that report frequent boredom at work and co-occurring exhaustion will be identified.

1.2. The role of challenge and hindrance stressors

In this study we draw from challenge – hindrance stressor framework (Cavanaugh et al., 2000) to examine the role of different types of stressors in determining whether employees are bored, exhausted or both. This framework distinguishes two types of stressors. Challenge stressors (e.g., time pressure, workload and responsibility) are straining but can also stimulate and motivate employees as they involve opportunities for accomplishment and mastery. Hindrance stressors (e.g., role conflict, red-tape), in turn, thwart employee performance and impede their goal accomplishment (LePine et al., 2005). While research on boredom at work has focused on insufficient job demands or lacking challenges as the root cause of boredom, the role of hindrance stressors has been largely overlooked. In this study, we argue that hindrance stressors are likely to foster boredom at work because they make it harder for employees to engage in goal-relevant and thus satisfying activity.

Aligning with Westgate and Wilson's (2018) proposition of different profiles of boredom, we argue that lacking challenge stressors may foster a different configurational profile of boredom and exhaustion than hindrance stressors. This is because challenge stressors provide opportunities to become stimulated, engage attention and pursue a sense of accomplishment (LePine et al., 2005) which is antithetical to boredom at work. In contrast, as challenge stressors have been positively linked to strain and exhaustion (e.g., Crawford et al., 2010; Rosen et al., 2020), it is likely that they will be positively related to profiles characterized by lower levels of boredom and higher levels of exhaustion. Furthermore, hindrance stressors impede employees' pursuit towards valued goals (Cavanaugh et al., 2000; LePine et al., 2005; Podsakoff et al., 2007) Because boredom occurs when individuals cannot carry out satisfying or goal-relevant activities (Eastwood et al., 2012; Pekrun, 2006; Westgate & Wilson, 2018), we expect hindrance stressors to positively relate to more frequent experiences of boredom at work. Because hindrance stressors are consistently shown to foster exhaustion (e.g., Boswell et al., 2004; Crawford et al., 2010; Hatch et al., 2019; Podsakoff et al., 2007) they may therefore drive both boredom and exhaustion at work at the same time. Supporting this argument, a recent study found that red-tape, which can be considered as a hindrance stressor, was positively related to both boredom at work and burnout (Harju et al., 2022). Therefore, we hypothesize:

Hypothesis 2a. High levels of challenge stressors predicts less frequent job boredom.

Hypothesis 2b. High levels of challenge stressors predicts more frequent exhaustion.

Hypothesis 2c. High levels of hindrance stressors predict more frequent job boredom.

Hypothesis 2d. High levels of hindrance stressors predicts more frequent exhaustion.

1.3. Boredom and exhaustion over time

In this study, we will also examine whether and in what way experiences of boredom at work and exhaustion change over time and how *changes* in challenge and hindrance stressors predict these changes across the study period.

Variable-centered studies have shown that boredom and exhaustion at work are relatively stable psychological states (Harju et al., 2016 and Hall et al., 2010, respectively). Person-centered studies on the stability of profiles of exhaustion over time are limited, but the existing evidence implies that the level of exhaustion does not considerably change over time (e.g., Mäkikangas et al., 2017) or when it does it tends to be towards more severe exhaustion (Mäkikangas et al., 2021). While corresponding evidence is not available for boredom at work, a similar pattern is plausible. Although boredom at work is a transient state that can come and go like any emotion, employees may also get stuck feeling bored at work. This is because emotions, while dynamic and often short-lived, can involve inertia that renders affective experiences, such as boredom, slow to change (De Longis et al., 2022). According to Daniels et al. (2004), negative affective states, such as boredom at work, can become a learned response to certain situations that can further explain why it reoccurs. Following this reasoning, state boredom may become a frequently recurring experience at workplace that shows little change over time. Hence, while for many employees both boredom and exhaustion may remain stable experiences over time, we also expect changes to occur as a response to changes in job stressors.

Specifically, increases in challenge and hindrance stressors are likely to play a role in how experiences of boredom at work and exhaustion evolve among employees. Increases in challenge stressors should predict less boredom at work, because challenging stimuli enables employees to engage their attention on their tasks (Daniels et al., 2004; Westgate & Wilson, 2018). In contrast, such increases are likely to relate to higher levels of exhaustion, because employees will have to extend more effort and expend more energy as a response. To illustrate, Rosen et al. (2020) found that increase in challenge stressors was related to higher levels of stress and anxiety. Increase in hindrance stressors, in turn, may deplete employees' energy and interest in activities that impede attainment of valued goals, which is why it is likely to foster more frequent experience of both boredom and exhaustion at work. To examine the role of these different job stressors in how profiles of boredom and exhaustion evolve over time, we present our final hypotheses:

Hypothesis 3a. Increases in challenge stressors (T1-T2) will predict less frequent job boredom at T2.

Hypothesis 3b. Increases in challenge stressors (T1-T2) will predict more frequent exhaustion at T2.

Hypothesis 3c. Increases in hindrance stressors (T1-T2) will predict more frequent job boredom at T2.

Hypothesis 3d. Increases in hindrance stressors (T1-T2) will predict more frequent exhaustion at T2.

2. Study 1

2.1. Method

2.1.1. Participants

Participants for this study ($N = 311$) were UK -based employees that were recruited from Prolific Academic, an online research platform targeted for academic research. Prolific Academic is suggested to be similar to data quality than Amazon MTurk, but with a more varied participant pool (Peer et al., 2017). The participants were paid £1.25 for filling in the questionnaire. We followed recommendation for quality checks (Mason & Suri, 2012) and included a simple arithmetic question to control for attention. Altogether 10 respondents were omitted based on failed attention check question ($N = 1$) and too short response times ($N = 9$) that indicate careless responses. Final sample was thus 301 employees. Participants were employed full-time and had reported English as their first language. Altogether 12 % had secondary level education, 14 % intermediate vocational education, 40 % had a Bachelor's degree, 30 % had a Master's degree and 9 % had a doctoral degree. Mean age of the sample was 32 years (SD = 8.32), 54 % were male and 80 % had a permanent contract. 18 % worked in education and health services, 17 % in IT industry, 9 % in professional and business services, 9 % in manufacturing, 7 % in government and the rest in various industrial sectors.

2.1.2. Measures

Boredom at work was assessed with the English version of Dutch Boredom Scale (DUBS; Reijseger et al., 2013), which consists of six items capturing the affective, cognitive and behavioral aspects of boredom. Response scale ranged from 0 = never to 6 = always (example item: "*I feel bored at work*"; α = 0.83).

Exhaustion at work was assessed with eight items from the English version of the Burnout Assessment Tool (BAT; Schaufeli et al., 2020). Response scale ranged from 0 = never to 6 = always (example item: *"At work, I feel mentally exhausted*" α = 0.87).

Challenge stressors were assessed with four items reflecting workload and time pressure from the psychological workload questionnaire (VBBA; van Veldhoven & Meijman, 1994). The items were back-translated to English language. Response scale ranged from 1 = never to 5 = always (example item: "*Do you often have to hurry?*"; α = 0.75).

Hindrance stressors were assessed with three items reflecting red-tape and organizational constraints from the English version of JDR-Q (Schaufeli, 2015). Response scale ranged from 1 = never to 5 = always (example item: *"Because of unnecessary rules, I am not able to perform my work as well as I would like"*; α = 0.75).

Because job boredom and exhaustion at work are argued to result not just from job stressors but also from lacking job resources, we controlled for decision making autonomy that was captured by three items that were adapted from the job content questionnaire (Karasek et al., 1998), namely: I can decide how I perform my work; I have freedom to perform my tasks, and; I can participate in decisions that have to do with my work (α = 0.77). Responses scale was from 1 = never to 5 = always. We also used age and gender (male = 1, female = 2) as control variables. Younger individuals as well as male employees have been found to report more boredom at work in previous studies (e.g., Harju et al., 2014). As for exhaustion, female and younger employees have been found to be more at risk (Hatch et al., 2019).

2.1.3. Analytical procedure

All analyses were performed in MPlus statistical package (version 8.7; Muthèn & Muthèn, 1998–2017) using the full information maximum likelihood (FIML) with standard errors robust to non-normality (MLR estimator) which allowed us to use all observations in the dataset. LPA was performed to investigate whether different subgroups of employees could be identified based on their mean levels of boredom and exhaustion. LPA aims to identify unobserved latent profiles from the observed data and estimates parameters for these profiles (Muthèn & Muthèn, 1998–2017).

We performed analyses for each model with 1000 random sets of start values with 100 iterations and retained the 100 best solutions for final stage optimization (Hipp & Bauer, 2006). As the correct number of latent profiles is not known a priori, we tested different number of profiles. We started with a one-profile solution and increased the number of profiles until model fit no longer improved. The decision of the number of latent profiles was based on different criteria. Akaike Information Criterion (AIC) Bayesian Information Criterion (BIC) and the sample-adjusted BIC (aBIC) were used to assess model fit. Lower values indicate a better fit of the model. In addition, the bootstrap likelihood ratio test (BLRT) was employed to compare solutions with different numbers of latent classes (k or $k - 1$ number of classes). A low p value (<.05) indicates that the $k - 1$ model must be rejected in favor of a model with at least k classes.

The clarity and interpretability of the latent class solution was also assessed in deciding on the number of profiles. For this purpose, the distinctiveness of the profiles was evaluated with assessing entropy values, which describe the accuracy of the overall classification, and average latent class posterior probabilities (AvPP), which assess the likelihood of an observation being assigned to a specific profile. For entropy, the closer the value is to 1 (from 0 to 1) the better the classification is (Celeux & Soromenho, 1996). For average latent class posterior probabilities, values >0.70 indicate that the solution may be interpreted using the mean profiles (Nagin, 2005). After the final profile solution was chosen, we also examined mean differences in challenge and hindrance stressors and autonomy across profiles using Bolck-Croon-Hagenaar (BCH) method in MPlus to further establish the validity of the profiles (Spurk et al., 2020).

Next, we performed multinomial logistic regression analyses using R3STEP command in MPlus (Asparouhov & Muthén, 2014) to examine whether challenge and hindrance stressors were associated with profile membership. Following Morin et al. (2016) and

Bennett et al. (2016), we calculated odds ratios (OR) to ease the interpretation of the results by describing the change in likelihood to belong to the target profile versus the comparison profile as a result of one unit increase in the job stressor.

2.2. Results

Table 1 shows means and correlations of the study variables. Boredom at work and exhaustion were positively correlated. Boredom at work was positively correlated with hindrance stressors. The correlation between challenge stressors and boredom at work was marginal and not statistically significant. Exhaustion, in turn, was positively correlated with both challenge and hindrance stressors. This aligns with the literature concerning different relations between boredom at work, exhaustion and challenge stressors and indicates similar relations between boredom at work, exhaustion and hindrance stressors.

2.2.1. Profiles of boredom and exhaustion at work

Fit indices for latent profile analyses of job boredom and exhaustion are presented in Table 2. The fit criteria implied that model improvement slowed down at 4-profiles, and after adding the fifth profile the value of BIC increased, the BLRT test approached the threshold of $p = .05$, and the AvPP values for profiles decreased. We further examined the qualitative differences between four and five-profile solutions and did not find that the fifth profile added much information to the information provided by the four-profile solution. Thus, a more parsimonious, four-profile solution was chosen. Entropy criterion (0.80) and the AvPP for profile membership (> 0.70) supported the quality of the profile solution.

Fig. 1 depicts the profiles. The largest profile consisted of 60 % of the participants who experienced both boredom and exhaustion sporadically ($M = 1.39$ for boredom $M = 1.70$ for exhaustion). We considered this profile as normative and labelled it "neither bored nor exhausted". Second largest profile involved 20 % of the participants who reported feeling exhausted often ($M = 3.79$) and bored less frequently ($M = 2.61$) that we labelled "exhausted and somewhat bored". The third largest profile included 13 % of the participants who were frequently bored ($M = 3.23$) and exhausted ($M = 2.42$). We labelled this profile "somewhat bored, somewhat exhausted". In addition, a fourth profile was identified in which 7 % of the participants reported being bored and exhausted very often ($M = 4.78$ for boredom; $M = 4.41$ for exhaustion), which we labelled "bored and exhausted". Hence, distinct profiles characterized by different levels of job boredom and exhaustion were identified. Notably, employee groups who reported frequent boredom at work also reported equal levels of exhaustion thus indicating that boredom at work may be accompanied by exhaustion in support of Hypothesis 1.

2.2.2. Distinct effects of challenge and hindrance stressors

Results of the multinomial regression analyses are presented in Table 3. They show that high levels of challenge stressors increased the likelihood for belonging to the exhaustion dominant profile where boredom was experienced less frequently (i.e., "exhausted and somewhat bored") rather than to "neither bored nor exhausted" profile ($OR = 9.54$). Hence, Hypotheses 2a and 2b were supported. In contrast, belonging to the profile where employees experienced both frequent boredom and exhaustion (i.e., "somewhat bored, somewhat exhausted") was more than four times more likely when the level of hindrance stressors was high ($OR = 4.10$) in comparison to belonging to the "neither bored nor exhausted" profile. Similarly, higher level of hindrance stressors made it four times more likely to belong to "bored and exhausted" profile vs. "neither bored nor exhausted" profile ($OR = 4.46$). These results thus support Hypotheses 2c and 2d.

As for control variables, autonomy increased likelihood of being neither bored nor exhausted than exhausted and somewhat bored ($OR = 0.50$). Higher age increased likelihood of belonging to "neither bored nor exhausted" compared to "somewhat bored, somewhat exhausted" ($OR = 0.88$) and "exhausted and somewhat bored" ($OR = 0.91$). Female gender, in turn, increased likelihood of being exhausted and somewhat bored than neither ($OR = 3.70$).

We further examined the differences in mean scores of job stressors and autonomy to further validate the profile solution (results are presented in Appendix Fig. 1). Specifically, exhausted and somewhat bored employees reported higher challenge stressors than employees in all other profiles. These employees, along with those who were bored and exhausted, also reported higher hindrance demands than those who were neither bored nor exhausted. The profiles did not statistically significantly differ in mean scores of autonomy, apart from exhausted and somewhat bored employees who reported lower autonomy than neither bored nor exhausted employees. This indicates that profiles of boredom and exhaustion at work can be distinguished based on job stressors rather than job

Table 1
Means, correlations and Cronbach's alphas (in italics in the diagonal) of the study variables.

		M	SD	1	2	3	4	5
1	Boredom	2.10	1.20	*0.83*				
2	Exhaustion	2.39	1.19	.59***	*0.87*			
3	Challenge stressors	2.59	0.70	0.01	.50***	*0.75*		
4	Hindrance stressors	2.54	0.90	.28***	.47***	.60***	*0.75*	
5	Autonomy	3.50	0.90	−.162**	−.145*	0.01	−.179**	*0.77*

$N = 301$.
*** $p < .001$.
** $p < .01$.
* $p < .05$.

Table 2
Fit indices for latent profile analyses of job boredom and exhaustion.

No. of profiles	Log likelihood (free parameters)	AIC	BIC	aBIC	BLRT	Latent class %	Latent class n	Entropy
1	−960.508 (4)	1929.016	1943.844	1931.158		100	301	
2	−884.441 (7)	1782.883	1808.832	1786.632	0.000	29/71	88/213	0.81
3	−868.082 (10)	1756.164	1793.235	1761.521	0.000	62/32/6	190/95/16	0.81
4	−856.326 (13)	1738.651	1786.844	1745.615	0.000	60/20/7/13	185/63/19/34	0.80
5	−850.332 (16)	1732.664	1791.978	1741.235	0.040	57/15/15/9/4	178/42/45/25/11	0.80
6	−847.469 (19)	1732.937	1803.372	1743.115	0.667	49/13/9/17/9/3	153/38/27/46/26/11	0.75

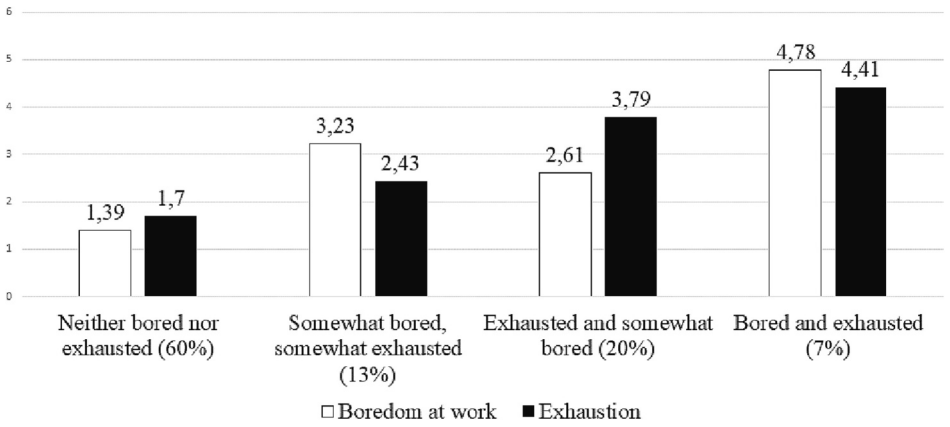

Fig. 1. Profiles of boredom and exhaustion at work ($N = 301$).

Table 3
Results of the multinomial regression analyses (R3STEP).

	Somewhat bored, somewhat exhausted		Exhausted and somewhat bored		Bored and exhausted	
	Coeff. (SE)	OR	Coeff. (SE)	OR	Coeff. (SE)	OR
Age	−.124* (.063)	0.88	−.089* (.044)	0.91	−0.064 (0.048)	0.94
Gender	1.09 (0.724)	2.97	1.309* (.581)	3.70	−0.278 (0.750)	0.76
Autonomy	−0.224 (0.382)	0.80	−.701* (.338)	0.50	−0.177 (0.360)	0.84
Challenge stressors	−1.702 (0.964)	0.18	2.256*** (.470)	9.54	−1.376 (0.770)	0.25
Hindrance stressors	1.412** (.538)	4.10	0.215 (0.321)	1.24	1.495*** (.438)	4.46

$N = 301$.
Note. "Neither bored nor exhausted" is the comparison profile. Positive coefficient values indicate that higher values of the antecedent render an individual more likely to be in the target profile of the two in the comparison. Negative coefficient indicates that a higher value in the antecedent renders one more likely to belong to the comparison profile. ORs above one (e.g. 2.6) indicate that an individual is that many times (e.g. 2.6 times) more likely to belong to the first profile than the comparison profile given a one unit increase in the predictor, whereas ORs that fall below 1 indicate that individual is more likely to belong to the second profile than the first profile.
*** $p \leq .001$.
** $p \leq 6.01$.
* $p \leq .05$.

autonomy.

All in all, the results supported Hypotheses 2a–2d, as higher challenge stressors were associated with profiles where the level of exhaustion was higher and boredom at work was lower (H2a–H2b) whereas hindrance stressors predicted membership to profiles where both boredom at work and exhaustion were prevalent (H2c–H2d).

3. Study 2

3.1. Method

3.1.1. Participants

Data were collected between 2016 and 2018 with a survey questionnaire that was distributed to employees in 40 Finnish municipalities at two time points with 18 months between measurements. The sample population included 84,600 employees, out of

which 10,920 returned the first questionnaire. At the end of the first questionnaire, the participants were asked whether they agreed to take part in the follow-up. At the second measurement, 18 months later, the questionnaire was sent to those employees ($N = 4302$) that had indicated their willingness to participate. The final sample included those respondents, who returned the questionnaire at both time points ($N = 2453$; 57 %). Out of these respondents, 85,5 % were women, the mean age was 49 years (SD = 9.59) and 39 % had completed secondary education, 33 % had completed vocational education and 33 % had university level education.

3.1.2. Measures

Table 4 shows the descriptive statistics and Cronbach alphas of the study variables. *Boredom at work* was assessed with three items (i.e., *"When I work, my mind wanders onto other things"; "At work, time goes by very slowly"*, and; *"I feel bored at my work"*) from DUBS (Reijseger et al., 2013). Response scale ranged from 0 = never to 6 = always.

Exhaustion at work was assessed with four items from Oldenburg Burnout Inventory (OLBI; Demerouti et al., 2001; example item: *"After work day, I feel worn out"*). The response scale ranged from 0 = never to 6 = always.

Challenge stressors were assessed by three items describing the amount and pace of work. One item was from the measurement instrument developed by Karasek Jr (1979; example item: "*I have too much work to do*?") and two of the items were from QPS-Nordic (Dallner et al., 2000; e.g., *"My workload is irregular so my work piles up"*).

Hindrance stressors were assessed with two items reflecting role conflict ("*I have to carry out tasks in a way I feel would need to be performed in a different way"*; QPS-Nordic and "Conflicting expectations from various parties/actors complicate my work") and three items reflecting red-tape (e.g., *"At work I have to deal with unnecessary rules, procedures and regulations*"; Schaufeli, 2015). The job stressor items were scored on a scale ranging from 1 = very seldom to 5 = very often. Similarly to Study 1, age and gender (1 = female, 2 = male) were controlled.

Apart from QPS-Nordic, which is available in Finnish, all scales have been back-translated from the original English version with a bilingual translator specialized in occupational health terminology.

3.1.3. Analytical procedure

As a preliminary step, we tested the invariance of the measurement model (MI) over time, to ensure that the measures used captured the constructs in the same way at both time points (Van de Schoot et al., 2012; details of the procedure are presented in the Supplementary materials). Next, starting with a one-profile solution, we increased the number of profiles until model fit no longer improved. Especially in large samples, however, it is typical for aBIC to keep decreasing and thus suggesting more profiles to the solution, which is why we also assessed the profile solution from a theoretical perspective to avoid over-interpretation of the empirical results (Lubke & Muthén, 2005; Morin et al., 2016). We followed Kam et al. (2016) and tested alternative models to find the optimal solution for LTA by comparing models in which variance of the indicators were fixed across profiles (i.e., MPlus default) and models wherein variance was freely estimated within profiles.

After the final model solution was retained, we imposed longitudinal invariance constraints on the means of each of the profiles to better assess and interpret the stability and change of profile membership (Kam et al., 2016; Muthén & Asparouhov, 2011). LTA model comparisons were performed to test whether covariates have a significant effect of latent profiles and transitions across profiles by using scaled log likelihood difference tests (Satorra & Bentler, 2010). Specifically, we compared an LTA model with no covariates to an LTA model where covariates (i.e., age, gender, challenge and hindrance stressors) predicted profiles at T1 which was further compared to an LTA model where latent change scores (McArdle, 2009) for challenge and hindrance stressors across T1 and T2 predicted profile transitions over 18-month measurement period.

The final LTA solution was used for multinominal regression analyses, wherein we increased random sets of start values to 2500 and retained the 200 best solutions for final stage optimization to avoid the local maxima (Hipp & Bauer, 2006). To ease interpretation of the results, we report odds ratios (OR) for all multinominal logistic regression coefficients as well as for the transition probabilities under different values of change scores (Asparouhov & Muthén, 2021).

Table 4
Means, correlations and Cronbach's alphas (in italics in the diagonal) of the study variables.

		M	SD	1.	2.	3.	4.	5.	6.	7.	8.
1.	Boredom T1	2.08	1.29	*0.71*							
2.	Exhaustion T1	3.13	1.31	.42**	*0.79*						
3.	Challenge stressors T1	3.23	0.89	−0.03	.41**	*0.85*					
4.	Hindrance stressors T1	2.90	0.86	.27**	.35**	.34**	*0.82*				
5.	Boredom T2	2.31	1.38	.68**	.32**	−0.01	.23**	*0.74*			
6.	Exhaustion T2	3.39	1.35	.34**	.69**	.32**	.29**	.42**	*0.81*		
7.	Challenge stressors T2	3.27	0.92	−0.01	.33**	.62**	.27**	−.06**	.41**	0.86	
8.	Hindrance stressors T2	2.96	0.85	.24**	.31**	.27**	.63**	.28**	.40**	.37**	.82*

$N = 2453$.
** $p < .01$.
* $p < .05$.

3.2. Results

3.2.1. Latent Transition Analysis

We examined LTA solutions for up to six profiles at both time points with variances of the indicators both fixed (i.e. MPlus default) and freely estimated across profiles to estimate alternative models and find the best fitting model solution (see Kam et al., 2016 for a similar procedure). Each model was estimated with 1000 random sets of start values to ensure that the best loglikelihood value was sufficiently replicated, increased the default to 100 iterations for these random starts and retained the 100 best solutions for final stage optimization (Hipp & Bauer, 2006).

Table 5 shows fit indices for each estimated model. The fit criteria were better with the parametrization in which the variances of boredom and exhaustion were freely estimated within profiles. The aBIC values for fit criteria continued to decrease to up to six profiles, which is common in large samples (Kam et al., 2016; Marsh et al., 2009). However, for the six-profile solution the best loglikelihood value was not replicated, which is indicative of a suboptimal solution (i.e. local maxima; Hipp & Bauer, 2006; Spurk et al., 2020). After comparing the four- and five-profile solutions, we deemed that the fifth profile did not add theoretical value and therefore chose the more parsimonious four-profile solution for the final LTA. Thereafter we followed the recommended procedure and imposed invariance constraints on profile means for the final retained profile solution, in order to better interpret the stability and change of the profiles over time (Kam et al., 2016; Muthén & Asparouhov, 2011). Model comparison with the freely estimated model (Log likelihood = −14,920.355; no. of free parameters = 31; AIC = 299,002.711; BIC = 30,082.668; aBIC = 29,984.173; entropy = 0.79) showed that the constrained model was a superior fit (Log likelihood = −12,350.913; no. of free parameters = 39; AIC = 24,779.826; BIC = 25,006.224; aBIC = 24,882.311) and its classification quality was good (entropy = 0.81).

Fig. 2 depicts the profiles of the final solution. In the largest profile, which included 33 % of the employees at T1 and 31 % at T2, employees reported exhaustion regularly (M = 3.36), but boredom only sporadically (M = 1.61). Hence, we labelled this profile "somewhat exhausted". The second largest profile was "neither bored nor exhausted" (M = 1.18 for boredom, M = 1.78 for exhaustion) comprising 28 % of the employees at T1 and 24 % at T2. We also found a "somewhat bored, somewhat exhausted" profile (M = 3.36 for boredom, M = 3.24 for exhaustion), which was the third largest including 21 % of the employees at T1 and 21 % at T2. Finally, we found a "exhausted and somewhat bored" profile (M = 3.12 for boredom, M = 4.94 for exhaustion). The proportion of employees who belonged to this least favorable well-being profile increased from 18 % at T1 to 24 % at T2. These findings mainly replicate the profiles found in Study 1 and thus support Hypothesis 1 as many employees experienced both frequent boredom and exhaustion at work.

Table 6 presents the conditional transition probabilities of staying vs. moving to another profile which show that, overall, employees were more likely to stay in their respective profiles than to move during the 18-month measurement period. Odds for transitioning to other profiles were small but significant. They also tended to be towards worse, particularly from "neither bored nor exhausted" to "somewhat exhausted" and from "somewhat exhausted" to "exhausted and somewhat bored". This is also illustrated by the percentage of employees in the "neither bored nor exhausted" and "somewhat exhausted" profiles decreased whereas the proportion assigned to exhausted and somewhat bored increased. Model comparisons showed that the covariates had a statistically significant effect on transition probabilities beyond profile stability (see Appendix Table 1), thus indicating that challenge and hindrance stress played a role in profile transitions. All in all, these findings indicate that for most employees, levels of boredom and exhaustion do not change considerably over time with some change typically towards more frequent boredom and exhaustion at work.

3.2.2. The role of challenge and hindrance stressors within and across time

Results from multinominal regression analyses are presented in Table 7. As in Study 1 "neither bored nor exhausted", was chosen as a reference profile, against which the likelihood of belonging to a target profile was compared.

Higher age increased the likelihood of belonging to "neither bored nor exhausted" profile as compared to all the other profiles characterized by boredom and/or exhaustion. Female employees were more likely to belong to the two exhaustion dominant profiles, whereas male employees were more likely to be somewhat bored and somewhat exhausted.

In support of H2a, we found that higher levels of challenge stressors at T1 decreased the likelihood of being somewhat bored and

Table 5
Latent Transition Analysis.

Number of profiles	Log likelihood (no. of free parameters)	AIC	BIC	aBIC	Entropy
Means free, variance fixed					
2	−15,573.415 (15)	31,176.830	31,263.906	31,216.248	0.87
3	−15,184.478 (24)	30,416.956	30,556.278	30,480.024	0.82
4	−14,942.438 (35)	29,954.876	30,158.054	30,046.850	0.82
5	−14,810.979 (48)	29,717.959	29,996.602	29,844.094	0.81
6	−14,688.890 (63)	29,503.781	29,869.500	29,669.334	0.83
Means and variances freely estimated					
2	−15,403.535 (19)	30,845.071	30,955.367	30,895.000	0.88
3	−15,109.842 (32)	30,283.684	30,469.446	30,367.775	0.84
4	−14,881.659 (47)	29,857.318	30,130.156	29,980.826	0.82
5	−14,678.410 (64)	29,484.819	29,856.344	29,653.000	0.82
6	−14,567.000 (83)	29,299.999	29,781.820	29,518.109	0.82

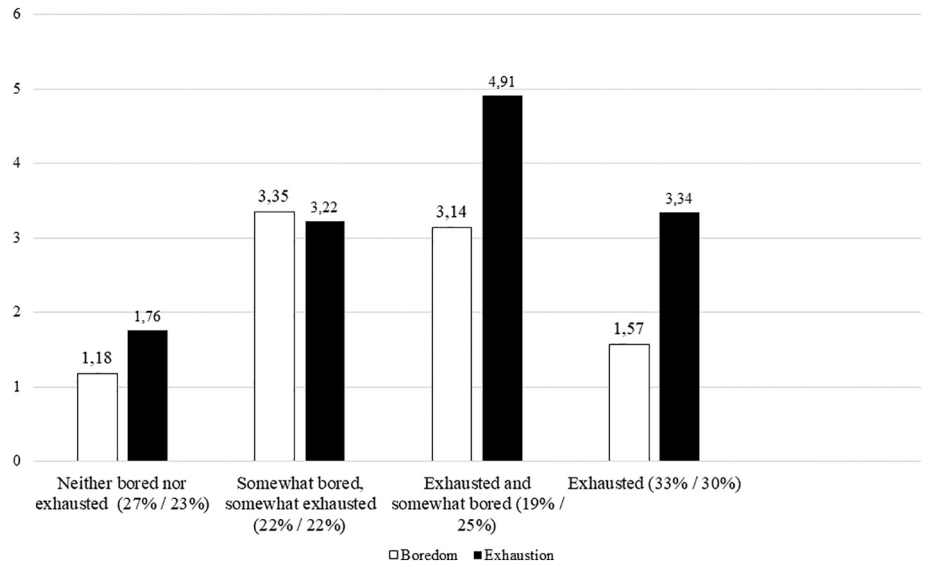

Fig. 2. Final Latent Transition Analysis model.

Table 6
Transition probabilities/odds and 95 % CI for the odds (in parentheses) across profiles.

	Neither bored nor exhausted T2	Exhausted, somewhat bored T2	Somewhat bored, somewhat exhausted T2	Somewhat exhausted T2
Neither bored nor exhausted T1	0.825/1	0.005/0.001 (0.00, 0.037)	0.044/0.036 (0.007, 0.174)	0.127/0.105 (0.045, 0.241)
Exhausted, somewhat bored T1	0.007/0.001 (0.000, 0.017)	0.964/1	0.029/0.005 (0.001, 0.034)	0.000/0
Somewhat bored, somewhat exhausted T1	0.014/0.010 (0.002, 0.048)	0.069/0.018 (0.000, 0.895)	0.913/1	0.004/0.002 (0.000, 0.203)
Somewhat exhausted T1	0.008/0.005 (0.001, 0.036)	0.168/0.147 (0.078, 0.274)	0.006/0.002 (0.000, 0.909)	0.817/1

Note. Transition probabilities are calculated from the multinomial logistic regression between a given profile at T2 regressed on the same profile at T1 evaluated at the sample mean for all covariates. Non-symmetrical CI indicates significance if the CI does not include 1. The odds represent the likelihood of moving to the comparison profile vs. staying in the same profile. For example, employees who were neither bored nor exhausted at T1 had small but significant odds (0.105) to transfer to the somewhat exhausted profile, whereas those who were somewhat exhausted at T1 had small but significant odds (0.147) to move to the exhausted and somewhat bored profile.

somewhat exhausted as compared to being neither bored nor exhausted ($OR = 0.55$). This indicates that higher level of challenge demands predicted belonging to a profile where both boredom at work and exhaustion were less frequent. In contrast, higher levels of challenge stressors at T1 also predicted belonging to profiles where exhaustion was relatively more dominant. Specifically, higher levels of challenge stressors at T1 increased the likelihood of being somewhat exhausted ($OR = 2.86$) and exhausted and somewhat bored ($OR = 4.10$) rather than neither bored nor exhausted. Hypothesis 2b was thus supported.

Hindrance stressors, in turn, increased the likelihood for the employee to belong to "somewhat exhausted" profile compared to "neither bored nor exhausted" ($OR = 1.84$). In addition, one-unit increase in hindrance stressors rendered employees more likely to belong to "somewhat bored, somewhat exhausted" profile ($OR = 5.05$) as well as "exhausted and somewhat bored" profile ($OR = 10.70$) in comparison to "neither bored nor exhausted" profile at T1. The findings thus indicate that hindrance stressors predict belonging to all profiles of poorer well-being, and particularly to those prevalent of both boredom and exhaustion at work. Hypotheses 2c and 2d were therefore supported.

Hypotheses 3a–3d concerned the role of changes in challenge and hindrance stressors for profile membership across time. We found that increases in challenge stressors decreased likelihood of belonging to "somewhat bored, somewhat exhausted" profile ($OR = 0.21$) at T2, but this relation was only marginally significant ($p = .051$). An increase in challenge stressors during the study period (T1-T2) also increased the likelihood of belonging to "somewhat exhausted" profile rather than "neither bored nor exhausted" at T2 ($OR = 3.71$). We cannot thus claim support for Hypothesis 3a but did find support for Hypothesis 3b. Furthermore, increases in hindrance stressors during the study period made it 40 times ($OR = 40.04$) more likely to be exhausted and somewhat bored and 10 times more likely to be somewhat bored and somewhat exhausted ($OR = 9.87$) than neither bored nor exhausted at T2. Hence, Hypotheses 3c and 3d were supported.

To examine the profile transitions in more detail, we calculated odds ratios for transitioning across profiles when changes in

Table 7
Predictors of boredom and exhaustion profiles at T1 and T2.

	Somewhat exhausted T1		Somewhat bored, somewhat exhausted T1		Exhausted and somewhat bored T1	
	B (SE)	OR	B (SE)	OR	B (SE)	OR
Age	−.02* (.01)	0.98	−.09*** (.01)	0.91	−.08*** (.01)	0.92
Gender	−.86** (.28)	0.42	.52* (.24)	1.68	−0.17 (0.30)	0.84
Challenge T1	1.05*** (.18)	2.86	−.59* (.27)	0.55	1.41*** (.29)	4.10
Hindrance T1	.61*** (.18)	1.84	1.62*** (0.20)	5.05	2.37*** (.22)	10.70

	Somewhat exhausted T2		Somewhat bored, somewhat exhausted T2		Exhausted and somewhat bored T2	
	B (SE)	OR	B (SE)	OR	B (SE)	OR
ΔChallenge T1-T2	1.31* (.58)	3.71	−1.57(*) (.81)	0.21	1.32 (0.93)	3.74
ΔHindrance T1-T2	0.95 (0.84)	2.59	2.29** (.84)	9.87	3.69*** (1.09)	40.04

$N = 2453$.
Note. "Neither bored nor exhausted" profile is the comparison profile. ORs above one (e.g. 2.86) indicate that an individual is that many times (e.g. 2.9 times) more likely to belong to the target profile than the comparison profile given a one unit increase in the predictor, whereas ORs that fall below 1 indicate that individual is more likely to belong to the comparison profile.
*** $p \leq .001$.
** $p < .01$.
* $p < .05$.
(*) $p < .055$.

hindrance and challenge stressors increase by one unit as compared to sample mean.

The results are presented in Tables 8 and 9. They indicate that those employees who were neither bored nor exhausted at T1, were more than four times more likely to be exhausted and somewhat bored at T2 ($OR = 4.47$) and more than two times more likely to be somewhat bored and somewhat exhausted at T2 ($OR = 2.57$) given a one-unit increase in changes in hindrance stressors. Furthermore, employees who were somewhat exhausted but not bored at T1, were three times more at risk to be even more exhausted and somewhat bored at T2 ($OR = 3.11$), given a one-unit increase in changes in hindrance stressors. As for the effects of changes in challenge stressors on profile transitions, we found a different pattern whereby employees were more likely to move either towards more exhaustion or towards less boredom. Specifically, those employees who were neither bored nor exhausted at T1, were more than twice as likely to be somewhat exhausted at T2 ($OR = 2.42$) given one unit increase in changes in challenge stressors. Those employees who were somewhat bored and exhausted at T1, in turn, were about six times more at risk to stay somewhat bored and be even more exhausted ($OR = 5.75$) or remain somewhat exhausted and be less bored ($OR = 6.14$) given one unit increase in changes in challenge stressors. This indicates that increases in challenge stressors may either increase exhaustion or decrease boredom. All in all, these results verify the pattern of our findings and show that challenge and hindrance stressors play different roles in predicting membership in boredom and exhaustion profiles.

3.2.3. Supplementary analyses

We performed supplementary analyses wherein we used a variable-centered approach to examine the cross-lagged relations between job boredom and exhaustion to gain more information on the direction of their relation in the sample population. Mean scores of job boredom and exhaustion were modeled at both time points, and the cross-lagged paths were estimated while controlling for the baseline at T1. We found that job boredom at T1 positively predicted exhaustion at T2 ($b = 0.058$, $p = .001$) after controlling for exhaustion at T1 ($b = 0.665$, $p < .001$). Exhaustion at T1, in turn, positively predicted job boredom at T2 ($b = 0.035$, $p = .042$) after controlling for job boredom at T1 ($b = 0.668$, $p < .001$). These results indicate that job boredom and exhaustion may have a reciprocal relation over time.

Table 8
Effects of 1 SD increase in changes in hindrance stressors on transition table odds ratio (95 % CI).

	Neither bored nor exhausted T2	Exhausted, somewhat bored T2	Somewhat bored, somewhat exhausted T2	Somewhat exhausted T2
Neither bored nor exhausted T1	–	**4.47 (1.837, 10.858)**	**2.57 (1.275, 5.169)**	1.44 (0.739, 2.789)
Exhausted, somewhat bored T1	**0.22 (0.092, 0.544)**	–	0.58 (0.170, 1.946)	**0.32 (0.189, 0.545)**
Somewhat bored, somewhat exhausted T1	**0.39 (0.193, 0.785)**	1.74 (0.514, 5.892)	–	0.56 (0.205, 1.529)
Somewhat exhausted T1	0.70 (0.359, 1.354)	**3.11 (1.834–5.281)**	1.79 (0.654, 4.890)	–

Note. Significant transition ORs in bold. Asymmetric confidence intervals indicate significance when the CI does not include 1.
Note. The reference group represents all covariates at sample mean. For example, OR 5.0 for transitioning across profiles refers to five times higher likelihood for that transition given one unit increase in changes in stressors. A value below one would indicate that the transition is less likely given one unit increase in changes in stressors than if all covariates were at sample mean.

Table 9
Effects of 1 SD increase of changes in challenge stressors on transition table odds ratio (95 % CI).

	Neither bored nor exhausted T2	Exhausted, somewhat bored T2	Somewhat bored, somewhat exhausted T2	Somewhat exhausted T2
Neither bored nor exhausted T1	–	2.26 (0.742, 6.898)	0.39 (0.134, 1.154)	**2.42 (1.252, 4.662)**
Exhausted, somewhat bored T1	0.442 (0.145, 1.347)	–	**0.174 (0.031, 0.990)**	1.068 (0.415, 2.750)
Somewhat bored, somewhat exhausted T1	2.54 (0.867, 7.456)	**5.75 (1.010, 32.765)**	–	**6.14 (1.933, 19.505)**
Somewhat exhausted T1	**0.41 (0.215, 0.799)**	0.94 (0.364, 2.412)	**0.163 (0.051, 0.517)**	–

Note. Significant transition ORs in bold. Asymmetric confidence intervals indicate significance when the CI does not include 1.
Note. The reference group represents all covariates at sample mean. For example, OR 5.0 for transitioning across profiles refers to five times higher likelihood for that transition given one unit increase in changes in stressors. A value below one would indicate that the transition is less likely given one unit increase in changes in stressors than if all covariates were at sample mean.

4. Discussion

This paper consisted of a cross-sectional study (i.e., Study 1) and a field study with two measurement points (i.e., Study 2) that aimed to examine different combinations of job boredom and exhaustion among employees and whether and how these experiences change over time. We found in both studies that job boredom and exhaustion are not mutually exclusive and can occur in tandem. Study 2 also showed that the frequency of these experiences is rather stable over time and that for employees who reported changes, the experience tended to change towards more boredom and/or exhaustion. Moreover, both studies showed that hindrance stressors increased the likelihood of experiencing both exhaustion and boredom at work, whereas challenge stressors were a stronger predictor of experiencing more exhaustion.

4.1. Employees may be both bored and exhausted

Across the two studies, we discovered that some employees reported neither boredom nor exhaustion and could therefore be considered to represent a relatively healthy employee profile. We also found that for many employees, exhaustion was a more prevalent experience than boredom at work. However, other employees experienced both boredom and exhaustion at work, rather than just one or the other. Even though studies have conceptualized these states as resulting from opposite conditions, namely that of lacking demands vs. excessive demands, these findings imply that boredom and exhaustion may occur in tandem. Moreover, for some employees the frequency of these experiences grew over time. While these changes were to some extent explained by changes in job stressors, we also performed supplementary analyses to examine whether and to which direction job boredom and exhaustion predicted each other and found a positive reciprocal relation between the two states. Hence, it is possible that for some employees, recurring experience of boredom at work increases exhaustion. Supporting this, Sousa and Neves (2021) found that job boredom was positively related to exhaustion via affective rumination. Boredom at work is an aversive experience which, as such, is straining and stressful (Danna & Griffin, 1999), as indicated by previous studies (e.g., Harju et al., 2014; Matthews et al., 2000; van Hooff & van Hooft, 2014). Alternatively, job boredom may develop as a response to exhaustion. This may reflect a process, where exhausted employees lose a sense of meaning and purpose in their work (Maslach et al., 2001), which is a fertile ground for boredom to grow (Pekrun, 2006; Westgate & Wilson, 2018).

Although we found that some employees reported frequent exhaustion without experiencing boredom (Study 2), frequently experienced boredom at work was typically accompanied by frequent exhaustion. This may indicate a difference between exhaustion and boredom at work. Specifically, employees may be fatigued while remaining interested in their work, whereas boredom at work may be an exhausting experience in itself. It should be noted that for most employees, the frequency of these experiences did not considerably change over a study period of 18 months meaning that employees who were bored and exhausted at work were likely to stay that way. This may illustrate emotional inertia of boredom (De Longis et al., 2022), or it may also illustrate that the boring and exhausting aspects of work tend to remain constant. Boredom, like other unpleasant affect, may be automatically triggered by a frequent situation or an event and thus become a prevailing experience at work (Daniels et al., 2004). Hence, even though boredom at work is a transient affective state (Fisher, 1993), it may reoccur given the prevalence of its causes in the work environment.

4.2. Hindrance stressors drive both boredom and exhaustion

Across the two studies, higher hindrance stressors increased the likelihood of more frequent boredom and exhaustion whereas higher challenge stressors were positively associated with more frequent exhaustion and less frequent boredom. In Study 1, where the role of autonomy was also examined, we found that different combinations of exhaustion and boredom at work were driven by job stressors rather than lacking resources. Specifically, perceptions of having more autonomy distinguished employees who reported neither boredom nor exhaustion from those who reported more exhaustion. Although we did not focus on work engagement in this study, this finding may reflect the role of job resources in determining who are engaged and well at work and who are exhausted (Demerouti et al., 2001). In our study, job resources (i.e., autonomy) did not seem to play an important role in distinguishing employees who experienced boredom at work.

Furthermore, we found that increases in hindrance stressors increased the likelihood of transitioning towards profiles with higher

levels of both boredom and exhaustion. While earlier research literature has focused on job boredom as a function of lacking challenges (e.g., Daniels et al., 2004), this study implies that hindrance stressors play an important role in the emergence and intensification of boredom as well as exhaustion at work. These findings resonate with the notion of boredom as a response to individuals wanting to, but not being able to, engage in satisfying activity (Eastwood et al., 2012). Hindrance stressors represent obstacles for employees to get involved in their work and perform their task in a satisfying way. As hindrance stressors are also associated with strain (Crawford et al., 2010), they explain why employees may be both bored and exhausted at the workplace.

The finding that increases in challenge stressors increased the likelihood of more exhaustion rather than both boredom and exhaustion, aligns with challenge – hindrance stressor framework, wherein challenging stressors, while potentially stimulating, may also be straining for the employees (Crawford et al., 2010). We also expected increases in challenge stressors to predict less boredom at work but did not find strong evidence to support this hypothesis. This may be explained by the "double-edged sword" effect of challenge stressors that we observed, whereby increases in challenge stressors were boredom-reducing for some employees while exhaustion-inducing for others. Hence, even though boredom at work is often understood as a function of work underload (Reijseger et al., 2013; Sousa & Neves, 2021) quantitative underload may not be the main driver of boredom at work (Harju et al., 2022). Studies have shown that merely intensifying work is more likely to strain employees than motivate them, unless more work comes with enriched tasks (Campion & McClelland, 1993). These different patterns may also reflect the role of individual appraisals in determining whether a given stressor is challenging or hindering. While this study did not focus on appraisal processes, earlier research has shown that employees may perceive some challenge stressors, such as workload, as hindrance stressors (Webster et al., 2011). Even though workload and time pressure are typically considered as challenge stressors in research, they may not be perceived motivating as much as impediments by some employees.

4.3. Limitations and suggestions for further research

This study has limitations that need to be addressed. First, the sample size for Study 1 was much smaller than in Study 2, which may have influenced the differences in profile solutions. However, it is noteworthy that both of these studies using datasets from different countries and different measurement instruments captured mainly similar profiles, lending credence to the key findings. We urge future studies to further employ person-centered methods to uncover different types of (un-)well-being profiles among employees and examine their causes. For example, studies could examine how work engagement may combine with boredom and exhaustion. Exploring whether employees who report recurring boredom and exhaustion also report low engagement, or whether and why engaged employees may also report frequent boredom at work could broaden the often bi-polar understanding of employee well-being and shed light on the nuances concerning these experiences among the workforce. In addition to further studies on how boredom at work combines with other employee experiences, it would also be important to investigate the implications of these different combinations for employees. While it is plausible that combination of boredom and exhaustion at work is more detrimental for employee health and performance than either boredom or exhaustion alone, future studies need to empirically examine the consequences of these different configurations of boredom and exhaustion.

On this note, the diversity of these experiences may also vary depending on the diversity of employee populations. The findings of this study are based on non-representative samples of employees in the United Kingdom and Finland and should not be generalized to other cultural contexts. It would be interesting and important to examine how boredom and exhaustion manifest in more culturally diverse and non-western employee populations.

Second, in Study 2 we used a shortened three-item instrument to measure job boredom. However, we selected the three items that represented different aspects of boredom that had the highest factor loadings in Study 1. Additionally, we used the dataset of Study 1 to assess the validity of the three-item measure against the six-item measure, and the correlation between these two measures was very high ($r = 0.94$).

Lastly, we operationalized challenge stressors as workload and work pressure in this study. Even though this is commonly done (e.g., Crawford et al., 2010), other types of challenges may also have distinct implications on employee well-being. For example, studies have found that increasing the quality and complexity of tasks enhance motivation rather than strain (e.g., Campion & McClelland, 1993). This may be explained by the potential motivational effect of cognitive demands, which is suggested to make the jobs more meaningful and thus buffer the straining effects (Morgeson & Humphrey, 2006). Future studies could therefore distinguish these different types of challenge stressors in examining their effects on different employee well-being profiles. We also urge studies to zoom into the interactions of challenge and hindrance stressors, and examine whether the motivating potential of challenges is moderated by the level of hindrance stressors. Lastly, it could also be useful to examine the role of various job resources in predicting distinct well-being profiles among employees. While this study focused on the impact of distinct job stressors, we included decision making autonomy in Study 1 and found that job stressors explained profiles of boredom and exhaustion more prominently. Lacking other types of job resources could nevertheless explain, why some employees may be bored or exhausted. For example, lacking job resources such as task variety and task significance that make the work feel worthwhile (Hackman & Oldham, 1976) may foster job boredom. Lacking social support, in turn, may explain why employees are exhausted (Maslach et al., 2001). Uncovering such differences underlying boredom and exhaustion may further extend understanding on these phenomena prevailing at workplaces.

4.4. Practical implications

The cost of employee stress and exhaustion is huge for organizations and societies (Hassard et al., 2018). Our study suggests, however, that a great portion of employees are not just exhausted but also frequently bored at work, that is, lacking both energy and

interest in work, which calls for managers' attention. Strikingly, our results indicate that employees tended to remain in their profile throughout the study period of 18 months. This means that boredom, like exhaustion, may not just pass on its own, and that identifying the drivers of these different states of well-being may help managers to design effective interventions to improve employee well-being or, better yet, prevent problems from emerging.

To this end, our study suggests that diagnosing threats to employee well-being should be done with care to address them effectively. While the first instinct in organizations might be to increase challenging aspects of work to tackle employee boredom, it may not always be the best way to re-design work. Our findings indicate that increases in workload may rather result in more exhaustion than less boredom. This may be especially the case, if increases in workload are not accompanied by an increase in the motivational aspects of work, such as job complexity and responsibility (Johns, 2010).

Inversely, reducing workload may not be the best remedy for those employees who are both bored and exhausted and that addressing hindrance stressors may be more efficient for this group of employees. Managers can thus improve employee well-being by addressing the aspects of work that prevent employees from accomplishing their goals, for example, by getting rid of unnecessary red-tape and making sure employees know what is expected of them in their respective roles.

4.5. Conclusions

Work stress and exhaustion are often juxtaposed with boredom at work, which may not be as easily identified nor admitted in organizations. Contrasting this, we found that job boredom and exhaustion may often co-exist and prevail over time. Particularly hindrance demands increased the likelihood of belonging to profiles characterized by prevalent boredom and exhaustion. These findings suggest that it is possible to be both bored and exhausted at work and that hindrance demands may explain why.

Ethical statement

The study protocol was approved by the ethical committee of the Finnish Institute of Occupational Health (Hakanen 01 16; 29.1.2016).

CRediT authorship contribution statement

Lotta K. Harju: Conceptualization, Methodology, Formal analysis, Data curation, Software, Writing – original draft, Visualization. **Piia Seppälä:** Writing – review & editing. **Jari J. Hakanen:** Writing – review & editing.

Declaration of competing interest

The authors declare no conflict of interest.

Data availability

Data will be made available on request.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jvb.2023.103898.

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