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## How and when cyberloafing affect innovative work behavior?

Section:  
HR management

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### Abstract

Cyberloafing has traditionally been viewed as counterproductive work behavior that detracts from employee productivity. However, emerging research suggests it may offer unexpected benefits. This study investigates how and when cyberloafing affects innovative work behavior by examining the mediating role of knowledge acquisition and the moderating role of time of day. A two-wave survey was conducted with 342 employees in technology companies. At Wave 1, employees reported their cyberloafing frequency and job demands; at Wave 2, they reported knowledge acquisition, while supervisors rated their innovative work behavior. A multi-group analysis using covariance-based SEM compared employees before 12 PM and after 12 PM. The findings reveal that knowledge acquisition mediates the relationship between cyberloafing and innovative work behavior, but this mediation is contingent on time of day. Before 12 PM, cyberloafing influences innovation indirectly through knowledge acquisition, suggesting a learning-oriented mechanism. After 12 PM, cyberloafing directly affects innovation, potentially through restorative mechanisms that replenish cognitive resources. This study advances understanding of cyberloafing as a multifaceted phenomenon with both learning and restorative functions, demonstrating that its effects on innovation are not uniform but depend critically on when it occurs. Organizations should consider differentiated policies that recognize the temporal dynamics of cyberloafing.

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## Abstrak

Cyberloafing secara tradisional dipandang sebagai perilaku kerja kontraproduktif yang mengurangi produktivitas karyawan. Namun, penelitian terbaru menunjukkan bahwa hal itu mungkin menawarkan manfaat yang tak terduga. Studi ini menyelidiki bagaimana dan kapan cyberloafing memengaruhi perilaku kerja inovatif dengan memeriksa peran mediasi perolehan pengetahuan dan peran moderasi waktu dalam sehari. Survei dua gelombang dilakukan dengan 342 karyawan di perusahaan teknologi. Pada Gelombang 1, karyawan melaporkan frekuensi cyberloafing dan tuntutan pekerjaan mereka; pada Gelombang 2, mereka melaporkan perolehan pengetahuan, sementara supervisor menilai perilaku kerja inovatif mereka. Analisis multi-kelompok menggunakan SEM berbasis kovarians membandingkan karyawan sebelum pukul 12 siang dan setelah pukul 12 siang. Temuan menunjukkan bahwa perolehan pengetahuan memediasi hubungan antara cyberloafing dan perilaku kerja inovatif, tetapi mediasi ini bergantung pada waktu dalam sehari. Sebelum pukul 12 siang, cyberloafing memengaruhi inovasi secara tidak langsung melalui perolehan pengetahuan, menunjukkan mekanisme yang berorientasi pada pembelajaran. Setelah pukul 12 siang, cyberloafing secara langsung memengaruhi inovasi, berpotensi melalui mekanisme restoratif yang mengisi kembali sumber daya kognitif. Studi ini meningkatkan pemahaman tentang cyberloafing sebagai fenomena multifaset dengan fungsi pembelajaran dan pemulihan, menunjukkan bahwa dampaknya terhadap inovasi tidak seragam tetapi sangat bergantung pada kapan hal itu terjadi. Organisasi harus mempertimbangkan kebijakan yang berbeda yang mengakui dinamika temporal dari cyberloafing.

**Kata kunci:** Cyberloafing, perilaku kerja inovatif, perolehan pengetahuan, waktu dalam sehari, analisis multi-kelompok

## INTRODUCTION

Cyberloafing, defined as employees' voluntary use of their company's internet access for personal purposes during working hours (Lim, 2002), has become a pervasive phenomenon in modern workplaces, particularly with the rise of digital technology. Traditionally, this practice has been viewed through a negative lens, conceptualized as a counterproductive work behavior that diverts attention from work tasks, thereby disrupting organizational objectives and diminishing productivity (Muthuswamy & Varshika, 2023; Soral et al., 2020). As a result, many organizations have implemented policies to limit or block access to non-work-related websites. However, this entirely negative perspective is increasingly being challenged by a growing body of literature.

Emerging research suggests a more nuanced view, proposing that cyberloafing, especially when it involves browsing for new information, may offer unexpected benefits to employees. Studies indicate that such activity can function as a coping mechanism to alleviate workplace stress (J. Wu et al., 2020), provide a necessary mental break for recovery, and, perhaps most intriguingly, serve as an inadvertent source of new ideas and creativity (Koay & Soh, 2019; Rajah & Lim, 2018). This duality—where a behavior can be both a potential liability and a resource—highlights a critical research gap. While we are beginning to understand *that* cyberloafing can have positive effects, the literature lacks a clear explanation of how exactly these personal online activities can be translated into tangible positive outcomes, such as innovative work behavior, and under what conditions this effect is most pronounced. Addressing this gap is essential to developing a balanced, comprehensive understanding of cyberloafing in the contemporary workplace.

Innovative work behavior (IWB) involves generating, introducing, and applying novel ideas in the workplace (Al-Omari et al., 2019; Cingöz & Akdoğan, 2011). Innovation requires diverse input, and cyberloafing can contribute to it. Browsing for information during cyberloafing exposes employees to industry trends and new problem-solving methods that can enhance their work (Rahman et al., 2022). Research supports this idea, showing that informational cyberloafing during crises, such as the COVID-19 pandemic, positively affects innovation performance by increasing perceived work meaning (Zhong et al., 2022). Specific activities, such as social and informational browsing, have been linked to improved idea generation and creativity, which can fuel innovation. However, excessive cyberloafing can lead to negative outcomes, such as job anxiety and reduced

focus, which hinder the cognitive resources needed for innovation (Zhong et al., 2022). This duality of cyberloafing—both enabling and inhibiting innovation—highlights the need for deeper research. This study will explore how and when cyberloafing impacts IWB, focusing on the mediating mechanisms and boundary conditions involved. Drawing the Job Demands-Resources (JD-R) theory as a lens (Bakker & Demerouti, 2017), we propose that knowledge acquisition acts as the mediating mechanism (the *how*), while job demands serve as a moderator (the *when*) that can strengthen or weaken the positive effects of cyberloafing.

## THEORETICAL FRAMEWORK

This study is grounded in the Job Demands-Resources (JD-R) theory (Bakker & Demerouti, 2014), which provides a comprehensive framework for understanding how workplace characteristics influence employee outcomes. The JD-R theory posits that working conditions can be categorized into two broad categories: job demands and job resources. Job demands refer to aspects of work that require sustained physical, psychological, or cognitive effort, potentially leading to exhaustion and health impairment. Job resources, conversely, refer to aspects that help achieve work goals, reduce job demands, and stimulate personal growth and development. The JD-R framework is particularly relevant for understanding cyberloafing because it recognizes that employee behaviors can serve both resource-depleting and resource-enhancing functions.

Traditionally, cyberloafing has been conceptualized as a form of withdrawal behavior that detracts from job performance (Lim, 2002). However, emerging perspectives suggest that cyberloafing may also serve as a personal resource, providing opportunities for recovery, informal learning, and cognitive stimulation that ultimately benefit employees and organizations. This dual potential positions cyberloafing uniquely within the JD-R framework, where its effects depend on how employees utilize it and under what conditions it occurs. Furthermore, the JD-R theory emphasizes that the interaction between job demands and resources shapes employee outcomes. When job demands are high, resources become particularly valuable for maintaining engagement and performance. This interactionist perspective informs our understanding of **when** cyberloafing may be most beneficial—suggesting that contextual factors, such as time of day and associated fluctuations in cognitive resources, may determine whether cyberloafing functions as a resource or a liability.

### Cyberloafing and knowledge acquisition

Knowledge acquisition involves capturing expertise from experts, datasets, or other sources and transforming it into a computerized or structured format for use in intelligent systems or organizational decision-making (Chen & Xia, 2009; Hua, 2008; Nezafati et al., 2008). It often requires handling dynamic and incomplete data, necessitating incremental updates to maintain the relevance and accuracy of the acquired knowledge (Shu et al., 2019). The process includes converting tacit knowledge (unspoken, intuitive knowledge) into explicit knowledge (formalized, documented knowledge), which can then be used for further knowledge generation (Cairó & Guardati, 2013). Cyberloafing refers to employees' voluntary use of their company's internet access for personal purposes during working hours (Lim, 2002). While traditionally viewed as counterproductive, recent research suggests that certain types of cyberloafing, particularly browsing-related activities, may offer unexpected benefits. When employees engage in informational browsing, they inadvertently encounter new ideas, industry trends, and diverse perspectives that can enhance their knowledge base (Rahman et al., 2022). This process aligns with social learning theory, which suggests that individuals acquire knowledge through observation and exposure to information from their environment.

The JD-R framework supports this proposition by conceptualizing browsing-related cyberloafing as a potential resource for knowledge acquisition. Unlike passive entertainment or gaming, informational cyberloafing involves active engagement with content that may be relevant

to employees' work contexts. For instance, reading industry blogs, following professional discussions on social media, or exploring new technologies during brief online breaks can expose employees to innovations and solutions they might not encounter through formal channels (Zhong et al., 2022). This serendipitous learning is particularly valuable in knowledge-intensive industries where staying current with rapid technological changes is essential. Moreover, cyberloafing may enhance knowledge acquisition by providing employees with autonomy over their learning. When employees self-direct their online browsing based on their interests and curiosity, they may be more intrinsically motivated to absorb and retain information. This informal, self-directed learning complements formal training and development programs, filling gaps and exposing employees to diverse knowledge sources. A previous study (Zhu et al., 2023) explicitly highlights that social media use indirectly enhances creativity through knowledge acquisition, though it does not directly link this to cyberloafing. Another study (Zhong et al., 2022) highlights that informational cyberloafing during the COVID-19 pandemic positively influenced employees' innovation performance by enhancing their perceived work meaning. This implies that cyberloafing can facilitate knowledge acquisition, thereby supporting innovative thinking. Therefore, we propose:

**Hypothesis 1:** Cyberloafing positively affects knowledge acquisition.

#### Cyberloafing and innovative work behavior

Innovative work behavior (IWB) comprises actions aimed at generating, introducing, and applying novel and useful ideas in the workplace (Janssen, 2000). The relationship between cyberloafing and IWB is theoretically grounded in both cognitive and affective mechanisms. From a cognitive perspective, exposure to diverse information through cyberloafing provides the intellectual raw materials necessary for creative idea generation. Innovation rarely emerges from a vacuum; it requires input from varied sources that can be recombined into novel solutions. Cyberloafing exposes employees to ideas, practices, and technologies from outside their immediate work context, fueling the creative process (Rahman et al., 2022).

From an affective perspective, cyberloafing may enhance innovation by providing mental breaks that restore cognitive resources. The attention restoration theory suggests that brief diversions from focused work allow depleted cognitive resources to replenish, enhancing subsequent creative thinking (Reshadi & Fitzgerald, 2023). When employees take short breaks to engage in personal online activities, they return to their tasks with renewed energy and perspective, potentially approaching problems more creatively. This restorative function is particularly relevant in knowledge work, where sustained cognitive effort can lead to mental fatigue and diminished creative capacity. Furthermore, cyberloafing may enhance innovative behavior by reducing work-related stress. Stress narrows cognitive focus and impairs the flexible thinking necessary for innovation. By providing a coping mechanism for work demands, cyberloafing may alleviate stress and free up cognitive resources for innovative activities (Wu et al., 2020). Cyberloafing has been shown to positively influence IWB in certain contexts. For example, studies indicate that browsing-related cyberloafing can enhance creative performance by facilitating knowledge acquisition. Similarly, cyberloafing activities (e.g. informational or leisure-related) positively impact IWB by fostering creativity and innovation (Divya & Narwal, 2023; Kwala & Agoyi, 2024). Employees who use cyberloafing to manage stress may be better positioned to engage in the exploratory and generative thinking that underlies innovation. Based on these arguments, we propose:

**Hypothesis 2:** Cyberloafing has a positive direct effect on innovative work behavior.

#### Knowledge acquisition and innovative work behavior

Knowledge acquisition is widely recognized as a precursor to innovation. The knowledge-based view of the firm posits that knowledge is the primary resource for organizational innovation and competitive advantage. At the individual level, employees who acquire new knowledge are better equipped to generate novel ideas, identify opportunities for improvement, and develop creative solutions to work problems (Nanda & Banerjee, 2021). Knowledge provides the cognitive building blocks that employees combine and recombine to create innovations. The relationship between knowledge acquisition and innovative work behavior operates through several mechanisms. First, new knowledge exposes employees to different ways of thinking and problem-solving, expanding their cognitive repertoire and enabling them to approach challenges from multiple perspectives.

Second, knowledge acquisition keeps employees up to date on developments in their field, enabling them to integrate cutting-edge ideas into their work. Third, the process of acquiring knowledge itself may stimulate curiosity and intellectual engagement, creating a mindset conducive to innovation (Kimiagari & Asadi Malafe, 2021). Empirical evidence supports this relationship across various contexts. Employees who actively seek and acquire new knowledge demonstrate higher levels of creativity, idea generation, and innovation implementation. Knowledge acquired through informal channels, such as online browsing, may be particularly valuable because it reflects employees' genuine interests and is acquired in contexts that facilitate application. Therefore, we propose:

**Hypothesis 3:** Knowledge acquisition has a positive effect on innovative work behavior.

### The mediating role of knowledge acquisition

Taken together, the preceding arguments suggest that knowledge acquisition mediates the relationship between cyberloafing and innovative work behavior. This mediation answers the "how" question central to this study—identifying the mechanism through which cyberloafing translates into innovative outcomes. When employees engage in cyberloafing, particularly browsing-related activities, they acquire new knowledge and insights. This acquired knowledge then serves as input for innovative work behaviors, enabling employees to generate, promote, and implement novel ideas. This mediated relationship is consistent with the JD-R framework's emphasis on resource generation.

Previous study (Wu, 2011) discusses the mediating role of knowledge acquisition in the relationship between network factors (e.g. mutual trust) and innovation performance. This suggests that knowledge acquisition is a critical mechanism for fostering innovation, though it does not explicitly link this to cyberloafing. Similarly, another study (Zhu et al., 2023) finds that social media usage enhances creativity through knowledge acquisition while reducing cyberloafing. This implies that knowledge acquisition can act as a bridge between digital behaviors (like social media use) and innovative outcomes, though cyberloafing is not directly tied to this process. Another studies (Aristana et al., 2024; Chughtai & Khan, 2024; Elamin et al., 2024) emphasize the role of knowledge-sharing behaviors in mediating relationships between various factors (e.g. leadership, engagement) and IWB. While these studies do not mention cyberloafing, they reinforce the idea that knowledge-related processes are central to innovation.

Cyberloafing serves as a resource that enables knowledge acquisition, which, in turn, facilitates innovation—a positive organizational outcome. The indirect pathway acknowledges that cyberloafing's effects on innovation are not always direct but may operate through cognitive mechanisms that require time and reflection to manifest. Employees may not immediately apply knowledge gained from cyberloafing; instead, they may store and integrate this knowledge, drawing upon it when opportunities for innovation arise. Moreover, the mediation model recognizes that cyberloafing's benefits extend beyond immediate stress reduction or mental breaks. By positioning knowledge acquisition as the mediating mechanism, this study emphasizes the learning potential of cyberloafing and its capacity to contribute to employees' intellectual capital. This perspective challenges the purely negative view of cyberloafing and suggests that organizations may benefit from recognizing its potential as an informal learning tool. Accordingly, we propose:

**Hypothesis 4:** Knowledge acquisition mediates the positive relationship between cyberloafing and innovative work behavior.

### The moderating role of time of day

While the mediation model explains how cyberloafing affects innovation, understanding when this effect occurs requires examining boundary conditions. This study proposes that time of day moderates the mediating effect of cyberloafing on innovative work behavior. The rationale for this

moderation is grounded in research on circadian rhythms, fluctuations in cognitive resources, and the changing nature of work demands throughout the day.

Research on circadian rhythms demonstrates that cognitive resources and information-processing capabilities fluctuate systematically throughout the day (Schachter & Singer, 1962). Morning hours are typically associated with higher alertness, better analytical processing, and greater capacity for deep information encoding. During this period, employees may be more receptive to new information and better able to acquire and retain knowledge through cyberloafing. Consequently, the knowledge acquisition pathway—where cyberloafing enhances innovation through learning—may be particularly salient before 12 PM. As the workday progresses, employees accumulate job demands, experiencing mental fatigue and depleted cognitive resources (Duxbury et al., 2020). By afternoon, the capacity for deep information processing may diminish, while the need for recovery increases. During this period, the restorative functions of cyberloafing may become more prominent than its learning functions. Employees may use cyberloafing primarily as a mental break to replenish depleted resources, and this restoration may directly enhance creative thinking without the need for deliberate knowledge acquisition and reflection.

These temporal dynamics suggest that the mechanism through which cyberloafing affects innovation differs before and after 12 PM. In the morning, when cognitive resources are abundant, cyberloafing may enhance innovation primarily through knowledge acquisition—employees learn from their online browsing and subsequently apply this knowledge innovatively. In the afternoon, when fatigue accumulates, cyberloafing may enhance innovation primarily through direct pathways—providing restorative breaks that replenish cognitive resources and enable creative thinking, independent of new knowledge acquisition. Therefore, we propose that time of day moderates the mediated relationship, such that the indirect effect through knowledge acquisition is stronger before 12 PM. In comparison, the direct effect is stronger after 12 PM:

Hypothesis 5 : Time of day moderates the relationship between cyberloafing and innovative work behavior.

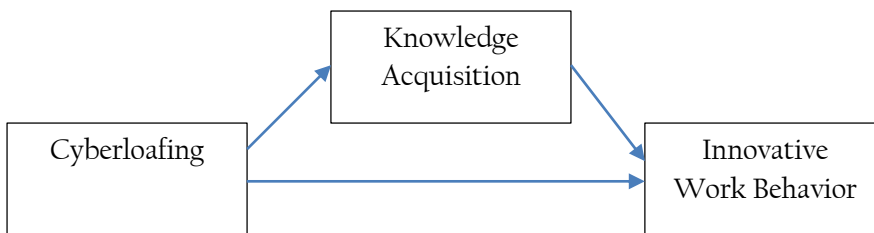


Figure 1. Conceptual model of the relationship between cyberloafing and innovative work behavior

## METHODS

### Sample and Procedures

The target population for this study was permanent employees working in Jakarta. Data were collected through an online survey platform administered in two waves, separated by a one-month interval. At Wave 1, employees reported their frequency of cyberloafing and their perception of job demands. One month later (Wave 2), the same employees reported their knowledge acquisition, while their direct supervisors rated the employees' innovative work behavior. Supervisor ratings were employed to provide an objective assessment of innovative behavior that is not subject to self-report bias and to substantially reduce concerns about common method variance by using different sources for predictor and outcome variables (Hendryadi et al., 2019; Tricahyadinata et al., 2020).

After matching employee responses across the two waves with supervisor ratings, the final sample comprised 342 respondents. Regarding gender distribution, female respondents accounted for 52% of participants, while male respondents accounted for the remaining 48%, resulting in a

relatively balanced gender composition. In terms of age, the majority of respondents (61%) were between 21 and 30 years old, followed by those aged 31–40 years (23%), respondents below 21 years (9%), those aged 41–50 years (5%), and respondents above 50 years (2%). Regarding educational background, most respondents held a bachelor's degree (57%), followed by postgraduate degrees (28%), diploma or associate degrees (12%), and high school education or below (3%).

The predominance of young professionals (61% aged 21–30) is particularly relevant to this study, as this demographic is often characterized as a digital native, highly proficient at navigating online environments and integrating personal internet use into their work routines. Furthermore, the high proportion of university-educated respondents (85% holding at least a bachelor's degree) is consistent with the knowledge-intensive nature of the technology sector. It supports the study's focus on knowledge acquisition as a key mechanism, as employees with higher levels of education are likely to possess the cognitive skills necessary to evaluate and apply information encountered during cyberloafing critically.

To ensure the sample size was adequate to detect the hypothesized effects, a power analysis was conducted before data collection. Following recommendations for structural equation modeling (Hair et al., 2019), the required sample size was determined based on model complexity, expected effect sizes, and statistical power. The proposed model includes three latent variables with a total of 19 indicators, and multi-group analysis comparing two groups (before 12 PM and after 12 PM). Using the guidelines proposed by Westland (2010) for SEM power analysis, with an anticipated medium effect size ( $f^2 = 0.15$ ), desired statistical power of 0.80, and alpha level of 0.05, the minimum required sample size was estimated to be approximately 200 respondents for the overall model. For multi-group analysis, larger samples are recommended to ensure stable parameter estimates across groups. The achieved sample of 342 respondents exceeds the minimum requirements, providing adequate statistical power to detect the hypothesized relationships and conduct multi-group comparisons. Furthermore, the sample size satisfies the commonly recommended ratio of at least 10 observations per indicator (19 indicators  $\times$  10 = 190), confirming that the sample is sufficient for the planned analyses (Hair et al., 2019).

## Measurements

Cyberloafing was measured using a seven-item scale adapted from personal cyberloafing (Hendryadi & Mustika, 2023). A sample item is "Visiting entertainment websites." Respondents rated their agreement on a [specify scale, e.g., 5-point Likert scale ranging from 1 = never to 5 = very often]. Knowledge Acquisition was measured using a four-item scale assessing the extent to which employees gain new insights and information from non-work online activities. The items captured: (1) the employee's ability to learn new technologies and ideas, (2) gaining new insights from various sources, (3) the degree of new skill improvement, and (4) enhancement of professional skills and competencies. Respondents rated their agreement on a [specify scale, e.g., 5-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree]. Innovative Work Behavior was measured using the nine-item Innovative Work Behavior Scale developed by Janssen (2000). Respondents rated their agreement on a [specify scale, e.g., 5-point Likert scale ranging from 1 = never to 5 = always].

## Data analysis procedures

The data analysis for this study was conducted using JAMOVI software, employing a covariance-based Structural Equation Modeling (SEM) approach with Multi-Group Analysis (MGA) to examine the influence of cyberloafing on knowledge acquisition and innovative work behavior based on time constraints, specifically comparing employees before 12 PM and after 12 PM. Preliminary analyses included data screening for missing values, outliers, and normality, followed by descriptive statistics and correlations for the overall sample and each time group. The measurement model was assessed through Confirmatory Factor Analysis (CFA) to evaluate factor loadings, composite reliability, Cronbach's alpha, average variance extracted (AVE), and

discriminant validity using the Fornell-Larcker criterion and HTMT ratio. Before multi-group analysis, measurement invariance was tested by establishing configural, metric, and scalar invariance across the two time groups to ensure meaningful comparisons.

The structural model was then specified with cyberloafing as the independent variable, knowledge acquisition as the mediator, and innovative work behavior as the dependent variable, and was estimated simultaneously for both groups using maximum likelihood estimation, with model fit assessed through chi-square, CFI, TLI, RMSEA, and SRMR. To determine whether time constraints moderated the relationships, a multi-group comparison was performed by contrasting an unconstrained model with a constrained model in which structural paths were set equal across groups; a significant chi-square difference test indicated moderation effects. Standardized path coefficients were examined for each group, and critical ratios were calculated to identify specific paths that differed significantly between the groups before 12 PM and after 12 PM. Mediation analysis was conducted using bootstrapping with 5,000 resamples to generate bias-corrected confidence intervals for indirect effects, which were compared across groups. Finally, common method bias was assessed using Harman's single-factor test and by including a common method factor in the measurement model, following prior recommendations (Kock et al., 2021; Podsakoff et al., 2012).

## RESULTS AND DISCUSSION

### Measurement model evaluation

The goodness-of-fit evaluation assessed the overall suitability of the proposed structural model. As presented in Table 1, the model was estimated using covariance-based Structural Equation Modeling (SEM) with a chi-square ( $\chi^2$ ) value of 441.16 and 298 degrees of freedom (df). The chi-square statistic was significant ( $p < 0.001$ ), indicating a statistically significant difference between the predicted and observed covariance matrices. However, it is important to note that the chi-square test is highly sensitive to sample size. With a relatively large sample of 342 respondents, a significant chi-square value is commonly observed and does not necessarily imply model rejection (Hair et al., 2019).

Further examination of the absolute fit indices reveals that the model demonstrates acceptable fit. The Root Mean Square Error of Approximation (RMSEA) is 0.053, which falls below the recommended threshold of 0.08, indicating a reasonable approximation error in the population. The 90% confidence interval for RMSEA ranges from 0.042 to 0.063, remaining entirely below the 0.08 cutoff and suggesting precise estimation. More importantly, the RMSEA p-value for close fit (test that  $RMSEA \leq 0.05$ ) is 0.311, which exceeds the 0.05 significance level, indicating that the null hypothesis of close fit cannot be rejected and that the model exhibits excellent close fit. Additionally, the Standardized Root Mean Square Residual (SRMR) is 0.059, which is below the recommended maximum of 0.08, suggesting that the residuals between the predicted and observed covariance matrices are relatively small.

The incremental fit indices all exceed the recommended thresholds. The Comparative Fit Index (CFI) is 0.946, the Tucker-Lewis Index (TLI) is 0.938, the Bentler-Bonett Non-normed Fit Index (NNFI) is 0.938, and the Relative Noncentrality Index (RNI) is 0.946. All these values exceed the minimum recommended cutoff of 0.90, indicating that the proposed model demonstrates substantial improvement in fit relative to the baseline null model. The consistency among these indices further supports the model's stability and adequacy.

The parsimonious fit indices also support the overall model fit. The Goodness of Fit Index (GFI) is 0.964, and the Adjusted Goodness of Fit Index (AGFI) is 0.950, both substantially exceeding the recommended minimum threshold of 0.90. The GFI indicates the proportion of variance and covariance in the observed matrix that the model explains, while the AGFI adjusts this value for the model's degrees of freedom. The high values of both indices suggest that the model is not only well-fitting but also parsimoniously efficient. Therefore, the structural model proposed in this study is acceptable and suitable for further interpretation of the hypothesized relationships among variables.

Table 1. Goodness of Fit Indices

| Fit Index                                       | Value            | Cut-off Criteria | Fit Level |
|---|------------------|------------------|-----------|
| <b>Absolute Fit Indices</b>                     |                  |                  |           |
| Chi-Square ( $\chi^2$ )                         | 441.16           | Expected small   | -         |
| Degrees of Freedom (df)                         | 298              | -                | -         |
| Significance Level (p)                          | <0.001           | >0.05            | Poor      |
| Root Mean Square Error of Approximation (RMSEA) | 0.053            | $\leq 0.08$      | Good      |
| 90% Confidence Interval RMSEA                   | 0.042 –<br>0.063 | -                | -         |
| RMSEA p-value (Close Fit)                       | 0.311            | >0.05            | Good      |
| Standardized Root Mean Square Residual (SRMR)   | 0.059            | $\leq 0.08$      | Good      |
| Goodness of Fit Index (GFI)                     | 0.964            | $\geq 0.90$      | Good      |
| <b>Incremental Fit Indices</b>                  |                  |                  |           |
| Comparative Fit Index (CFI)                     | 0.946            | $\geq 0.90$      | Good      |
| Tucker-Lewis Index (TLI)                        | 0.938            | $\geq 0.90$      | Good      |
| Bentler-Bonett Non-normed Fit Index (NNFI)      | 0.938            | $\geq 0.90$      | Good      |
| Relative Noncentrality Index (RNI)              | 0.946            | $\geq 0.90$      | Good      |
| <b>Parsimonious Fit Indices</b>                 |                  |                  |           |
| Adjusted Goodness of Fit Index (AGFI)           | 0.950            | $\geq 0.90$      | Good      |

Note: n = 342 respondents. Chi-square is sensitive to large sample sizes; therefore, other fit indices provide more reliable assessment of model fit (Hair et al., 2019)

The measurement model was evaluated to assess the reliability and validity of the constructs for both groups: before 12 PM (Group 1) and after 12 PM (Group 2). The results of the confirmatory factor analysis (CFA) are presented in Table 2, including factor loadings ( $\beta$ ), standard errors (SE), confidence intervals, and significance levels for each indicator. For Group 1 (Before 12 PM), all factor loadings for the Cyberloafing (CB) construct ranged from 0.642 to 0.766, with the highest loading observed for CB3 ( $\beta = 0.766$ ,  $p < 0.001$ ) and the lowest for CB2 ( $\beta = 0.642$ ,  $p < 0.001$ ). All six items demonstrated statistically significant loadings ( $p < 0.001$ ), indicating that each indicator contributes meaningfully to the measurement of cyberloafing. The confidence intervals for all CB items did not include zero, further supporting the precision of the estimates.

The Innovative Work Behavior (IWB) construct in Group 1 exhibited factor loadings ranging from 0.675 to 0.821. The highest loading was observed for IWB8 ( $\beta = 0.821$ ,  $p < 0.001$ ), while IWB7 showed the lowest but still acceptable loading ( $\beta = 0.675$ ,  $p < 0.001$ ). All nine IWB items were statistically significant ( $p < 0.001$ ), with z-values ranging from 8.183 to 10.047, indicating strong measurement properties. The confidence intervals for all IWB items were consistently positive and did not cross zero. For the Knowledge Acquisition (KA) construct in Group 1, factor loadings ranged from 0.629 to 0.811. KA2 demonstrated the strongest loading ( $\beta = 0.811$ ,  $p < 0.001$ ), followed by KA3 ( $\beta = 0.798$ ,  $p < 0.001$ ) and KA4 ( $\beta = 0.697$ ,  $p < 0.001$ ). KA1, set to 1.000 for identification purposes, had a standardized loading of 0.629. All KA items were statistically significant ( $p < 0.001$ ), confirming their contribution to measuring knowledge acquisition.

For Group 2 (After 12 PM), the Cyberloafing construct demonstrated factor loadings ranging from 0.598 to 0.696. CB4 and CB6 showed the highest loadings ( $\beta = 0.694$  and  $\beta = 0.696$ , respectively,  $p < 0.001$ ), while CB1 showed the lowest loading ( $\beta = 0.598$ ). Despite the slightly lower

loading for CBI, all items remained statistically significant ( $p < 0.001$ ) with z-values exceeding 6.66, indicating acceptable measurement properties. The Innovative Work Behavior construct in Group 2 exhibited factor loadings ranging from 0.646 to 0.776. IWB5 demonstrated the strongest loading ( $\beta = 0.776$ ,  $p < 0.001$ ), followed by IWB9 ( $\beta = 0.724$ ,  $p < 0.001$ ). All nine IWB items were statistically significant ( $p < 0.001$ ), with z-values ranging from 8.314 to 9.891, confirming the robustness of the IWB measurement across both time groups. For the Knowledge Acquisition construct in Group 2, factor loadings ranged from 0.524 to 0.806. KA2 demonstrated the strongest loading ( $\beta = 0.806$ ,  $p < 0.001$ ), followed by KA3 ( $\beta = 0.778$ ,  $p < 0.001$ ). KA4 showed the lowest loading ( $\beta = 0.524$ ,  $p < 0.001$ ), and KA1, fixed at 1.000 for identification, showed a standardized loading of 0.540. Although KA4's loading was relatively lower, it remained statistically significant and above the minimum threshold of 0.50 recommended for exploratory research (Hair et al., 2019).

**Table 2.** Measurement model evaluation

| Latent                        | Observed | Estimate | SE   | Lower | Upper | $\beta$ | p     |
|-------------------------------|----------|----------|------|-------|-------|---------|-------|
| <b>Before 12 AM (Group 1)</b> |          |          |      |       |       |         |       |
| <b>CB</b>                     | CB1      | 1.00     | 0.00 | 1.00  | 1.00  | 0.71    |       |
|                               | CB2      | 0.94     | 0.13 | 0.68  | 1.20  | 0.64    | <.001 |
|                               | CB3      | 1.10     | 0.13 | 0.84  | 1.36  | 0.77    | <.001 |
|                               | CB4      | 1.02     | 0.14 | 0.75  | 1.29  | 0.67    | <.001 |
|                               | CB5      | 0.96     | 0.13 | 0.70  | 1.22  | 0.66    | <.001 |
|                               | CB6      | 0.91     | 0.13 | 0.66  | 1.17  | 0.65    | <.001 |
| <b>IWB</b>                    | IWB1     | 1.00     | 0.00 | 1.00  | 1.00  | 0.73    |       |
|                               | IWB2     | 1.00     | 0.12 | 0.77  | 1.23  | 0.70    | <.001 |
|                               | IWB3     | 1.08     | 0.11 | 0.86  | 1.30  | 0.78    | <.001 |
|                               | IWB4     | 0.98     | 0.12 | 0.75  | 1.20  | 0.70    | <.001 |
|                               | IWB5     | 1.04     | 0.12 | 0.81  | 1.27  | 0.72    | <.001 |
|                               | IWB6     | 1.06     | 0.12 | 0.83  | 1.30  | 0.73    | <.001 |
|                               | IWB7     | 0.95     | 0.12 | 0.72  | 1.17  | 0.68    | <.001 |
|                               | IWB8     | 1.18     | 0.12 | 0.95  | 1.41  | 0.82    | <.001 |
|                               | IWB9     | 1.12     | 0.13 | 0.88  | 1.37  | 0.74    | <.001 |
| <b>KA</b>                     | KA1      | 1.00     | 0.00 | 1.00  | 1.00  | 0.63    |       |
|                               | KA2      | 1.31     | 0.17 | 0.97  | 1.65  | 0.81    | <.001 |
|                               | KA3      | 1.14     | 0.15 | 0.84  | 1.44  | 0.80    | <.001 |
|                               | KA4      | 1.00     | 0.15 | 0.72  | 1.29  | 0.70    | <.001 |
| <b>After 12 AM (Group 2)</b>  |          |          |      |       |       |         |       |
| <b>CB</b>                     | CB1      | 1.00     | 0.00 | 1.00  | 1.00  | 0.60    |       |
|                               | CB2      | 1.02     | 0.14 | 0.74  | 1.30  | 0.68    | <.001 |
|                               | CB3      | 1.10     | 0.16 | 0.79  | 1.40  | 0.66    | <.001 |
|                               | CB4      | 1.12     | 0.16 | 0.81  | 1.42  | 0.69    | <.001 |
|                               | CB5      | 1.06     | 0.16 | 0.75  | 1.38  | 0.62    | <.001 |
|                               | CB6      | 1.09     | 0.15 | 0.79  | 1.38  | 0.70    | <.001 |
| <b>IWB</b>                    | IWB1     | 1.00     | 0.00 | 1.00  | 1.00  | 0.70    |       |
|                               | IWB2     | 0.97     | 0.11 | 0.76  | 1.19  | 0.69    | <.001 |
|                               | IWB3     | 0.99     | 0.12 | 0.76  | 1.22  | 0.66    | <.001 |
|                               | IWB4     | 0.92     | 0.11 | 0.70  | 1.13  | 0.65    | <.001 |
|                               | IWB5     | 1.19     | 0.12 | 0.95  | 1.43  | 0.78    | <.001 |
|                               | IWB6     | 1.03     | 0.11 | 0.81  | 1.25  | 0.71    | <.001 |
|                               | IWB7     | 1.05     | 0.12 | 0.83  | 1.28  | 0.71    | <.001 |

|    |      |      |      |      |      |      |       |
|----|------|------|------|------|------|------|-------|
|    | IWB8 | 1.13 | 0.12 | 0.89 | 1.38 | 0.71 | <.001 |
|    | IWB9 | 1.14 | 0.12 | 0.90 | 1.38 | 0.72 | <.001 |
| KA | KA1  | 1.00 | 0.00 | 1.00 | 1.00 | 0.54 |       |
|    | KA2  | 1.60 | 0.24 | 1.14 | 2.07 | 0.81 | <.001 |
|    | KA3  | 1.36 | 0.20 | 0.96 | 1.75 | 0.78 | <.001 |
|    | KA4  | 1.00 | 0.19 | 0.64 | 1.37 | 0.52 | <.001 |

Note: CB = Cyberloafing; IWB = Innovative Work Behavior; KA = Knowledge Acquisition; SE = Standard Error; Lower and Upper represent the 95% confidence interval bounds;  $\beta$  = Standardized factor loading; All p-values are two-tailed.

### Cross-Group Comparison

Comparing the two groups, all constructs demonstrated consistent measurement properties. The Cyberloafing items showed slightly higher loadings in Group 1 (range 0.642–0.766) compared to Group 2 (range 0.598–0.696), suggesting that the cyberloafing measure performs somewhat better for employees before 12 PM. The IWB construct showed comparable loadings across both groups, with Group 1 ranging from 0.675 to 0.821 and Group 2 ranging from 0.646 to 0.776, indicating that innovative work behavior is measured consistently regardless of time constraint. For Knowledge Acquisition, both groups showed similar patterns with KA2 and KA3 emerging as the strongest indicators, while KA1 and KA4 showed relatively lower loadings, particularly in Group 2, where KA4 loaded at 0.524.

Overall, the measurement model demonstrates satisfactory properties across both groups. All factor loadings exceeded the minimum recommended threshold of 0.50 (Hair et al., 2019) and were statistically significant at  $p < 0.001$ , indicating that each indicator reliably measures its respective latent construct. The confidence intervals for all parameter estimates were reasonably narrow and did not include zero, suggesting precise estimation. These results provide evidence for the adequacy of the measurement model and support proceeding with the structural model analysis and multi-group comparisons.

The reliability and convergent validity of the constructs were assessed separately for the two time-based groups (before 12 PM and after 12 PM) using Cronbach's alpha ( $\alpha$ ), composite reliability (CR), and average variance extracted (AVE). The results are summarized in Table 3. For Group 1 (before 12 PM), all constructs demonstrated excellent internal consistency. Cronbach's alpha values ranged from 0.820 to 0.913, and composite reliability values ranged from 0.824 to 0.913, all well above the recommended threshold of 0.70. This indicates that the items measuring cyberloafing (CB), innovative work behavior (IWB), and knowledge acquisition (KA) are reliably measuring their respective constructs. Regarding convergent validity, the AVE for CB was 0.465, which falls slightly below the conventional cutoff of 0.50. However, given that the composite reliability for CB is high (0.839), the convergent validity can still be considered adequate, as a CR above 0.60 can compensate for a slightly low AVE (Fornell & Larcker, 1981). The AVE values for IWB (0.540) and KA (0.543) both exceed 0.50, indicating satisfactory convergent validity for these constructs in Group 1.

For Group 2 (after 12 PM), reliability remained acceptable, with Cronbach's alpha ranging from 0.757 to 0.898 and composite reliability from 0.762 to 0.899, all surpassing the 0.70 threshold. The AVE values, however, were lower than in Group 1: CB showed an AVE of 0.432, IWB an AVE of 0.498, and KA an AVE of 0.455. Although these values are below the ideal 0.50, they are still close to the cutoff. Moreover, the composite reliabilities for all constructs are strong ( $\geq 0.762$ ), suggesting that the measurement models in Group 2 still exhibit adequate convergent validity. Researchers have noted that AVE is a conservative measure, and convergent validity can be established when CR exceeds 0.70 even if AVE is slightly below 0.50 (Hair et al., 2019; Malhotra & Dash, 2011). Thus, despite the marginal AVE values, the constructs in Group 2 retain sufficient convergent validity. In

summary, the measurement models for both groups demonstrate satisfactory reliability, as indicated by  $\alpha$  and CR values consistently above 0.70. While some AVE values are marginally below 0.50, the strong composite reliabilities support the convergent validity of the constructs. These findings confirm that the measurement instruments performed adequately across the two time groups, allowing for meaningful multi-group comparisons in subsequent structural analyses.

Table 3. Reliability indices

| Group | Variable | $\alpha$ | CR   | AVE  |
|-------|----------|----------|------|------|
| 1     | CB       | 0.84     | 0.84 | 0.47 |
|       | IWB      | 0.91     | 0.91 | 0.54 |
|       | KA       | 0.82     | 0.82 | 0.54 |
| 2     | CB       | 0.82     | 0.82 | 0.43 |
|       | IWB      | 0.90     | 0.90 | 0.50 |
|       | KA       | 0.76     | 0.76 | 0.46 |

Table 4. Hypothesis Testing Results

| Hypothesis               | Relationship                          | Estimate | SE   | Lower | Upper | $\beta$ | p     |
|--------------------------|---------------------------------------|----------|------|-------|-------|---------|-------|
| Overall Model            |                                       |          |      |       |       |         |       |
|                          | CB $\Rightarrow$ KA                   | 0.45     | 0.07 | 0.31  | 0.59  | 0.50    | <.001 |
|                          | CB $\Rightarrow$ IWB                  | 0.23     | 0.08 | 0.07  | 0.39  | 0.21    | 0.01  |
|                          | KA $\Rightarrow$ IWB                  | 0.22     | 0.09 | 0.05  | 0.40  | 0.18    | 0.01  |
|                          | CB $\Rightarrow$ KA $\Rightarrow$ IWB | 0.10     | 0.04 | 0.02  | 0.18  | 0.09    | 0.02  |
| Group 1:<br>Before 12 PM |                                       |          |      |       |       |         |       |
|                          | CB $\Rightarrow$ KA                   | 0.45     | 0.10 | 0.24  | 0.65  | 0.47    | <.001 |
|                          | CB $\Rightarrow$ IWB                  | 0.07     | 0.12 | -0.16 | 0.31  | 0.07    | 0.54  |
|                          | KA $\Rightarrow$ IWB                  | 0.28     | 0.13 | 0.03  | 0.54  | 0.24    | 0.03  |
|                          | CB $\Rightarrow$ KA $\Rightarrow$ IWB | 0.13     | 0.06 | 0.01  | 0.25  | 0.11    | 0.04  |
| Group 2:<br>After 12 PM  |                                       |          |      |       |       |         |       |
|                          | CB $\Rightarrow$ KA                   | 0.44     | 0.10 | 0.24  | 0.63  | 0.51    | <.001 |
|                          | CB $\Rightarrow$ IWB                  | 0.38     | 0.12 | 0.15  | 0.60  | 0.35    | 0.001 |
|                          | KA $\Rightarrow$ IWB                  | 0.18     | 0.13 | -0.07 | 0.42  | 0.14    | 0.16  |
|                          | CB $\Rightarrow$ KA $\Rightarrow$ IWB | 0.08     | 0.06 | -0.03 | 0.18  | 0.07    | 0.16  |

Note: CB = Cyberloafing; KA = Knowledge Acquisition; IWB = Innovative Work Behavior; SE = Standard Error; Lower and Upper represent the 95% confidence interval bounds;  $\beta$  = Standardized coefficient; All p-values are two-tailed.

### Structural model evaluation and hypotheses testing

The hypothesis testing results for the overall model are presented in Table 4. Hypothesis 1 (H1) proposed that cyberloafing (CB) has a positive effect on knowledge acquisition (KA). The results support this hypothesis, showing a significant positive relationship between CB and KA ( $\beta = 0.50$ ,  $p < 0.001$ , 95% CI [0.31, 0.59]). This indicates that employees who engage in cyberloafing activities are more likely to acquire new knowledge from their online browsing. Hypothesis 2 (H2) predicted that cyberloafing would positively affect innovative work behavior (IWB). The findings support H2, with a significant positive direct effect of CB on IWB ( $\beta = 0.21$ ,  $p = 0.01$ , 95% CI [0.07, 0.39]). This suggests that cyberloafing directly contributes to employees' innovative behaviors in the workplace. Hypothesis 3 (H3) proposed that knowledge acquisition positively influences

innovative work behavior. The results confirm this relationship, demonstrating a significant positive effect of KA on IWB ( $\beta = 0.18$ ,  $p = 0.01$ , 95% CI [0.05, 0.40]). This finding indicates that employees who acquire more knowledge through their online activities exhibit higher levels of innovative work behavior. Hypothesis 4 (H4) tested the mediating role of knowledge acquisition in the relationship between cyberloafing and innovative work behavior. The indirect effect was significant ( $\beta = 0.09$ ,  $p = 0.02$ , 95% CI [0.02, 0.18]), supporting partial mediation.

To examine the "when" research question, multi-group analysis was conducted comparing employees before 12 PM and after 12 PM. Group 1 (Before 12 PM): In this group, cyberloafing had a significant positive effect on knowledge acquisition ( $\beta = 0.47$ ,  $p < 0.001$ ). However, the direct effect of cyberloafing on innovative work behavior was not significant ( $\beta = 0.07$ ,  $p = 0.54$ ), while knowledge acquisition significantly predicted IWB ( $\beta = 0.24$ ,  $p = 0.03$ ). The indirect effect of cyberloafing on IWB through knowledge acquisition was significant ( $\beta = 0.11$ ,  $p = 0.04$ , 95% CI [0.01, 0.25]), indicating full mediation. This suggests that before 12 PM, cyberloafing enhances innovative work behavior only indirectly through knowledge acquisition, with no direct effect. Group 2 (After 12 PM): In the afternoon group, cyberloafing significantly predicted both knowledge acquisition ( $\beta = 0.51$ ,  $p < 0.001$ ) and innovative work behavior ( $\beta = 0.35$ ,  $p = 0.001$ ). However, the effect of knowledge acquisition on IWB was not significant ( $\beta = 0.14$ ,  $p = 0.16$ ), and the indirect effect was also non-significant ( $\beta = 0.07$ ,  $p = 0.16$ , 95% CI [-0.03, 0.18]). This pattern indicates direct-only effects, in which cyberloafing influences innovative work behavior directly, without the mediating role of knowledge acquisition after 12 PM.

## Discussion

The primary objective of this study was to answer the research question: "How and when does cyberloafing affect innovative work behavior?" By employing a two-wave multi-group analysis comparing employees before 12 PM and after 12 PM, this study provides nuanced insights into the mechanisms and boundary conditions of cyberloafing's effects on innovation. The findings reveal that the relationship between cyberloafing and innovative work behavior is more complex than previously understood, with distinct pathways operating at different times of the workday.

The overall model results demonstrate that cyberloafing positively influences innovative work behavior both directly and indirectly through knowledge acquisition. The significant indirect effect confirms that knowledge acquisition is a key mechanism that explains how cyberloafing translates into innovative outcomes. This finding aligns with and extends the emerging literature that challenges the purely negative view of cyberloafing (Muthuswamy & Varshika, 2023; Soral et al., 2020). When employees engage in browsing-related cyberloafing, they inadvertently encounter new information, industry trends, and diverse perspectives that serve as cognitive inputs for innovation. This supports the theoretical proposition that cyberloafing can function as an informal learning mechanism, providing employees with the "raw materials" necessary for creative and innovative work (Hendryadi & Mustika, 2023; Rahman et al., 2022). The significant direct effect of cyberloafing on innovative work behavior in the overall model also suggests that, beyond knowledge acquisition, cyberloafing may stimulate innovation through other mechanisms, such as providing mental breaks that enhance cognitive flexibility (Kimiagari & Asadi Malafe, 2021) or exposing employees to diverse problem-solving approaches that can be directly applied to work tasks.

The multi-group analysis reveals a compelling pattern that answers the "when" question, demonstrating that the mechanism by which cyberloafing affects innovation differs significantly across time of day. For employees before 12 PM, cyberloafing influenced innovative work behavior only indirectly through knowledge acquisition, functioning as a full mediation model. In this group, the direct effect was not significant, while the indirect effect was significant. This suggests that in the morning, cyberloafing primarily serves a learning-oriented purpose. Employees may use morning cyberloafing to gather information, explore new ideas, and acquire knowledge that they later apply to innovative tasks. This finding is consistent with research on circadian rhythms and

cognitive functioning, which suggests that morning hours are often associated with higher analytical and information-processing capabilities (Schachter & Singer, 1962). During this period, employees may be more receptive to new information and better able to encode and retain knowledge gained from online browsing, subsequently channeling this knowledge into innovative work behaviors.

For employees after 12 PM, a markedly different pattern emerged. Cyberloafing had a significant direct effect on innovative work behavior, but the mediating role of knowledge acquisition was not significant. This indicates that, in the afternoon, cyberloafing stimulates innovation through mechanisms beyond knowledge acquisition. Several explanations may account for this finding. First, afternoon hours are often associated with mental fatigue and decreased cognitive resources for deep information processing (Duxbury et al., 2020). During this period, the primary benefit of cyberloafing may be restorative rather than informational—providing a mental break that replenishes depleted cognitive resources and enhances creative thinking (Reshadi & Fitzgerald, 2023). Second, afternoon cyberloafing may serve as a coping mechanism for accumulated work stress, and the resulting stress reduction may free up cognitive capacity for innovative thinking (J. Wu et al., 2020). Third, the direct effect may reflect the spontaneous application of ideas encountered during brief online breaks, in which employees quickly translate stimuli from cyberloafing into immediate, innovative actions without the need for deliberate knowledge acquisition and reflection. The primary objective of this study was to answer the research question: "How and when does cyberloafing affect innovative work behavior?" By employing a two-wave multi-group analysis comparing employees before 12 PM and after 12 PM, this study provides nuanced insights into the mechanisms and boundary conditions of cyberloafing's effects on innovation. The findings reveal that the relationship between cyberloafing and innovative work behavior is more complex than previously understood, with distinct pathways operating at different times of the workday.

The findings demonstrate distinct mechanisms at work at different times of day. Before noon, cyberloafing indirectly fosters innovative work behavior through knowledge acquisition, acting as a full mediator. Employees who engage in cyberloafing in the morning gain knowledge that subsequently enhances their innovative behaviors; however, cyberloafing itself does not directly spur innovation during this time. In contrast, in the afternoon, cyberloafing has a direct positive impact on innovative work behavior, independent of knowledge acquisition. The mediating role of knowledge acquisition becomes insignificant in the afternoon, indicating that alternative psychological mechanisms may be influencing behavior later in the workday. These insights offer a nuanced understanding of the boundary conditions surrounding cyberloafing's effects, illustrating that the timing of such activities determines the role of knowledge acquisition as a critical mediating factor. This research addresses the "when" question by revealing that the indirect effect through knowledge acquisition is significant exclusively before noon, while the direct effect emerges only after noon.

### **Theoretical contributions**

This study makes several important theoretical contributions to the cyberloafing and innovation literature. First, by identifying knowledge acquisition as a mediating mechanism, this study provides a cognitive explanation for how cyberloafing can positively contribute to workplace innovation. This extends the Job Demands-Resources (JD-R) framework by positioning cyberloafing not merely as a recovery activity but as a potential source of cognitive resources (knowledge) that fuel innovative behavior. The findings suggest that, under certain conditions, cyberloafing transcends its traditional characterization as a counterproductive work behavior and serves as an informal learning mechanism. Second, the study introduces time of day as a critical boundary condition, demonstrating that the effects of cyberloafing are not uniform throughout the workday. This contributes to the growing literature on temporal dynamics in organizational behavior, showing that the same behavior can have different consequences depending on when it occurs. The finding that knowledge acquisition mediates the cyberloafing-innovation relationship only before 12 PM, while direct effects dominate after 12 PM, advances our understanding of the contextual factors that shape cyberloafing outcomes. Third, the study responds to calls for more nuanced research on cyberloafing by demonstrating that its effects are not monolithic. By

distinguishing between indirect (knowledge-mediated) and direct pathways, and showing how these pathways vary by time, this research provides a more sophisticated understanding of the dual nature of cyberloafing—both as a potential resource for learning and as a direct stimulus for innovation.

### Practical Implications

The findings highlight practical implications for organizations to manage cyberloafing effectively. First, instead of banning cyberloafing outright, companies should consider tailored policies that allow flexible online browsing, especially in the morning, to boost innovation through knowledge acquisition. Second, managers should be aware that the timing of cyberloafing impacts its effects on innovation, as employees often self-regulate their activities based on their cognitive needs. Encouraging mindful engagement rather than imposing strict restrictions could lead to better outcomes. Third, creating knowledge-sharing platforms can help employees share insights gained from their browsing, enhancing collective knowledge and innovation. Lastly, recognizing that afternoon cyberloafing can provide restorative breaks is important, as these brief mental pauses can enhance creativity during times of fatigue.

### Limitations and Future Research Directions

This study has several limitations that suggest directions for future research. First, it examined a single mediating mechanism (knowledge acquisition) and one boundary condition (time of day). Future research could explore additional mediators, such as positive affect or psychological detachment, and other boundary conditions, such as job autonomy or individual differences. Second, the simplified time categorization (before vs. after 12 PM) could be refined through more detailed temporal analyses, such as experience sampling methods, better to understand the dynamic nature of cyberloafing throughout the day. Third, the focus was on browsing-related cyberloafing, so research should investigate various types (e.g., social media, entertainment) to see how they impact innovation differently. Fourth, the sample was limited to technology companies, which may affect generalizability. Future research should replicate findings across diverse industries and cultures. Finally, while the two-wave design helps with common method bias, stronger causal evidence could be gained through experimental or longitudinal studies with more time points.

## CONCLUSION

This study provides a nuanced answer to the question of how and when cyberloafing affects innovative work behavior. The findings demonstrate that cyberloafing enhances innovation by facilitating knowledge acquisition, particularly before 12 PM, when employees may be more receptive to new information. After 12 PM, cyberloafing directly stimulates innovation, potentially through restorative mechanisms that replenish cognitive resources depleted by accumulated work demands. By identifying these distinct pathways and their temporal contingencies, this research advances our understanding of cyberloafing as a multifaceted phenomenon with both learning and restorative functions that can contribute to workplace innovation. Organizations that recognize and harness these differential effects may be better positioned to leverage their employees' innovative potential while maintaining a balanced perspective on cyberloafing in the digital workplace.

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