Are intensified job demands positive challenges for employees? Associations with work engagement in different occupational samples

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Abstract

Purpose – Intensified job demands (IJDs; work intensification, intensified job- and career-related planning and decision-making demands, and intensified learning demands) illustrate the intensification of working life. This study examined relationships between IJDs and work engagement.

Design/methodology/approach – Nine diverse samples (n = 7,786) were analyzed separately via regression analysis by estimating linear and curvilinear relationships between IJDs and engagement.

Findings – The results showed that certain subdimensions of IJDs, i.e. intensified learning demands, related positively to engagement across several subsamples. Moreover, learning demands showed a curvilinear relationship with engagement in several subsamples; engagement was highest in a moderate level of learning demands whereas low and high levels of learning demands were associated with lower engagement. We also found that other subdimensions of IJDs did not show consistent positive relationships with engagement, and some of them were negatively associated with engagement.

Research limitations/implications – Cross-sectional design.

Practical implications – Organizations should consider what would be the optimal level of learning demands as excessive learning demands can be detrimental to employees' engagement.

Originality/value – This is a first study focusing on different manifestations of the intensification of working life, operationalized via IJDs, and their curvilinear relationships with engagement by applying a multi-sample design.

Keywords Work engagement, Job demands, Curvilinear relationships, Multi-sample study

Paper type Research paper

1. Introduction

Job characteristics have long been divided into hindrances and challenges (Cavanaugh *et al.*, 1998; Crawford *et al.*, 2010; Glazer and Ion, 2023; LePine, 2022; LePine *et al.*, 2005; Mazzola and Disselhorst, 2019; Podsakoff *et al.*, 2007). This distinction also forms the foundations of the challenge-hindrance framework (CHF) originally developed by Cavanaugh *et al.* (1998, 2000). In brief, the CHF describes the various characteristics of job demands (stressors) and their partly differing effects on individuals' well-being and motivation. Specifically, the CHF (Cavanaugh *et al.*, 2000; Crawford *et al.*, 2010; LePine *et al.*, 2005; LePine, 2022) argues that hindering job demands tend to result in negative outcomes (e.g. strain, poorer well-being)

because they arise from organizational constraints and practices that hinder employees from accomplishing their work tasks. Hindering job demands are resource draining, which, in turn, has negative consequences for well-being. Challenging job demands - the focus of the present study - are organization- or work-related demands that promote employees' growth and personal development in spite of requiring also mental effort at work (Crawford *et al.*, 2010; Cavanaugh *et al.*, 2000; LePine, 2022; Kubicek *et al.*, 2022; LePine *et al.*, 2005). Challenge demands may be handled better than hindrance demands and may also be mentally inspiring. Consequently, challenge demands can be more motivating and result in positive motivational outcomes, such as improved performance, personal growth, and engagement (LePine, 2022; LePine *et al.*, 2005; O'Brien and Beehr, 2019).

Although the CHF has been regarded as a sound practical tool in distinguishing and measuring different job demands in occupational contexts (O'Brien and Beehr, 2019; Podsakoff *et al.*, 2007), its basic premises have also been criticized, and scholars suggest that some assumptions of the CHF would benefit from additional research evidence (e.g. Glazer and Ion, 2023; Mazzola and Disselhorst, 2019). Moreover, some earlier results are actually contradictory. For example, some researchers have shown that challenge demands are consistently, that is, across different studies and samples, associated with positive motivational outcomes (LePine, 2022; O'Brien and Beehr, 2019). Nevertheless, other researchers (Mazzola and Disselhorst, 2019) have found that there is no firm empirical evidence to indicate that challenge demands are associated with positive (motivational) outcomes, as stated in the original CHF (Cavanaugh *et al.*, 1998; Cavanaugh *et al.*, 2000) and in meta-analyses and reviews (e.g. Crawford *et al.*, 2010; LePine *et al.*, 2005; LePine, 2022; Podsakoff *et al.*, 2007; Webster and Adams, 2015). Mazzola and Disselhorst (2019) even exhort employers not to increase challenge stressors at workplaces to boost personnel motivation and performance until more empirical evidence of their real positive effects has been gathered (see also Kubicek *et al.*, 2022). Other scholars have called for new empirical studies on the effects of challenge demands because these effects are less firmly established than the acknowledged negative effects found with regard to hindrance demands (Glazer and Ion, 2023; Kubicek *et al.*, 2022; LePine, 2022; Mazzola and Disselhorst, 2019; O'Brien and Beehr, 2019; Podsakoff *et al.*, 2007).

The contradictory findings described above guided our research to focus on challenges rather than hindrances. Moreover, even though the curvilinear effects of challenge demands were proposed in the initial CHF (Cavanaugh *et al.*, 1998; O'Brien and Beehr, 2019), these have rarely been empirically tested. Curvilinearity, in this case, would mean that the effects of a challenge demand are conditional upon the level of the demand. Altogether, we propose that both linear and curvilinear effects of challenge demands require better empirical confirmation, which we aim to do in this study. To address previous research gaps, we explore linear and curvilinear relationships between specific challenge demands, that is, *intensified job demands* (henceforth *IJDs)* and work engagement. IJDs have recently been defined as topical, common, and predominantly mental job demands in intensified and technologically accelerated working life (e.g. Herttalampi *et al.*, 2023; Huhtala *et al.*, 2021; Korunka *et al.*, 2015; Kubicek *et al.*, 2015; Mauno *et al.*, 2023, 2019). *Work engagement* (henceforth engagement), in turn, refers to a positive, fulfilling work-related state of mind characterized by vigor, dedication, and absorption (Schaufeli *et al.*, 2002, 2019; Schaufeli and Bakker, 2004). We regard engagement as a relevant positive motivational experience which, according to the CHF (Cavanaugh *et al.*, 2000; Crawford *et al.*, 2010; LePine *et al.*, 2005; LePine, 2022; Podsakoff *et al.*, 2007), can be assumed to be responsive to challenge demands. Accordingly, we study engagement as a criterion variable in relation to specific challenge demands (IJDs).

Our study is based on extensive data sets ($N = 7,786$) collected in nine different occupational contexts representing among other education, healthcare, retail trade, and industry. We analyzed each occupational sample separately to explore whether the relationships between IJDs and engagement were generalizable across the contexts or conditional upon the context.

LePine (2022), the developer of the CHF, has called for more attention to be paid to contextual factors in studies focusing on the CHF. This can be achieved by examining different occupational contexts, which may affect both an employee's appraisal of job demands as well as their possibly different outcomes. Indeed, the relevance of job demand(s) may always vary by occupational context, which we consider in the present study. Next, we describe the key phenomenon (IJDs) in a more detailed manner and explain the theoretical underpinnings of this study.

1.1 Describing intensified job demands (IJDs) as challenge demands

Working life has changed tremendously in recent decades in concert with job demands employees are facing with across occupations (e.g. Huhtala *et al.*, 2021; Kubicek *et al.*, 2015; Mauno and Kinnunen, 2021; Menon *et al.*, 2020; Minkkinen *et al.*, 2021; Rosa, 2003). The IJDs model describes the multifaceted essence of the quantitative and qualitative intensification of working life arising from the technological and social acceleration of the post-modern information society (Kubicek *et al.*, 2015; Mauno and Kinnunen, 2021; Rosa, 2003). We propose that IJDs capture the increasing mental complexity of work that employees are expected to deal with in contemporary post-modern information society fairly well. Because IJDs (described below) consisting of increases in different mental job demands may also evoke positive esteress (Herttalampi *et al.*, 2023; Korunka *et al.*, 2015; Mauno *et al.*, 2023), in this study we approach IJDs as challenge demands.

Specifically, the IJDs model (Kubicek *et al.*, 2015; Mauno *et al.*, 2019) proposes that the intensification of working life occurs in areas where job demands have become quantitatively more demanding (employees are expected to work faster/more effectively), and/or qualitatively more intense (employees are expected to put greater mental effort into their work). The multidimensional IJDs model has been increasingly applied to explore different facets of the intensification of working life (for a review, see Mauno *et al.*, 2023). Next, we briefly introduce the subdimensions of the IJDs model.

The first subdimension, *work intensification* (WI), corresponds to the traditional view of work intensification as increased working pace and time pressures (Green, 2004). According to Kubicek *et al.* (2015), this facet describes needs to work faster and handle time pressures and to perform different work tasks simultaneously. The second subdimension is *intensified job-related planning and decision-making demands* (IJP) and refers to increases in decision-making authority concerning work tasks, proposing that in contemporary working life employees increasingly decide for themselves, which tasks they need to perform (autonomy in planning) and how to perform them (autonomy in doing) in daily working. The third subdimension, *career-related planning and decision-making demands* (ICP), in turn, means that employees increasingly manage their own employability with the current employer, but are also increasingly aware of and receptive to other external career opportunities. Thus, both job- and career-related planning and decision-making demands underline that employees display initiative and proactive behaviors concerning their current work and career prospects. Finally, the subdimension of *intensified learning demands* (ILD) refers to increased demands to improve one's work-related knowledge, skills, and competencies. Employees increasingly update their job-relevant *knowledge* and competencies and adjust their *skills* to accomplish their work. This IJDs model has been increasingly applied in contemporary occupational health psychology (e.g. Herttalampi *et al.*, 2023; Korunka *et al.*, 2015; Kubicek *et al.*, 2015; Mauno *et al.*, 2023, 2019; Mauno and Kinnunen, 2021; Minkkinen *et al.*, 2021).

We propose that four dimensions of the IJDs model described above can be perceived as challenge demands according to the argumentation of the CHF. Time pressure/quantitative workload have previously been regarded as a challenge demand in the CHF and related empirical studies due to their high motivation potential (Cavanaugh *et al.*, 1998; Kubicek *et al.*, 2022; LePine *et al.*, 2005; LePine, 2022; O'Brien and Beehr, 2019; Prem *et al.*, 2017).

We therefore define the subdimension of WI as a potential challenge demand. However, it is good to bear in mind that there is empirical evidence showing that WI may also be associated with negative well-being consequences resembling in this respect a hindrance demand (e.g. Mauno *et al.*, 2023; Minkkinen *et al.*, 2021). Furthermore, some challenge demands can have both negative (e.g. occupational ill-being) and positive consequences, e.g. work motivation and performance (e.g. Crawford *et al.*, 2010; Mazzola and Disselhorst, 2019; O'Brien and Beehr, 2019; Podsakoff *et al.*, 2007; Prem *et al.*, 2017; Webster and Adams, 2015). Nevertheless, viewed in the light of the original CHF, we define WI as a challenge demand that should be positively related to engagement.

The other three subdimensions of IJDs, that is, IJP, ICP, and ILD, are clearly challenge demands in nature as they consist of mental demands and job complexity that relate to employees' job- and career-based autonomy and independence (IJP, ICP) and opportunities to acquire new skills, knowledge, and competences at work (ILD). According to the CHF, such complex job demands that require mental effort are likely to be motivating (Crawford *et al.*, 2010; Kubicek *et al.*, 2022; LePine, 2022; Mazzola and Disselhorst, 2019; O'Brien and Beehr, 2019; Podsakoff *et al.*, 2007). However, it has also been argued that challenge demands may be motivating (improving employees' performance, growth, or engagement) only up to the certain point (see Baethge *et al.*, 2018; Kubicek *et al.*, 2022; O'Brien and Beehr, 2019). Consequently, it has been proposed that the motivational effects of challenge demands may well be *curvilinear* (Cavanaugh *et al.*, 1998; Mazzola and Disselhorst, 2019; O'Brian and Beehr, 2019). This means that challenge demands (IJDs in this study) should result in optimal motivational outcomes when they are neither too low nor too high, but rather at a moderate level. Low challenges may be demotivating, whereas too high challenges may be distressing, and likely to suppress their positive effects. Extreme challenge demands may also turn into hindrances and thus decrease their initial positive impacts (O'Brien and Beehr, 2019; Prem *et al.*, 2017). Even though this reasoning sounds sensible, only few studies have empirically explored this assumption by performing curvilinear analyses of challenge demands. For example, Harrison (1985) observed that job complexity showed a curvilinear effect on employees' depression, but no motivational outcomes were explored in this groundbreaking study. For this reason, we also explore curvilinear relationships between challenge demands (IJDs) and a specific motivational outcome (engagement).

1.2 Hypotheses and their theoretical foundations

The present study and its hypotheses were inspired by two theories, namely, the above-described CHF (see Crawford *et al.*, 2010; Cavanaugh *et al.*, 2000; LePine, 2022; LePine *et al.*, 2005) and the conservation of resources theory (henceforth COR theory, see Hobfoll, 1989; Hobfoll and Shirom, 2001; Hobfoll *et al.*, 2018). Perceiving that CHF provided a meaningful distinction between job demands' challenges and hindrances and their different outcomes, we explore whether IJDs are challenge demands associated with positive outcomes (engagement). COR theory has been deemed a useful framework in occupational stress and well-being research (e.g. Haar and Harris, 2023; Hobfoll *et al.*, 2018; Moazami-Goodarzi *et al.*, 2015). It suggests that people are motivated to conserve and protect their resources, whether material (e.g. employment, money, status) or immaterial (e.g. health, well-being, social capital). Furthermore, COR theory argues that resources tend to form accumulative spirals (resource caravans). Similarly, resource losses accumulate, resulting in spirals of resource losses, describing the negative pathways between resource shortages. Generally, people want to conserve their resources and avoid resource losses. Applying COR theory to our study, we suggest that different challenging job demands, due to their large motivation potential argued in CHF (Crawford *et al.*, 2010; Cavanaugh *et al.*, 2000; Kubicek *et al.*, 2022; LePine, 2022; LePine *et al.*, 2005), may be regarded as resources enabling employees to gain other resources. We view IJDs as subtypes of challenging job demands

resulting in accumulation of resources, including work-related engagement, in line with the assumption that experiences of motivation and well-being are indeed resources. Consistent with the CHF and COR theories, our first hypothesis (H1) states that:

H1. All four subdimensions of IJDs (WI, IJP, ICP, and LD), representing challenge demands, will be positively associated with engagement.

More specifically, in line with COR theory, we propose that WI may help employees achieve work goals effectively, whereas ICP may help them gather beneficial work-related networks for resource accumulation with higher engagement as a motivational outcome of experiencing challenging job demands. Similarly, the subdimensions of LD and IJP may help employees gain additional resources, for example, improved competences and skills at work (learning demands as positive challenges) or better decision-latitude and autonomy in accomplishing work (planning and decision-making demands as positive challenges). Such experiences are positively reflected in engagement signaling resource accumulation at work.

Furthermore, we also argue that when a challenge demand (i.e. any subdimension of the IJDs) is high or low, the level of engagement will be lower than in the situation when this particular challenge demand is at a moderately high level. A moderately high challenge demand (reasonable challenges) should produce the best motivational outcomes (engagement) (O'Brien and Beehr, 2019). A less challenging working environment may be demotivating, whereas an extremely challenging working environment maybe distressing and resource depleting, and these both situations would produce lower motivation, that is, lower engagement. This reasoning is again explicable through COR theory (Hobfoll, 1989; Hobfoll *et al.*, 2018; Hobfoll and Shirom, 2001); too low challenging demands do not encourage employees to undertake additional resource gathering but result rather in amotivational states or lower motivational states. However, excessively challenging demands potentially deplete employees' psychosocial resources, become negative stressors, and hinder other resource acquisition, which is detrimental to resource accumulation, including employee engagement. Thus, COR theory was applicable in explaining both the direct positive and curvilinear effects on engagement of the challenge demands (IJDs). Consistent with this reasoning our second hypothesis (H2) states that:

H2. All four subdimensions of IJDs will show a *curvilinear relationship* with engagement, meaning that the level of engagement is conditional upon the level of IJDs.

We analyze linear (H1) and curvilinear relationships (H2) using occupationally diverse subsamples to examine whether they are generalizable across (or conditional upon) different occupational contexts representing among others education, healthcare, retail trade, and industry. It has recently been claimed that different contextual factors, e.g. occupational contexts, should be more carefully considered in studying the CHF because contextual factors may affect the relationships between job demands and their outcomes, i.e. act as moderators (LePine, 2022). However, we do not hypothesize occupational variation in the associations studied but analyze this possibility as we were able to utilize large and occupationally diverse data sets (N = 7,786). Next, we describe the research methodology applied in our study (data collection, participants, measures, and statistical analyses), followed by the results (direct and curvilinear associations), and discussion (theoretical and practical implications, and study limitations).

2. Methods
2.1 Data collection and participants
The study was carried out in nine occupationally heterogeneous subsamples as a part of a large research project investigating the intensification of working life. The subsamples and data (including means and standard deviations of IJDs) have been described in more detail in

earlier publications (anonymized references), which, however, have focused on aspects other than testing the challenge hypothesis. The data collection was implemented in nine subsamples between 2017 and 2019, when we collected these cross-sectional data sets by means of an electronic survey. Eight out of nine subsamples were collected via the membership registers of the Finnish national trade unions: The Finnish Union of University Professors (professors), the Finnish Union of University Researchers and Teachers (academics), the Union of Finnish Business School Graduates (economists), Academic Architects and Engineers in Finland TEK (engineers), the Trade Union of Education OAJ (teachers), the Industrial Union (industrial employees), Service Union United PAM (service sector employees), and the Trade Union Pro (industrial and financial professionals). The ninth subsample was collected from the personnel of one large healthcare organization (hospital employees). This subsample was intended to sue in an organizational case study in this larger research project and was not therefore based on trade union registers. The numbers of participants and their basic demographical background factors across nine subsamples are shown in Table 1. It is noteworthy that we present only demographical information (gender, education, age) which was available in each subsample as surveys and variables were not fully identical across subsamples.

There were 7,786 respondents in this study. The response rates varied between 13 and 48% depending on the subsample (3 anonymized references). Gender distribution varied statistically significantly by subsample (χ^2 (8) = 1275.32; $p < 0.001$). The female-dominated samples were OAJ (79% women), PAM (75% women) and the healthcare organization (87%), while the male-dominated organizations were the Union of Professors (64%), TEK (71%) and the Industrial Union (74%). The levels of education also differed significantly between the subsamples in all comparisons (Games-Howell test, $p < 0.001$), except for the comparison between TEK and the Finnish Business School Graduates (Games-Howell test, $p = 0.055$). Respondents from the unions of Professors and University Researchers and Teachers had the highest levels of education, while the respondents from the Industrial Union and PAM had the lowest levels of education. The oldest employees were in the Union of Professors and the youngest in PAM, and these subsamples differed from all other subsamples in terms of average age (Games-Howell test, $p < 0.001$).

2.2 Measures

Intensified job demands (IJDs) were measured using the 19-item Intensification of Job Demands Scale (IJDs scale; Kubicek *et al.*, 2015; 3 anonymized references). The factor structure of the IJDs scale and the reliabilities of the subscales have been found to be good in European samples, including Finnish samples (Korunka *et al.*, 2015; Kubicek *et al.*, 2015, Mauno *et al.*, 2019; 3 anonymized references). Respondents were asked to rate whether they had experienced intensification regarding different job demands (defined in the Introduction; WI, IJP, ICP, and ILD) during the last five years (or during a shorter time period if they had been working less than five years in their current position). Each item was rated on a 5-point Likert scale ranging from 1 (completely disagree) to 5 (completely agree), with higher mean scores indicating greater intensification in perceived job demands.

In this study, IJDs were examined using four subdimensions. *Work intensification* (WI) was measured with five items (e.g. "Ever more work has to be completed by fewer and fewer employees"). Reliability coefficients for the WI subdimension were acceptable across the subsamples (Cronbach's alpha coefficients ranged from 0.85 to 0.90). *Intensified job-related planning and decision-making demands* (IJP) were measured with five items (e.g. "One has to increasingly check independently whether the work goals have been reached"). Reliabilities for the IJP subdimension were high, at 0.81–0.86 across the subsamples. *Intensified career-related planning and decision-making demands* (ICP) were measured with three items

	1 n (%) n = 547	2 n (%) n = 773	3 n (%) n = 486	4 n (%) n = 373	5 n (%) n = 2246	6 n (%) n = 587	7 n (%) n = 761	8 n (%) n = 643	9 n (%) n = 999	Total sample n (%)
Gender										
Female	195 (35.6)	508 (65.7)	316 (65.0)	108 (29.0)	1784 (79.4)	154 (26.2)	571 (75.0)	414 (64.4)	868 (86.9)	4918 (63.2)
Male	352 (64.4)	265 (34.3)	170 (35.0)	265 (71.0)	462 (20.6)	433 (73.8)	190 (25.0)	229 (35.6)	131 (13.1)	2497 (32.1)
Education										
Comprehensive school									12 (1.2)	12 (0.2)
Vocational school/upper secondary school		6 (0.8)			24 (1.1)		90 (11.8)		121 (11.9)	328 (84.4)
Special vocational degree					15 (0.7)	408 (69.3)	465 (61.0)	165 (25.7)	17 (1.7)	1070 (14.4)
Vocational post-secondary degree					152 (6.7)	39 (6.6)	43 (5.6)	42 (6.5)	244 (24.0)	520 (7.0)
Bachelor's degree or vocational university degree				11 (3.0)	466 (20.7)	43 (7.3)	86 (11.3)	200 (31.1)	384 (37.7)	1210 (16.3)
Master's degree or higher vocational university degree		281 (37.3)	449 (94.3)	321 (87.7)	1509 (66.9)	21 (3.6)	64 (8.4)	183 (28.5)	146 (14.3)	2974 (40.1)
Doctoral or licentiate degree	547 (100)	466 (61.9)	13 (2.7)	34 (9.3)	88 (3.9)	1 (0.2)	14 (1.8)	37 (5.8)	94 (9.2)	1294 (17.5)
Age										
Mean (SD)	7.6 (1.5)	5.6 (2.0)	5.5 (2.0)	5.5 (2.1)	5.9 (2.5)	5.3 (2.4)	3.9 (2.5)	5.9 (2.0)	5.5 (2.3)	5.6 (2.4)

Note(s): 1 = Professors, 2 = Academics, 3 = Economists, 4 = Engineers, 5 = Teachers, 6 = Industry employees, 7 = Service sector employees, 8 = Industry and financial professionals, 9 = hospital employees
Source(s): Created by authors

Table 1.
Background characteristics across nine subsamples

(e.g. "One's own professional development increasingly requires keeping other alternatives open"). Reliabilities for the IJP subdimension were acceptable across subsamples (α = 0.74–0.80). Finally, *intensified learning demands* (ILD) were measured with six items (e.g. "One has to acquire new expertise for the job more often" and "One has to use new work equipment (devices, programs, etc.) more often"). In the original IJDs scale, ILDs are related to both knowledge and skills and have been measured by two subscales, which, however, have been strongly correlated in earlier studies (r = 0.70–0.90) and therefore can be combined into one scale (Kubicek *et al.*, 2015, 3 anonymized references). Reliabilities for the ILD subdimension were high across subsamples varying between 0.91 and 0.94.

The dependent variable, that is, *work engagement* was measured with the Ultra-Short Measure of Work Engagement (UWES-3; Schaufeli *et al.*, 2019), which is a shortened version of the original Utrecht Work Engagement Scale (UWES; Schaufeli *et al.*, 2002; Schaufeli *et al.*, 2019). The scale includes three items representing the three subdimensions of engagement: "At work, I feel that I am bursting with energy" (vigor), "I am enthusiastic about my job" (dedication) and "I am immersed in my work" (absorption), with the response range from never (1) to daily (7), high scores indicating high engagement. Reliabilities for the engagement scale were high across subsamples (α = 0.80–0.87).

2.3 Statistical analyses

The relationships between the subdimensions of IJDs and engagement were investigated via hierarchical regression analysis, where, in the first step, the background variables gender, age, and education were entered to control for their effects (these variables were available in all subsamples). In the second step, the four subdimensions of IJDs were entered as standardized scores (abbreviations in the regression table WI, IJP, ICP, ILD). In the third step, the standardized IJDs were entered as interaction terms (abbreviations in the regression table WI × WI, IJP × IJP, ICP × ICP, ILD × ILD). Interaction terms were modeled to analyze the effect of the *level* of IJDs (each subdimension) on engagement depicting their potential curvilinearity. Statistically significant interaction effects were interpreted as figures based on the key parameter values (regression coefficients, their standard deviations and confidence intervals). Because we were also interested in the generalizability versus specificity of the relationships across occupational contexts, all regression analyses were carried out separately in nine occupational subsamples. All analyses were performed with IBM SPSS Statistics, version 26. Correlation matrices including the variables analyzed in nine subsamples are available from the authors (due to space restrictions). Correlations between independent and dependent variables are marked in Table 2.

3. Results

The results of the regression analyses are presented in Table 2 by subsample. Noteworthy, each significant effect reported is based on the step when the variable/groups of variables were first entered into the model (to avoid multi-collinearity).

Regarding the *direct relationships* (testing HI), we found that IJP was related to higher engagement (see Step 2, IJP) in five out of nine subsamples (except in academics, engineers, teachers, and hospital employees). ILDs were also positively related to engagement in six out of nine subsamples (see Step 2, ILDs) (except in academics, teachers, and hospital employees). These findings supported HI, which suggested that IJDs, as challenge demands, are related positively to engagement. However, the empirical support was only partial because this hypothesis was confirmed only for two out of four dimensions of IJDs (IJP, ILD). Furthermore, contrary to our hypothesis, these positive direct relationships were not found in all nine subsamples, signifying that the occupational context moderated the associations.

Table 2.
Intensified job demands (IJDs) as predictors of work engagement in nine subsamples

Predictor[a]	1 n = 423	2 n = 535	3 n = 329	4 n = 264	5 n = 1911	6 n = 453	7 n = 542	8 n = 638	9 n = 980
Step II									
WI	−0.16*	−0.02	−0.17*	−0.15*	−0.20***	−0.18**	−0.21***	−0.17***	−0.14***
	−0.02	0.03	−0.01	−0.04	−0.17***	−0.07	−0.12**	−0.06	−0.10***
IJP	*0.14**	0.05	*0.27***	0.08	−0.01	*0.18***	*0.12**	*0.14***	−0.01
	0.17***	0.04	0.15**	0.10	−0.09***	0.11*	0.06	0.08*	0.00
ICP	0.09	−0.06	−0.20***	−0.14*	0.01	−0.05	−0.09	−0.03	0.07
	0.15***	0.01	−0.02	−0.04	−0.06**	0.05	−0.01	0.01	0.04
ILD	*0.12**	0.07	*0.18***	*0.31***	*0.06**	*0.14**	*0.18***	*0.09**	0.03
	0.17***	0.07	0.18***	0.29***	−0.01	0.11*	0.18***	0.07*	0.02
ΔR²	*0.05***	0.00	*0.07***	*0.10***	*0.04***	*0.05***	*0.05***	*0.03***	*0.02***
Step III									
WI × WI	−0.08	0.07	−0.07	−0.07	0.00	0.07	−0.03	−0.01	−0.10**
	−0.11*	0.02	−0.06	−0.03	0.05	0.05	0.06	−0.02	−0.04
IJP × IJP	−0.00	−0.00	−0.05	0.12	−0.01	−0.07	0.05	−0.11*	0.04
	−0.14**	−0.02	−0.03	0.04	0.02	−0.12**	−0.04	−0.12**	0.02
ICP × ICP	−0.05	0.03	0.03	−0.08	0.01	0.00	0.06	0.07	−0.02
	−0.14**	0.01	0.01	−0.10*	0.02	−0.07	0.02	0.01	−0.02
ILD × ILD	−0.11*	−0.15**	−0.08	−0.10*	−0.04	−0.25***	−0.16*	−0.04	0.02
	−0.18***	−0.14***	−0.05	−0.21***	−0.04	−0.16***	−0.14***	−0.07*	0.01
ΔR²	*0.03**	*0.02*	0.00	*0.02*	0.00	*0.02*	0.01	0.01	0.00

Note(s): [a] Control (background) variables at Step I (gender, age, and education) are not reported due to space limitations
1 = Professors, 2 = Academics, 3 = Economists, 4 = Engineers, 5 = Teachers, 6 = Industry employees, 7 = Service sector employees, 8 = Industry and financial professionals, 9 = hospital employees. For abbreviations: WI = work intensification; IJP = intensified job-related planning and decision-making demands; ICP = intensified career-related planning and decision-making demands; ILD = intensified learning demands
ΔR^2 Change in explanation rate and its significance when the group of predictors were entered into the regression model
Statistically significant β-coefficients and changes in explanation rates ΔR^2, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$
Standardized β- and r-coefficients (below), change in explanation rates (ΔR^2), and their statistical significance
Source(s): Created by authors

Some unexpected direct relationships were also observed. First, the subdimension of WI (Step 2, WI) was negatively (not positively) associated with engagement in eight out of nine subsamples (the exception being academics), suggesting that WI may be a hindrance rather than a challenge demand with negative outcomes, and this finding was also readily generalizable across different occupational contexts. Furthermore, ICP was related negatively to engagement in two subsamples (economists and engineers), suggesting that in these two subsamples ICP was appraised as a hindrance rather than a challenge demand, and thus with negative outcomes. These two direct negative relationships were unexpected and inconsistent with H1.

Next, we explored the *curvilinear relationships* between IJDs and engagement in each subsample. First, we created an interaction term for each IJD using standardized scores of the demands resulting altogether in four interaction terms (WI $\times$ WI, IJP $\times$ IJP, ICP $\times$ ICP, and ILD $\times$ ILD), which were entered into the regression equations at the final step. In other respects, the steps were similar to those described above (linear relationships). Significant curvilinear relationships (which were consistent with the respective correlation coefficients) were found for ILD in five out of nine subsamples (Table 2, Step 3). These curvilinear relationships are illustrated in Figures 1 and 2 (for academics and industry employees; the other three figures were similar and are available upon request due to space restrictions). The figures show that the relationship between ILD and engagement was clearly curvilinear; the highest engagement was experienced when levels of ILD were moderately high, whereas at low and high levels of ILD, lower engagement was experienced. Because this curvilinear relationship was found in altogether five subsamples, it provides relatively strong support for H2.

Two other interaction effects also emerged, but in only two subsamples. The interaction effect of IJP $\times$ IJP was significant among industry and financial professionals and was curvilinear (Table 2, Step 3). Figure 3 indicates that engagement was highest when these employees experienced moderately high IJP compared to a situation when IJPs were either low or high. This finding supported H2, albeit in only one subsample. The interaction effect of WI $\times$ WI on engagement was significant among hospital employees. However, this effect was not so clearly curvilinear but relatively flat. As shown in Figure 4, engagement was highest when WI was moderately high and started already to decrease at relatively low levels of WI. Furthermore, engagement was not particularly low at low levels of WI, suggesting that this relationship was not markedly curvilinear in this sample.
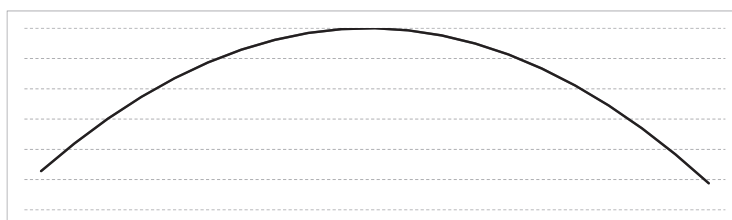
Note(s): Stand. ILD $\times$ ILD $\beta = -0.150$, $p < 0.01$, non-stand. ILD $\beta = -0.010$, SD = 0.067, CI -0.133 to 0.122, non-stand. ILD $\times$ ILD $\beta = -0.123$, SD = 0.043, CI -0.207 to 0.038
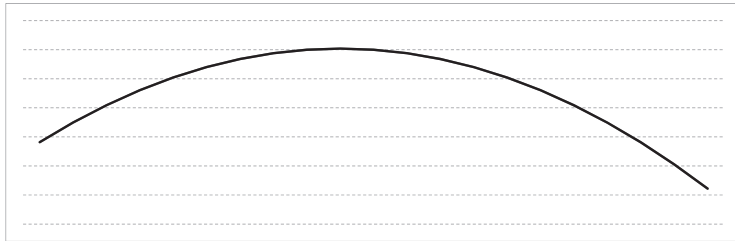**Source(s):** Created by authors

4. Discussion

The present study explored specific challenge demands of contemporary working life, that is, IJDs, and their linear and curvilinear associations with engagement by utilizing large multi-sample data sets (N = 7,786), which were analyzed separately. Our main goal was to test the assumptions concerning the boosting effects of challenge demands on motivational outcomes
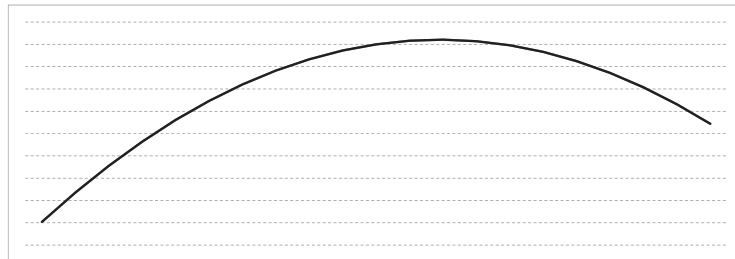

Note(s): Stand. ILD × ILD β = –0.250 p < 0.001, non-stand. ILD β = –0.080, SD = 0.112, CI 0.042 to 0.386, non-stand. ILD × ILD β = –0.199, SD = 0.066, CI –0.328 to –0.070
Source(s): Created by authors

Figure 2.
Curvilinear effect of *intensified learning demands* (ILD × ILD) on work engagement among industrial employees (subsample 6)

Note(s): Stand. IJP × IJP β = –0.110, p < 0.05, non-stand. IJP β = –0.110, SD = 0.061, CI 0.058 to 0.364, non-stand. IJP × IJP β = –0.144, SD = 0.061, CI –0.263 to –0.025
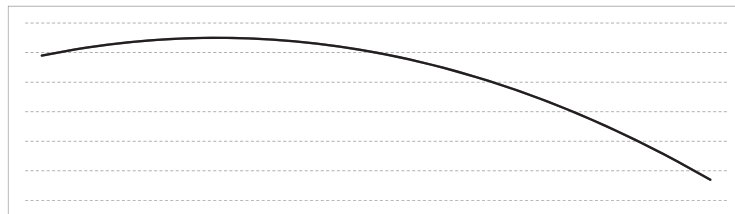**Source(s):** Created by authors

Figure 3.
Curvilinear effect of *intensified job-related planning and decision-making demands* (IJP × IJP) on work engagement among industry and financial professionals (subsample 8)

Note(s): Stand. WI × WI β = –0.100, p < 0.01, non-stand. WI β = –0.210, SD = 0.047, CI –0.258 to –0.084, non-stand. WI × WI β = –0.110, SD = 0.042, CI –0.061 to 0.105
Source(s): Created by authors

Figure 4.
Curvilinear effect of *work intensification* (WI × WI) on work engagement among hospital employees (subsample 9)

(engagement) based on the CHF (Cavanaugh *et al.*, 1998, 2000; LePine, 2022; LePine *et al.*, 2005; Podsakoff *et al.*, 2007) and COR models (Hobfoll, 1989; Hobfoll *et al.*, 2018; Hobfoll and Shirom, 2001). As far as we know, this is the first international multi-sample study to explore curvilinear associations between IJDs and engagement utilizing explicitly these theoretical models. The findings provided mixed support for the predictions of the CHF regarding its challenge hypothesis. In this respect, we highlight three key findings that will be next discussed both in terms of their theoretical and practical implications.

4.1 Theoretical implications

First, not all IJDs were positively related to engagement. Thus, not all challenge demands, defined here via IJDs, may be equally beneficial for motivational outcomes (for similar findings, see Baethge *et al.*, 2018; Kubicek *et al.*, 2022; Mazzola and Disselhorst, 2019). This means that IJDs did not show fully consistent resource accumulation effects (hypothesized according to COR theory) considering engagement as an endpoint of resource accumulation. Second, none of the significant relationships, neither direct nor curvilinear, were generalizable in each of the nine subsamples, yet certain significant relationships emerged in several subsamples. This indicates that contextual factors, such as occupational context, may be relevant in defining and analyzing challenge demands and their motivational outcomes (see LePine, 2022; O'Brien and Beehr, 2019). Third, even though dividing job demands into hindrances and challenges may be an appealing practical tool to assess job demands (LePine, 2022; O'Brien and Beehr, 2019; Prem *et al.*, 2017), such a binary distinction may be less useful or scientifically sound in real work settings due to the complexity of job demands and the occupational variations in them (Glazer and Ion, 2023; Kubicek *et al.*, 2022; Mazzola and Disselhorst, 2019). Indeed, various "third factors" may explain why the assumptions of the CHF may not always hold in empirical studies. This was also true in our multi-sample study, which resulted in mixed findings regarding the challenge hypothesis of the CHF. These will be next discussed in relation to the hypotheses.

The first hypothesis suggested that IJDs are positive challenges and will therefore relate positively to engagement, according to the challenge hypothesis (see Cavanaugh *et al.*, 2000, 1998; LePine, 2022; LePine *et al.*, 2005; O'Brien and Beehr, 2019) and the principles of resource accumulation outlined in COR theory (Hobfoll, 1989; Hobfoll *et al.*, 2018). However, we did not find unambiguous support for this hypothesis. Of the IJDs (with four subdimensions), the strongest support was obtained for intensified learning demands (ILD), which were positively associated with engagement in several subsamples (six out of nine). These results point to the conclusion that learning demands can be positive challenges at work, boosting positive motivational outcomes, as has also been suggested in the CHF (Cavanaugh *et al.*, 1998, 2000; LePine, 2022; LePine *et al.*, 2005) and documented in subsequent empirical studies of the relationships between learning/cognitive demands and motivational outcomes (e.g. Korunka *et al.*, 2015; Kubicek *et al.*, 2022; Prem *et al.*, 2017). Moreover, these results are consistent with the COR model (Hobfoll, 1989; Hobfoll *et al.*, 2018), showing that learning demands can promote other resources, for example, here, employees' engagement.

However, the motivational potential of learning demands seems to hold only to a certain extent as we found that when learning demands were higher or lower compared to their average level, they were associated with lower engagement. This was indicated by the curvilinear relationships which we found between learning demands and engagement across several subsamples (five out of nine). This interesting finding supported the second hypothesis (i.e. the relationships between IJDs and engagement are curvilinear) and is consistent with the initial challenge hypothesis of the CHF, although such curvilinearity has rarely been tested empirically (see Harrison, 1985; O'Brien and Beehr, 2019). Altogether, we can conclude that learning demands can operate as positive challenge demands but only up to

the certain point. Also, this curvilinear finding is consistent with COR theory; challenge demands (e.g. learning demands) may become hindrances, particularly if too high, starting to deplete employees' psychosocial resources resulting in decreased motivational and/or increased strain-related consequences (e.g. Harrison, 1985; O'Brien and Beehr, 2019).

Regarding other direct relationships, we found that employees' increased autonomy in job-related planning and decision-making, described by the subdimension of IJP, related to higher engagement and this association emerged again in several subsamples (five out of nine). Also, this relationship was consistent with the first hypothesis and the challenge assumption of the CHF (Cavanaugh et al., 1998, 2000; LePine, 2022; LePine et al., 2005) as well as the key premises of COR theory (Hobfoll, 1989; Hobfoll and Shirom, 2001). We take the view that the subdimension of IJP shares some conceptual overlapping with job autonomy/control, which has long been regarded as a positive job-related resource rather than as a negative demand (Karasek and Theorell, 1990). However, within the IJDs framework (see Herttalampi et al., 2023; Kubicek et al., 2015; Mauno et al., 2023, 2019; Mauno and Kinnunen, 2021) which we applied, IJP represents a work-related challenge demand caused by social acceleration (Mauno and Kinnunen, 2021; Rosa, 2003). Viewed within the CHF, our results point to the conclusion that IJP may be a challenge demand in some occupational contexts, yet not in all contexts.

The challenge hypothesis regarding the remaining two subdimensions of IJDs, i.e. WI and ICP, was not supported, signifying that not all types of IJDs can be regarded as positive challenges. Quite the reverse, the subdimension of WI, characterized by employees' perceived increases in time pressures and multitasking demands, was associated very consistently with lower engagement across subsamples (eight out of nine), implying that it is rather a hindrance than a challenge demand. Thus, we suggest that WI is a hindrance demand implying rather a resource loss than resource gain accumulation resulting in negative outcomes. Indeed, such quantitative work intensification has recently been related to negative consequences (for a review, see Mauno et al., 2023). Also, other recent studies have indicated that time pressures at work/quantitative workload (measured differently across studies), initially considered as challenges in the CHF (e.g. Cavanaugh et al., 2000; LePine, 2022; LePine et al., 2005; O'Brien and Beehr, 2019), may result in negative rather than positive outcomes (Baethge et al., 2018; Kubicek et al., 2022). The assessment of WI in the present study may partly explain its hindrance role; we measured the experiences of increased time pressures and multitasking demands during the past five years. Such a retrospective long-time frame may describe chronic time pressures which can be more difficult to overcome than episodic/momentary time pressures (Baethge et al., 2018), thus constituting a hindrance demand. As the results concerning time pressures/quantitative workload continue to be inconsistent within the CHF (i.e. whether this demand is a challenge or a hindrance), future studies should pay more attention to definitions and operationalizations of job demands describing (quantitative) workload. Contradictory findings may always reflect inconsistencies in conceptualizations and measurement.

Finally, we would like to point out that occupational context moderated many of the relationships and some direct (regarding ICP) and curvilinear relationships (regarding WI and IJP) were found to be sample-specific and not generalizable across subsamples. Although such unique findings may be useful regarding the practical implications in particular occupational contexts, we consider them less valuable in a wider and theoretical sense and do not discuss these atypical findings further. Nonetheless, it is important to keep in mind that occupational context determines the content and relevance of job demands, which needs to be considered in assessing job demands and their outcomes (see also Glazer and Ion, 2023; LePine, 2022; Mazzola and Disselhorst, 2019; O'Brien and Beehr, 2019). Furthermore, an individual's direct *appraisal* of job demands (whether she/he perceives a particular demand as a challenge or a hindrance) is crucial and constitutes a core element in psychological stress

theories ([Lazarus and Folkman, 1984](); [LePine, 2022]()). However, this premise, too, has recently been questioned. An individual's direct appraisal of job demands (hindrances vs. challenges) has not been so influential, for example, in explaining stress outcomes as previously assumed ([Glazer and Ion, 2023](); [Kubicek *et al.*, 2022]()).

4.2 Practical implications
In addition to being theoretically sound and explicable (through CHF and COR models), our results also have important implications for organizations and management. Quantitative work intensification (WI), consisting of increased time pressures, constant effectivity, and multitasking demands at work, is potentially harmful and should be minimized in organizations. First steps would include educational interventions; making managers better aware of health and well-being risks related to quantitative work intensification despite its possibly positive effects on organizations' effectivity and productivity. In the long run, these positive productivity benefits might be short-lived if employees' well-being is compromised. Moreover, continuous learning demands (ILDs) are virtually a norm in technologically driven society, and organizations and managers should realize that although a moderate amount of learning demands may well enhance employees' engagement, low and high learning demands may do the opposite. This should be considered when making training and educational plans in organizations; every employee needs enough time and an authentic demand for learning and training, whereas all futile learning should be avoided.

4.3 Limitations
There are certain noteworthy limitations in this study, which naturally direct future research on this topic and the CHF more generally. First, the design was cross-sectional and we cannot rule out the reverse causality hypothesis (i.e. engagement determines the perceptions of IJDs, not vice versa). Relatedly, due to cross-sectional data, we were unable to test for a process nature of resource accumulation (gain or loss spirals). Second, we focused on specific types of contemporary job demands, IJDs, and cannot be sure whether the findings obtained here apply to other kinds of job demands. As long as there are significant differences in defining and measuring job demands, which may affect their distinction to challenges vs. hindrances, empirical studies may easily yield inconsistent findings. Consequently, future studies should explore a wide variety of different job demands as potential challenges and hindrances with multiple potential outcomes. Moreover, job demands should be studied using well-validated scales and also by utilizing longitudinal designs. Third, we did not evaluate employees' direct appraisal, i.e. whether they appraised a particular demand as a challenge or as a hindrance, although such a direct appraisal approach has been recommended if applying the CHF in empirical studies (e.g. [LePine, 2022](); [O'Brien and Beehr, 2019](); [Prem *et al.*, 2017]()).

The final shortcoming is that we focused exclusively on the challenge hypothesis and did not examine the hindrance hypothesis. We included only motivational outcomes (engagement) in the design and excluded well-being/strain-related outcomes, which again are crucial in testing the hindrance hypothesis ([Cavanaugh *et al.*, 2000](); [LePine, 2022](); [LePine *et al.*, 2005](); [Mazzola and Disselhorst, 2019](); [O'Brien and Beehr, 2019]()). Nevertheless, we suggest that there is already quite convincing empirical support for the negative effects of IJDs on strain-based outcomes, e.g. job burnout, strain (for a review, see [Mauno *et al.*, 2023]()). Thus, we saw more novelty in testing the challenge hypothesis, on which earlier findings have generally been more inconclusive ([Kubicek *et al.*, 2022](); [Mazzola and Disselhorst, 2019]()).

4.4 Conclusions
This study produced new information on whether certain contemporary job demands (IJDs), rooted in social acceleration ([Kubicek *et al.*, 2015](); [Rosa, 2003]()), act as challenge demands

across different occupational groups. Regarding theoretical conclusions, the overall trend in our findings was in line with earlier research; the challenge hypothesis of the CHF was not unambiguously confirmed, yet reasonably well supported. This means that the CHF should not be rejected but would benefit from certain reformulations and new empirical evidence (see also LePine, 2022; Mazzola and Disselhorst, 2019; O'Brien and Beehr, 2019). Regarding practical conclusions, we highlight that occupational well-being risks associated with quantitative work intensification and continuous learning demands should be taken seriously in society and organizations.

References

Baethge, A., Vahle-Hinz, T., Schulte-Braucks, J. and van Dick, R. (2018), "A matter of time? Challenging and hindering effects of time pressure on work engagement", *Work and Stress*, Vol. 32 No. 3, pp. 228-247, doi: 10.1080/02678373.2017.1415998.

Cavanaugh, M.A., Boswell, W.R., Roehling, M.V. and Boudreau, J.W. (1998), "'Challenge' and 'hindrance' related stress among U.S. managers", Center for Advanced Resource Studies Working paper, Cornwell University, Ithaca, NY.

Cavanaugh, M.A., Boswell, W.R., Roehling, M.V. and Boudreau, J.W. (2000), "An empirical examination of self-reported work stress among U.S. managers", *Journal of Applied Psychology*, Vol. 85 No. 1, pp. 65-74, doi: 10.1037/0021-9010.85.1.65.

Crawford, E.R., LePine, J.A. and Rich, B.L. (2010), "Linking job demands and resources to employee engagement and burnout: a theoretical extension and meta-analytic test", *Journal of Applied Psychology*, Vol. 95 No. 5, pp. 834-848, doi: 10.1037/a0019364.

Glazer, S. and Ion, A. (2023), "Challenging challenge and hindrance appraisals", *Work and Stress*, Vol. 37 No. 3, pp. 299-324, doi: 10.1080/02678373.2022.129513.

Green, F. (2004), "Work intensification, discretion, and the decline in well-being at work", *Eastern Economic Journal*, Vol. 30 No. 4, pp. 615-625, available at: https://www.jstor.org/stable/40326152

Haar, J. and Harris, C. (2023), "A moderated mediation study of high-performance work systems and insomnia on New Zealand employees: job burnout mediating and work-life balance moderating", *The International Journal of Human Resource Management*, Vol. 34 No. 1, pp. 68-91, doi: 10.1080/09585192.2021.1961161.

Harrison, R.V. (1985), "The person-environment fit model and the study of job stress", in Beehr, T.A. and Bhagat, R.S. (Eds), *Human Stress and Cognitions in Organization*, Wiley, New York, pp. 23-55.

Herttalampi, M., Wiese, B. and Feldt, T. (2023), "Leaders' intensified job demands: their multi-level associations with leader–follower relationships and follower well-being", *Work and Stress*, Vol. 37 No. 1, pp. 78-99, doi: 10.1080/02678373.2022.2080776.

Hobfoll, S.E. (1989), "Conservation of resources: a new attempt at conceptualizing stress", *American Psychologist*, Vol. 44 No. 3, pp. 513-524, doi: 10.1037/0003-066X.44.3.513.

Hobfoll, S.E. and Shirom, A. (2001), "Conservation of resources theory: applications to stress and management in the workplace", in Golembiewski, R.T. (Ed.), *Handbook of Organizational Behavior*, Taylor & Francis, New York, pp. 57-80.

Hobfoll, S.E., Halbesleben, J., Neveu, J.P. and Westman, M. (2018), "Conservation of resources in the organizational context: the reality of resources and their consequences", *Annual Review of Organizational Psychology and Organizational Behavior*, Vol. 5 No. 1, pp. 103-128, doi: 10.1146/annurev-orgpsych-032117-104640.

Huhtala, M., Geurts, S., Mauno, S. and Feldt, T. (2021), "Intensified job demands in healthcare and their consequences for employee well-being and patient satisfaction: a multilevel approach", *Journal of Advanced Nursing*, Vol. 77 No. 9, pp. 3718-3732, doi: 10.1111/jan.14861.

Karasek, R. and Theorell, T. (1990), *Healthy Work: Stress, Productivity, and the Reconstruction of Working Life*, Basic Books, New York, NY.

Korunka, C., Kubicek, B., Paškvan, M. and Ulferts, H. (2015), "Changes in work intensification and intensified learning: challenge or hindrance demands?", *Journal of Managerial Psychology*, Vol. 30 No. 7, pp. 786-800, doi: 10.1108/JMP-02-2013-0065.

Kubicek, B., Paškvan, M. and Korunka, C. (2015), "Development and validation of an instrument for assessing job demands arising from accelerated change: the intensification of job demands scale", *European Journal of Work and Organizational Psychology*, Vol. 24 No. 6, pp. 898-913, doi: 10.1080/1359432X.2014.979160.

Kubicek, B., Uhlig, L., Hülsheger, U.R., Korunka, C. and Prem, R. (2022), "Are all challenge stressors beneficial for learning? A meta-analytical assessment of the differential effects of workload and cognitive demands", *Work and Stress*, Vol. 37 No. 3, pp. 269-298, doi: 10.1080/02678373.2022.2142986.

Lazarus, R. and Folkman, S. (1984), *Stress, Appraisal and Coping*, Springer, New York, NY.

LePine, M.A. (2022), "The challenge-hindrance stressor framework: an integrative conceptual review and path forward", *Group and Organization Management*, Vol. 47 No. 2, pp. 223-254, doi: 10.1177/10596011221079970.

LePine, J.A., Podsakoff, N.P. and LePine, M.A. (2005), "A meta-analytic test of the challenge stressor–hindrance stressor framework: an explanation for inconsistent relationships among stressors and performance", *Academy of Management Journal*, Vol. 48 No. 5, pp. 764-775, doi: 10.5465/amj.2005.18803921.

Mauno, S., Herttalampi, M., Minkkinen, J., Feldt, T. and Kubicek, B. (2023), "Is work intensification bad for employees? A review of outcomes for employees over the last two decades", *Work & Stress*, Vol. 37 No. 1, pp. 100-125, doi: 10.1080/02678373.2022.2080778.

Mauno, S. and Kinnunen, U. (2021), "The importance of recovery from work in intensified working life", in Korunka, C. (Ed.), *Flexible Working Practices and Approaches: Psychological and Social Implications of a Multifaceted Phenomenon*, Springer, pp. 59-79, available at: https://link.springer.com/book/10.1007/978-3-030-74128-0

Mauno, S., Kubicek, B., Minkkinen, J. and Korunka, C. (2019), "Antecedents of intensified job demands: evidence from Austria", *Employee Relations*, Vol. 41 No. 4, pp. 694-707, doi: 10.1108/ER-04-2018-0094.

Mazzola, J.J. and Disselhorst, R. (2019), "Should we be 'challenging' employees? A critical review and meta-analysis of the challenge-hindrance model of job stress", *Journal of Organizational Behavior*, Vol. 40 No. 8, pp. 949-961, doi: 10.1002/job.2412.

Menon, S., Salvatori, A. and Zwysen, W. (2020), "The effect of computer use on work discretion and work intensity. Evidence from Europe", *British Journal of Industrial Relations*, Vol. 58 No. 4, pp. 1004-1038, doi: 10.1111/bjir.12504.

Minkkinen, J., Kinnunen, U. and Mauno, S. (2021), "Does psychological detachment from work protect employees under high intensified job demands?", *Scandinavian Journal of Work and Organizational Psychology*, Vol. 6 No. 1, p. 9, doi: 10.16993/sjwop.97.

Moazami-Goodarzi, A., Nurmi, J.E., Mauno, S. and Rantanen, J. (2015), "Cross-Lagged relations between work–family enrichment, vigor at work, and core self-evaluations: a three-wave study", *Journal of Business and Psychology*, Vol. 30 No. 3, pp. 473-482, doi: 10.1007/s10869-014-9376-3.

O'Brien, K.E. and Beehr, T.A. (2019), "So far, so good: up to now, the challenge–hindrance framework describes a practical and accurate distinction", *Journal of Organizational*, Vol. 40 No. 8, pp. 962-972, doi: 10.1002/job.2405.

Podsakoff, N.P., LePine, J.A. and LePine, M.A. (2007), "Differential challenge stressor- hindrance stressor relationships with job attitudes, turnover intentions, turnover, and withdrawal behavior: a meta-analysis", *Journal of Applied Psychology*, Vol. 92 No. 2, pp. 438-454, doi: 10.1037/0021-9010.92.2.438.

Prem, R., Ohly, S., Kubicek, B. and Korunka, C. (2017), "Thriving on challenge stressors? Exploring time pressure and learning demands as antecedents of thriving at work", *Journal of Organizational Behavior*, Vol. 38 No. 1, pp. 108-123, doi: 10.1002/job.2115.

Rosa, H. (2003), "Social acceleration: ethical and political consequences of a desynchronized high–speed society", *Constellations*, Vol. 10 No. 1, pp. 3-33, doi: 10.1111/1467-8675.00309.

Schaufeli, W. and Bakker, A. (2004), "Job demands, job resources and their relationship with burnout and engagement: a multi-sample study", *Journal of Organizational Behavior*, Vol. 25 No. 3, pp. 293-315, doi: 10.1002/job.248.

Schaufeli, W., Salanova, M., Gonzalez-Roma, V. and Bakker, A. (2002), "The measurement of engagement and burnout: a two-sample confirmatory factor analytic approach", *Journal of Happiness Studies*, Vol. 3 No. 1, pp. 71-92, doi: 10.1023/A:1015630930326.

Schaufeli, W.B., Shimazu, A., Hakanen, J., Salanova, M. and De Witte, H. (2019), "An ultra-short measure for work engagement: the UWES-3 validation across five countries", *European Journal of Psychological Assessment*, Vol. 35 No. 4, pp. 577-591, doi: 10.1027/1015-5759/a000430.

Webster, J.R. and Adams, G.A. (2015), "A meta-analysis of the challenge-hindrance framework at the intersection of work and family", *Academy of Management Proceedings*, Vol. 1 No. 1, p. 4911, doi: 10.5465/ambpp.2015.324.

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