“What did you do this weekend?” Relationships between weekend activities, recovery experiences and changes in work- related well-being.

Received: 24 July 2019
Supplementary materials:
<https://osf.io/6xqdr/>
For correspondence:
clement.ginoux@univ-grenoble-alpes.fr

Clément Ginoux¹, Sandrine Isoard-Gauthier¹, & Philippe Sarrazin¹

¹Univ. Grenoble Alpes, SENS, F-38000 Grenoble, France

Please cite as: Ginoux, C., Isoard-Gauthier, S. & Sarrazin, P. (2020). “What did you do this weekend?” Relationships between weekend activities, recovery experiences and changes in work-related well-being. *SportRxiv*. <https://doi.org/10.31236/osf.io/4k8vz>

ABSTRACT

Recovery refers to the process of replenishing resources that occurs when employees distance themselves from their work, leading to improvements in work-related well-being indicators (WRWB), such as burnout and vigor. Research has shown that weekend activities are related to changes in WRWB, and that recovery experiences could mediate these relationships. This study aims to examine the indirect relationships of recovery activities on changes in burnout and vigor, through weekend recovery experiences. It extends past research by considering a greater number of recovery activities and experiences, and by controlling for job demands. 249 employees from various occupations completed two online surveys before and

after the weekend, assessing their WRWB, weekend recovery activities and experiences, and job demands. Structural equation modeling revealed that after controlling for job demands, changes in burnout and vigor were positively predicted by a latent variable – the weekend recovery experience – subjacent to perceptions of detachment, relaxation, mastery, control and relatedness. In addition, four out of six weekend activities predicted negative (work-related activities) or positive (social, physical, and creative activities) recovery experiences. Additional analyses showed that the recovery experience was a full mediator of the relationships between weekend activities and vigor change. These results confirm the importance of weekend activities and recovery experience for improving WRWB. They contribute to expanding current knowledge on recovery from work, highlighting the importance of considering creative activities and relatedness in future studies.

INTRODUCTION

Over the last few decades, work and organizational psychology has focused mainly on the stress process, explaining how the work environment influences work-related well-being (WRWB) [for a review, see 1], represented by indicators such as burnout [defined as a combination of emotional exhaustion, cognitive weariness, and physical fatigue; ,2] and vigor [defined as the feeling of having optimal levels of emotional energy, cognitive liveliness and physical strength; ,3]. Recently, research has also focused on recovery processes that can improve WRWB during non-work time [4]. Two recovery mechanisms have been studied: the *recovery activities* that people do during non-work time and the *recovery experiences* that people feel during these activities. The assumption is that activities carried out during a non-work time period (e.g., evening, weekend, holidays) can either facilitate or hinder recovery experiences, which in turn impact WRWB (e.g., Sonnentag et al., 2017). The purpose of the present study is to identify which activities employees should do or avoid during the weekend to promote their recovery and in turn to improve their WRWB on Monday. More specifically, we empirically tested a model in which recovery activities carried out during the weekend predicted employees' recovery experiences and in turn burnout and vigor on Monday, controlling for Friday baseline and Monday job demands. Our study contributes to the literature in several ways. First, it measured a greater number of recovery activities (i.e., work-related, household and childcare, low-effort, social, physical, and creative activities) and experiences (i.e., psychological detachment, relaxation, mastery, control, and relatedness) that previous studies. This enabled us to identify which activities are the most positively and negatively related to

recovery experiences, and consequently which recovery activities would be the more efficient to recover from work. Second, we controlled for job demands on Monday. Since job demands can be correlated both with WRWB, recovery activities and experiences, this precaution made it possible to identify unbiased relationships between recovery activities, recovery experiences, and WRWB. Third, using data collected before and after the weekend and using structural equation modeling, the design allowed us to rigorously test the indirect relationships of recovery activities on changes in burnout and vigor, through weekend recovery experiences.

How Does Recovery during Non-Work Time Work?

Recovery activities

To better understand how employees can recover from work during non-work time, authors have examined their behaviors, and notably the activities they engaged in during non-work time, and how this engagement was associated with WRWB [4]. These *recovery activities* have been classified according to their recovery potential, differentiating those that could provide additional personal energetic resources to employees, from those that could consume them [5].

Firstly, some activities have a low-duty profile, involving different resources from those used at work or not involving the use of resources. During these activities, employees could restore their depleted resources and obtain new ones. These *resource-providing activities* include social, physical, low effort or creative activities that employees generally perform during their leisure time [4,6]. *Social activities* refer to activities that promote social contact and allow people to spend time with valuable peers. Studies have shown that they were associated with lower levels of burnout, and higher levels of vigor and well-being, during the next workday [7–9]. *Physical activities* are active activities that have a moderate-to-high energy expenditure, such as walking, team, or endurance sports. They have been shown to be positively associated with greater vigor [10,11] and lower burnout [12,13]. *Low-effort activities* are passive activities with low physical and psychological load, such as relaxing, reading, or watching television. Employees who spent time in low-effort activities reported higher levels of well-being afterward [9–11]. Finally, *creative activities* refer to activities with low energy expenditure and in which individuals have the potential for being creative, such as playing music, painting, or amateur dramatics. Research has shown that *creative activities* were positively related to work-related performance [14], and authors suggested investigating their effect on WRWB [4].

Secondly, resource-consuming activities refer to activities that have a high-duty profile. *Work-related activities* refer to activities such as completing a task for work or preparing for the next workday, and activities related to personal administrative tasks, such as completing a tax return or paying bills. Work-related activities were related to low levels of vigor [11], as well as high levels of burnout [9]. *Household/childcare activities* are not workplace demands, but they are assumed to draw on similar resources because they are also obligatory and require sustained concentrated effort [5]. We assessed these six activities by asking the amount of time, in hours, that employees spent on them in order to minimize the overlap with measures of recovery experiences.

Recovery experiences

Authors have also pointed out the positive effect of some psychological experiences in the recovery process. They suggest that this recovery effect associated with activities (i.e. their behaviors) may be due more to how people experience these activities (i.e. the cognitive or psychological processes), than the nature of the activities themselves [15]. They have proposed that some psychological mechanisms – i.e., *recovery experiences* – may be responsible for changes in WRWB observed during the next working day. The ERM theory [16, Effort-Recovery Model; ,17] postulates that employees use their personal resources during efforts they make at work and they are only able to recover when they distance themselves from their job and its demands. In light of this theory, psychological detachment and relaxation are considered as experiences which do not use any personal energetic resources and do not involve any demands. As a result, they can help employees to restore their depleted resources at work. *Psychological detachment from work* refers to the subjective experience of leaving work, "switching off" and forgetting work during non-working time. *Relaxation* refers to the experience of low sympathetic activation aimed at relaxing the body and mind. It refers not only to progressive muscle relaxation or meditation, but more generally to rest periods that employees can enjoy in their non-work time.

The COR theory [Conservation Of Resources; ,18,19], postulates that individuals are intrinsically motivated to protect the resources they have and try to invest them to gain new ones. In light of this theory, even if mastery, control over leisure time, and relatedness may require the investment of some resources, these three recovery experiences are able to provide greater new resources to employees. *Mastery* refers to situations that provide stimulating experiences and opportunities to develop skills and competences, which can

increase employees' self-esteem and sense of self-efficacy. *Control on leisure time* refers to the extent to which a person can decide what he/she wants to do in his/her leisure time, as well as when and how to do it. In addition to these four mechanisms, the *relatedness* or affiliation feeling – namely, the person's experiences of closeness and connectedness with others – has been proposed as an additional recovery experience during leisure activities likely to improve WRWB [20,21]. In their leisure time, employees are likely to interact with others and benefit from these interactions, regardless of the activity.

Existing studies have mainly considered these recovery experiences over short periods of time, especially after the workday. During these periods, employees are often busy with other time-consuming daily tasks during the evenings, such as commuting, childcare or household duties [22,23] and have little time to engage in non-work activities and fewer opportunities to have recovery experiences. Weekends seem more appropriate for recovering from work, offering longer and more peaceful non-work time periods, during which employees can easily engage in numerous activities or have more opportunities for recovery experiences. Research has reported that employees reported higher levels of well-being after the weekend, compared to the last workday of the previous week [22,24,25]. However, some studies reported different relationships between recovery experiences and WRWB, and notably that all recovery experiences were not associated with WRWB. These mixed results could be caused by statistical artefacts and especially shared variance issues. Because the estimates of the five experiences on WRWB represent the unique effect of each one, the lack of significant relationships for some of them could mean that these non-significant relationships did not have sufficient remaining variance for significant associations to be observed in the analyses. We assessed these five experiences by asking participants about the extent to which the activities they did during the weekend allowed them to feel these recovery experiences, and we considered a latent variable derived from our five recovery experiences.

The recovery activities – experiences relationships

Research has shown that recovery experiences and activities are closely related, and that specific activities can support or prevent recovery experiences. Concerning activities with a low duty profile, studies have highlighted that social activities were positively associated with high levels of psychological detachment from work, relaxation and mastery [11,23,26]. Regarding physical activity, much evidence has highlighted the links with high levels of psychological detachment from work, relaxation, mastery, and relatedness [11,20,23].

Moreover, employees have reported high levels of relaxation during low-effort activities [11]. In addition, it has been demonstrated that creative activities were positively associated with experiences of mastery, control and relaxation, but not significantly associated with psychological detachment from work [14]. However, to our knowledge, the Eschleman and colleagues' study is the only one which has investigated the links between creative activities and recovery experiences, and they do not consider WRWB indicators. As a result, the links between creative activities, recovery experiences, and WRWB need to be confirmed.

Concerning resource-consuming activities, studies have demonstrated that work-related activities were related to low levels of psychological detachment from work, relaxation, and control [11,26,27]. At the same time, results on associations between household/childcare activities and recovery experiences have been mitigated. In some studies, these activities were negatively associated with psychological detachment from work, relaxation and mastery [11,23], whereas, nonsignificant or positive relationships have also been found for psychological detachment from work, control or relaxation [23]. To summarize, resource-providing activities are typically positively associated, whereas resource-consuming activities are typically negatively or not related to recovery experiences.

Hypothesis H1a: the amount of time spent in resource-providing activities is positively related to recovery experiences felt during the weekend.

Hypothesis H1b: the amount of time spent in resource-consuming activities is negatively related to recovery experiences felt during the weekend.

Recovery experiences and WRWB

Studies have shown that employees who reported high recovery experiences (i.e., detachment, relaxation, mastery and control) over the weekend also reported low levels of burnout, as well as high levels of vigor the following Monday. Specifically, employees who were able to detach themselves psychologically from their work during the weekend reported lower burnout [28–31] and higher vigor [32,33]. In addition, past studies have shown that employees who experience high levels of relaxation report higher levels of vigor and lower levels of burnout [25]. Moreover, employees who experienced significant mastery during the weekend reported lower levels of burnout [25,30] and higher levels of vigor [25,32,34]. Similarly, employees who perceived high control and autonomy during their non-work time at weekends, reported higher levels of WRWB [15,25,30,35]. To the best of our knowledge, none of the previous studies have examined the relationships between feelings of relatedness during the

weekend and WRWB.

Hypothesis H2a: Recovery experiences felt during the weekend are negatively related to burnout on Monday (controlling for Monday job demand levels and Friday burnout)

Hypothesis H2b: Recovery experiences felt during the weekend are positively related to vigor on Monday (controlling for Monday job demand levels and Friday vigor)

An integrated model of weekend recovery

In light of the theoretical elements and empirical results presented previously, recovery activities and experiences together could explain the recovery process occurring during non-work time that are accountable for changes in WRWB. According to the ERM theory, the effect of activities would be beneficial to recovery only if employees have the opportunity to detach themselves from work psychologically and relax. Simultaneously, according to the COR theory, if the activities in which employees engage themselves promote experiences of control, mastery, and relatedness, then they can recover from work. These two assumptions lead to considering recovery experiences as mediators of the relationships between recovery activities and WRWB. Few studies have examined effects of both recovery activities and experiences to explain changes in WRWB over short-time period [11], and few examined the mediating effects of recovery experiences [11,28]. Regarding weekends, a limited number of studies have considered the mediating role of recovery experiences in the recovery activity – WRWB relationships [23,27]. For example, the study by Ragsdale and Beehr (2016) indicated that recovery experiences and personal resources (i.e. optimism and self-regulatory capacity) were indirect-only mediators for the relationships between recovery activities and WRWB. These results confirmed the presumed mediating role of recovery experiences during the weekend, even if more evidence is needed [4].

Hypothesis H3: Recovery experiences mediate the recovery activities – WRWB relationships (controlling for Monday job demand levels and Friday WRWB).

METHOD

Recruitment and Participants

Participants were contacted with a brief text presenting the study protocol and inclusion criteria. It was specified that participants had to work full time (i.e., minimum 35h per

week), and have two consecutive weekend days. Volunteers received an email describing the procedure and the two links to respond to the two online questionnaires. An email was sent to them on Friday and Monday afternoon to remind them to answer the questionnaires.

Participants had to answer the first survey (T1) on Friday afternoon, just before leaving work. This first survey assessed burnout, vigor, and demographic variables. On Monday afternoon, just before leaving work, participant answered the second online survey (T2) assessing burnout, vigor, job demands met during the workday, and weekend recovery activities and experiences.

For this study 336 responses were received. Among them, 69 were deleted because some individuals answered twice at the first measurement time, and 18 were excluded from the sample because they did not answer at the second measurement time (preliminary analyses indicated that these individuals were not significantly different from others on primary outcomes). Consequently, the final sample included 249 participants. This sample was composed by 37.1 % men and the mean age was 39.06 years ($SD = 11.91$). Work experience and hours worked per week were respectively 9.76 years ($SD = 9.73$) and 38.77 hours per week ($SD = 7.56$). Our sample was composed of 2.0 % senior managers, 35.7 % executives and intellectual professions, 16.9 % intermediary professions, 38.2 % employees and 3.6 % blue collar workers. Most of responders (73.5 %) had an open-ended contract, 16.5 % had a fixed-term contract, 7.2 % had a self-employed status (2.8 % did not answer to this question). Among participants, 3.2 % had college degree or no diploma, 4.4 % had a professional qualification, 13.6 % had a high school graduation, 17.8 % had an associate degree and 58.2 % had a bachelor degree or higher graduation (2.8 % did not answer to this question).

Measures

Burnout.

Burnout was assessed with the French version [36] of the Shirom Melamed Burnout Measure [SMBM; 37]. The scale consists of 14 items divided into three subscales: *physical fatigue* (e.g., "I feel physically drained"), *cognitive weariness* (e.g., "I feel I'm not thinking clearly"), and *emotional exhaustion* (e.g., "I feel I am not capable of investing emotionally in coworkers and customers"). Scores were rated using a seven-point Likert scale (1 = never; 7 = always). Cronbach's alphas were .92, .92 and .86 on Friday, and .93, .92 and .91 on Monday, respectively for physical fatigue, cognitive weariness and emotional exhaustion. In prior research, the

English [38–40] and French [36] versions of the SMBM have shown to be valid and reliable instruments to assess burnout.

Vigor.

Vigor was measured with the French version [41] of the Shirom Melamed Vigor Measure [SMVM; 3]. The scale consists of 12 items divided into three subscales: *physical strength* (e.g., “I feel I have physical strength”), *cognitive liveliness* (e.g., “I feel able to be creative”), and *emotional energy* (e.g., “I feel able to show warmth to others”). Scores were rated using a seven-point Likert scale (1 = never; 7 = always). Cronbach’s alphas were .95, .89 and .91 on Friday, and .95, .83 and .93 on Monday, respectively for physical strength, cognitive liveliness and emotional energy. In prior research, the English [42–44] and French [41] versions of the SMVM have shown to be valid and reliable instruments to assess vigor at work.

Recovery activities

Recovery activities were assessed with an adapted and translated questionnaire from Sonnentag and Zijlstra [8]. The questionnaire was translated in French using back translation method, according to the guidelines for Translating and Adapting Tests of the International Test Commission [ITC, 45]. Participants were asked to assess six types of activity, (a) *work-related activities* (e.g., finishing or preparing for work duties and doing one’s private administrative tasks), (b) *household and childcare activities* (e.g., cooking, doing the dishes, shopping, taking care of the children), (c) *low-effort activities* (e.g., watching TV, taking a bath); (d) *social activities* (e.g., meeting with others, making a phone call in order to chat); (e) *physical activities* (e.g., sports, cycling); and (f) *expressive activities* (e.g., drama, music, singing). The latter were not included in the original questionnaire from Sonnentag and Zijlstra [8], *but considering creative activities as important for recovery* [4], we added them as a sixth activity, and used the description proposed by Eschleman et al. [14]. To facilitate participants’ ability to address these items, we adopted a different scale from the original one by using a Likert scale, which was previously used by Ragsdale et al. [27]. For all six activity categories, participants reported how much time they had spent on that type of activity during the weekend with a 7-point Likert scale with 1-hour increments (1 = 0 hours; 7 = more than 6 hours).

Recovery experiences

Recovery experiences – psychological detachment, relaxation, mastery, control – were assessed using 12 items from an adapted and translated version of the Recovery Experience Questionnaire [REQ; 15]. The questionnaire was translated in French using back translation method, according to the guidelines for Translating and Adapting Tests of the International Test Commission (ITC, 2018), and adapted to fit with the time period of the weekend. Participants were asked the following question, “To what extent would you say that the activities you did this weekend allowed you to (...)”. Items were slightly reformulated to correspond with temporality and the context: “(...) distanced myself from work” (psychological detachment), “(...) to relax” (relaxation), “(...) seek out intellectual challenges” (mastery), and “(...) decide my own schedule” (control). In addition, we added the relatedness subscale of the Balanced Measure of Psychological Needs [BMPN; 46]. The subscale was translated in French using back translation method, according to the guidelines for Translating and Adapting Tests of the International Test Commission (ITC, 2018). This subscale contains three items which were slightly reformulated to correspond with previous items of the REQ: “(...) feel a sense of contact with people who were also participating in these activities”. We ran confirmatory factor analyses to check the structural validity of the five recovery experiences represented distinct construct. Results showed that the five-factor model with 3-items per construct showed a satisfactory fit, Root Mean Square Error of Approximation (RMSEA) = .068, 95% CI [.054; .082]; Tucker-Lewis Index (TLI) = .952, Comparative Fit Index (CFI) = .963; Standardized Root Mean Square Residual (SRMR) = .038. Cronbach’s alphas were respectively .90, .90, .72, .88 and .92 for psychological detachment, relaxation, mastery, control and relatedness (see supplemental material for the complete version of this questionnaire).

Control variables

Job demands during the day.

As much evidence has demonstrated effects of job demands on WRWB [for an overview, see 1,47], job demands were added as a control variable and measured on Monday. Monday job demands were assessed with three-single items from the “quantitative demands” dimension of the French version [48] of the Copenhagen Psychosocial Questionnaire [49]. We selected three items to assess *workload* (“Today, I had enough time for my work tasks?”), *work pace* (“Today, it was necessary to keep working at a high pace?”), and *cognitive demands* (“Today, my work required me to remember a lot of things?”). These three items have been slightly

reformulated to correspond to the response time (i.e., workday). Cronbach's alpha was .62 for this scale.

Statistical analyses

First, descriptive analyses and correlation matrices were performed to observe variables and their relationships. The hypothesized model was tested using Structural Equation Modelling (SEM) with the Lavaan package [50; version 0.6-3] in R (version 3.5.2). Considering correlations among the 5 recovery experiences (r_s from .35 to .59) we decided to model recovery experience as a latent variable subjacent to perception of Detachment, Relaxation, Mastery, Control and Relatedness. Moreover, in light of the high number of variables in the model, we decided to reduce this by using the residualized scores for WRWB variables, controlling for the self-regressive effects and control variables (see Drach-Zahavy & Marzuq, 2013 for a similar analysis strategy). Residualized change scores for burnout and vigor dimensions were calculated by regressing Monday's outcome scores onto Friday's outcome and Monday's job demands scores. The residuals of these regression analyses were used as input for subsequent SEM. Thus, shared variance between job demands and the residualized indicators is not included in the model. In the same vein, shared variance between WRWB indicators at Time 1 and the residualized indicators is not included in the model either. Considering correlations among the three burnout dimensions on the one hand (r_s from .57 to .73), and the three vigor dimensions on the other (r_s from .54 to .74) (see table 1), we decided to create two latent variables in the SEM model, representing respectively overall burnout and vigor changes from Friday to Monday, controlling for Monday job demands. Residual change scores are preferable to simple change scores, because they eliminate auto-correlated errors and regression to mean effects [51]. A positive residualized change score indicates that the dependent variable increases between Friday and Monday, whereas a negative residualized change score indicates that the dependent variable decreases between Friday and Monday. Therefore, a significant negative relationship between the independent variable (IV) or mediator variable (MV) and the dependent variable (DV) suggested that IV or MV were negatively associated with a decrease in burnout between Friday and Monday. For vigor, a significant positive relationship between IV or MV and DV suggested IV or M were associated with an increase in vigor between Friday and Monday.

In a first step, we tested a fully mediated SEM model in which the 6 weekend activities are presumed to predict experience recovery that in turn is presumed to predict burnout and

vigor changes (see Figure 1). **All non-significant paths were removed from the model according to the methods described by MacCallum [52] to keep the most parsimonious model.** The significance of the paths will determine support for the Hypotheses 1 and 2. In a second step, to test Hypothesis 3 regarding recovery experiences mediating between recovery activities and WRWB, an alternative partially mediated model was tested in which direct paths were added from the weekend activities to the two WRWB indicators. Comparison of the adjustment indices of the alternative partially mediated model to adjustment indices of the fully mediated model hypothesized will give additional support for the mediation hypothesis [53,54].

RESULTS

Residual outcome variables created for burnout and vigor dimensions were normally distributed, skewness and kurtosis respectively ranged from $[-.50 \text{ to } .87]$ and $[-.69 \text{ to } .54]$. Skewness and kurtosis values for other variables respectively ranged from $[-1.61 \text{ to } 2.75]$ and $[-1.21 \text{ to } 8.45]$, meaning that some variables were not normally distributed [55], so the SEM model was tested with a robust maximum likelihood estimator [56]. Correlations between residual outcome variables and independent variables are presented in Table 1. Results supported the existence of a latent 'recovery experiences' variable subjacent to the five recovery experiences. As shown in Figure 1, all the experiences contributed significantly and highly to the recovery experiences latent variable.

The fully mediated SEM model yielded an acceptable fit to the data, $\chi^2 = 179.94$, $df = 76$, $RMSEA = .075$, 95% CI $[.061; .090]$, $TLI = .91$, $CFI = .93$, supporting the tenets of the model. Directions and standardized values of the different paths between variables can be viewed in Figure 1. Non-significant paths between household/childcare activities and recovery experiences and between low-effort activities and recovery experiences were removed, in order to keep the most parsimonious model [52,57]. In addition, according to modification indices, covariances between the errors were allowed between physical fatigue and physical strength, between emotional exhaustion and emotional energy, between cognitive weariness and cognitive liveliness, between relaxation and relatedness, between relaxation and control, and between mastery and control to improve the model fits [58]. Results of the structural model revealed that work-related activities are related to lower recovery experiences ($\beta = -.363$, $p = .001$), while social ($\beta = .304$, $p = .001$), physical ($\beta = .168$, $p = .004$) and creative ($\beta = .147$, $p = .016$) activities are related to higher recovery experiences. Recovery activities accounted for 33 % of the recovery experience variance. Hypotheses H1a and H1b were

partially supported. On the other hand, results indicated that recovery experiences are related to burnout change ($\beta = -.189, p = .049$) explaining 4 % of its variance, and are related to higher vigor change ($\beta = .303, p = .001$) and explained 9 % of its variance, supporting H2a and H2b.

The fit of the partially mediated model was acceptable-to-poor (i.e., $df = 68, \chi^2 = 169.13$, RMSEA = .079 [.064; .094], TLI = .91, CFI = .93) and not significantly better than the fully mediated model ($\Delta\chi^2[8] = 10.474, p = .233$). Therefore, the less parsimonious model (i.e., the alternative partially mediated model) should be rejected in favor of the fully mediated model that was hypothesized originally [53,54]. This supports H3 that recovery experiences fully mediate the relationships between recovery activities and changes in WRWB over the weekend.

Figures and Tables

Table 1. Correlation matrix

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Cognitive weariness resid.	0.0 0	0.9 7																
2 Emotional exhaustion resid.	0.0 0	1.0 5	.675***															
3 Physical fatigue resid.	0.0 0	1.2 0	.737***	.576***														
4 Cognitive liveliness resid.	0.0 0	0.8 9	-.640** *	-.477** *	-.602** *													
5 Emotional energy resid.	0.0 0	0.9 9	-.505** *	-.613** *	-.403** *	.590** *												
6 Physical strength resid.	0.0 0	1.1 2	-.672** *	-.477** *	-.763** *	.738** *	.538** *											
7 Work-related activities (H)	0.8 7	1.6 0	-.032	.084	-.093	.002	-.060	-.012										
8 Household & childcare (H)	3.5 9	1.9 4	.049	-.054	.028	-.031	.012	-.028	-.092									
9 Low-effort activities (H)	3.7 1	1.7 0	-.027	-.079	-.035	-.024	.032	-.013	-.069	.038								
10 Social activities (H)	4.1 5	1.9 3	-.106	.003	-.012	.042	.005	.031	-.149*	-.071	-.017							
11 Physical activities (H)	2.2 8	1.8 1	-.022	-.039	.017	.058	.052	.037	-.043	-.121	-.125*	.023						
12 Creative activities (H)	0.4 7	1.0 4	-.058	-.117	-.044	.175**	.110	.108	-.097	.107	-.043	.009	.030					
13 Detachment	5.7 9	1.2 8	-.109	-.081	-.096	.178**	.164**	.224**	-.444** *	.049	-.029	.202**	.089	.164**				
14 Relaxation	5.6 3	1.2 6	-.239** *	-.106	-.226** *	.224**	.118	.273** *	-.284** *	-.140 *	.219* *	.206**	.093	.114	.591** *			
15 Mastery	4.0 8	1.4 4	.009	.123	.052	.142*	-.031	.063	-.157*	-.144 *	-.044	.110	.282** *	.231** *	.386** *	.415** *		
16 Control	5.4 5	1.2 6	-.203**	-.099	-.150*	.177**	.122	.169**	-.205**	-.114	.161*	.121	.119	.133*	.422** *	.570** *	.435** *	
17 Relatedness	5.6 9	1.3 3	-.127*	-.029	-.019	.134*	.137*	.109	-.262** *	-.046	-.082	.477** *	.166**	.047	.465** *	.367** *	.350** *	.369** *

Note. *** $p < .001$. ** $p < .01$. * $p < .05$. (H) = in hours ; N = 249.

Figure 1. Structural equation modeling of the relations between recovery activities, recovery experiences and work-related well-being. Completely standardized robust maximum likelihood parameter estimates. Solid lines indicate significant paths, and dotted lines indicate nonsignificant paths. $\chi^2 = 179.94$, $df = 76$, $RMSEA = .075$, 95% CI [.061; .090], $TLI = .91$, $CFI = .93$. $***p < .001$. $**p < .01$. $*p < .05$.

DISCUSSION

Previous research has shown that rest periods are important for employees to recover the resources they have exhausted at work [4]. In this study, we focused on the recovery process that occurs during the weekend because this non-work time period has the twofold advantage of offering the opportunity to engage in many different activities (compared to the evening period), and to occur more frequently (compared to an annual vacation) [23].

First, our results showed that the recovery experiences were moderately to strongly correlated and that it might be interesting to consider them collectively rather than individually, namely as a latent variable subjacent to the five recovery experiences perceived by employees during the weekend. This result is consistent with the those of Bennett and colleagues [59], who highlighted the existence of three recovery profiles (i.e., high, moderate, low) and the relevance of considering them jointly rather than individually. Two experiences have a slightly higher contribution than the others to the latent variable: psychological detachment from work and relatedness. The higher weight of detachment on recovery experience is in line with the ERM and COR theories [19,60] and recent meta-analyses and reviews [47,61], highlighting the fundamental role of psychological detachment in recovery from work. One of the advances of our study compared to the existing literature is the addition of a fifth recovery experience: relatedness. SEM indicated that the weight of this experience to the latent recovery experience factor was the third most important after detachment and relaxation. This result supports the results of Feuerhahn's study [20] and emphasizes the relevance of considering relatedness as an additional recovery experience in future studies.

Second, our results confirmed that resource-consuming activities prevent recovery from work. More precisely, our analyses indicated that the time spent on work-related activities negatively predicted recovery experiences over the weekend. This result is consistent with past studies, which have already shown that employees who pursue professional or similar tasks during their non-work time report limited recovery experiences during the evening [11], or over the weekend [23,27]. In accordance with the COR and ERM theories, these activities would likely consume employees' resources, reducing possibilities for recovery experiences, and potentially preventing recovery from work [5]. Unlike our hypothesis, the results indicated that household and childcare activities were not significantly related to recovery experiences. Previous results regarding these activities showed that they are generally not related to WRWB [11,23]. One explanation is that these activities could be perceived as pleasant or mandatory

depending on the individuals concerned [6,8,10]. It is possible that the effects of these activities on recovery experiences depend on the motivation to do them. For example, research has previously shown that individuals' self-determined motivation could reduce the negative effect of these resource-consuming activities on WRWB [9]. Thus, if an individual is autonomously motivated by household and childcare activities, their negative effect on WRWB can be cancelled. Conversely, if an individual does these activities with feelings of obligation or guilt, then the negative effect of these activities on WRWB can be greater. The employees' self-determination for these commonly "high-duty profile" activities should be considered in future studies to deepen knowledge on the relationships between these activities and WRWB.

Considering the resource-providing activities, our analyses tend to confirm their beneficial effect on recovery experiences, since our results have indicated that social, physical, and creative activities positively predicted the recovery experiences, while low-effort activities were not related to them. The results regarding social and physical activities are consistent with previous studies, which had shown positive relationships between these two activities and recovery experiences [11,23,26]. Combined with previous evidence, our study highlights that employees who engaged in social and physical activities during their weekend non-work time have higher levels of recovery experiences. There is only one study to our knowledge that has examined the links between creative activities and recovery [14]. Like this study, our results showed that these two variables were positively correlated. That means that employees who allocated time to creative activities during their weekend, increased the chance of having high recovery experiences helping them to restore and gain resources. However, unlike the Eschelman et al. [14] study that only looked at creative activities, our study showed that these activities are not the only ones to be related to recovery experiences. Employees would therefore be well advised to spend time doing social and/or physical and/or creative activities to recover, as the relationships of these three activities on recovery experiences are independent.

This result brings new research perspectives for recovery from work research and stresses the need to take these activities into account in future studies examining recovery activities. The non-significant relationship between low-effort activities and recovery may appear surprising. In fact, findings are mixed regarding more passive activities requiring little effort. Some studies have found positive associations between time spent on low-effort activities and well-being indicators at the day level [6,9,11] and others not [8,62]. At the weekend level, there is only one study to our knowledge that examined the connections

between these activities and recovery experiences [23]. In this study a low positive correlation was observed between low-effort activities and relaxation. It is likely that some moderators such as the type of low-effort activity done, the feelings experienced in doing them [e.g., boredom vs. interest; 5], or dispositional differences [e.g., 63], may increase or decrease the weight of the relationship between low-effort activities and recovery experiences.

Finally, our results show that recovery experiences positively predict a decrease in burnout and an improvement in vigor over the weekend. This result is in line with the principles of the COR and ERM theories, and the theoretical contributions of Sonnentag [4], suggesting that individuals can acquire new resources through the activities and experiences they have during non-work time, which will help them to recover from their work, to replenish their depleted resources and to reach an optimal level of resources. In this study, we have chosen to assess burnout as a negative and vigor as a positive WRWB indicator, considering the existence of three intrinsic energetic resources, essential for individuals. These measures allowed us to directly observe the resource replenishment effect of recovery activities and experiences. Since we controlled for Monday job demands, as well as the level of Friday vigor, the relationships we observed mean that the weekend recovery experiences had a negative effect on the evolution of burnout and a positive effect on the evolution of vigor between Friday evening and Monday evening controlling for Monday job demands. In other words, our results demonstrate that weekend recovery activities help employees to recover, providing them with new personal energetic resources through high recovery experiences.

Strengths and limitations

The present study has four main strengths. (a) In contrast to previous studies, ours observed the recovery process through two indicators of WRWB, burnout and vigor [2,64,65]. These two indicators directly represent employees' personal energetic resource levels. In addition, we used residual scores to capture changes in WRWB between Friday and Monday. Thus, this study directly examines the effect of recovery activities and experiences on the process of resource replenishment that occurs during non-work time. (b) Our study is the first to consider creative activities as an additional recovery activity, and (c) relatedness as an additional recovery experience, in the context of recovery from work during weekends. Results of this study have shown that both are relevant to understand the recovery process occurring during non-work time, and should be considered in future studies for confirmation. (d) Finally, our study is the first to control for job demands on Monday. This precaution allowed us to examine relationships between recovery activities, recovery experiences, and WRWB by taking

account of the elements of the working environment that directly influence WRWB.

Despite these strengths, several limitations deserved to be considered. (a) First, considering our sample, increasing the number of participants would allow for a greater generalization of the results and confirm the relationships observed in this study across different socio-professional categories and professional contexts. (b) We cannot draw conclusions about causal relationships between our variables. Experimental studies or intervention studies manipulating recovery activities and experiences are needed to confirm the causal links of the proposed relationships. (c) In this study, participants reported on Monday what recovery activities and experiences they had during the weekend. This method can induce some biases, like recall bias or common method bias. The accuracy of the data collected could have been improved by using techniques such as booklets to immediately report the type and the length of activities, and recovery experiences felt. Also, we could also have assessed the extent to which the activities were important or perceived as useful for recovery by individuals, in addition to the time spent in the activity. Nevertheless, although they were assessed at the same time, the time referent as well as the use of Friday controls helps disentangle the weekend and Monday variables [23].

Implications for future studies

Based on results of the present study, some recommendations for future studies could be formulated. First, it could be relevant to associate findings from the job demands-resources model [1] and results from recovery from work studies [4,47] to understand the dynamic of WRWB over entire weeks. Future studies should observe, not only how employees exhaust their resources over a week to cope with the demands of their work environment, but also how they replenish these resources both on weekday evenings and during the weekend, before returning to work. This would allow the investigation of inter-individual differences in exhaustion and recovery, but also intra-individual fluctuations during the week depending on the recovery activities and experiences pursued/felt during non-work time.

Finally, regarding employees' daily life, it appears to be divided into three main domains: (a) work that could drain employees' resources, (b) non-work time that could help them to recover, and (c) sleep. The latter is the second vector of recovery, allowing the employee to effectively restore not only emotional and cognitive, but also physical resources. In line with Sonnentag's recommendations [47], it seems interesting to examine the additive effects of these three aspects of an employee's life to fully understand determinants of work-related and general well-being.

CONTRIBUTIONS

All the authors developed the study concept and contributed to the study conception and design. All the authors contributed to data acquisition. C.G. analyzed and interpreted the data under the supervision of S.I.G. and P.S. C.G., S.I.G. and P.S. drafted the manuscript, and the remaining authors provided critical revisions. All of the authors approved the final version of this manuscript for publishing

ACKNOWLEDGEMENTS

FUNDING INFORMATION

No funding was received for this study.

DATA AND SUPPLEMENTARY MATERIAL ACCESSIBILITY

The R code and the dataset for this research can be found in an open platform OFSHOME <https://osf.io/6xqdr/>

REFERENCES

- [1] A.B. Bakker, E. Demerouti, Job demands-resources theory: Taking stock and looking forward, *J. Occup. Health Psychol.* 22 (2017) 273–285.
<https://doi.org/10.1037/ocp0000056>.
- [2] A. Shirom, Reflections on the study of burnout, *Work Stress.* 19 (2005) 263–270.
<https://doi.org/10.1080/02678370500376649>.
- [3] A. Shirom, Feeling Vigorous At Work? the Construct of Vigor and the Study of Positive Affect in Organizations, in: P.L. Perrewe, D.C. Ganster (Eds.), *Res. Occup. Stress Well Being*, Emerald Group Publishing Limited, Greenwich, CT, 2003: pp. 135–164.
[https://doi.org/10.1016/S1479-3555\(03\)03004-X](https://doi.org/10.1016/S1479-3555(03)03004-X).
- [4] S. Sonnentag, L. Venz, A. Casper, Advances in recovery research: What have we learned? What should be done next?, *J. Occup. Health Psychol.* 22 (2017) 365–380.
<https://doi.org/10.1037/ocp0000079>.
- [5] E. Demerouti, A.B. Bakker, S.A.E. Geurts, T.W. Taris, Daily recovery from work-related

- effort during non-work time, in: S. Sonnentag, P.L. Perrewé, D.C. Ganster (Eds.), *Curr. Perspect. Job-Stress Recover. (Research Occup. Stress Well-Being)*, Emerald Group Publishing Limited, 2009: pp. 85–123. [https://doi.org/10.1108/S1479-3555\(2009\)0000007009](https://doi.org/10.1108/S1479-3555(2009)0000007009).
- [6] S. Sonnentag, Work, recovery activities, and individual well-being: a diary study., *J. Occup. Health Psychol.* 6 (2001) 196–210. <https://doi.org/10.1037/1076-8998.6.3.196>.
 - [7] W.G.M. Oerlemans, A.B. Bakker, Burnout and daily recovery: A day reconstruction study, *J. Occup. Health Psychol.* 19 (2014) 303–314. <https://doi.org/10.1037/a0036904>.
 - [8] S. Sonnentag, F.R.H. Zijlstra, Job characteristics and off-job activities as predictors of need for recovery, well-being, and fatigue, *J. Appl. Psychol.* 91 (2006) 330–350. <https://doi.org/10.1037/0021-9010.91.2.330>.
 - [9] L.L. ten Brummelhuis, J.P. Trougakos, The recovery potential of intrinsically versus extrinsically motivated off-job activities, *J. Occup. Organ. Psychol.* 87 (2014) 177–199. <https://doi.org/10.1111/joop.12050>.
 - [10] W.G.M. Oerlemans, A.B. Bakker, E. Demerouti, How feeling happy during off-job activities helps successful recovery from work: A day reconstruction study, *Work Stress.* 28 (2014) 198–216. <https://doi.org/10.1080/02678373.2014.901993>.
 - [11] L.L. ten Brummelhuis, A.B. Bakker, Staying engaged during the week: The effect of off-job activities on next day work engagement, *J. Occup. Health Psychol.* 17 (2012) 445–455. <https://doi.org/10.1037/a0029213>.
 - [12] L.M. Naczenski, J.D. de Vries, M.L.M. van Hooff, M.A.J. Kompier, Systematic review of the association between physical activity and burnout, *J. Occup. Health.* 59 (2017) 477–494. <https://doi.org/10.1539/joh.17-0050-RA>.
 - [13] O. Ochentel, C. Humphrey, K. Pfeifer, Efficacy of exercise therapy in persons with burnout. A systematic review and meta-analysis, *J. Sport. Sci. Med.* 17 (2018) 475–484.
 - [14] K.J. Eschleman, J. Madsen, G. Alarcon, A. Barelka, Benefiting from creative activity: The positive relationships between creative activity, recovery experiences, and performance-related outcomes, *J. Occup. Organ. Psychol.* 87 (2014) 579–598. <https://doi.org/10.1111/joop.12064>.
 - [15] S. Sonnentag, C. Fritz, The Recovery Experience Questionnaire: Development and Validation of a Measure for Assessing Recuperation and Unwinding From Work, *J. Occup. Health Psychol.* 12 (2007) 204–221. <https://doi.org/10.1037/1076-8998.12.3.204>.
 - [16] T.F. Meijman, G. Mulder, Psychological aspects of workload, in: *Handb. Work Organ. Psychol.*, 1998: pp. 5 – 33. <https://doi.org/10.2307/2392800>.
 - [17] S.A.E. Geurts, S. Sonnentag, Recovery as an explanatory mechanism in the relation between acute stress reactions and chronic health impairment, *Scand. J. Work. Environ. Heal.* 32 (2006) 482–492. <https://doi.org/10.5271/sjweh.1053>.
 - [18] S.E. Hobfoll, Conservation of Resources: A New Attempt at Conceptualizing Stress, *Am.*

- Psychol. 44 (1989) 513–524. <https://doi.org/10.1037/0003-066X.44.3.513>.
- [19] S.E. Hobfoll, J. Halbesleben, J.-P. Neveu, M. Westman, Conservation of Resources in the Organizational Context: The Reality of Resources and Their Consequences, *Annu. Rev. Organ. Psychol. Organ. Behav.* 5 (2018) annurev-orgpsych-032117-104640. <https://doi.org/10.1146/annurev-orgpsych-032117-104640>.
- [20] N. Feuerhahn, S. Sonnentag, A. Woll, Exercise after work, psychological mediators, and affect: A day-level study, *Eur. J. Work Organ. Psychol.* 23 (2014) 62–79. <https://doi.org/10.1080/1359432X.2012.709965>.
- [21] D.B. Newman, L. Tay, E. Diener, Leisure and Subjective Well-Being: A Model of Psychological Mechanisms as Mediating Factors, *J. Happiness Stud.* 15 (2014) 555–578. <https://doi.org/10.1007/s10902-013-9435-x>.
- [22] C. Binnewies, S. Sonnentag, E.J. Mojza, Recovery during the weekend and fluctuations in weekly job performance: A week-level study examining intra-individual relationships, *J. Occup. Organ. Psychol.* 83 (2010) 419–441. <https://doi.org/10.1348/096317909X418049>.
- [23] J.M. Ragsdale, T.A. Beehr, A rigorous test of a model of employees' resource recovery mechanisms during a weekend, *J. Organ. Behav.* 37 (2016) 911–932. <https://doi.org/10.1002/job.2086>.
- [24] C. Fritz, S. Sonnentag, P.E. Spector, J.A. McInroe, The weekend matters: Relationships between stress recovery and affective experiences, *J. Organ. Behav.* 31 (2010) 1137–1162. <https://doi.org/10.1002/job.672>.
- [25] A. Drach-Zahavy, N. Marzuq, The weekend matters: Exploring when and how nurses best recover from work stress, *J. Adv. Nurs.* 69 (2013) 578–589. <https://doi.org/10.1111/j.1365-2648.2012.06033.x>.
- [26] V.C. Hahn, C. Binnewies, S. Haun, The role of partners for employees' recovery during the weekend, *J. Vocat. Behav.* 80 (2012) 288–298. <https://doi.org/10.1016/j.jvb.2011.12.004>.
- [27] J.M. Ragsdale, T.A. Beehr, S. Grebner, K. Han, An Integrated Model of Weekday Stress and Weekend Recovery of Students, *Int. J. Stress Manag.* 18 (2011) 153–180. <https://doi.org/10.1037/a0023190>.
- [28] M. Sianoja, C.J. Syrek, J. de Bloom, K. Korpela, U. Kinnunen, Enhancing daily well-being at work through lunchtime park walks and relaxation exercises: Recovery experiences as mediators, *J. Occup. Health Psychol.* 23 (2018) 428–442. <https://doi.org/10.1037/ocp0000083>.
- [29] C. Fritz, M. Yankelevich, A. Zarubin, P. Barger, Happy, healthy, and productive: the role of detachment from work during nonwork time., *J. Appl. Psychol.* 95 (2010) 977–983. <https://doi.org/10.1037/a0019462>.
- [30] M. Siltaloppi, U. Kinnunen, T. Feldt, Recovery experiences as moderators between psychosocial work characteristics and occupational well-being, *Work Stress.* 23 (2009)

- 330–348. <https://doi.org/10.1080/02678370903415572>.
- [31] J. Kühnel, S. Sonnentag, M. Westman, Does work engagement increase after a short respite? The role of job involvement as a double-edged sword, *J. Occup. Organ. Psychol.* 82 (2009) 575–594. <https://doi.org/10.1348/096317908X349362>.
 - [32] U. Kinnunen, S. Mauno, M. Siltaloppi, Job insecurity, recovery and well-being at work: Recovery experiences as moderators, *Econ. Ind. Democr.* 31 (2010) 179–194. <https://doi.org/10.1177/0143831X09358366>.
 - [33] E. Demerouti, A.B. Bakker, S. Sonnentag, C.J. Fullagar, Work-related flow and energy at work and at home: A study on the role of daily recovery, *J. Organ. Behav.* 33 (2012) 276–295. <https://doi.org/10.1002/job.760>.
 - [34] J. De Bloom, U. Kinnunen, K. Korpela, Recovery Processes during and after Work: Associations with Health, Work Engagement, and Job Performance, *J. Occup. Environ. Med.* 57 (2015) 732–742. <https://doi.org/10.1097/JOM.0000000000000475>.
 - [35] J. Dettmers, E. Bamberg, K. Seffzek, Characteristics of extended availability for work: The role of demands and resources, *Int. J. Stress Manag.* 23 (2016) 276–297. <https://doi.org/10.1037/str0000014>.
 - [36] N. Sassi, J.P. Neveu, Traduction et validation d’une nouvelle mesure d’épuisement professionnel: Le Shirom-Melamed Burnout Measure, *Can. J. Behav. Sci.* 42 (2010) 177–184. <https://doi.org/10.1037/a0017700>.
 - [37] A. Shirom, S. Melamed, A comparison of the construct validity of two burnout measures in two groups of professionals, *Int. J. Stress Manag.* 13 (2006) 176–200. <https://doi.org/10.1037/1072-5245.13.2.176>.
 - [38] I.H. Jonsdottir, L. Rödder, E. Hadzibajramovic, M. Börjesson, G. Ahlborg, A prospective study of leisure-time physical activity and mental health in Swedish health care workers and social insurance officers, *Prev. Med. (Baltim).* 51 (2010) 373–377. <https://doi.org/10.1016/j.ypmed.2010.07.019>.
 - [39] M. Lindwall, M. Gerber, I.H. Jonsdottir, M. Börjesson, G. Ahlborg, The relationships of change in physical activity with change in depression, anxiety, and burnout: A longitudinal study of Swedish healthcare workers, *Heal. Psychol.* 33 (2014) 1309–1318. <https://doi.org/10.1037/a0034402>.
 - [40] S. Melamed, U. Ugarten, A. Shirom, L. Kahana, Y. Lerman, P. Froom, Chronic burnout, somatic arousal and elevated salivary cortisol levels, *J. Psychosom. Res.* 46 (1999) 591–598. [https://doi.org/10.1016/S0022-3999\(99\)00007-0](https://doi.org/10.1016/S0022-3999(99)00007-0).
 - [41] S. Isoard-Gautheur, C. Ginoux, J.-P. Heuzé, D. Tessier, D. Trouilloud, E. Guillet-Descas, P. Sarrazin, Construct Validation of the French Shirom-Melamed Vigor Measure: A Multitrait/Multimethod Approach, *Eur. J. Psychol. Assess.* (2019). <https://doi.org/10.1027/1015-5759/a000518>.
 - [42] A. Shirom, S. Toker, S. Berliner, I. Shapira, S. Melamed, The Effects of Physical Fitness and

- Feeling Vigorous on Self-Rated Health, *Heal. Psychol.* 27 (2008) 567–575.
<https://doi.org/10.1037/0278-6133.27.5.567>.
- [43] A.J. Wefald, M.J. Mills, M.R. Smith, R.G. Downey, A Comparison of Three Job Engagement Measures: Examining their Factorial and Criterion-Related Validity, *Appl. Psychol. Heal. Well-Being.* 4 (2012) 67–90. <https://doi.org/10.1111/j.1758-0854.2011.01059.x>.
 - [44] G. Armon, S. Shmuel, A. Shirom, The Relationship of the Job Demands-Control-Support Model with Vigor across Time: Testing for Reciprocity, *Appl. Psychol. Heal. Well-Being.* (2012). <https://doi.org/10.1111/j.1758-0854.2012.01074.x>.
 - [45] D. Bartram, G. Berberoglu, J. Grégoire, R. Hambleton, J. Muniz, F. van de Vijver, ITC Guidelines for Translating and Adapting Tests (Second Edition), *Int. J. Test.* 18 (2018) 101–134. <https://doi.org/10.1080/15305058.2017.1398166>.
 - [46] K.M. Sheldon, J.C. Hilpert, The balanced measure of psychological needs (BMPN) scale: An alternative domain general measure of need satisfaction, *Motiv. Emot.* 36 (2012) 439–451. <https://doi.org/10.1007/s11031-012-9279-4>.
 - [47] S. Sonnentag, The recovery paradox: Portraying the complex interplay between job stressors, lack of recovery, and poor well-being, *Res. Organ. Behav.* 38 (2018) 169–185. <https://doi.org/10.1016/j.riob.2018.11.002>.
 - [48] É. Dupret, C. Bocéréan, M. Teherani, M. Feltrin, Le COPSQ : un nouveau questionnaire français d'évaluation des risques psychosociaux, *Sante Publique (Paris).* 24 (2012) 189–207.
 - [49] T.S. Kristensen, H. Hannerz, A. Høgh, V. Borg, The Copenhagen Psychosocial Questionnaire - A tool for the assessment and improvement of the psychosocial work environment, *Scand. J. Work. Environ. Heal.* 31 (2005) 438–449. <https://doi.org/10.5271/sjweh.948>.
 - [50] Y. Rosseel, lavaan : An R Package for Structural Equation Modeling , *J. Stat. Softw.* 48 (2015). <https://doi.org/10.18637/jss.v048.i02>.
 - [51] B.D. Zumbo, The simple difference score as an inherently poor measure of change, in: B. Thompson (Ed.), *Adv. Soc. Sci. Methodol.*, Ed., JAI Press, Greenwich, CT, 1999: pp. 269–304.
 - [52] R. MacCallum, Specification Searches in Covariance Structure Modeling, *Psychol. Bull.* 100 (1986) 107–120. <https://doi.org/10.1037/0033-2909.100.1.107>.
 - [53] D. Danner, D. Hagemann, K. Fiedler, Mediation analysis with structural equation models: Combining theory, design, and statistics, *Eur. J. Soc. Psychol.* 45 (2015) 460–481. <https://doi.org/10.1002/ejsp.2106>.
 - [54] X. Zhao, J.G. Lynch, Q. Chen, Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis, *J. Consum. Res.* 37 (2010) 197–206. <https://doi.org/10.1086/651257>.
 - [55] B.G. Tabachnick, L.S. Fidell, *Using multivariate statistics*, Pearson Ed, Boston, 2012. <https://doi.org/10.1037/022267>.

- [56] R.B. Kline, Principles and practices of structural equation modelling, 2016.
- [57] R. MacCallum, J. Austin, Applications of structural equation modeling, Psychol. Res. (2000).
- [58] T.A. Whittaker, Using the modification index and standardized expected parameter change for model modification, J. Exp. Educ. 80 (2012) 26–44.
<https://doi.org/10.1080/00220973.2010.531299>.
- [59] A.A. Bennett, A.S. Gabriel, C. Calderwood, J.J. Dahling, J.P. Trougakos, Better together? Examining profiles of employee recovery experiences., J. Appl. Psychol. 101 (2016) 1635–1654. <https://doi.org/10.1037/apl0000157>.
- [60] S. Sonnentag, C. Fritz, Recovery from job stress: The stressor-detachment model as an integrative framework, J. Organ. Behav. 36 (2015) S72–S103.
<https://doi.org/10.1002/job.1924>.
- [61] J. Wendsche, A. Lohmann-Haislah, A meta-analysis on antecedents and outcomes of detachment from work, Front. Psychol. 7 (2017) 1–24.
<https://doi.org/10.3389/fpsyg.2016.02072>.
- [62] M.L.M. van Hooff, S.A.E.E. Geurts, D.G.J.J. Beckers, M.A.J.J. Kompier, Daily recovery from work: The role of activities, effort and pleasure, Work Stress. 25 (2011) 55–74.
<https://doi.org/10.1080/02678373.2011.570941>.
- [63] J.M. Ragsdale, C.S. Hoover, K. Wood, Investigating affective dispositions as moderators of relationships between weekend activities and recovery experiences, J. Occup. Organ. Psychol. 89 (2016) 734–750. <https://doi.org/10.1111/joop.12150>.
- [64] A. Shirom, Burnout in work organizations, in: C.L. Cooper, I. Robertson (Eds.), Int. Rev. Ind. Psychol., Eds., Wiley, New-York, 1989: pp. 25–48.
- [65] A. Shirom, Job-Related Burnout : A Review, in: Handb. Occup. Heal. Psychol., American Psychological Association, Washington, 2001: pp. 245–264.
<https://doi.org/10.1037/10474-012>.