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After-hours connectivity and its consequences: How work intrusions after hours induce employee silence and deceptive knowledge concealment

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Abstract: This study investigates the mechanism by which after-work work intrusion influences two critical organizational behaviors: employee silence and deceptive knowledge concealment. Based on Conservation of Resources Theory (COR) and Social Exchange Theory (SET), we construct and validate a theoretical model: non-work connectivity depletes employees' psychological resources, prompting protective silence and thereby increasing the likelihood of deceptive knowledge concealment. Using structural equation modeling (SEM) on survey data from 412 full-time employees in digitally intensive roles, results indicate that after-work connectivity significantly and positively predicts employee silence, which in turn significantly and positively predicts deceptive knowledge concealment, with after-work connectivity mediating this relationship. Furthermore, restorative experiences mitigate the impact of after-work connectivity on employee silence, while ethical climate weakens the promotional effect of employee silence on deceptive knowledge concealment. This study enriches theories in digital work and organizational behavior, offering practical recommendations for organizational managers in establishing post-work communication norms, promoting employee psychological recovery, and fostering ethical organizational climates.

Keywords: *After-work connectivity; Employee silence; Deceptive knowledge concealment; Recovery experiences; Ethical climate.*

1. Introduction

Innovations in digital communication technologies are profoundly reshaping modern work practices. With the widespread adoption of mobile devices, collaboration platforms, and instant messaging systems, organizations can achieve real-time operational coordination, gradually eroding the once-clear boundaries of working hours [1]. Against this backdrop, an increasing number of employees are expected to remain reachable and handle work matters beyond their contracted working hours a phenomenon termed after-hours connectivity. While organizations generally perceive constant connectivity as enhancing efficiency and competitiveness, growing research indicates that persistent post-work digital intrusions may lead to adverse psychological and behavioral consequences, such as resource depletion, insufficient recovery, and heightened perceptions of unfairness [2]. Early research primarily examined the effects of after-hours connectivity on employee emotional exhaustion, stress responses, and work-family conflict. However, as digital workloads intensify, scholars increasingly recognize that employees adopt defensive or resource-conserving strategies when resources are depleted. Employee silence and deceptive knowledge concealment have garnered particular attention, as both hinder organizational knowledge flow, erode trust foundations, and diminish innovation and developmental potential [3].

Despite the significance of employee silence and knowledge concealment in organizational behavior, existing research exhibits several critical gaps. First, outcomes of after-hours connectivity remain understudied. Current work primarily examines psychological consequences like stress, burnout, and work-family conflict, while research on key organizational behaviors such as communication and knowledge-sharing is insufficient [4]. The relationship between digital work intrusions and these two disruptive communication behaviors has not been adequately explored. Second, the sequential behavioral mechanism linking employee silence to deceptive

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knowledge concealment remains unclear. Existing studies treat them as independent variables. However, from a behavioral logic perspective, employee silence may serve as a precursor to more severe knowledge concealment. This potential pathway lacks theoretical or empirical support. Furthermore, employee silence as a behavioral pathway has been understudied, primarily examined in contexts of leadership, psychological safety, or organizational culture. Few studies explore it as a behavioral response to digital intrusions or its potential mediating role between after-hours connectivity and knowledge concealment. Third, research on deceptive knowledge concealment remains insufficient. While knowledge concealment studies are abundant, investigations into its most destructive form deceptive concealment, are scarce, particularly lacking empirical exploration in digitally intensive contexts. Additionally, research on moderating factors is inadequate. Employees' responses to digital intrusion may vary based on their resilience, while ethical climate may influence whether silence escalates into deceptive knowledge concealment. Although restorative experiences and ethical climate are recognized as key factors affecting stress responses and ethical behavior, systematic research embedding these within the path from after-hours connectivity, silence, and knowledge concealment remains lacking [5]. Finally, integrated theoretical frameworks are lacking. Existing literature has not combined resource conservation theory with social exchange theory to explain how resource depletion and perceived inequity jointly influence organizational communication behaviors in the digital era [6].

Addressing these gaps, this study focuses on core questions in digital work settings: Does after-hours connectivity induce employee silence? Does employee silence facilitate deceptive knowledge concealment? Does employee silence mediate the relationship between after-hours connectivity and deceptive knowledge concealment? Does restorative experience moderate the effect of after-hours connectivity on employee silence? Does moral climate moderate the relationship between employee silence and deceptive knowledge concealment? How do after-hours connectivity behaviors, individual restorative characteristics, and organizational ethical norms interact to influence employees' destructive communication behaviors?

The core objectives of this study are: to examine the direct impact of after-hours connectivity on employee silence and reveal its resource depletion mechanism based on resource conservation theory; to analyze the pathways through which employee silence influences deceptive knowledge concealment; to test the mediating role of employee silence between the two; to explore the moderating effect of restorative experiences; to examine the moderating role of ethical climate; and to construct a comprehensive model explaining the interactions among after-hours connectivity behaviors, individual restorative capacity, and organizational contextual factors.

This study addresses a highly relevant issue in the digital age: the consequences of after-hours connectivity, holding significant theoretical and practical implications. Theoretically, by revealing how after-hours connectivity induces employee silence and deceptive knowledge concealment, it offers a new theoretical perspective for understanding often-overlooked yet highly destructive communication behaviors within organizations. Furthermore, it integrates resource conservation theory and social exchange theory to construct a unified analytical framework, addressing limitations in existing research [4]. Practically, this study introduces two critical boundary conditions: recovery experiences and moral climate, offering actionable insights for organizations seeking to enhance employee mental health, optimize knowledge sharing, and foster positive organizational cultures. Recommendations include establishing reasonable post-work communication norms, promoting employee recovery and psychological repair mechanisms, and strengthening moral climate to reduce destructive knowledge behaviors [7]. Overall, this study deepens theoretical understanding and offers practical value for research on communication and knowledge behaviors in digital work settings. It lays a foundation for future research and provides crucial guidance for designing organizational digital work systems.

2. Literature Review and Research Hypotheses

2.1. Resource Conservation Theory and Social Exchange Theory

This study's theoretical framework integrates Resource Conservation Theory and Social Exchange Theory, providing dual support for analyzing the impact mechanisms of after-hours connectivity behaviors.

Resource conservation theory posits that individuals, in response to stress and environmental challenges, are motivated to continuously acquire, maintain, and protect valued personal, social, and structural resources. The threat or actual loss of resources constitutes the core source of stress [8]. Non-work connectivity continuously activates employees' cognitive resources, hindering resource replenishment during off-duty hours and leading to resource depletion. To protect remaining resources, employees may reduce resource-investing behaviors (e.g., silence) or even resort to deceptive knowledge concealment to avoid further consumption [9].

Social exchange theory emphasizes that individuals establish and maintain relationships through the exchange of various valuable resources during social interactions. They evaluate inputs and returns based on

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reciprocity and fairness principles, thereby influencing attitudes and behaviors [10]. Non-working-hour connectivity disrupts this reciprocal equilibrium. Employees who continuously contribute without commensurate returns may diminish their willingness to engage in altruistic behaviors. They may reduce resource expenditure through actions like silence or deceptive knowledge concealment to restore psychological exchange balance [6].

2.2. Core Construct Definition and Literature Review

2.2.1. After-Hours Connectivity Behavior

After-hours connectivity refers to employees engaging in work-related communication or handling work tasks via digital communication tools outside scheduled work hours [11]. In highly digitized work environments, this behavior has evolved into an implicit organizational expectation of availability, rather than being entirely voluntary [12]. Research indicates that persistent after-hours connectivity diminishes psychological detachment, leads to continuous resource depletion, and induces a range of negative work-family outcomes [2, 13].

2.2.2. Employee Silence

Employee silence refers to the deliberate choice not to express organization-related opinions, concerns, or suggestions when not explicitly prompted [14]. At its core, it is a resource-conservation-oriented strategic behavior, particularly prevalent in high-workload and low psychological safety contexts [15]. The persistent cognitive activation and resource depletion triggered by after-hours connectivity further reinforce employees' tendency to avoid additional communication and work demands through silence [7].

2.2.3. Deceptive Knowledge Concealment

Deceptive knowledge concealment refers to the intentional avoidance of sharing work-related knowledge or information when explicitly requested by others, achieved through misdirection, feigned ignorance, or false responses [4]. Compared to other forms of knowledge concealment, this behavior exhibits greater strategic intent and destructiveness. Existing research primarily focuses on antecedents such as trust deficits and emotional exhaustion, while the underlying mechanisms within digitally intrusive work contexts require further exploration [16, 17]. From a behavioral logic perspective, employee silence may provide the behavioral foundation for deceptive knowledge concealment [18].

2.2.4. Recovery Experiences

Recovery experiences refer to the process by which employees psychologically or behaviorally recover from stress and fatigue after work, primarily encompassing psychological detachment, relaxation, sense of control, and sense of mastery [19]. Recovery experiences help replenish individual resources and buffer the impact of work stress on negative attitudes and behaviors. Non-work connectivity disrupts the formation of recovery experiences, making employees more prone to defensive reactions like silence when resources are depleted [9].

2.2.5. Ethical Climate

Ethical climate refers to the shared organizational members' perceptions of ethical norms, moral responsibilities, and acceptable behaviors within the organization [20]. A high ethical climate emphasizes honesty, fairness, and accountability, enhancing employees' psychological safety and constraining opportunistic behaviors [21]. In resource-depleted or stressful situations, ethical climate can inhibit employees from escalating silence into deceptive knowledge concealment, making it a crucial contextual factor in this behavioral relationship [22].

2.3. Research Hypotheses

2.3.1. Relationship Between After-Hours Connectivity and Employee Silence

With the proliferation of information and communication technologies, after-hours connectivity has increasingly become a significant component of employees' work experience. Research indicates that extended availability and additional work demands after hours diminish employees' psychological disengagement and the quality of evening recovery, while increasing fatigue and emotional exhaustion levels the following day [23]. Psychological exhaustion and burnout significantly amplify employees' tendency toward silence, as workers opt for low-cost coping strategies to conserve limited resources [23]. Furthermore, after-hours connectivity intensifies work intrusion into family life, heightening work-family conflict and subjective imbalance, which further suppresses employees' willingness to engage in high-investment advice-giving or expressive behaviors [24]. Based on resource conservation theory, employees employ silence as a defensive strategy to reduce additional consumption of limited time, energy, and emotional resources [25]. Simultaneously, social exchange theory

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indicates that extra work demands during non-working hours typically lack reciprocal rewards, disrupting the mutual balance between organizations and employees. Employees are thus more likely to respond to resource depletion and organizational pressure through silence [26]. Consequently, the following hypothesis is proposed:

H_1: Connectivity during non-working hours positively influences employee silence.

2.3.2. The Relationship Between Employee Silence and Deceptive Knowledge Concealment

Employee silence is not merely an absence of opinion expression; it may also serve as a significant antecedent to defensive knowledge-level behaviors. Research indicates that employee silence weakens knowledge flow within organizations and significantly increases the probability of knowledge concealment [27].

In contexts of imbalanced social exchange and sustained resource depletion, employees may perceive the organization as failing to fulfill implicit reciprocal commitments, leading them to respond to perceived unfair demands through deceptive knowledge concealment [26]. Thus, employee silence not only directly reflects negative attitudes but may further evolve into deceptive knowledge concealment. Integrating social exchange theory, low perceived reciprocity among silent employees reduces their willingness to share knowledge, prompting deceptive concealment [6]. Therefore, we propose the following hypotheses:

H_2: Employee silence positively influences deceptive knowledge concealment.

2.3.3. The Mediating Role of Employee Silence

Non-work time connectivity disrupts temporal boundaries, exposing employees to work demands during periods traditionally used for psychological detachment and resource replenishment. This activates work-related cognition and emotional responses, increasing psychological strain and undermining resource restoration [6]. Based on resource conservation theory, sustained cognitive and emotional activation leads employees to perceive resource constraints, heightening their perception of the costs associated with additional communication, opinion expression, or suggestion-making [6]. In this context, employees tend to adopt silence as a typical defensive strategy, conserving limited cognitive and emotional resources by reducing communication and interaction [14, 15]. As silence accumulates over time, the quality of employee interactions with the organization and colleagues declines, weakening their sense of responsibility and identification with knowledge sharing. This makes them more likely to adopt strategic, misleading, or perfunctory responses when explicitly requested for knowledge [7, 18].In summary, employee silence is not only a direct psychological and behavioral response to after-hours connectivity but also a key mechanism transmitting this behavior toward deceptive knowledge concealment. Therefore, we propose the following hypothesis:

H_3: Employee silence mediates the relationship between after-hours connectivity and deceptive knowledge concealment.

2.3.4. The Moderating Role of Recovery Experiences

Restorative experiences serve as a critical mechanism through which employees replenish cognitive and emotional resources during off-duty hours via psychological detachment, relaxation activities, and feelings of control and competence [19]. Employees with high restorative experience levels can effectively interrupt resource depletion caused by off-duty connectivity. Even when facing frequent after-hours work demands, they maintain resource reserves, reducing the likelihood of adopting silence behaviors due to resource exhaustion [19]. Specifically, high restorative experiences lower the perceived costs of additional communication, expressing opinions, or offering suggestions, enabling employees to maintain high communication willingness and engagement when confronted with after-hours connectivity. Conversely, employees with insufficient restorative experiences are more likely to perceive resource scarcity when connectivity behaviors continuously activate work-related cognition and emotions, significantly increasing their tendency toward silence [9].In summary, restorative experiences exert a buffering moderating effect between after-hours connectivity and employee silence, mitigating the impact of digital intrusions on employees' strategic disengagement. Therefore, we propose the following hypothesis:

H_4: Recovery experiences moderate the relationship between after-hours connectivity and employee silence. Higher recovery experiences weaken the positive influence of after-hours connectivity on employee silence.

2.3.5. The Moderating Role of Ethical Atmosphere

Moral climate reflects the extent to which an organization emphasizes ethical norms such as honesty, transparency, fairness, and accountability. It provides crucial contextual cues for employee behavior and shapes psychological safety and normative commitment among organizational members [20, 21].In high-ethical-climate settings, employees' personal values align strongly with organizational ethics, fostering greater organizational

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identification and trust. This reduces tendencies toward self-serving behavior and knowledge concealment [22]. Specifically, even when employees perceive resource depletion due to after-hours connectivity and lean toward silence, a high ethical climate can inhibit the transformation of silence into deceptive knowledge concealment by reinforcing moral responsibility and collective values. Conversely, in low-moral-atmosphere settings, ambiguous organizational norms make employees more likely to perceive silence as a rational defensive strategy, thereby increasing the probability of deceptive knowledge concealment [4, 22]. Thus, moral atmosphere mediates the relationship between employee silence and deceptive knowledge concealment, acting as an organizational boundary condition that influences the evolution of employees' strategic behaviors. Therefore, we propose the following hypothesis:

H_5: Ethical climate moderates the relationship between employee silence and deceptive knowledge concealment. The stronger the ethical climate, the weaker the positive effect of employee silence on deceptive knowledge concealment.

3. Methodology

3.1. Research Design

This study employs a quantitative research method with a cross-sectional design [5] primarily aiming to empirically examine the impact of work connectivity during non-working hours on employee behavior and explore its mechanisms and boundary conditions. Cross-sectional designs are suitable for examining multiple psychological constructs and their interrelationships at a single point in time, particularly when these constructs involve attitudes, behaviors, or organizational environments rather than experimental variables. This design aligns with existing research in organizational behavior and occupational psychology, where surveys are often considered the most feasible and effective method for measuring psychological variables such as employee silence, ethical climate, and knowledge concealment.

Quantitative methods enable the use of validated scales, accurate estimation of latent variables, and application of complex statistical techniques like structural equation modeling to test theoretical models. Given this study's theoretical framework, grounded in resource conservation theory and social exchange theory, quantitative research is most appropriate due to the need to quantify mediating and moderating effects [28].

3.2. Research Participants and Sampling Procedure

This study employed purposive sampling [ ], selecting full-time employees in Anhui Province as research subjects (N=700). The actual subjects were knowledge-based full-time employees working in highly digitalized environments. Such environments exhibit the following characteristics: frequent reliance on digital devices (e.g., smartphones, corporate email, instant messaging tools, and project management systems) for communication, coordination, and task execution. The study encompassed industries including culture and sports, information technology and services, finance, tourism, and hospitality [9] as these sectors typically demand high levels of continuous connectivity and frequent digital interactions. Convenience sampling was employed to ensure participants had actual experience with after-hours digital communication. To guarantee sample representativeness, the following eligibility criteria were established: (1) Full-time employees with at least 12 months of tenure in their current organization;(2) Frequent use of digital communication tools in their work; (3) Receipt of at least one work-related message or task outside working hours within the past month. This ensured respondents had authentic exposure to after-hours connectivity behaviors. The sample spanned multiple regions to enhance representativeness and minimize cultural bias. The final valid sample comprised 412 questionnaires, selected through rigorous data integrity and quality screening. This sample size significantly exceeded the minimum requirement (typically at least 200 or 10 samples per parameter), ensuring sufficient statistical power for hypothesis testing.

3.3. Data Collection Procedure

Data was collected via an online self-administered questionnaire distributed and retrieved through platforms including Wenjuanxing and WeChat. The online format suited digitally intensive workers, enabling completion via electronic devices while facilitating access to geographically dispersed samples. A pre-test involving 127 respondents assessed the questionnaire's clarity, readability, and comprehension prior to the formal survey. Based on feedback, ambiguities in wording were revised to ensure accuracy and consistency in the final questionnaire. To minimize bias, participants were explicitly informed of the study's purpose and assured of anonymity and confidentiality. The entire questionnaire took approximately 12-15 minutes to complete, preventing fatigue from affecting response quality. No personally identifiable information was collected. Data collection spanned four weeks to ensure sufficient response volume and sample diversity.

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3.4. Questionnaire Development and Measurement Tools

All variables in this study employ established scales widely used and validated in international research to ensure measurement reliability and validity. While adhering to the original structure and measurement dimensions, all scales underwent moderate revisions to align with non-work time contexts. Unless otherwise specified, all items are rated on a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

3.4.1. Non-Work Time Work Connectivity Behavior

This scale primarily focuses on the frequency and persistence with which employees handle work-related information and tasks during non-working hours, effectively reflecting the level of connectivity during non-working hours in a digital context. This study contextualized the wording without altering the original measurement structure [11]. This variable is rated on a five-point Likert scale.

3.4.2. Employee Silence ()

Employee silence is measured using the Silence Scale developed by Zhu and Chen [29] and Jungst and Verbeeck [14]. This scale measures employees' tendency to refrain from expressing views or opinions when not explicitly requested to do so, based on assessments of risk, reward, or organizational attitudes. It is a classic tool for measuring employee silence in organizational behavior research. This study confined its measurement context to non-working hours, with all items scored on a five-point Likert scale.

3.4.3. Deceptive Knowledge Concealment

Deceptive knowledge concealment was measured using the established scale developed by Bashir et al. [4]. This scale specifically assesses employees' intentional avoidance of knowledge sharing through misleading responses or feigned ignorance when explicitly requested by others, serving as a representative tool for measuring unethical knowledge concealment. Scoring was conducted using a five-point Likert scale.

3.4.4. Recovery Experience

Recovery experiences were measured using the Recovery Experience Questionnaire, widely applied in work and organizational studies. It encompasses four dimensions: psychological detachment, relaxation, sense of control, and sense of mastery [30]. This scale demonstrates strong reliability, validity, and cross-cultural applicability, effectively reflecting employees' resource recovery levels during non-work hours. All items were rated on a five-point Likert scale.

3.4.5. Ethical Atmosphere

Ethical climate was measured using a well-established scale developed by Elçi et al. [20]. This 7-item scale assesses organizational ethical norms and behavioral expectations regarding honesty, transparency, fairness, and accountability [20]. This variable was rated on a five-point Likert scale.

To reduce cognitive load and minimize skip-item effects, all scales were presented online in paragraph format.

3.5. Data Analysis Techniques

This study employed structural equation modeling (SEM) to analyze data, simultaneously testing complex mediating and moderating pathways. After data cleaning, the measurement model was validated via confirmatory factor analysis (CFA). All fit indices (CFI, TLI, SRMR, RMSEA) met standards (e.g., CFI $\geq$ .900, RMSEA $\leq$ .080).

The structural model employed 5,000 bootstrap samples to estimate direct effects, indirect effects (mediation), and interaction effects (moderation). For the moderating role of restorative experiences and ethical climate, simple slope analysis was further applied to elucidate the moderation pattern [31].

3.6. Ethical Considerations

The study strictly adhered to ethical principles for human subjects research. Participants were fully informed about the study's purpose, anonymity, and voluntary participation. The questionnaire did not collect identifying information, and all data were stored on encrypted servers.

This study ensured reliable results capable of revealing behavioral mechanisms linking non-work time connectivity, employee silence, and deceptive knowledge concealment through mature scales, appropriate sampling, rigorous statistical analysis, and strict ethical procedures. By integrating theoretical foundations with structural equation modeling, the findings accurately reflect behavioral processes within digital work environments.

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4. Data Analysis

4.1. Data Screening and Preparation

All samples passing preliminary screening were considered usable data with no missing values. Normality tests indicated skewness and kurtosis within acceptable ranges (±2). Variance inflation factors (VIF) were consistently below 3, ruling out multicollinearity effects [32].

4.2. Descriptive Statistics and Correlation Analysis

Table 1.
Descriptive Statistics and Correlation Coefficients (N = 412).

Construct	Mean	SD	1	2	3	4	5
1. WCBA	3.677	0.822	—				
2. Employee Silence	3.545	0.934	-0.415 **	—			
3. Deceptive Knowledge Hiding	3.539	0.880	0.456**	0.395**	—		
4. Recovery Experience	2.181	0.934	−0.293**	0.208**	−0.163**	—	
5. Ethical Climate	2.594	0.943	−0.166**	−0.439**	−0.337**	0.214**	—

Note: **p<.010.

Table 1 presents the means, standard deviations, and intercorrelations among constructs. The means and standard deviations for non-work connectivity, employee silence, and deceptive knowledge concealment were moderate. The mean restorative experience score was low (M = 2.181, SD = .934), while the mean ethical atmosphere score was 2.594 (SD = 0.943). Thus, off-duty connectivity behavior showed significant positive correlations with silence and knowledge concealment, while exhibiting negative correlations with restorative experiences and ethical climate. The overall direction of correlations aligns with theoretical expectations.

4.3. Reliability and Validity of Measurement Instruments

4.3.1. Internal Consistency Reliability

Table 2.
Reliability and Convergent Validity.

Construct	Cronbach's Alpha	CR	AVE
WCBA	0.896	0.896	0.520
Employee Silence	0.904	0.904	0.512
Deceptive Knowledge Concealment	0.904	0.904	0.540
Recovery Experience	0.952	0.952	0.555
Ethical Climate	0.883	0.883	0.519

All constructs shown in Table 2 exhibited Cronbach's α coefficients and composite reliability (CR) values exceeding .70, indicating good internal consistency in measurement [33]. All AVE values exceeded 0.50, meeting the criteria for convergent validity.

4.4. Measurement Model (Confirmatory Factor Analysis, CFA)

Table 3.
CFA Model Fit.

Fit Index	Value	Threshold
χ^2/df	1.365	< 3
CFI	0.968	> 0.90
TLI	0.966	> 0.90
RMSEA	0.028	< 0.08
SRMR	0.038	< 0.08

The results indicate that the measurement model in this study exhibits good overall fit (χ^2/df = 1.365). Both the Comparative Fit Index (CFI = .968) and Tucker–Lewis Index (TLI = .966) exceed recommended thresholds, demonstrating significant improvement in model fit compared to the independent model. Absolute fit indices also show favorable performance (RMSEA = .028; SRMR = .038). Overall, the confirmatory factor analysis results

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indicate that the five-factor measurement model presented in Table 3 and Figure 3 demonstrates good fit, providing a reliable foundation for subsequent structural model analysis [34].

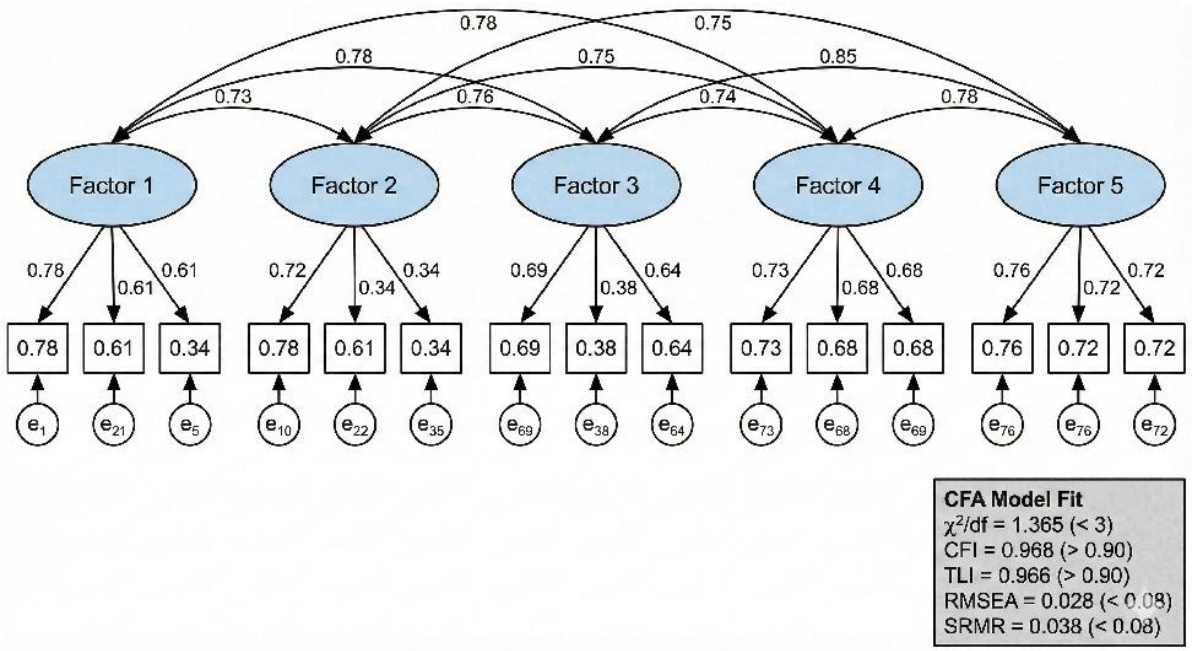

Figure 1.
Confirmatory Factor Analysis (CFA) Model Fit.

4.5. Structural Equation Modeling (SEM) Results

All hypotheses were tested using structural equation modeling (SEM) with maximum likelihood estimation.

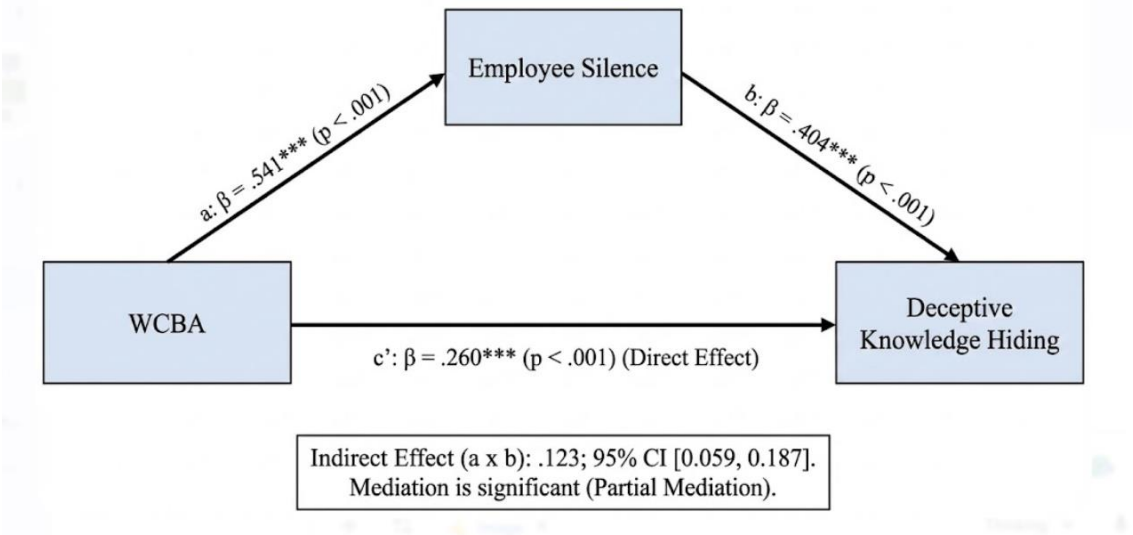

Figure 2.
Structural model with standardized coefficients.

- Non-work time connectivity → Employee silence ($\beta = .541$, $p < .001$)
- Employee Silence → Deceptive Knowledge Concealment ($\beta = .404$, $p < .001$)
- Non-work time connectivity → Deceptive knowledge concealment ($\beta = .260$, $p < .001$)

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- After-hours connectivity → Employee silence → Deceptive knowledge concealment (indirect effect = .123, CI [.059, .187]) The mediating effect was significant ( ). Mediational analysis revealed that employee silence significantly mediated the relationship between after-hours connectivity and deceptive knowledge concealment.

4.6. Research Hypothesis Results

Table 4.
Research Hypothesis Results.

Hypothesis	Hypothesis Content	β	p-value	Result
H1	Non-working hours connectivity positively influences employee silence	0.541***	< 0.001	Supported
H2	Employee silence positively influences deceptive knowledge concealment	0.404***	< 0.001	Support
H3	Employee Silence Mediates the Relationship Between Non-Work Time Connectivity and Deceptive Knowledge Concealment	0.340***	< 0.001	Support
H4	Recovery experiences exert a negative moderating effect on the relationship between off-duty connectivity and employee silence	-0.101*	< 0.050	Support
H5	Ethical climate has a negative moderating effect on employee silence and deceptive knowledge concealment	-0.327***	< 0.001	Support

4.7. Mediating Effects

Bootstrap (5000 samples) results indicate that employee silence significantly mediates the relationship between non-work-time connectivity behavior and deceptive knowledge concealment.

Indirect effect: .123

- 95% CI: [.059,.187], which does not include zero, indicates a significant mediating effect.

Since the direct path remained significant (β = .366, p < .001), this mediation was partial. This indicates that non-work connectivity jointly influences deceptive knowledge through employee silence and the direct path.

4.8. Moderating Effects Analysis

4.8.1. Moderating Role of Recovery Experiences (H4)

Results indicate that the interaction term between off-duty connectivity and restorative experiences significantly and negatively predicts employee silence ($\beta = -0.101$, $p < .05$, $F = 38.921$, $p < .001$). Slope analysis revealed that the positive effect of off-duty connectivity on employee silence was more pronounced at low levels of restorative experiences, while this positive relationship weakened significantly at high levels of restorative experiences. These findings indicate that restorative experiences exert a negative moderating effect between off-duty connectivity and employee silence.

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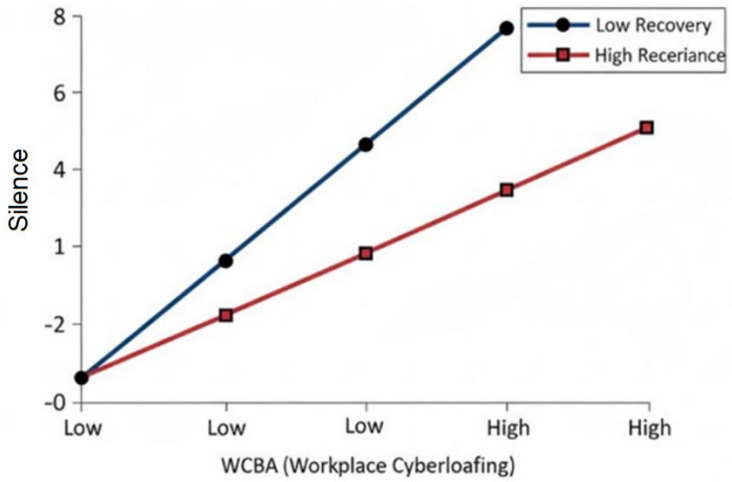

Figure 3.
Interaction Plot: Recovery Moderation.

This figure illustrates the moderating effect of restorative experiences on the relationship between after-hours connectivity and employee silence

4.8.2. Moderating Role of Moral Atmosphere (H5)

Results indicate that ethical climate significantly moderates the relationship between employee silence and deceptive knowledge concealment ($\beta = -.320$, $p < .001$, $F = 25.562$, $p < .001$), with the model exhibiting high explanatory power for deceptive knowledge concealment ($R^2 = 31.3\%$). Slope analysis revealed that under low ethical climate conditions, the positive influence of employee silence on deceptive knowledge concealment was more pronounced; whereas under high ethical climate conditions, this positive relationship was significantly attenuated. Findings indicate that ethical climate exerts a negative moderating effect between employee silence and deceptive knowledge concealment. As shown in Figure 4.

Figure 4.
Moderating effect of moral climate on the relationship between employee silence and deceptive knowledge concealment

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5. Discussion

This study investigates the effects of after-hours work connectivity on employee silence and deceptive knowledge concealment, while examining the moderating roles of restorative experiences and moral climate. Based on structural equation modeling analysis of a sample of 412 employees, the findings strongly support the proposed theoretical model. This section integrates the theoretical contributions and practical implications of the research findings, offering a systematic discussion in light of existing literature.

5.1. Predictive Role of After-Hours Connectivity on Employee Silence

Findings validate Hypothesis 1: off-duty connectivity significantly and positively influences employee silence, aligning with the core tenets of resource conservation theory. Persistent work-related information intrusions during off-duty hours continuously activate employees' work-related cognition, undermining their psychological disengagement capacity and hindering resource recovery processes. To conserve remaining cognitive and emotional resources, employees proactively reduce resource-investing behaviors such as voicing opinions or offering suggestions. This silence is not indifference but a self-protective strategy to resist technological intrusions and maintain psychological boundaries.

This finding expands the research scope on the consequences of after-hours connectivity: while previous studies primarily focused on psychological impacts like stress and burnout, this research explicitly identifies employee silence as a key organizational behavioral outcome. It provides a new contextual perspective for studying the causes of employee silence in the digital age.

5.2. Mechanism of Employee Silence Evolving into Deceptive Knowledge Concealment

Hypothesis 2 was validated, with employee silence significantly and positively predicting deceptive knowledge concealment, revealing a behavioral evolution from "passive withdrawal" to "active concealment. "Silencing manifests as avoidance and restraint in information exchange, whereas deceptive knowledge concealment represents a more proactive strategic behavior. When employees persistently remain silent, their communication bonds with the organization and colleagues gradually weaken, making them more likely to provide misleading responses when knowledge is requested.

This finding aligns with social exchange theory: perceptions of reciprocity imbalance stemming from non-work connectivity prompt employees to reduce resource investment through silence. Deceptive knowledge concealment further diminishes their willingness to reciprocate, restoring psychological exchange equilibrium. This discovery fills a gap in existing research by elucidating the linkage mechanism between silence and deceptive knowledge concealment.

5.3. Mediating Role of Employee Silence

Research confirms that employee silence partially mediates the relationship between after-hours connectivity and deceptive knowledge concealment. This supports a theoretical pathway integrating resource conservation theory and social exchange theory: after-hours connectivity intensifies resource depletion, inducing silence; silence further weakens reciprocity motivation, ultimately facilitating deceptive knowledge concealment.

This mediating mechanism clearly elucidates the destructive pathway of digital intrusions on organizational knowledge flow: Compared to mere emotional impacts, after-hours connectivity erodes communication quality and collaboration efficiency by altering employees' strategic behaviors in subtle ways, particularly significant for organizations operating in remote or hybrid work environments.

5.4. The Buffering Protective Effect of Recovery Experiences

Hypothesis 4 is supported: restorative experiences significantly moderate the relationship between after-hours connectivity and employee silence. Employees with high restorative experiences (achieving psychological detachment, relaxation, and autonomy during off-hours) are less prone to silence even when exposed to frequent after-work connectivity.

This finding validates the resource conservation theory's principle that "resource acquisition offsets resource depletion," demonstrating that restorative experiences as critical individual psychological resources effectively buffer the negative impacts of digital intrusions, sustaining employees' willingness to communicate and organizational engagement. Individual differences in responses to digital intrusions exist, with restorative capacity serving as a core influencing factor.

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5.5. Boundary Constraint Effect of Moral Atmosphere

Hypothesis 5 holds: ethical climate significantly moderates the relationship between employee silence and deceptive knowledge concealment. In organizations with high ethical climates, values emphasizing integrity, transparency, and accountability effectively constrain employee behavior. Even when resource depletion leads to silence, it is unlikely to escalate into deceptive knowledge concealment.

This finding expands the scope of ethical climate research, demonstrating that it not only influences individual moral judgments but also intervenes in the transformation of withdrawal behaviors into unethical concealment. In high-pressure digital work environments, it can serve as a "bottom-line mechanism" to inhibit knowledge misdirection and deliberate concealment [35].

5.6. Theoretical and Practical Contributions

5.6.1. Theoretical Contributions

First, it establishes non-working-hour connectivity as a key antecedent to silence and deceptive knowledge concealment, advancing digital work research from emotional impacts to behavioral consequences. Second, it uncovers the mediating transmission mechanism of silence, bridging the gap between technological intrusion and unethical knowledge behaviors. Third, it integrates resource conservation theory and social exchange theory to construct a unified explanatory framework, elucidating the interplay between resource depletion, reciprocity, and boundary resources. Fourth, it introduces recovery experiences and moral atmosphere as moderating variables, enriching boundary condition research on organizational behavior in digital contexts.

5.6.2. Practical Implications

Organizations should establish explicit after-hours disconnection rules or digital curfew policies, train managers to distinguish between necessary and unnecessary non-work communication, establish systematic employee recovery support mechanisms to enhance resource replenishment capabilities, strengthen ethical norms and value guidance to reduce knowledge concealment risks, and proactively identify signs of silence and knowledge concealment to prevent problem accumulation [36].

6. Conclusions, Implications, Limitations, and Future Research Directions

6.1. Conclusions

This study examines the impact of after-hours connectivity a defining feature of the digital workplace, on employee silence and deceptive knowledge concealment. Grounded in resource conservation theory and social exchange theory, findings reveal that after-hours connectivity depletes cognitive and emotional resources, thereby increasing silence, which further serves as a precursor to deceptive knowledge concealment. Mediation analysis indicates that the unethical consequences of after-hours connectivity are partially mediated by employee silence. The moderating effects of restorative experiences and moral climate further suggest that boundary resources at both individual and organizational levels can mitigate these impacts. These findings underscore the need to regulate post-work digital communication to mitigate potential learning, collaboration, and ethical risks.

6.2. Theoretical Implications

This study deepens the behavioral understanding of the consequences of after-hours connectivity, revealing how resource depletion influences unethical knowledge behaviors through the mechanism of silence [37]. It also validates the critical role of moderating factors in digital work contexts, providing integrative evidence for related theories.

6.3. Management and Practical Implications

Organizations must reassess the necessity of after-hours access. While unrestricted after-hours connectivity may appear efficient in the short term, it risks long-term communication degradation, suppression of employee voices, and knowledge distortion. Organizations should: establish disconnect rules; train managers to prioritize communication effectively; optimize flexible work arrangements and leave policies to enhance employee resilience; improve wellness facilities and psychological support services; strengthen ethical leadership and transparency systems; and proactively monitor signs of communication disengagement.

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6.4. Policy Implications

Regulators should address the adverse effects of after-hours connectivity. This study supports national legislation on the right to disconnect, particularly in highly digitized industries. Labor policies safeguarding employee rest and psychological safety can reduce burnout and unethical behavior risks.

6.5. Research Limitations

Limitations include: cross-sectional design constrains causal inference; self-reported questionnaires may introduce common method bias; sample concentration in digitally intensive industries limits generalizability; silence and knowledge concealment exhibit cultural variations requiring cross-cultural validation.

6.6. Future Research Directions

Future research could: employ longitudinal designs to capture cumulative effects of after-hours connectivity; use experiments to differentiate characteristics of digital intrusions; explore influences of personality traits (conscientiousness, neuroticism, digital resilience, etc.); examine team-level ethical climate and leadership behaviors; utilize digital monitoring data instead of self-reports to enhance objectivity.

In summary, after-hours connectivity is not merely a technological convenience but a potent driver of organizational behavior. This study reveals silence and deceptive knowledge concealment as its dual consequences, while highlighting the crucial protective functions of resilience and ethical climate. Against the backdrop of accelerating global digitalization, understanding and managing after-hours connectivity is essential for safeguarding organizational ethics, communication quality, and performance.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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