Maladaptive Working Time Strategies and Exhaustion: A Daily Diary Study on Violating Breaks, Working Faster, and Working Overtime

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Abstract

To maintain employees' health, it is important to prevent work-related exhaustion in general but also on a day-to-day basis. With a quantitative ten-day diary study, we investigated three different working time strategies as underlying mechanisms of the effects of day-specific work overload and work scheduling autonomy on end-of-work exhaustion. The sample comprised 578 daily measurements from 93 employees in Germany. Daily work overload was positively related to daily break violations, working faster and unplanned overtime. Daily work scheduling autonomy was negatively related to overtime (vs. finishing work on time/early). Work overload (and telework, which we used as control variable) and work scheduling autonomy were significantly and indirectly related to higher and lower, respectively, end-of-work exhaustion via unplanned overtime. To prevent employee exhaustion, it is important to promote good work design in everyday working life so that employees do not need to extend their working days.

Keywords: Maladaptive Working Time Strategies, Exhaustion, Violating Breaks, Working Faster, Working Overtime

Introduction

Many employees leave the workforce early and sickness absence due to mental health problems is increasing (Duchaine et al. 2020). Therefore, taking measures to maintain and improve employees' physical and mental health and with this their work ability is very important (Shao et al. 2022). To this end, work must be designed in such a way that chronic exhaustion – or

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burnout – can be prevented as a precursor of various illnesses and sickness-related absences (Ahola/Toppinen-Tanner/Seppänen 2017). Work-related exhaustion can accordingly be seen as a sensible target for occupational health and safety measures. However, for such measures to be effective, it is crucial to understand which, how and why work design characteristics contribute to higher or lower exhaustion. According to the job demands-resources model (Demerouti et al. 2001), two classes of work characteristics are crucial in this respect. Specifically, job demands – of which workload is a key example – and job resources – of which autonomy is a key example – can influence employees' short-term exhaustion and long-term burnout via two different theoretical pathways. However, the specific underlying mechanisms, particularly employees' behaviors to cope with heavy workload and efficiently use high autonomy are not well understood. This is especially true as most research has focused on chronic work characteristics as predictors of chronic exhaustion or burnout, neglecting that chronic burnout often is a result of the chronification of daily exhaustion (Venz/Casper/Sonnentag 2020), which in turn results from day-specific work characteristics (Pindek/Arvan/Spector 2019) and behaviors (e.g., Venz/Nesher Shoshan 2022). Accordingly, it is important to consider the daily fluctuations in work characteristics and employees' behavioral responses and exhaustion consequences (Sonnentag/Völker/Wehrt 2024). We therefore conducted a daily diary study. Specifically, building on recent research on maladaptive working time strategies such as skipping breaks, working overtime, or working harder to cope with job demands (e.g., Baethge et al. 2019; Mumenthaler/Knecht/Krause 2021; Sandmeier et al. 2022; Vahle-Hinz/Deci/Baethge 2024), we investigated skipping/shortening work breaks, working faster, and working longer than planned as day-specific working time strategies in the context of workload and autonomy in relation to end-of-work exhaustion.

Work Overload, Work Scheduling Autonomy, and Exhaustion

Exhaustion is a short-term strain response to stressors characterized by feeling empty, tired, worn-off, and drained (Demerouti et al. 2001), which is negatively related to employees' long-term health (e.g., Headrick et al. 2023). There are several theoretical explanations why stressors cause exhaustion. According to the job demands-resources model (Bakker/Demerouti 2007), job stressors such as workload (called demands in the model) consume mental or physical energy and therefore cause exhaustion, which in turn leads to deteriorated health (i.e., health-impairment process). Job resources, such as autonomy, on the other hand, contribute to higher motivation and via this to better work-related outcomes including better health (i.e., motivational process). Additionally, job resources can be invested to reduce the adverse strain effects of stressors. Similar considerations on the functioning of job stressors and job resources can also be found in other work-stress models, which all have in common that they propose that stressors cause strain, such as exhaustion, while job resources cause well-being or reduce strain (e.g., job demand-control model, Karasek 1979; transactional model of stress, Lazarus/Folkman 1984). Overall, according to work-stress theories, experiencing job demands is a stressful experience that causes strain, while experiencing job resources has a strain-sheltering effect (Sonnentag/Tay/Nesher Shoshan 2023).

Workload has been proposed as a central job demand or stressor in several work-stress

theories, including the job demands-resources model (Bakker/Demerouti 2007). Workload can be divided into quantitative workload, defined as the amount of work to be done, and qualitative workload, defined as the difficulty of work tasks (Spector/Jex 1998). We focus on quantitative workload. When quantitative workload is too high, work overload is perceived in the form of heavy time and work pressure (Sandmeier et al. 2022; Venz/Boettcher 2022), which activates the energy-consuming health-impairment process as proposed in the job demands-resources model (Bakker/Demerouti/Sanz-Vergel 2023). Specifically, because a lot of resources, especially energy, must be invested to deal with heavy workload, work overload likely leads to exhaustion. Importantly, workload and overload can vary from day to day (e.g., Demerouti/Bakker/Halbesleben 2015; Venz/Boettcher 2022), for example depending on the tasks of the day. In line with the theoretical considerations of the job demands-resources model, many studies have found work (over)load to indeed be positively related to different facets of exhaustion and fatigue (e.g., García-Arroyo/Segovia 2019; Pindek et al. 2020; for an exception see Johnston et al. 2019). Furthermore, meta-analyses show strong positive effects for this relationship both when considering chronic workload and chronic exhaustion (i.e., between-person level) and when considering day-specific workload and day-specific exhaustion (i.e., within-person level; Pindek/Arvan/Spector 2019). The latter suggests that employees feel more exhausted on days with higher work(over)load than on other days (e.g., Demerouti/Bakker/Halbesleben 2015; Keller/Meier 2023). On this basis, we hypothesize:

H1: Daily work overload is positively related to end-of-work exhaustion.

Work scheduling autonomy (Morgeson/Humphrey 2006) is a job resource that allows employees to structure their working day, for example in terms of when and in what order they complete their tasks. This autonomy in scheduling one's work can be beneficial for short-term well-being and long-term health (Karasek 1979) because it allows employees to organize their work in line with their needs in terms of personal obligations, rest, and productivity (e.g., Messenger et al. 2017).

According to the job demands-resources model (Bakker/Demerouti 2007), job autonomy (often also called job control) is a key resource that positively influences motivation, well-being and health. This assumption found support regarding chronic autonomy and chronic burnout/exhaustion (Humphrey/Nahrgang/Morgeson 2007) and regarding day-specific autonomy and day-specific exhaustion (e.g., Poetz/Volmer 2022). Work scheduling autonomy specifically enables employees to adapt the completion of their daily work tasks to their current needs, demands, and resources, thus preventing energy loss. Accordingly, work scheduling autonomy is considered an essential job resource to prevent exhaustion (Takahashi et al. 2012). For example, in an employee-population representative study, Vieten/Wöhrmann/Michel (2022) found negative cross-lagged effects of work time control (i.e., a facet of work scheduling autonomy that focuses on working time flexibility) on exhaustion. Moreover, in organizational studies, Moen et al. (2011) found that increasing work schedule control reduced exhaustion in the context of the introduction of a results-only-work-environment, and Wayne et al. (2016) found that work scheduling autonomy was negatively related to exhaustion. Thus, there is evidence that employees with high work scheduling autonomy are less exhausted.

Importantly, employees not only differ from each other in how much work scheduling autonomy they generally have, but employees' work scheduling autonomy also varies from day to day (i.e., within person; e.g., Demerouti/Bakker/Halbesleben 2015), for example depending

on the number of scheduled meetings or the extent of task interdependence on a given day. At the end of a day with low work scheduling autonomy, employees may be more exhausted because they were unable to adjust their work tasks to their personal needs, such as for rest or productive times. However, on workdays with high work scheduling autonomy, they can re-arrange tasks to fit their personal productivity cycle, take breaks when they need them, and even postpone work tasks to another working day. This, in turn, may result in less exhaustion at the end of the day. In summary, work scheduling autonomy can be invested to protect mental and physical energy. We therefore propose:

H2: Daily work scheduling autonomy is negatively related to end-of-work exhaustion.

Working Time Strategies as Mediators

Work overload occurs when the assigned work tasks cannot be completed within the given time. This consumes energy, as explained in the health-impairment pathway of the job demands-resources model. When individuals experience demands that exceed their resources, they use coping strategies to deal with them (e.g., Lazarus/Folkman 1984). These coping strategies can be categorized into emotion-focused and problem-focused strategies, the latter meaning strategies that directly address the situation or demand. There are several ways to deal with a situation of work overload on a given working day. One strategy is to invest more time to meet the high demands inherent to work overload. Investing more time in work on a given day could prevent task failure and lead to feelings of accomplishment and high performance on that day–but at the cost of energy expenditure, which may lead to greater exhaustion. This is because investing more time in work is inevitably linked to reduced time for recovery, which can have detrimental effects on well-being and health (Venz et al. 2024). Coping strategies that are associated with increased investment of time or effort can therefore be considered maladaptive working time strategies (Baethge et al. 2019) or even self-endangering work behaviors (Vahle-Hinz/Deci/Baethge 2024).

Various strategies can be used to invest more time in work tasks on a given day, including shortening or skipping work breaks (hereafter referred to as break violations), working longer (i.e., unplanned overtime), and working faster (i.e., investing more effort in the available time). When regular working hours are not sufficient, for example due to heavy workload, extending the working day by shortening or skipping breaks and/or working longer than planned provides additional time to complete tasks (Mumenthaler/Knecht/Krause 2021). Indeed, working overtime is a widespread working time behavior. For example, in Germany, employees work a mean of 3.9 hours per week more than contractual working time (Brauner et al. 2020). There is some evidence that unplanned overtime is a maladaptive coping behavior with adverse well-being effects. For example, in a sample of teachers, Sandmeier et al. (2022) found that working overtime as a coping mechanism fully mediated the negative effect of work overload on exhaustion after one year.

Similar to working overtime, many employees in Germany violate their breaks by skipping them (Wendsche et al. 2022). However, employees who skip or interrupt their work breaks experience exhaustion about twice as often as others (Vieten et al. 2023). This is because work breaks are an important opportunity to recover during the workday (Chan et al. 2022), as they are crucial to build up energy resources to counteract effort expenditure and the associated

exhaustion. Taking enough and sufficiently long breaks is therefore important, even if this reduces working time (Albulescu et al. 2022). There is some evidence that taking or not taking breaks is a volitional process that is used as an intentional strategy. For example, employees reported more skipping of breaks on days with higher work overload (Mumenthaler/Knecht/Krause 2021) and positive work-break intentions are positively related to taking breaks (Blasche et al. 2021). Furthermore, employees with higher break intentions before their work shift reported less fatigue after their shift (Blasche et al. 2017). It can therefore be assumed that break violations are more likely on days with heavy workload and that when breaks are violated, exhaustion at the end of work is higher.

Another coping strategy to complete the work tasks on a given day, especially on a day characterized by heavy workload, is working faster (Vahle-Hinz/Deci/Baethge 2024). Unlike break violations and unplanned overtime, working faster is a strategy that does not extend the working time, but the effort invested. Higher energy investment inevitably leads to greater resource depletion and thus likely to higher exhaustion. In a daily diary study, Baethge et al. (2019) investigated overtime and working faster as maladaptive coping mechanisms in dealing with time pressure (an operationalization of work overload; Sandmeier et al. 2022). They found significant bivariate day-level correlations of time pressure with working faster and overtime, indicating that employees do indeed use these strategies to cope with work overload. Similarly, Mumenthaler/Knecht/Krause (2021) found that on days with higher workload than usual, employees were more exhausted at the end of the day, and that the strategies of skipping breaks and working overtime were used more on these days. Based on their findings, both author teams concluded that violating breaks, working faster and working overtime to overcome daily work overload is not recommended because these strategies endanger health and well-being (Vahle-Hinz/Deci/Baethge 2024). Based on the theoretical considerations and research results presented, we assume that exhaustion is higher at the end of working days with higher work overload because maladaptive working time strategies are more likely to be used. Accordingly, we propose that day-specific break violations, working faster and working unplanned overtime explain why work overload is positively related to end-of-work exhaustion:

H3: Break violations (a), working faster (b), and unplanned overtime (c) mediate the positive relationship between daily work scheduling autonomy and end-of-work exhaustion.

Autonomy gives employees the freedom to choose different strategies to meet the demands of their working day. For example, they have the option to choose between maladaptive strategies, including violating breaks, working faster and working overtime, and adaptive strategies, such as selecting, changing and optimizing their job demands, stressors, and resources (i.e., job crafting, e.g., Zhang/Parker 2022) or their use of personal resources (e.g., Venz/Pundt/Sonnentag 2018). On a day with high work scheduling autonomy specifically, employees can structure their working day in such a way that best suits their individual productivity cycle and their personal (recovery) needs to optimally manage their resources throughout the day. Work scheduling autonomy allows employees to use adaptive strategies that do not involve additional expenditure of time and/or energy (e.g., Nold/Wöhrmann 2022), but rather enable a smart distribution of work tasks (and breaks) throughout the day and perhaps even allow tasks to be postponed to another day. Thus, at the end of a working day with high work scheduling autonomy, exhaustion should be lower because less maladaptive working

time strategies were used (Vahle-Hinz/Deci/Baethge 2024). Empirical findings at the between-person level provide some support for this reasoning, showing, for example, that high work scheduling autonomy is related to working less time (Nold/Wöhrmann 2022), that perception of control is positively related to taking breaks (Blasche et al. 2021), and that taking breaks is negatively related to exhaustion (Albulescu et al. 2022). On this basis, we assume that exhaustion is lower at the end of working days with higher work scheduling autonomy because maladaptive working time strategies are less likely to be used. Accordingly, we propose:

H4: Break violations (a), working faster (b), and unplanned overtime (c) mediate the negative relationship between daily work scheduling autonomy and end-of-work exhaustion.

Figure 1: Tested research model

Daily work characteristics — Daily working time strategies
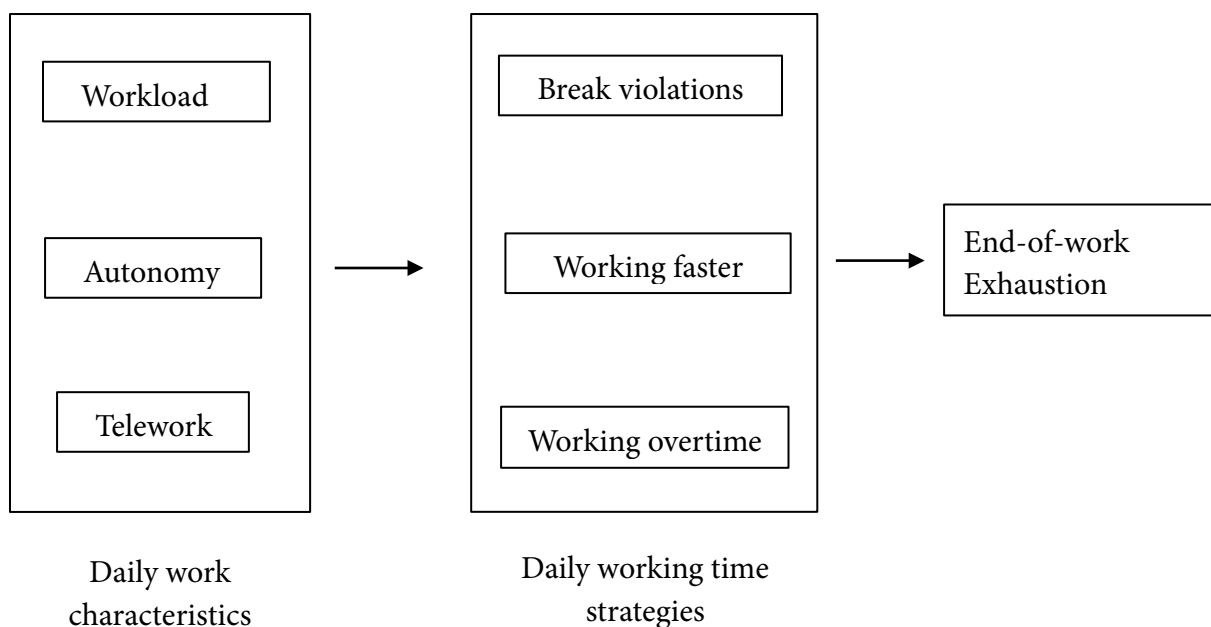
Methods

Study Design and Sample

Data collection for this study was carried out as part of an empirical thesis project at a German university in summer 2021. Four student recruiters acquired participants for a ten-day quantitative daily diary study (Ohly et al. 2010) within their personal networks, following recommendations on student-recruited samples (Demerouti/Rispens 2014). The study included four different surveys, a one-time survey to collect sociodemographic information and three daily surveys (morning, after work, before bed) to collect day-specific information. For the present publication, only information from the daily after-work survey was used.

Participants could receive a summary report of the results after project completion. Participation was further incentivized by promising a donation of 1 Euro to a social aid organization for every participant who responded to the one-time survey plus all three daily surveys for at least five working days. Data collection took place online at www.soscisurvey.de.

Of 105 persons who consented to participate and registered via an anonymous double-opt-in question, 102 answered the one-time survey. The after-work survey was accessible on each survey day (Mon-Fri on two consecutive weeks) from 3 pm to 8:30 pm and participants received an email invitation to each survey at 3 pm. A total of 586 after-work surveys were answered. To allow for within-person variation, we only included data from participants who answered at least 2 after-work surveys (e.g., Venz/Mohr 2022). Our final sample included 578 daily measurements from 93 participants (55.90 % female; 53.90 % university graduate; mean age = 37.18 years, SD = 14.24; mean organizational tenure = 6.03 years, SD = 7.99; mean weekly working hours = 38.57, SD = 7.78). Participants worked in a wide variety of occupations and industries (e.g., tax advisor, educator, account manager, cameraman). Most participants (65.90 %) worked from home at least 1 day per week, with 38.30 % working from home on 5 days a week and another 35.00 % on 4 or 3 days a week due to the ongoing COVID-19 pandemic.

Measures

Survey language was German. Unless otherwise stated, all items were answered on a 5-point Likert scale from 1 (not at all true) to 5 (completely true). As an indicator of internal consistency of multi-item measures, we report Cronbach's alpha as the mean across all survey days.

We measured *day-specific work overload* with 3 items from the Quantitative Workload Inventory (Spector/Jex 1998) in a German version adapted for daily use (Venz/Nesher Shoshan 2022). A sample is "Today, there was a great deal to be done". Cronbach's alpha was .87.

We measured *day-specific work scheduling autonomy* with three items from the German version (Stegmann et al. 2010) of the Work Design Questionnaire (Morgeson/Humphrey, 2006). A sample item is "Today, I could make my own decisions about how to schedule my work." Cronbach's alpha was .96.

We measured *day-specific break violations* with 1 item, using a loose adaptation of the measure used by Baethge et al. (2019). We asked participants whether they omitted any breaks during work "today". The possible responses were "*No*", "*No, but I shortened breaks*", "*Yes, I did not take short breaks*", "*Yes, I did not take my lunch break*", and "*Yes, I did not take any breaks*". For our analyses, we coded the extent of day-specific break violations as an ordinal variable, with 0 presenting no break violations, 1 some break violations (shortened breaks, omitting some breaks), and 2 extreme break violations (skipping all breaks). To be able to distinguish whether the extent of break violation matters or whether it is more the decision to violate breaks at all that matters, we additionally coded day-specific break violations as a binary variable with "No" coded as 0, and any form of break violation (i.e., shortening or skipping some or all breaks) as 1 and used this binary measure in an alternative analysis.

We measured *working faster* with 1 item adapted from Baethge et al. (2019), namely "Today, I worked faster than usual to get the work done.".

We measured *unplanned overtime* with 1 item following the approach of Baethge et al. (2019). Participants indicated whether they had finished their work for the day as planned. The possible answers were "*Yes*", "*No, I finished work earlier than planned*", and "*No, I finished work later than planned*". If the answer was "No", we recorded time in minutes. For our analyses, we used the amount of day-specific overtime indicated in minutes when responding "No, I finished

work later than planned" (n = 136 days). To be able to distinguish whether the extent of overtime (i.e., quantity) matters or whether it is rather the decision for overtime at all that matters, we additionally coded unplanned overtime as a binary variable, with underhours and no overtime coded as 0 and any length of overtime coded as 1, and used this binary measure in an alternative analysis.

We measured momentary *end-of-work exhaustion* with 3 items from the emotional exhaustion scale of the Oldenburg Burnout Inventory (Demerouti et al. 2003) in a German version adapted to daily use (Venz/Pundt 2021). A sample item is "I feel worn out.". Cronbach's alpha was .80.

To account for the work situation during the ongoing COVID-19 pandemic, we controlled for *day-specific telework* (i.e., working from home). The participants reported whether they had spent the day working (1) entirely away from home, (2) partially from home, or (3) entirely from home. Of the 586 days included, participants spent 51.8% partially or entirely teleworking.

Statistical Analyses

Given the hierarchical, dependent nature of our data (days nested within participants), we conducted multilevel analyses. Specifically, we tested our hypotheses using two-level path analyses with full information maximum likelihood estimation and Monte Carlo integration in MPlus version 8.5. We conducted our analysis twice (i.e., computing two different path models), first considering the extent of break violations and the extent of overtime, and second considering both measures as binary (i.e., dichotomous) variables. We modelled the extent of daily break violations (analysis 1) as well as binary break violations and binary unplanned overtime (analysis 2) as categorial, more specifically ordinal, variables, resulting in two-level logistic regression analyses for predicting these variables. For the respective relationships, in addition to path estimates, we report odds ratios together with the respective 95% confidence intervals (CI). If the 95% CI around an odds ratio does not contain the value 1, the odds ratio is significant with $p < .05$ (two-tailed).

We tested all hypotheses simultaneously within one overall path model (i.e., with telework, work overload, and work scheduling autonomy simultaneously as parallel predictors and the three working time strategies simultaneously as parallel mediators), once using extent measures for break violations and overtime (analysis 1) and once using binary measures (analysis 2). We centered day-specific work overload and work scheduling autonomy around their respective person means (i.e., group-mean centering) to remove any between-person variance in the predictors and thus enable pure within-person analysis (Ohly et al. 2010). We left all other variables uncentered, including day-specific telework, which we measured as a categorial variable. We defined all variables as within-person variables (i.e., Level 1) and tested our hypotheses only at the within-person level, modelling all slopes as fixed. We calculated the indirect effects of the predictors on end-of-work exhaustion via the three working time strategies using the product of coefficient method (i.e., a-path estimate*b-path estimate; MacKinnon/Fairchild/Fritz 2007) and used R (Selig/Preacher 2008) to obtain 95% CIs of the indirect effects based on the Monte Carlo method with 20,000 simulations. If the 95% CI does not include 0, the indirect effect is significant with $p < .05$ (two-tailed).

Results

Descriptives

Table 1 shows the means and frequencies, respectively, of the three working time strategies and telework in our sample. Of the 578 surveyed working days, participants reported committing any kind of break violation on 227 days (39.3 %), with shortening breaks being the most reported (15.9 % of all study days); extreme break violation in the form of skipping all breaks was reported on 53 days (9.2 % of all study days). The mean of working faster was 2.34 (on a five-point scale from 1 to 5; within-person-level SD = 1.08). Participants reported working unplanned overtime on 136 of the study days (23.5 %), with a mean of 43.51 minutes (SD = 30.09).

Table 1: Frequencies and Means of Daily Maladaptive Working Time Strategies and Telework

Break violations	n = 227 days	39.3 %		
Shortening breaks	n = 92 days	15.9 %		
Skipping short breaks	n = 43 days	7.4 %		
Skipping lunchbreak	n = 39 days	6.7 %		
Skipping all breaks	n = 53 days	9.2 %		
Working faster[a]	M = 2.34	SD = 1.08		
1 = not at all true	n = 146 days	25.3 %		
2 = not very true	n = 193 days	33.4 %		
3 = moderately true	n = 156 days	27.0 %		
4 = mostly true	n = 62 days	10.7 %		
5 = completely true	n = 21 days	3.6 %		
Unplanned overtime	M = 43.51	SD = 30.09		
Working longer than planned[b]	n = 136 days	23.5 %	Min = 5	Max = 180
End of work as planned	n = 386 days	66.8 %		
Working shorter than planned[b]	n = 56 days	9.7 %	Min = 5	Max = 180
Telework	n = 298 days	51.8 %		
Part of the day	n = 22 days	3.8 %		
The whole day	n = 276 days	47.8 %		

Note: Total N=578 days. [a] Measured on a five-point Likert scale from 1 to 5. [b] Measured in minutes. M = mean, SD = standard deviation on the day level, Min = minimum, Max = maximum.

For meaningful within-person analyses, it is crucial that all daily measured variables have sufficient within-person-level variance (Gabriel et al. 2019), as indicated by intraclass

correlation coefficients (i.e., ICC1) calculated in the two-level baseline model. ICC1 values (see Table 2) ranged from .23 (binary overtime) to .62 (teleworking). Accordingly, there was sufficient within-person-level variance (i.e., between 77 % and 38 %), justifying two-level modelling.

Before testing our hypotheses with path modelling, we inspected the within-person (i.e., day-level) bivariate correlations between the study variables. All correlations, including those at the between-person level, are summarized in Table 2.

Table 2: Descriptives and Bivariate Standardized Correlations of Study Variables

Variable	M	SD_{day}	SD_{person}	ICC1	1	2	3	4a	4b	5	6a	6b	7
1 Telework[a]	0.96	0.60	0.77	.62	--	.01	.04	-.01	-.01	.04	-.16*	-.04	-.14**
2 Work overload[b]	2.93	0.70	0.67	.48	.16	(.87)	-.20**	.21**	.22**	.47**	.27**	.17**	.11*
3 Work scheduling autonomy[b]	3.58	0.79	0.98	.60	-.01	-.13	(.96)	-.16**	-.15**	-.11*	-.04	-.15*	-.22**
4a Break violations - ordinal[c]	0.49	0.50	0.43	.42	-.08	-.01	-.23	--	.89**	.25**	.12	.03	.13**
4b Break violations - binary[d]	0.40	0.37	0.32	.43	-.01	.02	-.15	.96**	--	.23**	.22**	.05	.12**
5 Working faster[b]	2.36	0.90	0.57	.29	.36**	.42**	-.33*	.26*	.21	--	.25**	.03	-.08
6a Unplanned overtime - minutes	45.55	24.92	18.91	.37	.08	-.26	-.17	.66**	.51**	.15	--	.05*	.23**
6b Unplanned overtime - binary[d]	0.23	0.37	0.20	.23	.43**	.42**	-.05	.05	.09	.40*	-.33	--	.12*
7 End-of-work exhaustion[b]	2.24	0.72	0.56	.38	-.10	.19	-.34*	-.06	-.09	.36**	-.32	.03	(.80)

Note. M = mean, SDday = day-level standard deviation, SDperson = person-level standard deviation, ICC1 = intraclass correlation coefficient (=between-person variance). a 1 = no telework, 2 = part-time telework, 3 = full telework. b Five-point Likert scale with 1 = does not apply at all, 5 = fully applies. c 0 = no break violation, 1 = some break violation, 2 = extreme break violation. d 0 = no, 1 = yes.

Shown are standardized two-level correlations computed in Mplus 8.5. Two-tailed correlations above the diagonal show within-person-level correlations (i.e., day level, N = 578 days). Within-person-level correlations correspond to the hypothesized relationships. Two-tailed correlations below the diagonal show between-person-level correlations (i.e., person level, N = 93 persons) and are only shown for comprehensiveness. Values in brackets at the diagonal show mean Cronbach's alphas over the study days.

Regarding our hypotheses, bivariate within-person-level correlations indicate that daily work overload was positively and significantly correlated with end-of-work exhaustion (r = .11, p = .04) as well as with all forms and operationalizations of working time strategies (r = .17 to .47, all p < .001). Daily work scheduling autonomy was negatively and significantly correlated with end-of-work exhaustion (r = -.22, p < .001) and with all forms and operationalizations of working time strategies (r = -.11 to -.16, all p < .05), except for the extent operationalization of unplanned overtime (r = -.04, p = .54). Furthermore, all forms and operationalizations of working time strategies except for working faster (r = -.08, p = .13) were positively and significantly correlated with end-of-work exhaustion (r = .12 to .23, all p < .05). These findings are generally in line with our hypotheses.

Hypothesis Testing

We tested our hypotheses with two different operationalizations of break violations and unplanned overtime (i.e., extent in analysis 1 and binary in analysis 2). Within-person-level results of the two-level path models are presented in Table 3, results of indirect effect testing are presented in Table 4, and Table 5 provides a summary overview of all tested relationships. We report unstandardized estimates (est.), and for categorial/ordinal outcomes, we additionally report odds ratios (OR). In our analyses, we controlled for day-specific telework (coded as an ordinal variable with 0 = no, 1 = partially, 2 = fully). In analysis 1 considering the extent of break violations (as an ordinal variable with 3 categories) and the extent of unplanned overtime (in minutes), daily telework was negatively and significantly related to end-of-work exhaustion (est. = -0.08, p = .048). In analysis 2 with binary coding of break violations and overtime (0 = no, 1 = yes), daily telework was also negatively and significantly related to end-of work exhaustion (est. = -0.11, p = .004), indicating that exhaustion was lower at the end of work-from-home days.

H1 suggests that daily work overload is positively related to end-of-work exhaustion. In analysis 1 with extent measures of break violations and overtime, work overload was not significantly related to end-of-work exhaustion (est. = -0.03, p = .66). In analysis 2 with binary coding, work overload was also not significantly related to end-of-work exhaustion (est. = 0.02, p = .72). Hypothesis 1 was rejected.

H2 suggests that daily work scheduling autonomy is negatively related to end-of-work exhaustion. In analysis 1 with extent measures of break violations and overtime, work scheduling autonomy was negatively and significantly related to end-of-work exhaustion (est. = -0.17, p = .001). In analysis 2 with binary coding, work scheduling autonomy was also negatively related to end-of-work exhaustion (est. = -0.17, p = .001). Hypothesis 2 was supported.

H3 and H4 suggest that (a) break violations, (b) working faster, and (c) unplanned overtime mediate (H3) the positive relationship between daily work overload and end-of-work exhaustion and (H4) the negative relationship between daily work scheduling autonomy and end-of-work exhaustion. Before testing the indirect effects, we examined the relationships between the predictors and the three working time strategies (i.e., a-paths) and between the working time strategies and end-of-work exhaustion (b-paths). Regarding the control variable

daily telework, in analysis 1, which considered the extent of break violations and overtime, day-specific telework was not significantly related to break violations (est. = -0.06, p = .47; OR = 0.940, 95% CI [0.794, 1.113]), positively and significantly related to working faster (est. = 0.21, p < .001), and not significantly related to unplanned overtime (est. = -2.90, p = .27). In this analysis, work overload was positively and significantly related to break violations (est. = 0.44, p = .001; OR = 1.558, 95% CI [1.193, 2.035]), positively and significantly related to working faster (est. = 0.58, p < .001), and positively and significantly related to unplanned overtime (est. = 13.11, p = .003). Work scheduling autonomy was negatively but just not significantly related to break violations (est. = -0.22, p = .055; OR = 0.799, 95% CI [0.636, 1.005]), not related to working faster (est. = -0.03, p = .60), and not related to unplanned overtime (est. = -0.81, p = .80). Neither break violations (est. = 0.02, p = .68) nor working faster (est. = 0.05, p = .17) were significantly related to end-of-work exhaustion, but unplanned overtime was positively and significantly related to end-of-work exhaustion (est. = 0.01, p = .04).

In analysis 2 with binary coding, day-specific telework was not significantly related to break violation (est. = -0.03, p = .70; OR = 0.966, 95% CI [0.813, 1.149]), positively and significantly related to working faster (est. = 0.21, p < .001), and positively and significantly related to unplanned overtime (est. = 0.36 p < .001; OR = 1.439, 95% CI [1.173, 1.765]). Work overload was positively and significantly related to binary break violation (est. = 0.46, p = .001; OR = 1.581, 95% CI [1.201, 2.082]), positively and significantly related to working faster (est. = 0.58, p < .001), and positively and significantly related to binary unplanned overtime (est. = 0.42 p = .008; OR = 1.523, 95% CI [1.114, 2.082]). Work scheduling autonomy was negatively but just not significantly related to binary break violation (est. = -0.21, p = .08; OR = 0.807, 95% CI [0.636, 1.025]), not significantly related to working faster (est. = -0.03, p = .60), but negatively and significantly related to binary unplanned overtime (est. =- 0.32 p = .02; OR = 0.724, 95% CI [0.553, 0.948]). Binary break violation was not significantly related to end-of-work exhaustion (est. = 0.02, p = .84). Working faster was positively but not significantly related to end-of-work exhaustion (est. = 0.06, p = .14). Binary unplanned overtime was positively and significantly related to end-of-work exhaustion (est. = 0.20, p = .03).

Table 3: Results of the two-leel path model predicting end-of-work exhaustion on the within-person level

	Model 1	Model 2 - Analysis 1				Model 2 - Analysis 2			
	End-of-work exhaustion	Extent of break violations	Working faster	Extent of overtime (minutes)	End-of-work exhaustion	Binary break violation	Working faster	Binary overtime	End-of-work exhaustion
Telework	-0.09*	-0.06	0.21**	-2.90	-0.08*	-0.03	0.21**	0.36**	-0.11**
Work overload	0.07	0.44**	0.58**	13.11**	-0.03	0.46**	0.58**	0.42**	0.02
Work scheduling autonomy	-0.18**	-0.22†	-0.03	-0.81	-0.17**	-0.21†	-0.30	-0.32*	-0.17**
Break violations					0.02				0.02
Working faster					0.05				0.06
Unplanned overtime					0.01*				0.20*

*Note. Model 1 is the two-level path model not including working time strategies. Model 2 is one overall path model with all predictors, mediators, and outcome included simultaneously. Analysis 1 pertains to analysis using extent measures of break violations and overtime. Analysis 2 pertians to analysiss using binary measures of brak violations and overtime (0=No, 1=Yes). Unstandardized within-person-level path estimates are shown. † p<.10, *p<.05, **p<.01 (all two-tailed).*

Regarding analysis 1, which considered extent measures of break violations and unplanned overtime, despite some significant a- and b-paths, none of the indirect effects was significant. Thus, both Hypothesis 3 and Hypothesis 4 were rejected in this analysis.

Regarding analysis 2 with binary coding, none of the indirect effects via break violation and working faster was significant. Accordingly, Hypotheses 3a, 3b, 4a, and 4b were not supported. However, all three within-person indirect effects via binary unplanned overtime were significant (for telework: indirect effect = 0.072, 95% CI [0.005, 0.159]; for work overload: indirect effect = 0.083, 95% CI [0.004, 0.199]; for work scheduling autonomy: indirect effect = -0.064, 95% CI [-0.161, -0.0004]). These results support Hypothesis 3c and 4c when overtime is coded binary. Together with the non-significant indirect effects regarding the extent of unplanned overtime, this finding indicates that it is not the duration of unplanned overtime that is decisive, but whether or not overtime was taken at all.

Table 4: Within-person indirect effects of day-specific work characteristics on end-of-work exhaustion via working time strategies

	Indirect effect	95 % CI
Telework → break violations extent → exhaustion	0.001	[-0.017, 0.011]
Telework → binary break violations → exhaustion	-0.001	[-0.018, 0.015]
Telework → working faster → exhaustion	0.011	[-0.004, 0.030]
Telework → overtime extent → exhaustion	-0.015	[-0.056, 0.010]
Telework → binary overtime → exhaustion	**0.072**	[0.005, 0.159]
Overload → break violations extent → exhaustion	0.011	[-0.042, 0.069]
Overload → binary break violations → exhaustion	0.007	[-0.067, 0.082]
Overload → working faster → exhaustion	0.031	[-0.013, 0.077]
Overload → overtime extent → exhaustion	0.069	[-0.002, 0.158]
Overload → binary overtime → exhaustion	**0.083**	[0.004, 0.199]
Autonomy → break violations extent → exhaustion	-0.005	[-0.040, 0.023]
Autonomy → binary break violations → exhaustion	-0.003	[-0.046, 0.035]
Autonomy → working faster → exhaustion	-0.002	[-0.015, 0.008]
Autonomy → overtime extent → exhaustion	-0.004	[-0.045, 0.031]
Autonomy → binary overtime → exhaustion	**-0.064**	[-0.161, -0.0004]

Note. Within-person indirect effects are shown. CI=confidence interval. If the 95% CI does not include zero, the respective indirect effect is considered significant (two-tailed). Significant indirect effects are depicted in bold.

Supplementary Analysis

In addition to main effects of job demands and job resources on employee exhaustion, the job demands-resources model proposes an interaction between job demands and job resources so that job resources buffer the negative, straining effect of job demands (Bakker/Demerouti 2007). Following this notion, we tested whether work scheduling autonomy buffers the negative effects of work overload by adding the interaction between both variables as predictor of end-of-work exhaustion as well as the different forms and operationalizations of maladaptive working time strategies. Work overload and work scheduling autonomy did not interact in predicting any of the maladaptive working time strategies of any operationalization, nor in predicting end-of-work exhaustion.

Table 5: Summary of All Results of Two-Level Path Modelling

	Extent of break violations	Binary break violations	Working faster	Extent of overtime	Binary overtime	End-of-work exhaustion
Telework	X	X	+	X	+	-
Work overload	+	+	+	+	+	X
Work scheduling autonomy	X	X	X	X	-	-
Extent of break violations						X
Binary break violation						X
Working faster						X
Extent of unplanned overtime						+
Binary overtime						+

Note. + denotes a positive, significant relationship, - denotes a negative, significant relationship, x denotes a non-significant relationship. We considered parameter estimates with $p < .05$ as statistically significant (two-tailed).

Discussion

In summary, we found some support that day-specific work characteristics are related to exhaustion at the end of work via (non)engagement in maladaptive working time strategies. Precisely, work overload was associated with higher end-of-work exhaustion via unplanned overtime while work scheduling autonomy was associated with lower end-of-work exhaustion via finishing work on time. Interestingly, when considered simultaneously with break violations and working faster in the path models, working overtime per se (i.e., the decision to work overtime at all) was most decisive in exhaustion and more crucial than the extent of unplanned overtime. However, when considering the bivariate correlations, the extent of unplanned overtime was the strongest predictor of end-of-work exhaustion. Working faster was not related to end-of-work exhaustion. Although being positively correlated with end-of-work exhaustion, day-specific break violations were not significantly related to end-of-work exhaustion in the path models.

Somewhat surprisingly, the same was true for work overload, which also was not directly related to end-of-work exhaustion in the path models (i.e., when considered simultaneously with telework and work scheduling autonomy). Given the significant bivariate correlations of work overload with all forms and operationalizations of working time strategies and exhaustion, and of all working time strategies (except working faster) with exhaustion, we suggest that the missing direct link between work overload and exhaustion in the path models is due to a complex interplay of daily working conditions and (maladaptive) working time strategy choices. This complexity might be explored in future research, as we discuss below.

Importantly, work overload was positively and simultaneously related to all three different working time strategies, suggesting that all these strategies are in fact used to deal with heavy workload. By looking at three different working time strategies in different operationalizations, this result critically replicates and extends previous findings on the detrimental role of work overload in maladaptive working-time strategy choices (Mumenthaler/Knecht/Krause 2021; Sandmeier et al. 2022; Vahle-Hinz/Deci/Baethge, 2024). However, there is no clear cause-and-effect relationship in the sense that one strategy (break violations, working faster, unplanned overtime) is preferred over another. Rather, we suspect that different strategies are chosen to different degrees and in different combinations by different people and/or on different days to cope with overload. Overall, it seems likely that work overload triggers the choice of more than one maladaptive working time strategy as a coping behavior and that it is a combination of these strategies that explains why work overload is related to higher end-of-work exhaustion, with the decision to work overtime being the most decisive.

Regarding autonomy, whereas work overload predicted all three forms of working time strategies, work scheduling autonomy was only significantly (negatively) related to the working overtime. Put differently, daily work scheduling autonomy predicted finishing work on time. Considering that unplanned overtime was the only strategy related to end-of-work exhaustion and that we found a significant mediation effect, we conclude that work scheduling autonomy is an important resource to prevent maladaptive working time behavior.
Regarding the effects of working time strategies, the fact that we tested the three strategies

simultaneously (i.e., additive effects in a parallel mediator model) might explain why most of the individual effects on end-of-work exhaustion in the full path model were not significant although all strategies except working faster showed significant bivariate correlations with end-of-work exhaustion. This aligns with previous research, which also found that day-specific working time strategies do not predict exhaustion when modelled simultaneously (Mumenthaler/Knecht/Krause 2021). Nevertheless, the bivariate correlations indicate the maladaptive character of overtime and break violations – but not of working faster, at least when it comes to end-of-work exhaustion. That day-specific working faster was not related to end-of-work exhaustion suggests that investing higher effort seems to be risk-free if used only exceptionally. Nevertheless, working faster might be harmful (i.e., maladaptive) if used as a general strategy, as we discuss below.

Although we are not the first to investigate maladaptive working time strategies in relation to work characteristics and well-being, our study is the most comprehensive to date in comparison. Specifically, we examined overload and autonomy together, considered telework, and distinguished all three possible forms of within-workday maladaptive working-time strategies also using extent measures. In contrast, for example, Baethge et al. (2019) subsumed skipping breaks and working longer under one measure, Mumenthaler/Knecht/Krause (2021) only considered skipping breaks and overtime but not working harder, and Vahle-Hinz/Deci/Baethge (2024) only considered working harder and overtime but not break violations. Our approach allowed us to compare three different maladaptive working times strategies that employees may use during work and their predictors and exhaustion effects. This led us to discover that particularly daily unplanned overtime might be maladaptive, but that the principal choice to work unplanned overtime rather than the duration (i.e., quantity) is decisive. We argue that the potential of break violations and working faster in being helpful to deal with work overload is limited compared to working overtime because there is a natural limit to how fast someone can work and how much break time can be skipped. To a lesser extent, this also applies to the amount of time that someone can work longer on a given day. This may explain why, although work overload significantly predicted all three forms and operationalizations of maladaptive working time strategies, only the indirect effect with end-of-work exhaustion via the binary measure of unplanned overtime was significant.

Our study not only expands the understanding of the role of daily work characteristics in the choice of specific working time strategies and their role in exhaustion, but also provides insights into the co-occurrence, that is, the simultaneous use of different maladaptive working time strategies on a given day. As the bivariate within-person correlations indicate, working faster tended to co-occur with break violations and unplanned overtime, whereas break violations were unrelated to unplanned overtime. This suggests that on any given day that employees choose to engage in maladaptive working time strategies, they would try to work faster *and* invest more time in their tasks, but regarding the latter, they would likely choose to either invest more time during work by violating breaks or after their planned end of work by working overtime.

In summary, our findings provide important theoretical insights into the job demands-resources model (Bakker/Demerouti 2007), indicating that the long-term health-impairment process triggered by job demands can be explained by the short-term use of energy-draining

maladaptive coping strategies, whereas the long-term motivational, health-sheltering process triggered by job resources may be explained, at least in part, by enabling the short-term use of more adaptive strategies that prevent the need to work overtime. Comparing the three working time strategies we examined, it seems that they differ in their functioning and functionality as coping behaviors. Specifically, according to our findings, the decision to work overtime at all can be considered most maladaptive of a set of maladaptive strategies. Taken together, and considering previous studies that found no effects of, for example, daily break extent on fatigue (e.g., Blasche/Arlinghaus/Crevenna 2022), our results indicate a need for further (day-level) research examining and comparing working time strategies, their co-occurrence, predictors, and effects.

Besides the implications of our core findings regarding the use of day-specific (maladaptive) working time strategies in relation to work overload and work scheduling autonomy, our study offers further empirical contributions. Specifically, our results provide noteworthy insights into day-specific telework (which we included as covariate) as an important context variable. Interestingly, whereas between-person studies indicate that telework is a double-edged sword associated with both higher perceived workload and higher autonomy (e.g., Wang et al. 2021), in our data, day-specific telework was neither significantly associated with work overload nor with work scheduling autonomy on that day. Perhaps even more interestingly, we found a direct negative relationship between day-specific telework and end-of-work exhaustion, but a positive indirect relationship via overtime (binary). This suggests that teleworking on a given day might be a protective factor on the one hand but also seems to contribute to overtime work and thus higher exhaustion – a finding that has been previously reported at the between-person level (e.g., Wöhrmann/Ebner 2021). Given that hybrid work settings (i.e., switching between onsite and remote work within the workweek) are the 'new normal' (Gajendran et al. 2024), it would be interesting to know why unplanned overtime is more likely on teleworking days. We accordingly call for future research to delve deeper into the behavioral and possibly cognitive mechanisms underlying the effects of day-specific teleworking.

Finally, although we focused on within-person (i.e., day-specific) processes, we consider it important to also embed our results within the prevailing between-person perspective and research findings. Comparing within-person with between-person correlations allows for this and provides notable insights. Specifically, regarding work overload, there were no significant between-person correlations with break violations, indicating that skipping or shortening breaks is indeed a reaction to high day-specific workload, while persons with higher general workload would rather work faster and longer on each workday. Accordingly, high general work overload could result in a culture of overwork. Moreover, whereas work scheduling autonomy was negatively correlated with all three types of working time strategies at the within-person level, the only significant (negative) between-person correlation was with working faster. At the same time, and most interesting in our view, at the within-person level, working faster was the only of the strategies examined that was not related to end-of-work exhaustion, while at the between-person level, the opposite is true, such that working faster was the only of the strategies that was significantly (positively) related to end-of-work exhaustion. This shows that working faster, although seemingly risk-free or possibly even helpful on a single day, is highly exhausting as a sustained strategy. Overall, the finding that work overload was positively

correlated with working faster and work scheduling autonomy was negatively correlated with working faster at the between-person level supports our main conclusion that high workload is a risk factor for and work scheduling autonomy is a protective factor against choosing the maladaptive working time strategy of overwork, which has been identified as a huge health risk (e.g., Tsutsumi 2019).

Study Limitations and Avenues for Future Research

As with any study, some limitations of our research must be considered. First, we relied solely on self-report measures and assessed the working time strategies using 1-item measures. This might raise concerns about the validity and breath of these measures. Importantly, however, our two-level analysis approach automatically prevents typical person-related biases that could affect the within-person-level results, such as same-source bias or social-desirability bias (Gabriel et al. 2019). Nevertheless, reports from other people (e.g., coworkers) or objective data sources (e.g., time-log data from automated work time measurements) could provide further insights into the use and effects of at least some types of maladaptive working time strategies and thus might be used in future research. Regarding our measures, specifically our operationalization of the extent of break violations could be further criticized. Compared to the operationalization of overtime, it is unclear whether the skipping/shortening of breaks was unplanned, and we did not measure the extent of break violation based on the duration or number of daily breaks but rather based on the severity of the break violations. Future research could measure the extent of break violations analogous to our extent measure of overtime, asking for how many and for which time breaks were skipped and shortened, respectively.

Second, because we only used one daily measurement point, different patterns of causality are possible. For example, on days when many and too long breaks are taken, work overload could be a consequence of this behavior, which could then lead to unplanned overtime. Thus, more complex interdependencies even between different working time strategies are possible. Event sampling, in which a survey must be answered after each break taken, or a daily reconstruction approach (e.g., Bosch/Sonnentag 2019) could be methodological options for future studies.

Third, we investigated the three maladaptive working time strategies as parallel, additive mediators. Examining the three strategies in combination, that is, the simultaneous use of different strategies on the same day, could provide deeper insights. Potentially, the more maladaptive working time strategies are used on a given day (e.g., working faster, severe break violations, and overtime), the higher the exhaustion could be at the end of work. To investigate this idea, a within-person latent class analysis would be an interesting statistical approach (see Mäkigangas et al. 2018). Additionally, further outcome variables might be considered, such as performance outcomes on the one hand, and recovery, such as evening recovery experiences or next-morning well-being on the other hand (see Venz et al. 2024). Likewise, other day-specific work characteristics (and their interactions) could be considered on the predictor side, such as performance pressure (Mitchell et al. 2019), unpredictable tasks (see Sonnentag/Völker/Wehrt 2024), information processing demands, or work methods autonomy (Morgeson/Humphrey 2006). Furthermore, it would be worthwhile to consider person-related predictors, such as state

perfectionism (Mohr/Venz/Sonnentag 2022).

Fourth, we did not account for between-person differences. Whereas our chosen two-level analysis approach controls for all potential person-level confounders (Gabriel et al. 2019), cross-level moderators might play a role in shaping day-level effects. For example, socio-demographic and socio-economic factors such as gender, care responsibilities or occupation and stable person characteristics such as workaholism might alter the effects both of work characteristics on maladaptive working time strategies and of these strategies on exhaustion. Similarly, general aspects of the work context, such as industry, and stable workplace characteristics, such as competitive climate or job complexity, might play a role in this regard.

Finally, scholars could extend our research model and investigate whether, how and possibly why the effects of maladaptive working time strategies extend to non-work time. For example, the role of maladaptive working time strategies in explaining the recovery paradox (i.e., that employees have difficulty recovering particularly on days when they need it most, e.g., when they are exhausted; see Venz et al. 2024) is a promising avenue for future research. Regarding predictors, exploring the motives for choosing certain working time strategies could provide further insights important for designing effective interventions.

Practical Implications

Several implications for practice can be derived from our findings. First, employees should be granted sufficient work scheduling autonomy, enabling them to structure their working day in such a way that they can take their breaks, work at a for them optimal pace, and finish their work as planned. Even more important, workload should be manageable, that is, not so heavy that it results in overload experiences. Addressing these work characteristics through appropriate work design measures – especially in the context of teleworking (Wang et al. 2021, Wöhrmann/Ebner 2021) – should be the first step in preventing the use of maladaptive working time strategies and thus the occurrence of ill-being. Various work design measures to prevent overwork were identified by Tsutsumi (2019). Furthermore, findings on daily working time recording (Backhaus et al. 2021) suggest that it could help to prevent maladaptive working time behaviors, especially overtime. Second, because work characteristics may not be possible to be shaped on every single day, and especially telework is an integral part of modern work, employees' own decisions regarding working time behavior should also be addressed, for example by implementing stress-management programs (see Kröll/Doebler/Nüesch 2017) such as time management trainings (see Aeon/Faber/Panaccio 2021); such interventions can be well conducted online (Althammer/Wöhrmann/Michel 2023). Finally, it seems advisable to improve personal attitudes and control beliefs regarding work and break times (Blasche et al. 2021).

Conclusion

Our results contribute to the understanding of the dynamic relationships between work characteristics and exhaustion by taking a day-specific perspective and examining the explanatory role of different working time strategies. Indeed, employees choose different working time strategies to deal with overload – violating breaks, working faster, and working overtime – with working overtime appearing most maladaptive. Granting work scheduling autonomy can prevent overtime and thus counteract exhaustion. One promising avenue for future research is the investigation of maladaptive working time strategies in relation to employee off-work recovery.

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References

Aeon, Brad, Aïda Faber, and Alexandra Panaccio (2021). Does Time Management Work? A Meta-Analysis. *PloS one* 16(1): e0245066. https://doi.org/10.1371/journal.pone.0245066

Ahola, Kirsi, Salla Toppinen-Tanner, and Johanna Seppänen (2017). Interventions to Alleviate Burnout Symptoms and to Support Return to Work Among Employees with Burnout: Systematic Review and Meta-analysis. *Burnout Research* 4: 1-11. https://doi.org/10.1016/j.burn.2017.02.001

Albulescu, Patricia, Irina Macsinga, Andrei Rusu, Coralia Sulea, Alexandra Bodnaru, and Bogdan Tudor Tulbure (2022). "Give Me a Break!" A Systematic Review and Meta-Analysis on the Efficacy of Micro-Breaks for Increasing Well-Being and Performance. *PloS ONE* 17(8): e0272460. https://doi.org/10.1371/journal.pone.0272460

Althammer Sarah E., Anne M. Wöhrmann, and Alexandra Michel (2023). Comparing Web-Based and Blended Training for Coping With Challenges of Flexible Work Designs: Randomized Controlled Trial. *Journal of Medical Internet Research* 25: e42510. https://doi.org/ 10.2196/42510

Backhaus, Nils, Lisa-Katharina Stein, and Ines Entgelmeier (2021). *Arbeitszeiterfassung und Flexibilität - Ergebnisse der BAuA-Arbeitszeitbefragung 2019*. Dortmund: Bundesanstalt für Arbeitsschutz und Arbeitsmedizin. https://doi.org/10.21934/baua:fokus20211001

Baethge, Anja, Nicole Deci, Jan Dettmers, and Thomas Rigotti (2019). 'Some Days Won't End Ever': Working Faster and Longer as a Boundary Condition for Challenge versus Hindrance Effects of Time Pressure. *Journal of Occupational Health Psychology* 24(3): 322–32. https://doi.org/10.1037/ocp0000121

Bakker, Arnold B., and Evangelia Demerouti (2007). The Job Demands-Resources Model: State of the Art. *Journal of Managerial Psychology* 22(3): 309–28. https://doi.org/10.1108/02683940710733115

Bakker, Arnold B., Evangelia Demerouti, and Ana Sanz-Vergel (2023). Job Demands–Resources Theory: Ten Years Later. *Annual Review of Organizational Psychology and Organizational Behavior* 10: 25-53. https://doi.org/10.1146/annurev-orgpsych-120920-053933

Blasche, Gerhard, Anna Arlinghaus, and Richard Crevenna (2022). The Impact of Rest Breaks on Subjective Fatigue in Physicians of the General Hospital of Vienna. *Wiener klinische Wochenschrift*: 1-6.

Blasche, Gerhard, Sanja Pasalic, Verena-Maria Bauböck, Daniela Haluza, and Rudolf Schoberberger (2017). Effects of Rest-Break Intention on Rest-Break Frequency and Work-Related Fatigue. *Human Factors* 59(2): 289–98. https://doi.org/10.1177/0018720816671605

Blasche, Gerhard, Johannes Wendsche, Theresa Tschulik, Rudolf Schoberberger, and Lisbeth Weitensfelder (2021). Individual Determinants of Rest-Break Behavior in Occupational Settings. Healthcare (Basel) 9(10): 1330. https://doi.org/10.3390/healthcare9101330

Bosch, Christine and Sabine Sonnentag (2019). Should I Take a Break? A Daily Reconstruction Study on Predicting Micro-breaks at Work. *International Journal of Stress Management* 26(4): 378–388. https://doi.org/10.1037/str0000117

Brauner, Corinna, Anne M. Wöhrmann, Nils Backhaus, Frank Brenscheidt, and Anita Tisch (2020). Überstunden, Ausgleichsmöglichkeiten, Gesundheit und Work-Life Balance. Repräsentative Ergebnisse der BAuA-Arbeitszeitbefragung 2017. *Sozialpolitik.ch* 3, 2020: 1-26. https://doi.org/10.18753/2297-8224-168

Chan, Phoenix H. H., Joshua Howard, Nathan Eva, and Herman H. M. Tse (2022). A Systematic Review of At-Work Recovery and a Framework for Future Research. *Journal of Vocational Behavior* 137 (September): 1–19. https://doi.org/10.1016/j.jvb.2022.103747

Demerouti, Evangelia, Arnold B. Bakker, and Jonathon R. B. Halbesleben (2015). Productive and Counterproductive Job Crafting: A Daily Diary Study. *Journal of Occupational Health Psychology* 20(4): 457–69. https://doi.org/10.1037/a0039002

Demerouti, Evangelia, and Sonja Rispens (2014). Improving the Image of Student-recruited Samples: A Commentary. *Journal of Occupational and Organizational Psychology* 87(1): 34–41. https://doi.org/10.1111/joop.12048

Demerouti, Evangelia, Arnold B. Bakker, Friedhelm Nachreiner, and Wilmar B. Schaufeli (2001). The Job Demands-Resources Model of Burnout. *Journal of Applied Psychology* 86(3): 499–512. https://doi.org/10.1037/0021-9010.86.3.499

Demerouti, Evangelia, Arnold B. Bakker, Ioanna Vardakou, and Aristotelis Kantas (2003). The Convergent Validity of Two Burnout Instruments: A Multitrait-Multimethod Analysis. *European Journal of Psychological Assessment* 19(1): 12–23. https://doi.org/10.1027//1015-5759.19.1.12

Duchaine, Caroline S., Karine Aubé, Mahée Gilbert-Ouimet, Michel Vézina, Ruth Ndjaboué, Victoria Massamba, Denis Talbot, et al. (2020). Psychosocial Stressors at Work and the Risk of Sickness Absence Due to a Diagnosed Mental Disorder: A Systematic Review and Meta-Analysis. *JAMA Psychiatry* 77(8): 842–851. https://doi.org/10.1001/jamapsychiatry.2020.0322

Gabriel, Allison S., Nathan P. Podsakoff, Daniel J. Beal, Brent A. Scott, Sabine Sonnentag, John P. Trougakos, and Marcus M. Butts (2019). Experience Sampling Methods: A Discussion of Critical Trends and Considerations for Scholarly Advancement. *Organizational Research Methods* 22(4): 969–1006. https://doi.org/10.1177/1094428118802626

Gajendran, Ravi S., Ajay R. Ponnapalli, Chen Wang, and Anoop A. Javalagi (2024). A Dual Pathway Model of Remote Work Intensity: A Meta-analysis of its Simultaneous Positive and Negative Effects. *Personnel Psychology* (Advance Online Publication). https://doi.org/10.1111/peps.12641

García-Arroyo, José A., and Amparo Osca Segovia (2019). Work Overload and Emotional Exhaustion in University Teachers: Moderating Effects of Coping Styles. *Universitas Psychologica* 18(2): 1–12. https://doi.org/10.11144/Javeriana.upsy18-2.woee

Headrick, Lucille, Daniel A. Newman, Young Ah Park, and Yijue Liang (2023). Recovery Experiences for Work and Health Outcomes: A Meta-Analysis and Recovery-Engagement-Exhaustion Model. *Journal of Business and Psychology* 38(4): 821-864 https://doi.org/10.1007/s10869-022-09821-3

Humphrey, Stephen E., Jennifer D. Nahrgang, and Frederick P. Morgeson (2007). Integrating Motivational, Social, and Contextual Work Design Features: A Meta-analytic Summary and Theoretical Extension of the Work Design Literature. *Journal of Applied Psychology* 92(5): 1332–56. https://doi.org/10.1037/0021-9010.92.5.1332

Johnston, Derek W., Julia L. Allan, Daniel J.H. Powell, Martyn C. Jones, Barbara Farquharson, Cheryl Bell, and Marie Johnston (2019). Why Does Work Cause Fatigue? A Real-Time Investigation of Fatigue, and Determinants of Fatigue in Nurses Working 12-hour Shifts. *Annals of Behavioral Medicine* 53): 551-562.

Karasek Jr., Robert A. (1979). Job Demands, Job Decision Latitude, and Mental Strain: Implications for Job Redesign. *Administrative Science Quarterly* 24: 285-308. https://doi.org/10.2307/2392498

Keller, Anita C., and Laurenz L. Meier (2023). It's a New Day–Is It? Testing Accumulation and Sensitisation Effects of Workload on Fatigue in Daily Diary Studies. *Work & Stress* (Advance Online Publication). https://doi.org/10.1080/02678373.2023.2251124

Kröll, Claudia, Philipp Doebler, and Stephan Nüesch (2017). Meta-Analytic Evidence of the Effectiveness of Stress Management at Work. *European Journal of Work and Organizational Psychology* 26(5): 677-693. https://doi.org/10.1080/1359432X.2017.1347157

Lazarus, Richard S., and Susan Folkman (1984). *Stress, Appraisal, and Coping.* Springer.

MacKinnon, David P., Amanda J. Fairchild, and Matthew S. Fritz (2007). Mediation Analysis. *Annual Review of Psychology* 58: 593–614. https://doi.org/10.1146/annurev.psych.58.110405.085542

Mäkikangas, Anne, Asko Tolvanen, Kaisa Aunola, Taru Feldt, Saija Mauno, and Ulla Kinnunen (2018). Multilevel Latent Profile Analysis With Covariates: Identifying Job Characteristics Profiles in

Hierarchical Data as an Example. *Organizational Research Methods* 21(4): 931–54. https://doi.org/10.1177/1094428118760690

Messenger, Jon, Oscar Vargas Llave, Lutz Gschwind, Simon Boehmer, Greet Vermeylen and Mathijn Wilkens (2017). *Working Anytime, Anywhere: The Effects on the World of Work*. Eurofound and the International Labour Office. https://doi.org/10.2806/372726

Mitchell, Marie S., Rebecca L. Greenbaum, Ryan M. Vogel, Mary B. Mawritz, and David J. Keating (2019). Can You Handle the Pressure? The Effect of Performance Pressure on Stress Appraisals, Self-regulation, and Behavior. *Academy of Management Journal* 62(2): 531–52. https://doi.org/10.5465/amj.2016.0646

Moen, Phyllis, Erin L. Kelly, Eric Tranby, and Qinlei Huang (2011). Changing Work, Changing Health: Can Real Work-Time Flexibility Promote Health Behaviors and Well-Being? *Journal of Health and Social Behavior* 52(4): 404–29. https://doi.org/10.1177/0022146511418979

Mohr, Monique, Laura Venz, and Sabine Sonnentag (2022). A Dynamic View on Work-related Perfectionism: Antecedents at Work and Implications for Employee Well-being. *Journal of Occupational and Organizational Psychology* 95(4): 846–66. https://doi.org/10.1111/joop.12403

Morgeson, Frederick P., and Stephen E. Humphrey (2006). The Work Design Questionnaire (WDQ): Developing and Validating a Comprehensive Measure for Assessing Job Design and the Nature of Work. *Journal of Applied Psychology* 91(6): 1321–39. https://doi.org/10.1037/0021-9010.91.6.1321

Mumenthaler, Jonas, Michaela Knecht, and Andreas Krause (2021). Short Term Effects of Workload and Extending Working Hours on Exhaustion. *Psychology of Everyday Activity* 14(2): 19-28. https://irf.fhnw.ch/handle/11654/32701

Nold, Johanna, and Anne M. Wöhrmann (2022). Flexibilität der Arbeitszeiten. In: BAuA (ed.). *Arbeitszeitreport Deutschland: Ergebnisse der BAuA-Arbeitszeitbefragung 2021.* Bundesanstalt für Arbeitsschutz und Arbeitsmedizin.

Ohly, Sandra, Sabine Sonnentag, Cornelia Niessen, and Dieter Zapf (2010). Diary Studies in Organizational Research: An Introduction and Some Practical Recommendations. *Journal of Personnel Psychology* 9(2): 79–93. https://doi.org/10.1027/1866-5888/a000009

Pindek, Shani, Maryana L. Arvan, and Paul E. Spector (2019). The Stressor–Strain Relationship in Diary Studies: A Meta-Analysis of the Within and Between Levels. *Work & Stress* 33(1): 1–21. https://doi.org/10.1080/02678373.2018.1445672

Pindek, Shani, Lorenzo Lucianetti, Stacey R. Kessler, and Paul E. Spector (2020). Employee to Leader Crossover of Workload and Physical Strain. *International Journal of Stress Management* 27(4): 326–34. https://doi.org/10.1037/str0000211

Poetz, Lennart, and Judith Volmer (2022). A Diary Study on the Moderating Role of Leader-Member Exchange on the Relationship Between Job Characteristics, Job Satisfaction, and Emotional Exhaustion. *Frontiers in Psychology* 13: 812103. https://doi.org/10.3389/fpsyg.2022.812103

Sandmeier, Anita, Sophie Baeriswyl, Andreas Krause, and Julia Muehlhausen (2022). Work until You Drop: Effects of Work Overload, Prolonging Working Hours, and Autonomy Need Satisfaction on Exhaustion in Teachers. *Teaching and Teacher Education* 118(October): 1–10. https://doi.org/10.1016/j.tate.2022.103843

Selig, James P., and Kristopher J. Preacher (2008). Monte Carlo Method for Assessing Mediation: An Interactive Tool for Creating Confidence Intervals for Indirect Effects in 1-1-1-multilevel models [Computer software]. Last access 20.05.2025 on: https://www.quantpsy.org/medmc/medmc111.htm

Shao, Yiduo, Bernadeta Goštautaitė, Mo Wang, and Thomas W. H. Ng (2022). Age and Sickness Absence: Testing Physical Health Issues and Work Engagement as Countervailing Mechanisms in a Cross-national Context. *Personnel Psychology* 75(4): 895-927. https://doi.org/10.1111/peps.12498

Sonnentag, Sabine, Louis Tay, and Hadar Nesher Shoshan (2023) A Review on Health and Well-being at Work: More than Stressors and Strains. *Personnel Psychology* 76(2): 473–510. https://doi.org/10.1111/peps.12572

Sonnentag, Sabine, Jette Völker, and Wilken Wehrt (2024). Good and Bad Days at Work: A Descriptive Review of Day-level and Experience-sampling Studies. *Journal of Organizational Behavior* (Advance Online Publication). https://doi.org/10.1002/job.2796

Spector, Paul E., and Steve M. Jex (1998). Development of Four Self-Report Measures of Job Stressors and Strain: Interpersonal Conflict at Work Scale, Organizational Constraints Scale, Quantitative Workload Inventory, and Physical Symptoms Inventory. *Journal of Occupational Health Psychology* 3(4): 356–67. https://doi.org/10.1037/1076-8998.3.4.356

Stegmann, Sebastian, Rolf van Dick, Johannes Ullrich, Julie Charalambous, Birgit Menzel, Nikolai Egold, and Tina Tai-Chi Wu (2010). Der Work Design Questionnaire – Vorstellung und erste Validierung einer deutschen Version. *Zeitschrift für Arbeits- und Organisationspsychologie* 54(1): 1-28. https://doi.org/10.1026/0932-4089/a000002

Takahashi, Masaya, Kenji Iwasaki, Takeshi Sasaki, Tomohide Kubo, Ippei Mori, and Yasumasa Otsuka (2012). Sleep, Fatigue, Recovery, and Depression after Change in Work Time Control: A One-Year Follow-up Study. *Journal of Occupational and Environmental Medicine* 54(9): 1078–85. https://doi.org/10.1097/JOM.0b013e31826230b7

Tsutsumi, Akizumi (2019). Preventing overwork-related deaths and disorders—needs of continuous and multi-faceted efforts. *Journal of Occupational Health* 61(4): 265-266. https://doi.org/10.1002/1348-9585.12062

Vahle-Hinz, Tim, Nicole Deci, and Anja Baethge (2024). Intensifying and Protective? – How Organizational Culture Shapes the Effect of Work Scheduling Autonomy on the Relationship between Time Pressure and Self-Endangering Work Behaviours. *European Journal of Work and Organizational Psychology* (Advance Online Publication) 1-15. https://doi.org/10.1080/1359432X.2024.2326620

Venz, Laura, Katrin Boettcher (2022). Leading in times of crisis: How perceived COVID-19-related work intensification links go daily e-mail demands and leader outcomes. *Applied Psychology* 71(3): 912-934. https://doi.org/10.1111/apps.12357

Venz, Laura, Anne Casper, and Sabine Sonnentag (2020). Affect, Stress, and Health: The Role of Work Characteristics and Work Events. In *The Cambridge Handbook of Workplace Affect.*, 105–19. New York, NY: Cambridge University Press. https://doi.org/10.1017/9781108573887.009

Venz, Laura, and Monique Mohr (2022). The Social Dynamics of Knowledge Hiding: A Diary Study on the Roles of Incivility, Entitlement, and Self-Control. *European Journal of Work and Organizational Psychology* 32(1): 47-59. https://doi.org/10.1080/1359432X.2022.2089562

Venz, Laura, and Alexander Pundt (2021). Rain, Rain Go Away! A Diary Study on Morning Weather and Affective Well-being at Work. *Applied Psychology: An International Review* 70(4): 1856–71. https://doi.org/10.1111/apps.12299

Venz, Laura, Alexander Pundt, and Sabine Sonnentag (2018). What Matters for Work Engagement? A Diary Study on Resources and the Benefits of Selective Optimization with Compensation for State Work Engagement. *Journal of Organizational Behavior* 39(1): 26–38. https://doi.org/10.1002/job.2207

Venz, Laura, and Hadar Nesher Shoshan (2022). Be Smart, Play Dumb? A Transactional Perspective on Day-Specific Knowledge Hiding, Interpersonal Conflict, and Psychological Strain. *Human Relations* 75(1): 113–38. https://doi.org/10.1177/0018726721990438

Venz, Laura, Anne M. Wöhrmann, Laura Vieten, and Alexandra Michel (2024). Recovery From Work Stress. In: Maria C.W. Peeters, Jan de Jonge, and Toon Taris (Eds.). *An Introduction to Contemporary Work Psychology, Volume* 2. Wiley-Blackwell, 321-344.

Vieten, Laura, Anne M. Wöhrmann, and Alexandra Michel (2022). Work-Time Control and Exhaustion: Internal Work-to-Home Interference and Internal Home-to-Work Interference as Mediators. *International Journal of Environmental Research and Public Health*, 19(6), 3487. https://doi.org/10.3390/ijerph19063487

Vieten, Laura, Anne M. Wöhrmann, Johannes Wendsche, and Alexandra Michel (2023). Employees' Work Breaks and their Physical and Mental Health: Results from a Representative German Survey. *Applied Ergonomics* 110: 103998. https://doi.org/10.1016/j.apergo.2023.103998

Wang, Bin, Yukun Liu, Jing Qian, and Sharon K. Parker (2021). Achieving Effective Remote Working During the COVID-19 Pandemic: A Work Design Perspective. *Applied Psychology* 70(1): 16-59. https://doi.org/10.1111/apps.12290

Wayne, Sandy J., Grace Lemmon, Jenny M. Hoobler, Gordon W. Cheung, and Morgan S. Wilson (2017). The Ripple Effect: A Spillover Model of the Detrimental Impact of Work–Family Conflict on Job Success. *Journal of Organizational Behavior* 38(6): 876–894. https://doi.org/10.1002/job.2174

Wendsche, Johannes, Andrea Lohmann-Haislah, Anika Schulz, and Ina Schöllgen (2022). Violation of German Rest Break Regulation Criteria and Health Complaints While Working in the Office and From Home. *Sozialpolitik ch* 2: Article 2.2. https://doi.org/10.18753/2297-8224-219

Wöhrmann, Anne M., and Christian Ebner (2021). Understanding the Bright Side and the Dark Side of Telework: An Empirical Analysis of Working Conditions and Psychosomatic Health Complaints. *New Technology, Work & Employment* 36(3): 348–70. https://doi.org/10.1111/ntwe.12208

Zhang, Fangfang, and Sharon K. Parker (2022). Reducing Demands or Optimizing Demands? Effects of Cognitive Appraisal and Autonomy on Job Crafting to Change One's Work Demands. *European Journal of Work and Organizational Psychology* 31(5): 641-654. https://doi.org/10.1080/1359432X.2022.2032665