scientific reports

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The impact of hedonic social media use during microbreaks on employee resources recovery

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This study investigates the impact of social media-related microbreaks on the resource recovery of employees. Specifically, we examined whether or not the brief, hedonic use of social media through algorithmic videos could fully replenish resources, such as vigor and fatigue, that are depleted after performing clerical tasks. We also compared this form of recovery to other established microbreak activities. We used a pre-registered, mixed-method experimental design to collect data from 308 employees. A series of mixed-method ANOVA tests complemented by quadratic linear contrast terms and post-hoc analyses were performed to test hypotheses and address research questions. The findings indicate that although social media microbreaks offer a certain degree of resource replenishment, they do not provide full recovery, particularly regarding fatigue. Social media facilitate a reasonable psychological detachment but fall short in other recovery experiences. Notably, exposure to nature yielded more beneficial results. The study contributes novel insights to a field primarily focused on the negative impacts of excessive social media use and suggests that rational and brief usage can be advantageous for employee well-being.

Keywords Recovery, Microbreak, Social media, Employee resources

In pursuing global sustainability, the United Nations[1] prioritized the well-being of employees. Understanding efficient recovery from work-related demands is central to achieving this goal. Among the various strategies for supporting employee recovery, microbreaks emerged as a verified and accessible strategy[2]. Concurrently, social media (SM) has permeated modern society, including the workforce[3]. Thus, exploring the relationship between SM use and the well-being of employees during microbreaks has become a pressing area of investigation.

This paper introduces a novel study that thoroughly investigates the effect of SM-related microbreaks on resource recovery. Utilizing an experimental design, it compares the restoration of psychological resources among 308 participants during SM microbreaks with comparison to no breaks, blank breaks, and nature-related breaks. The objective of the study was to elucidate better the potential impact of recent forms of SM use, such as short videos continuously presented to users through algorithm-based recommendations. The study also analyzes the experience perceived by individuals during microbreaks see[4].

This research contributes to the existing understanding of work-related recovery by exploring how SM-related microbreaks can have restorative effects. The findings reveal that brief use of SM can effectively replenish depleted psychological resources. While the recovery may be more subtle compared to other well-established microbreaks, it nonetheless contributes positively to resource replenishment. Additionally, the presented results deepen our understanding of SM's impact on recovery by demonstrating that the psychological detachment achieved through SM microbreaks is significant. Overall, the study offers insights into SM's positive influence on employee well-being and the conditions under which it occurs.

Recovery at work

The recovery process, which typically occurs within the work-and-rest cycle, is a vital aspect of occupational health[5]. It involves restoring strain level, which increases in response to work demands and then lowers to its pre-stressor level[6]. Working under high demands can deplete the energetic and cognitive resources of employees, which necessitates additional effort to replenish them for a successful return to work. In recovery research, these resources are generally defined as intrinsic, energy- or mood-related attributes, such as vigor or fatigue[2]. During nonwork time, the absence of demands provides an opportunity for recovery, leading to decreased strain symptoms[4]. However, when demands persist during nonwork periods, overload reactions can accumulate over time, resulting in a less-than-optimal state of employees.

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One of the contemporary methods of recovery and replenishment of psychological resources being studied are microbreaks[2]. Microbreaks, that is, brief intentional pauses lasting no more than 10 min, mitigate the adverse effects of extended work and can be analyzed using the two abovementioned perspectives[7]. In contrast to traditional breaks, microbreaks are distinct due to their brief duration and spontaneity, which provide mental and physical relief without disrupting work continuity[8,9]. Initially rooted in ergonomics to address physical issues, microbreaks evolved in the organizational literature as a succinct strategy for replenishing psychological resources[2,10].

Sonnentag et al.[4] highlight microbreaks as crucial tools for recharging the energy of employees. These brief respites enable mental disengagement and focus redirection, which improves cognitive functioning, creativity, and performance, especially in high-demand professions[8,9]. However, the effectiveness of microbreaks is dependent on type and timing. For example, break activities can be broadly categorized into active and passive, which differ in their potential to replenish employee resources. Although activities like outdoor time or social interactions are restorative, not all microbreaks yield equal benefits[11]. As digital trends, such as SM, increasingly permeate break activities, investigating their effects on recovery during microbreaks is becoming crucial.

SM at work

SM refers to platforms and technologies that enable users to create, share, and interact with content within online communities. These platforms share several defining characteristics, including user-generated content (UGC), interactivity, and the facilitation of real-time communication[12]. SM encompasses various social networking sites (SNSs) tailored to specific content-sharing modes such as text, images, or videos. Notably, UGC (e.g., short videos) is gaining prominence and is currently favored by users as the preferred content format[13,14]. Recently, three types of SM usage were delineated, namely, social use (utilizing SM to establish and maintain social connections), hedonic use (utilizing SM for relaxation, entertainment, and escapism), and cognitive use (creating content and sharing or expanding knowledge)[15,16].

The SM phenomenon catalyzed an array of changes in the manner organizations positively and negatively operate, communicate, and engage with employees, not only by fostering instant global connectivity, communication, and knowledge-sharing but also by increasing technostress and work-home interference[17–20]. To gain a comprehensive understanding of the influence of SM on employees and their well-being, employing robust methodologies and considering the distinct nature and intent of SM use (i.e., social, hedonic, or cognitive) is crucial for future research, which enables a nuanced comprehension of its effects.

Impact of SM use during microbreaks on the psychological resources of employees

Although SM use has become ubiquitous in contemporary workplaces, the specific impact of its hedonic use on employee resources remains unexplored. We propose that brief SM use during microbreaks leads to the recovery of the psychological resources of employees, including (a) fatigue and (b) vigor. The existing literature presents mixed results on the influence of SM on well-being, with outcomes varying dependent on specific SNSs[21,22]. Furthermore, prior studies illustrated that SM can exert both positive and negative effects on employees, which influences factors such as satisfaction, engagement, leave intention, job burnout, and work demand[17,20,23–28]. In summary, a notable research gap exists because studies that examined and systematically compared different types of SM use are limited.

The current understanding of the mechanism underpinning the hedonic utilization of SM in the work environment encourages contemplation of its potential value in aiding employee recovery. This proposition stems from evidence that SM use can effectively disengage individuals from ongoing tasks and facilitate a restorative break from demands. Researchers posited that SM could benefit workers, given that they are not excessively overused[24,29,30]. Maintaining such rational usage may, however, prove challenging due to the fact that SNSs are deliberately engineered to incorporate a range of design elements (e.g., social comparison, mere exposure effect, endowment effect) that foster additive interactions[31]. Conversely, SM can deplete employee resources when characterized by constant checks and overuse[16,32,33]. Furthermore, the hedonic use of SM is anticipated to evoke a potent emotional response akin to the experience of viewing online videos[34]. This notion positions SM as a potentially apt candidate for microbreak activities due to its unique characteristics, making it conducive to promoting brief respite periods within the workday.

The potential impact of SM on employee resources constitutes a hypothesis based on the Effort–Recovery Model (ERM)[35]. This framework postulates that when employees confront elevated job demands, corresponding cognitive load reactions occur, manifesting as psychological strain symptoms such as fatigue. Resource mobilization during mental activities supports performance but results in effort and energy depletion consecutively. The reduction of strain symptoms transpires when employees are no longer subject to additional demands and can, thus, engage in recovery processes. Notably, the absence of demands during nonwork intervals is seemingly pivotal in this recovery dynamic[36]. In this context, microbreaks assume heightened significance as a means of momentary energy replenishment[4]. Hence, the energetic resources of employees are no longer depleted when they partake in brief moments of hedonic SM use because it does not entail cognitive engagement. Provided that the use of the SM is brief, it will not cause any additional negative effects or discomfort. Therefore, the study poses the following:

H1. Brief SM use during microbreaks leads to the recovery of the psychological resources of employees, including (a) fatigue and (b) vigor.

Relative efficacy of SM-related microbreaks

Expanding upon our first hypothesis, we aim to compare the impact of SM-related microbreaks versus established microbreak type, i.e., nature-related activities, using a controlled trial approach[37]. We hypothesize

that employee recovery of psychological resources after microbreaks, including (a) fatigue and (b) vigor induced by SM activities, is lower than that induced by nature-related activities. The purpose of this part is not to evaluate the effects of nature-related micro-breaks but rather to gain a better understanding of the relative effectiveness of the hedonic use of SM as a form of brief resource restoration.

Prior studies documented the restorative effects of *green* microbreaks on the employees' attentional resources, increased positive emotions and reduced negative ones[2]. The theoretical foundations also support the benefits of engaging with nature, e.g., the attention restoration theory (ART) posits that nature viewing enhances focus and cognitive performance by improving voluntary attention and reducing distractions[38]. There are no documented negative repercussions associated with excessive engagement with natural environments. Conversely, excessive utilization of SM platforms has been correlated with the emergence of a distinct fatigue state, a sensation of being overwhelmed, the manifestation of counterproductive behaviors, and a reduction in task-focused attentional capacity[39–41]. In instances of persistent SM engagement, the uninterrupted influx of multimedia stimuli can compete for and potentially deplete the cognitive attentional resources of an employee[32,42] or hinder their full engagement[43,44]. Interacting with such overstimulating content can partially reduce the opportunities to replenish the mental energy necessary for subsequent tasks during working hours[45].

In conclusion, the employment of SM during breaks, despite its hypothetical beneficial impact, is concomitantly linked with specific constraints and risks. Conversely, contact with nature is free from such challenges and aligns with human biology. Therefore, although one might expect a certain level of resource replenishment from using SM during a short (provided the duration is brief), these advantages are unlikely to exceed those derived from breaks involving nature.

H2. Recovery of the psychological resources of employees after microbreaks, including (a) fatigue and (b) vigor induced by SM activity, is lower than that induced by nature-related activity.

Recovery experience during SM-related microbreaks

The action perspective has long influenced the study of microbreaks and their impact on employee resources. Nonetheless, an additional approach should be considered to comprehensively understand the recovery phenomenon, as Sonnentag et al.[4,6] underscored the necessity of integrating the recovery experience perspective. The subsequent section aims to scrutinize the current knowledge about employee experiences during SM use, which paves the way for formulating a targeted research question. The challenge in analyzing the impact of SM is the focus of the majority of studies on excessive engagement in digital activities at workplaces, resulting in various adverse effects, including emotional exhaustion, perceived stress, fear of missing out, rumination, heightened distractibility, and increased vigilance toward virtual notifications[15,16,40,46–49]. These factors may undermine employee experiences with SM, diminishing opportunities for effective resource recovery. However, whether or not only brief periods of SM usage yield these adverse effects remains uncertain.

Additionally, the existing studies frequently lack a precise categorization of the objectives of SM use, such as social, hedonic, or cognitive, and do not align well with established frameworks for understanding employee recovery experiences, such as that proposed by Sonnentag and Fritz[36]. They identified four distinct experiences that describe how individuals unwind and recover from work, namely, psychological detachment (mental disengagement from work tasks and responsibilities), relaxation (a state of low activation and increased positive affect), mastery (experiences associated with learning opportunities beyond the work domain), and control (freedom to select one's activities). Although Fritz et al.[50] initially defined these experiences in the context of off-job periods, they were also applicable to employee recovery during working hours[51]. Contrary to its negative portrayal, SM use during microbreaks can offer unique benefits to employees, which potentially aids in the replenishment of resources. However, evidence supporting such an impact remains preliminary.

Engaging in short bouts of SM is considered to facilitate psychological detachment from work by capturing the attention of employees and mentally immersing them in the digital realm. For instance, previous research has explored the use of SNSs as a means of facilitating psychological detachment from stressful life events, such as a pandemic[52]. For relaxation, engagement in SM enhances feelings of social connectedness and belonging and elevates mood[53,54], which may indicate achieved relaxation. Hedonic SM use should particularly contribute to this, as a prior study found that watching amusing video content during microbreaks reduces stress[55]. Regarding mastery, there is a notable absence of research explicitly investigating the connection between SM usage and this experience. Finally, despite their short duration, microbreaks can still offer employees a feeling of autonomy. This is because having access to social media may enhance a sense of control, as users can independently choose which content to engage with[56]. Limited evidence and lack of systematic analysis on how different types of SM use affect established recovery experience categories lead us to adopt an exploratory approach, prompting an open research question:

RQ1. To what extent is a brief SM use during microbreaks related to the four recovery experiences, namely, (a) psychological detachment, (b) relaxation, (c) mastery, and (d) control?

Method

Participants and sampling procedure

The study recruited 308 individuals. Gender distribution was as follows: 68.8, 29.2, and 1.9% identified as women, men, and no response, respectively. The average age was 24.9 years ($SD = 5.4$), and the average job experience was 4.6 years ($SD = 4.4$). For occupation, 62.3% 25% and 12.7% were engaged in office jobs, manual labor, or both. Overall, the sample predominantly consisted of young adult female office workers. The recruitment process involved posting advertisements on local SM groups, which resulted in 914 applications. Participants were then invited weekly from a random subsample, with the inclusion criteria determining invitation eligibility.

The inclusion criteria stipulated that participants must be employed, within working capacity age, and in an average health condition (physically and mentally). The intended sample size was 308 with a priori power analysis conducted using GPower (version 3.1.9.7). The following parameters were used to determine the size: repeated-measure ANOVA with within–between interaction as a statistical test, an anticipated weak-moderate effect size (0.20–0.25), moderate correlations (approximately 0.30) among repeated measures, an alpha value of 0.01, and a power value of 0.99. We utilized the study by Bennett et al.[7], which had a similar design, to estimate the anticipated effect sizes. Consequently, the study demonstrated sufficient sensitivity to conclude weak or nonsignificant effects ($F(6, 608) = 2.11$) with an alpha value of 0.05 and a statistical power of 0.80.

Measures

Vigor and fatigue

The study assessed two intrinsic resources: vigor (a state of pleasant activation) and fatigue (an experience of unpleasant deactivation). Both components, characterized as energetic resources within the conservation of resources theory (COR), necessitate replenishment when depleted[57]. Vigor contributes to the willingness to invest effort in tasks and sustain persistence, whereas fatigue represents its converse[58]. They were measured using the Polish version[59] of the profile of mood states (PoMS)[60]. The participants rated the degree of a specific mood they were experiencing at the moment using a five-point Likert-type scale (ranging from *definitely no* to *definitely yes*). The study used eight and seven items (adjectives) from the vigor (e.g., energetic and alert) and fatigue (e.g., worn out and exhausted) subscales. The questionnaire demonstrated reliability in Polish contexts and work-related environments and underwent back-translation as part of the adaptation process[7,61,62].

Recovery experience

The study measured the four recovery experiences listed in Sonnentag and Fritz's[36] framework: psychological detachment, relaxation, mastery, and control. We employed the recovery experience questionnaire (REQ) by Sonnentag and Fritz, adopted and modified by Bakker et al.[63] to measure momentary and state-based experiences. The participants rated their experiences while engaging in break activities. The measure consists of 16 items rated using a five-point Likert-type scale (ranging from *definitely no* to *definitely yes*). Previous scholars demonstrated that the instrument provides reliable and valid results[36,63]. Exemplary statements included *I forgot about the task to be done*, or *I used the time to relax.*

Demographics and controlled variables

This study employed several measures and controlled variables to establish comparable conditions between experimental groups. Age and gender were assessed via self-report. Subjective levels of sleepiness were evaluated using the Karolinska Sleepiness Scale[64], a single-item measure rated using a nine-point scale ranging from *extremely alert* to *extremely sleepy*. Additionally, factors such as engaging in sedentary work, caffeine consumption within three hours prior to the study, hours of work or study completed the same day before the study, use of glasses or contact lenses, and overall mental and physical health were measured.

Procedure and data collection

The study employed a randomized experimental design featuring a 4 × 3 mixed-effect plan with a between-subject factor *Type*, which spans four levels (no break, no activity break, nature-related break, and SM-related break) and a within-subject factor *Time*, which pertained to the repeated measurement of the psychological resources at distinct points (Time 1: prior to engagement in a clerical task, Time 2: after the clerical task, and Time 3: after a break). The study utilized a single-blinded design; thus, the participants remained unaware of the effect expected from the breaks of their groups.

The procedure (including all methods) was performed in accordance with the relevant guidelines and regulations. The experimental manipulation occurred within a controlled laboratory environment using a designated testing platform displayed on computer workstations. These workstations had a laptop featuring an external screen, a keyboard, a mouse, and wireless headphones with active noise cancellation. Additionally, two stacked document drawers and a mini keyboard with *like* and *dislike* keys were present. One or two sets of invoices were placed contingent on the scenario within the file drawers (with two sets assigned exclusively to the no break condition). Three workstations were positioned, separated by black screens. To enhance external validity and consider the social presence effect on daily office tasks[65], the study employed a group delivery approach[66]—three participants were studied simultaneously, all assigned to the same experimental scenario.

The experimental procedure encompassed multiple components: the participants engaged in clerical tasks and took breaks that varied across the four scenarios; their psychological resources and recovery experiences were then assessed. The procedural outline was as follows: the participants entered the laboratory in groups of three, and the research assistant described the objective of the study—to discern optimal working conditions—and guided the participants through the protocol. The participants were then apprised of the voluntary nature of their participation, the freedom to withdraw, and were requested to provide informed consent. Only then did they don the headphones and initiate the procedure by following on-screen instructions. Initially, the subjects provided demographic and control variable information. Subsequently, the first PoMS assessment was conducted; afterward, they underwent a 20-minute clerical task that involved retrieving invoices from the first drawer and inputting details from the paper document into a digital form. This timeframe was selected to induce resource depletion, congruent with previous studies that used a similar duration[67–70]. Another PoMS evaluation was conducted prior to the experimental manipulation. Then, the participants undertook a subsequent clerical task (utilizing a second set of invoices), were instructed to remain inactive, or were exposed to nature- or SM-related content. Ultimately (after the second clerical task or break), they completed a concluding PoMS assessment and REQ measure. Afterward, they were debriefed, encouraged to raise queries, received an incentive

of approximately $25, and were extended the opportunity to participate in a supplementary lottery, which offers a potential reward of approximately $120. The entire procedure spanned approximately 40 min. Additionally, following the completion of the first PoMS assessment (Time 1), participants received a message within the survey platform instructing them to wait for the research assistant's signal before proceeding further. This measure was implemented to ensure that all participants began and completed the clerical task and subsequent break at approximately the same time, thereby minimizing potential distractions and streamlining the procedural flow.

The participants were assigned to one of the four groups (between-subject factor). The **no-break** condition involved omitting a break, with participants immediately transitioning to the second task after completing the second PoMS assessment. The participants spent an additional 4 min typing invoice details instead of taking a break (this was the only group in which the second set of invoices was introduced and utilized). Arguably, this group experienced a microbreak given the interruption of clerical tasks provided by the PoMS assessment, as prior research indicated that even a brief engagement in different tasks could influence employee resources[7]. Nonetheless, the participants in this group worked while the other groups rested. Thus, this group is regarded as a control given the lack of a break.

The **blank break** condition entailed 4 min of rest without additional activities. The participants were instructed to rest and abstain from activities such as checking their phones. This condition is deemed a control group for the potential impact of microbreak activity.

The **nature-related** condition involved 4 min of observing natural landscapes such as forests, coastlines, mountains, and corresponding ambient sounds (e.g., flowing rivers). Videos featuring animals were excluded to mitigate their potential additional influence, which could introduce uncontrolled effects[71].

The **SM-related** conditions encompassed 4 min of viewing short, vertically oriented UGCs in video form, which reflects the prevalent trend of hedonistic, video-centric use of SM applications[72,73]. These videos ranged in duration from 10 to 30 s and were presented based on algorithmic suggestions. The participants experienced the content from a user's perspective, including scrolling transitions between videos and the mobile OS interface. The concise video format was adopted due to its dominance and continued growth on the Internet[74], in which a significant proportion consists of videos < 1 min[75]. The video themes included home decor, trivia, gadgets, life hacks, cuisine, and amusing videos. Videos featuring offensive, aggressive, political, or erotic content were omitted from the compilation. Nature and animal-related videos were also excluded to ensure the independence of the research conditions. Additionally, the participants used a mini keyboard to like or dislike the viewed videos, which is an essential inclusion given the interactive nature of SM[12,76]. The exclusion of this element may have rendered the activity close to simple video watching, compromising internal validity.

The participants were randomly allocated to these experimental groups in batches of three people. The block randomization approach was employed with block sizes of eight batches (a multiplication of the number of experimental groups). The list of blocks was generated using an online tool and is available, along with other study materials, in the Open Science Framework repository[77]. Unevenly distributed covariates were not expected to influence the investigated effect, which justifies the selection of a block-based plan[78].

The experimental design incorporated the within-subject factor of Time in line with the argument of Bennet et al.[7] that investigating recovery processes should encompass the study of resource depletion and subsequent replenishment effects. This allows for a comprehensive understanding of recovery, defined as the return to baseline resource levels. Although the current study did not anticipate that the two initial measurements of PoMS would yield significant group differences, they served the critical purpose of evaluating whether or not psychological resources were indeed depleted from Times 1 to 2 (after the clerical task) and subsequently replenished from Times 2 to 3 (after the break). Moreover, assessing actual differences in vigor and fatigue from Times 1 to 2 was a strategy to gauge the effectiveness of the experimental procedure.

Results

The participants were allocated among the experimental groups, and sample sizes were 76, 77, 77, and 78 for the no-break, blank break, nature-related break, and SM-related break groups, respectively. Table 1 provides an overview of the central tendencies, variability, and reliability of the measures of the variables. All psychological questionnaires demonstrated satisfactory or exceptionally high reliability, as evidenced by their alpha coefficient values.

To ensure the validity of the measures used in this study, the results from the psychological tests were subjected to confirmatory factor analysis. This analysis was conducted to assess the fit of the data to their theoretical structures and confirm that the results could be meaningfully interpreted at the scale level. Separate models were tested for the PoMS, which included two latent factors (vigor and fatigue), and for the REQ, which included four latent factors corresponding to each experience within the framework. The analyses were conducted using the *R* library *lavaan*[79], and both models were estimated using the Weighted Least Squares Mean-Adjusted estimator due to the data being collected via Likert-style and adjective scales, exhibiting non-normal distributions and having moderate sample size. A range of fit indices was compared, including absolute, relative, incremental, and parsimonious indices, along with non-centrality and absolute residual-based fit indices. Both models demonstrated a significant fit to the data (PoMS: $\chi^2(89) = 413$, $p < .001$; REQ: $\chi^2(98) = 145.43$, $p < .0.01$) and showed satisfactory to exceptional fit (PoMS: $TLI = 0.97$, $GFI = 0.98$, $AGFI = 0.98$, $PNFI = 0.82$, $RMSEA = 0.06$, $SRMR = 0.07$; REQ: $TLI = 0.99$, $GFI = 0.99$, $AGFI = 0.99$, $PNFI = 0.79$, $RMSEA = 0.04$, $SRMR = 0.06$)[80,81]. These results provided confidence in the validity of the measures, allowing us to proceed with further analyses.

We then assessed whether or not the controlled variables were equally distributed across groups, as expected due to the random assignment methodology. The study used χ^2 for proportions and one-way ANOVA for means. The results did not yield evidence for differences between experimental groups in terms of gender ($\chi^2(6) = 4.76$, $p = .0.57$), age ($F(3, 304) = 1.65$, $p = .18$), employment status ($\chi^2(6) = 6.62$, $p = 0.36$), office versus manual work type ($\chi^2(6) = 4.95$, $p = 0.55$), sedentary work ($\chi^2(12) = 12.42$, $p = 0.41$), average weekly hours of work ($F(3,$

Variable	M 95% CI [LL, UL]	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Vigor (time 1)	3.2 [3.13, 3.28]	0.69	(0.82)									
2. Vigor (time 2)	2.52 [2.44, 2.59]	0.70	0.56***	(0.85)								
3. Vigor (time 3)	2.92 [2.83, 3.01]	0.81	0.63***	0.66***	(0.88)							
4. Fatigue (time 1)	2.11 [2.02, 2.2]	0.80	−0.56***	−0.32***	−0.35***	(0.86)						
5. Fatigue (time 2)	2.74 [2.67, 2.82]	0.68	−0.19***	−0.34***	−0.21***	0.55***	(0.86)					
6. Fatigue (time 3)	2.45 [2.34, 2.55]	0.92	−0.30***	−0.36***	−0.55***	0.61***	0.50***	(0.86)				
7. Detachment	2.71 [2.58, 2.84]	1.15	0.00	−0.10	0.13*	0.04	0.12*	−0.17**	(0.84)			
8. Relaxation	2.78 [2.64, 2.93]	1.29	0.15**	0.11	0.42***	−0.04	0.02	−0.40***	0.52***	(0.94)		
9. Mastery	1.89 [1.78, 2]	0.96	0.13*	0.16**	0.24***	0.00	0.01	−0.03	−0.14*	0.07	(0.85)	
10. Control	2.24 [2.12, 2.37]	1.11	0.07	0.13*	0.31***	0.06	0.02	−0.17**	0.12*	0.36***	0.33***	(0.88)

Table 1. Descriptive statistics, measurement reliability, and variables correlations. LL, UL—95% confidence intervals for means, lower and upper limits, respectively; Cronbach's α are presented in diagonals. * $p < .0.05$; ** $p < 0.01$; *** $p < 0.001$.

304) = 0.96, $p = 0.41$), being well rested ($F(3, 304) = 1.19$, $p = 0.31$), taking caffeinated beverages before the study ($\chi^2(3) = 1.88$, $p = 0.60$), the number of hours worked before the survey ($F(3, 304) = 0.33$, $p = 0.80$), and wearing glasses or lenses ($\chi^2(3) = 6.55$, $p = .0.09$). The study observed an uneven distribution of variables between the groups in terms of work experience ($F(3, 304) = 2.72$, $p = 0.04$) and overall health status ($\chi^2(3) = 9.50$, $p = .0.02$). However, the effect sizes were negligible ($\eta^2 = 0.026$; $V = 0.176$).

H1 proposed that SM-related microbreaks facilitate the recovery of psychological resources, including (a) fatigue and (b) vigor, by enabling the return to baseline levels after being depleted by work tasks. First, a 4 (Type, between-subject factor) × 3 (Time, within-subject factor) mixed-method ANOVA was used. Vigor and fatigue were entered as the dependent variables in separate analyses. The recovery phenomenon was tested by including a quadratic linear contrast term for the main effect of Time. This analysis enables the assessment of signs of depletion from Times 1 to 2 (baseline to post-work) and replenishment from Times 2 to 3 (post-work to post-break) across experimental conditions. Three post-hoc analyses (paired *t*-tests) with Bonferroni corrections were conducted to evaluate whether or not a mean difference exists in each outcome variable (a) between Times 1 and 2 (depletion effect) and (b) between Times 2 and 3 (replenishment effect). Moreover, the study examined (c) if no mean difference exists in each psychological resource between Times 1 and 3 (recovery effect). Table 2 presents the results.

Impact of SM use during microbreaks on vigor

First, the initial assumptions for ANOVA with vigor as the dependent variable were tested. No extreme outliers (values exceeding the third quartile or falling below the first quartile by more than three times the interquartile range) were detected. The normality assumption was assessed using the Shapiro–Wilk test for each group, which reveals violations of this assumption in only four instances (all in Times 1 and 2). Given the sample size, the data quantiles were plotted against normally distributed ones, and all points were approximately aligned along the reference line, which enabled continued analysis. Levene's test indicated that the variance of the outcome variable was equal between the groups of the between-subject factor (break type) in all cases ($p > .0.05$). Box's M-test demonstrated the same for within-subject factor covariance ($M = 2.48$; $p = 0.48$).

The results of the 4 × 3 mixed-method ANOVA for the vigor outcome supported a main effect of Time ($F(2, 608) = 184.44$, $p < .05$, $\eta^2_P = 0.38$), which was quadratic as suggested by the polynomial linear contrast term ($F(1, 304) = 309.11$, $p < .0.001$, $\eta^2_P = 0.50$; Fig. 1). The main effect of Type was identified ($F(3, 304) = 3.18$, $p < .0.05$, $\eta^2_P = 0.03$), as well as the Type×Time effect ($F(6, 608) = 5.05$, $p < .0.001$, $\eta^2_P = 0.05$). This result implies that various types of activities observed during microbreaks exerted distinct impacts on vigor, which also varied at specific measurement times.

As the study concerns SM-related microbreaks, a simple main effect of Time for this microbreak activity was run and proved significant ($F(2, 154) = 42.09$, $p < .0.001$, $\eta^2_P = 0.35$). A series of paired *t*-tests with corresponding effect sizes (Table 2) further proved the nonlinear nature of changes in vigor among time points. The level of the outcome variable significantly decreased after the work task and subsequently increased following the SM microbreak. This replenishment effect was significant and moderate ($t = -4.02$, $p < .0.001$, $d = 0.46$). However, full recovery was not observed, as indicated by the Times 1 and 3 comparison. After SM use, vigor increased but did not fully return to baseline ($t = 4.96$, $p < .0.001$, $d = 0.56$). This result partially supports H1 regarding vigor as a significant but partial recovery phenomenon was observed.

Microbreak type	Time 1	Time 2	Time 3	Time 1–2	Time 2–3	Time 1–3
	M (SD)	M (SD)	M (SD)	t (d)	t (d)	t (d)
Vigor						
No break	3.34 (0.58)	2.62 (0.66)	2.81 (0.77)	9.86*** (1.13)	-3.01* (0.35)	6.67*** (0.77)
Blank	3.13 (0.66)	2.42 (0.69)	2.95 (0.78)	9.51*** (1.08)	-8.06*** (0.92)	2.93* (0.33)
Nature	3.28 (0.73)	2.61 (0.71)	3.21 (0.76)	8.33*** (0.95)	-8.01*** (0.91)	0.95 (0.11)
Social media	3.07 (0.75)	2.42 (0.73)	2.71 (0.83)	9.53*** (1.08)	-4.02*** (0.46)	4.96*** (0.56)
Fatigue						
No break	2.05 (0.85)	2.67 (0.75)	2.8 (1.02)	-4.77*** (-0.92)	-0.9 (-0.16)	-4.92*** (-0.99)
Blank	2.12 (0.78)	2.88 (0.69)	2.28 (0.78)	-6.4*** (-1.06)	5.06*** (0.92)	-1.27 (-0.29)
Nature	2.07 (0.76)	2.65 (0.66)	2.13 (0.85)	-5.06*** (-0.88)	4.24*** (0.67)	-0.46 (-0.07)
Social media	2.18 (0.81)	2.76 (0.62)	2.59 (0.85)	-5.02*** (-0.75)	1.43 (0.19)	-3.08*** (-0.51)

Table 2. Descriptive statistics and differences for vigor and fatigue per type and time. Significance and effect sizes (t and d) are presented for depletion (Time 1–2), replenishment (time 2–3), and recovery effects (time 1–3). * $p < 0.05$; ** $p < .0.01$; *** $p < 0.001$.

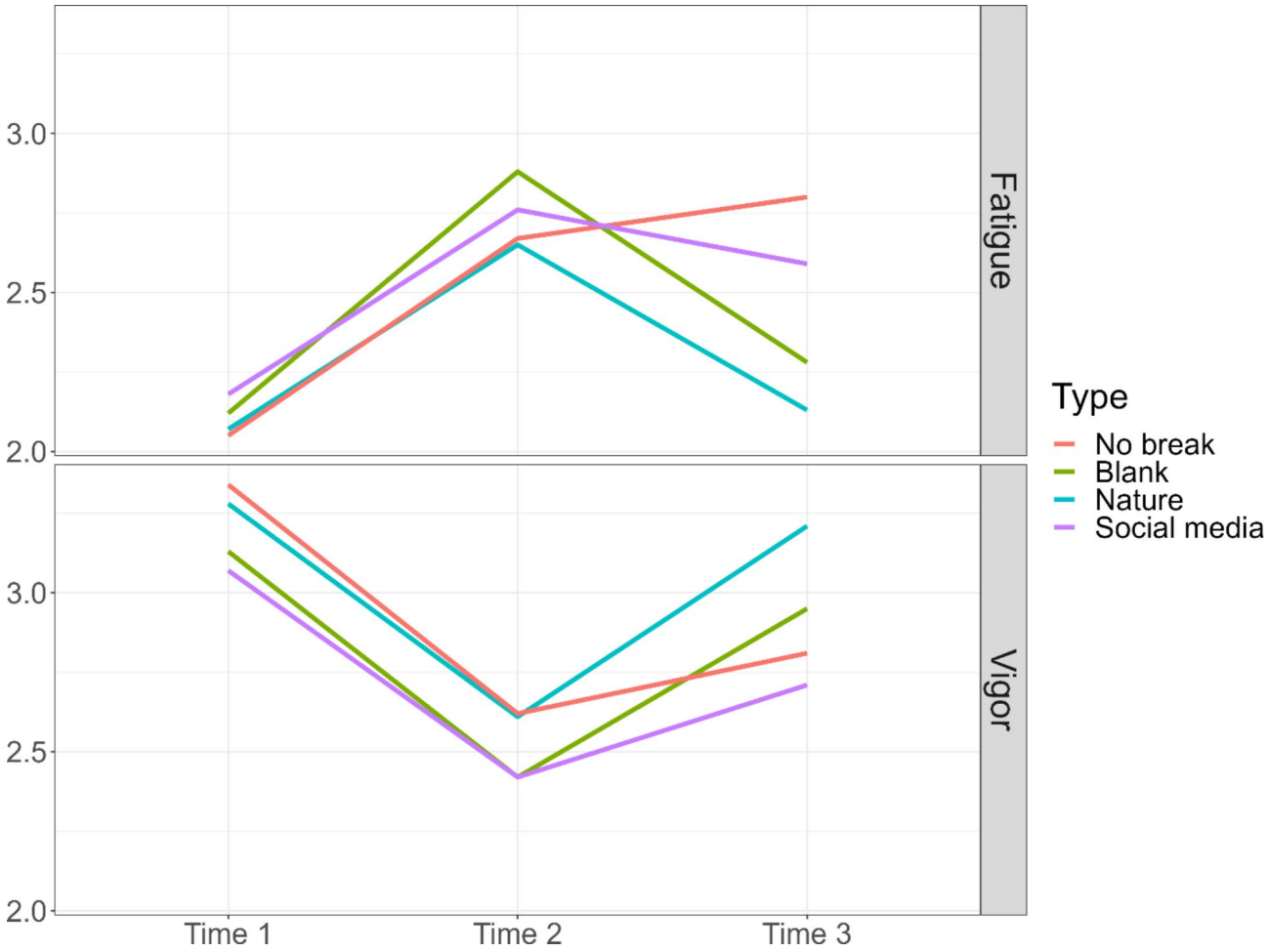

Fig. 1. Levels of employee resources at different times.

H2 involved a comparison of the recovery strengths between SM- and nature-related microbreaks. Notably, the nature-related microbreak was the only one that led to full recovery, as suggested by the lack of significant differences in vigor levels between Times 1 and 3 ($t = 0.95$; *ns*, $d = 0.11$). The depletion phenomenon exhibited a similar magnitude across groups, as evident by Cohen's *d* values, which makes the differences in recovery strength dependent on the replenishment effect. Specifically, the replenishment effect was weaker for the SM than the nature group (Cohen's *d*: 0.46 and 0.91, respectively). Interestingly, recovery was less robust with SM use compared with a blank break. These findings support H2 in terms of vigor.

Impact of SM use during microbreaks on fatigue

The initial assumptions were examined again before ANOVA, and no extreme outliers were identified. The normality assumption was confirmed through the Shapiro–Wilk test results, supported by an inspection of the plotted quantiles. Levene's test indicated homogeneity of outcome variable variance ($p > .05$ for all instances), and Box's *M* suggested the same for covariance ($M = 8.14$; $p = .04$). As suggested by Tabachnick and Fidell[82], the value of 0.001 was adopted for the significance determination due to the high sensitivity of Box's *M*-test.

The main effect of Time was supported when fatigue was tested as an outcome ($F(2, 608) = 114.97$, $p < .0001$, $\eta^2_P = 0.27$). Again, the results imply that the relationship can be characterized as quadratic ($F(1, 304) = 157.36$, $p < .0001$, $\eta^2_P = 0.34$). Only the Type×Time effect proved significant ($F(6, 608) = 10.09$, $p < .0001$, $\eta^2_P = 0.09$), as the Type does not impact fatigue level ($F(3, 304) = 1.98$, $p = .12$, $\eta^2_P = 0.02$). Thus, it should be assumed that the impact of break type on fatigue was evident only at selected times.

A simple effect of the Time factor for the SM group was tested and found significant ($F(2, 154) = 20.08$, $p < .0001$, $\eta^2_P = 0.21$). Pairwise mean comparison further supported the assertation of the nonlinear nature of fatigue changes. Fatigue level increased significantly after completion of the work task ($t = -6.64$, $p < .0001$, $d = 0.75$), then decreased after the SM-related break; this time, however, the change was nonsignificant ($t = 1.7$, *ns*, $d = 0.19$). Therefore, the end state of fatigue was significantly higher than the baseline ($t = -4.49$, $p < .0001$, $d = 0.51$).

To assess whether or not these findings support the hypothesis, contextualizing and comparing them against control conditions are essential steps. Among subjects without a microbreak, fatigue levels also increased after the task ($t = -8.03$, $p < .0001$, $d = 0.92$); however, a subsequent decrease was not observed. Instead, fatigue

increased after the absence of the microbreak ($t=-1.14$, *ns*, $d=0.16$). Consequently, the final fatigue state was even higher than those of the two previous conditions ($t=-8.59$, $p<.0.001$, $d=0.99$). The increase in fatigue observed in the no-break group was twice as strong as with SM use during the break (Cohen's *d*: 0.99 and 0.51, respectively). Based on this comparison of the SM-related and no-break conditions effect size ratios, the study infers that the findings partially support H1 for fatigue.

For H2, nature-related microbreak was superior in terms of fatigue recovery, which is the only break type that actually resulted in recovery to baseline ($t=-0.64$, *ns*, $d=0.07$). SM use also resulted in a less effective fatigue recovery compared to with a blank break ($t=-2.5$, $p<.0.001$, $d=0.29$). This aspect, therefore, offers robust support for H2 for fatigue.

Additionally, it should be noted that clerical tasks effectively depleted participant resources, as evidenced by differences in the measurements between Times 1 and 2 for all groups. The no-break scenario, which involved a brief interruption of clerical tasks, produced significantly worse results than other scenarios. Although minimal recovery was observed in this group regarding vigor, this finding aligns with the existing knowledge on microbreak efficacy, even those as short as 1 min[7].

Recovery experience during SM-related microbreaks

Finally, the study tested for the impact of different breaks on resource recovery. Prior to ANOVA, all initial assumptions were thoroughly tested. No outliers were found, and no assumptions were violated, including normality, variance homogeneity, and covariance homogeneity. The main effects for Type and Experience were statistically significant ($F(3, 304)=31.54$, $p<.001$, $\eta^2_p=0.28$; $F(2.67, 812.40)=66.38$, $p<.0.001$, $\eta^2_p=0.18$) with the interaction effect ($F(8.02, 812.40)=25.75$, $p<.001$, $\eta^2_p=0.20$). In other words, the participants perceived different recovery experiences during distinct microbreaks. Further support for this observation was obtained through post-hoc tests with Bonferroni's adjustment for the SM group ($F(2.52, 194.10)=32.30$, $p<.0.001$, $\eta^2_p=0.30$). Table 3 presents the results of the recovery experience measurements among the experimental groups.

Post-hoc analysis based on paired *t*-tests with Bonferroni corrections and their respective effect sizes provided insight into the characteristics of SM-related recovery experiences. In this group, the participants reported the relatively highest level of psychological detachment ($t=4.71$, $p<0.001$, $d=0.53$ compared with relaxation; $t=8.09$, $p<.0.001$, $d=0.92$ compared with mastery; $t=6.13$, $p<.0.001$, $d=0.69$ compared with control). It was significantly higher than that of the participants in the no-break condition ($t=8.45$, $p=.0.001$, $d=1.36$). However, no significant differences were observed compared with blank and nature-related breaks ($t=0.79$, *ns*, $d=0.12$; $t=0.99$, $p=ns$, $d=0.14$, respectively).

Relaxation was rated relatively and significantly higher than mastery ($t=-5.03$, $p<.0.001$, $d=0.57$) and control ($t=-2.81$, $p<.0.05$, $d=0.32$) within the SM-related microbreak condition. The participants who engaged in SM during break found their experience more relaxing than those without a break ($t=4.20$, $p<.0.001$, $d=0.68$) but significantly less relaxing than those with the blank ($t=5.72$, $p<.0.001$, $d=0.83$) or nature-related ($t=8.52$, $p<0.001$, $d=1.42$) break.

Among the recovery experiences of the SM group, mastery obtained the lowest rating, which is significantly lower than those of psychological detachment and relaxation but not control ($t=2.69$, *ns*, $d=0.32$). It also achieved the lowest rating compared with the mastery experience of the other groups. Nevertheless, the difference was only significant for the group without a break ($t=3.55$, $p<.0.001$, $d=0.53$).

The last experience, control, was rated virtually the same by those under the SM and no-break conditions. The control experience was evaluated as lower in the SM group than in the nature-related one. However, this time difference was nonsignificant ($t=2.58$, *ns*, $d=0.42$). The rating of this experience was also lower than that of the blank break group, and the difference was significant ($t=3.43$, $p<.0.001$, $d=0.54$).

Discussion

This study examines the effects of brief, hedonic SM use during microbreaks on employee energetic resource recovery. Drawing on the ERM[35], we hypothesize that SM use following clerical tasks will facilitate recovery in vigor and fatigue (H1). However, we expect this recovery to be less effective than that achieved through established microbreak activities (H2). The randomized experimental study partially confirms H1, demonstrating that SM microbreaks can replenish, but not fully recover, resources. H2 has also been supported, indicating that nature-based microbreaks are superior. Furthermore, the study offers initial insights into the effects of hedonic SM use on the four types of recovery experience outlined in the Sonnentag and Fritz[36] framework, which demonstrates its potential to aid in psychological detachment but not in relaxation, mastery, and control. The study makes a valuable contribution to the existing literature on SM and microbreaks by elucidating the potential benefits and drawbacks of such engagements during work intervals. Although we highlight the capacity of hedonic SM use

	Recovery experience M (SD)			
Microbreak type	Psychological detachment	Relaxation	Mastery	Control
No break	1.73 (0.71)	1.68 (0.83)	2.21 (0.75)	1.99 (1.02)
Blank	2.90 (0.98)	3.24 (1.05)	1.80 (0.69)	2.57 (0.78)
Nature	3.18 (1.11)	3.84 (0.99)	1.90 (0.66)	2.43 (0.85)
Social media	3.02 (1.13)	2.35 (1.1)	1.67 (0.62)	1.98 (0.85)

Table 3. Descriptive statistics for recovery experience between groups.

to replenish psychological resources, we also underscore its limitations in achieving full recovery and selected experiences.

Impact of SM on resource recovery

ERM[35] explains that high job demands can result in psychological strain, which manifests as symptoms such as fatigue. Engaging in hedonic SM use seemingly offers a means of disconnecting from such demands, allowing employees to replenish psychological resources without imposing a substantial cognitive burden. These findings challenge previous research that highlights the adverse effects of SM activities e.g.,[17,27,83] and align with those indicating that SM can help individuals rest from work-related strains e.g.,[24,29,30]. Therefore, the apparent contradiction in previous findings may be reconciled by considering the specific purpose and duration of SM use examined in the current study, which advocates for hedonic engagement within a reasonable timeframe (e.g., < 10 min).

The study not only strengthens evidence in favor of the benefits of SM use during microbreaks but also navigates the complex landscape highlighted by prior research regarding the dual-edged nature of SM. While a few studies reported adverse effects and potential resource depletion due to constant checking and excessive SM use[16,32,33], the current findings underscore the significance of moderation and type of content. SM use is pervasive in today's workplaces[13,29]. Therefore, organizations may wish to recognize that SM use can aid in moderate regeneration of employee energetic resources, provided it is used for appropriate purposes and within short intervals, making it a viable option for microbreak activities. The findings of this study also contribute to our understanding of SM's negative impacts, suggesting that reasonable and limited interruptions should not lead to destructive consequences.

SM-related relative efficiency

The secondary objective aim of this study was to investigate the relative effects of SM-related microbreaks on psychological recovery. The findings demonstrate that not all breaks are created equal in this context. Although the participants engaging in hedonic SM use experienced a replenishment of depleted resources, specifically fatigue, the recovery was partial. In contrast, exposure to nature-related content emerged as a highly effective activity for counteracting the resources drained by the effort exerted to complete the clerical task. Given that scholars reported that SM- and nature-related contents could induce positive feelings[55,71,84], which should facilitate resource replenishment, other factors likely account for the observed differences.

According to ERM[35], participants exposed to SM were likely to engage in specific demands such as cognitive ones. This engagement may have partially disrupted the alleviation of strain due to the need to mobilize resources for performing clerical tasks. While viewing nature-related content provides a micro-restorative experience by rejuvenating mental energy through indirect attention[38], engaging with SM likely demands direct attention, hindering full resource recovery. Additionally, exposure to natural settings calms the nervous system, facilitating better resource recovery[85,86]. On the other hand, SM content stimulates the nervous system[87], demanding users to process information and control their emotional states, thereby depleting mental resources[32,42]. Conceivably, the immersive and stimulating qualities of SM, mainly when used for hedonistic purposes, engage users in a manner that limits its effectiveness as a restorative activity during microbreaks. The results highlight that SM can be advantageous when used as a brief distraction or microbreak. However, it is not the most effective option for such purposes.

SM and recovery experience

The novel contribution of this study lies in its inaugural exploration of recovery experiences associated with SM use during microbreaks, which is rooted in a methodical comparison using an established framework. Thus, the study enriches the comprehension of the mechanisms that underlie the positive impact of SM. This approach aligns with the recent guidelines proposed by Sonnentag et al.[4], which emphasized the importance of understanding the underlying processes contributing to adequate work recovery. The obtained results suggest that SM offers a distinct form of recovery through psychological detachment. The capacity of these platforms to help workers disengage from work-related thoughts is notable and closely mirrors the effects of nature-related microbreaks. However, detachment is only one facet of recovery. Although SM enables mental detachment from work, it does not particularly excel at fostering feelings of mastery, relaxation, or control. These results suggest that although SM is a powerful tool for detachment due to its immersive nature, it may not offer a comprehensive recovery experience.

The study showed that taking microbreaks to engage with SM leads to relatively high degrees of psychological detachment compared with other recovery experiences. The novelty of this discovery is that it extends previous research, which confirmed the psychological distancing effects of SM in post-work settings[55,88]. Our results suggest that even brief SM use during work can offer some benefits. This may be due to SM's diverse content and multisensory stimulation[89], which fully absorbs one's attention and leaves no room for dwelling on work-related issues. Conversely, the same level of engagement may lead to a comparatively lower sense of relaxation experience due to the impact of SM on brain activity. SNSs, replete with dynamically changing multisensory content, activate reward and gratification systems, which increases dopamine levels. This tendency typically results in heightened excitement instead of relaxation. Investigating recovery experiences associated with SM-related microbreaks contributes to our comprehension of their restorative impact mechanisms. It suggests that the replenishment stems from the brief psychological detachment experienced by employees. However, the inability to attain other recovery experiences may impede complete recovery. This limitation is highlighted by comparing SM-related microbreaks with other, more established types of recovery activities, as demonstrated by the study's findings.

Practical implications

The study highlights the advantages of integrating SM-based microbreaks into the work routine. However, it also serves as a cautionary note against viewing these breaks as a universal remedy for depleted psychological resources. Organizations should contemplate the formulation of microbreak policies that consider the distinct attributes of SM and their impact on well-being. For example, they could permit limited access to video-based platforms during high-strain intervals and foster a collective understanding of its rational use. Additionally, organizations could integrate recent findings into educational initiatives to alert employees to potential advantages and risks, such as notification-induced tension or adverse health outcomes due to excessive SM use.

Limitations and future research

The study employs a rigorous experimental design to explore microbreaks' intricate impacts on employee resources. Nonetheless, the methodology gives rise to certain limitations and avenues for future research. Primarily, our study uses pre-recorded material in a controlled setting to simulate SM interactions, acknowledging the difference from the interactive, personalized nature of SNSs[12,76]. This approach aims to improve result consistency but may not fully capture SM's dynamic reality. Prioritizing internal validity, we intentionally standardized content over algorithm-driven personalization, given the sparse knowledge of SM's causal impacts[90]. Using standardized video content during microbreaks could potentially diminish the restorative effects of SM. Although our content selection was representative, individual preferences influence the rejuvenating quality of breaks. Previous research suggests that breaks tailored to personal preferences can be remarkably restorative[8,91], which introduced the concept of person–break fit[92]. Future research could enhance our approach by examining personalized UGC feeds to enhance the understanding of the impact of SM, which would help elucidate whether or not the restorative effects of SM are limited and less effective compared with other established forms of microbreaks.

Another external validity limitation was the sample composition, which predominantly consisted of young adult female office workers. This sample not only somewhat constrained the generalizability of the findings but also posed specific challenges in interpreting the results. Notably, research indicates that men and women differ in their motivations for using SNSs, with women more often engaging with SM for cognitive purposes[93]. Future research may benefit from examining whether these gender-specific motivational differences create distinct challenges when introducing SM-related microbreaks. Additionally, previous studies have shown that women are more susceptible to developing SM addiction compared to men[94]. Given that the presented study highlights the benefits of rational SM use during microbreaks and that the predominant participant group may be at greater risk for addiction, future research should explore ways to implement SM microbreaks without increasing the likelihood of addiction. However, it is essential to note that these limitations pertain primarily to external validity, while the study design was aimed at maximizing internal validity.

Conclusion

The hedonic use of SM during microbreaks presents potential advantages for the psychological resources of employees. Brief interactions, particularly those involving viewing algorithm-driven short videos, can replenish depleted resources such as vigor and fatigue. However, they only partially recover work-related effort. Simultaneously, using SM during these breaks enhances psychological detachment from work but does not provide the same benefits as those of other recovery experiences. Consequently, integrating SM microbreaks as part of a holistic employee well-being strategy may contribute to recovery, provided that their use is not excessive.

Data availability

Data Availability Statement The data that support the findings of this study and materials (including a randomization list) are openly available in the Open Science Framework at https://doi.org/10.17605/OSF.IO/3MJY7. The study hypotheses and design were pre-registered via the Open Science Framework (https://osf.io/c5nkw) to ensure transparency and rigor. Notably, no significant deviations from the registered plan were observed.

Received: 16 May 2024; Accepted: 10 September 2024
Published online: 16 September 2024

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Author contributions
All authors developed the hypotheses and research model. J.G. and M.G. designed the study and gathered the data. J.G. analyzed the data and prepared tables and a figure. All authors wrote the paper.

Funding
The study was founded by the Faculty of Psychology and Cognitive Science, Adam Mickiewicz University, Poznań, Poland.

Declarations

Competing interests
The authors declare no competing interests.

Ethical approval
This study was approved by the Research Ethics Committee of the Faculty of Psychology and Cognitive Science, Adam Mickiewicz University, decision no. 3/12/2023.

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