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Role-playing after 6 pm: conceptualization, scale development, and validation of formalistic overtime behavior in the Chinese workplace

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As a typical stressor undermining employee well-being, unpaid overtime is prevalent in workplaces with weak labor protections. However, the practical tactics that employees adopt to cope with such illegitimate requirements remain under-explored in the existing literature. Focusing on the Chinese labor context, this study examines a nascent yet neglected impression management tactic: employees' participation in performative work efforts during unpaid overtime, which we term Formalistic Overtime Behavior (FOB). This study integrates the literature on stress coping and impression management, establishes the conceptual foundation for the study of FOB and highlights its uniqueness. Through five studies involving six samples ($N = 1451$ Chinese adult full-time white-collar employees), we developed and validated a six-item FOB scale and preliminarily established its nomological network. Findings suggest that FOB is related to similar constructs (work withdrawal, workplace cheating, cyberloafing, facades of conformity, and surface acting) yet demonstrates unique characteristics. Moreover, illegitimate unpaid overtime exacerbates employees' negative emotions and thus leads to FOB, especially under conditions of higher extra effort from colleagues. Further, FOB induces off-duty work-life conflict among employees, thus undermining positive affective work prospection on the next day. This study highlights the importance of FOB as a strategic coping approach with stress in unethical work contexts and its potential detrimental consequences for employees, thus providing insights for organizations to mitigate exploitative practices and promote ethical labor policies. Finally, theoretical and practical implications, limitations, and directions for future research are discussed.

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Introduction

How many employees have participated in unpaid overtime? One in ten (Statistics Canada, 2023) or 40.5% (Niu and Yang, 2022)? Moreover, how much annual financial loss does unpaid overtime cause to employees? £32.7 billion (Cole et al., 2024) or \$91.4 billion (Macdonald, 2024)? These statistics are excessively frightening, yet unpaid overtime is prevalent in today's China or other economies with weak labor protections (Yu and Leka, 2022). Unpaid overtime is a manifestation of disrespect for employees (for example, compulsory requirements and long working hours) and is generally regarded as unfair by employees (Beckers et al., 2008). Thus, as a typical manifestation of illegitimate tasks (Ding and Kuvaas, 2023), externally-derived compulsory requirements are at the core of unpaid overtime (Tsai et al., 2016).

Surprisingly, even with the affective undertone of involuntariness, some Chinese employees also attempt to portray a positive impression of devotion and commitment (People's Daily Online, 2021). For example, some Chinese employees nowadays may choose to work overtime because their supervisors are still in the office (Kang et al., 2017; Yu and Leka, 2022) and attempt to prove their "dedication" by overtime until late at night (Guo et al., 2021). This contradicts the literature on stress. For example, in the stress as offense to self (SOS) theory, threats to respect and fairness are typically associated with negative work-related behaviors (Ding and Kuvaas, 2023). Then, during abnormal work periods against personal will, why do employees participate in such behaviors? Moreover, what connotations do such behaviors reflect? Relevant conceptual and empirical work remains relatively scarce, which may lead to incomplete theoretical landscapes of employee rights and well-being trade-offs.

Several pieces of evidence from practice provide significant enlightenment. For example, a survey indicates that 30.1% of Chinese employees would participate in "performative" overtime (Zhaopin, 2024). Such behaviors are characterized by employees paying excessive attention to whether observable behavioral performance follows organizational norms rather than caring about substantive work efficiency (People's Daily Online, 2021). Echoing such phenomena are several critical theoretical frameworks. For example, SOS theory states that maintaining positive self-impression is one of the fundamental needs of individuals and emphasizes that threats to self-impression are central to many organizational stressors (Semmer et al., 2015). Further, in the view of impression management theory, individuals are invariably interested in how others perceive them (Leary and Kowalski, 1990). As such, impression management in organizations is ubiquitous (Gardner and Martinko, 1988) and may even include deceptive undertones (Bolino et al., 2016). Accordingly, we propose that when faced with unpaid overtime, employees may cope with it through the "performative" behaviors described above.

We attempted to complete the above conceptualization by exploring the impression management tactics that Chinese employees participate in during unpaid overtime. Specifically, drawing on empirical evidence from Chinese organizations, we have observed that employees possibly participate in behaviors during unpaid overtime that superficially present a positive self-impression, but actual work efficiency is inconsistent with the surface impression (People's Daily Online, 2021), which we refer to as Formalistic Overtime Behavior (FOB). In this study, we clarified the concept of FOB and its uniqueness and developed a validated scale for FOB. Drawing on SOS theory and impression management theory, we propose a theoretical model and initially establish the nomological network of FOB (as shown in Fig. 1). This model hypothesizes that illegitimate unpaid overtime exacerbates employees' negative emotions, especially under conditions of higher extra effort from colleagues, ultimately leading to FOB. Furthermore, given that FOB not only implies that employees are required to work long hours but also represents an impression management tactic for employees, which typically consumes their resources. Therefore, we further propose that FOB exacerbates employees' off-duty work-life conflict, diminishing positive affective work prospection the next day.

We have contributed to the literature in several ways. First, by emphasizing when FOB occurs, we highlight the necessity of unpaid overtime as a unique work-time context. Presently, only a few studies have focused on whether overtime is paid or unpaid (Beckers et al., 2008), which has resulted in significantly less focus on unpaid overtime than on regular working hours or paid overtime. However, the impact of employee behavior typically varies across temporal contexts (Kawaguchi and Kasai, 2016). Therefore, the severity and persistence of unpaid overtime cannot be ignored (Ioannides et al., 2014). In this regard, we respond to the recommendations of related studies (Campbell, 2007; Kawaguchi and Kasai, 2016; Shahidi et al., 2024; Tsai et al., 2016) that it is necessary to distinguish unpaid overtime from other working time frameworks.

Additionally, limited literature has focused primarily on how unpaid overtime as an event impacts employees or organizations (Kawaguchi and Kasai, 2016; Papagiannaki, 2014). In the process, the timeframe attributes of unpaid overtime have largely been ignored. Therefore, the literature requires more refinement and should focus not only on unpaid overtime but also on employee behaviors that occur during unpaid overtime. Additionally, by emphasizing the "unethical" behaviors that employees participate in during unpaid overtime, a time frame contrary to ethics and the law, our study contributes to developing new perspectives in the literature on employee rights and well-being.

Second, by combining studies on stress coping and impression management, we explored impression management tactics that employees apply in stressful situations. Motivation to participate

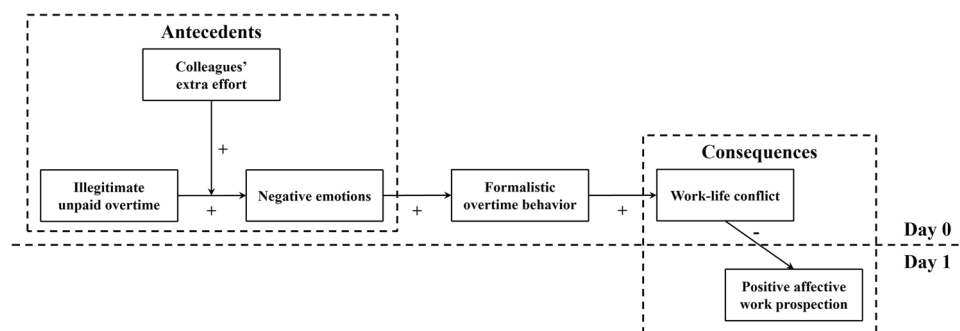


Fig. 1 Theoretical model. Survey periods: Day 0 (18:00–24:00 after work on the survey day); Day 1 (06:00–10:00 before work on the next day).

in impression management typically stems from maximizing expected rewards and minimizing expected punishments (Leary and Kowalski, 1990). However, current studies typically focus more on impression management resulting from approach motivation, for example, ingratiation and self-promotion (Bolino et al., 2016). It is worth emphasizing that impression management tactics do not exist in isolation and one-sidedly; instead, they are combinations of different tactics to varying degrees (Bolino et al., 2016). Therefore, through exploring this paradoxical behavior of FOB, we not only focused on impression management resulting from avoidance motivation but also attempted to respond to the suggestions of related studies (Bolino et al., 2016; Bourdage et al., 2018) and more comprehensively explored the combinatorial application of different impression management tactics in specific contexts. Meanwhile, we explored the possibility of impression management tactics as a stress-coping approach based on practical contexts in Chinese organizations, which is an interesting attempt both for the stress literature and impression management theory.

Furthermore, previous studies on impression management tactics have rarely emphasized their deceptive affective undertones, with the limited relevant studies focusing almost exclusively on interview contexts (Bourdage et al., 2018; Powell et al., 2021; Roulin et al., 2015) and have primarily focused on the external impacts of impression management tactics on employees, for example, performance and interview appraisals. Participating in impression management implies that employees need to constantly switch roles between the “front stage” and the “backstage” (Goffman, 1959), and role switching usually requires consuming employees’ psychological resources. Notably, the risk of deceptive impression management tactics being negatively perceived is greater (Bolino et al., 2016), which may consume more psychological resources. Therefore, this study, by emphasizing the “performative” characteristics of FOB and focusing on the internal impact of impression management tactics on employees, contributes to broadening the application of deceptive impression management tactics in the context of unpaid overtime and provides empirical evidence on the negative consequences of impression management tactics.

Finally, although journalism and practitioners in China have already paid extensive attention to the FOB phenomenon (People’s Daily Online, 2021; Zhaopin, 2024), academic work has limited attention to this superficial behavior. This study draws from real-world contexts, providing a foundation for unpaid overtime and FOB based on empirical evidence. As a result, we draw the attention of researchers to unpaid overtime and FOB and attempt to alleviate the widening gap between research and the real world.

Defining FOB

Core components of FOB

Unpaid overtime. Unpaid overtime refers to employees’ participation in work outside their normal working hours for which they are not compensated with any immediate monetary or leave transfer (Shahidi et al., 2024; Tseng, 2011). Existing working time frameworks are categorized into three types: regular working hours, paid overtime, and unpaid overtime, and their impacts on stress, income, and well-being are typically considered different (Kawaguchi and Kasai, 2016). Therefore, unpaid overtime is essentially a different form of work than other time frames (Shahidi et al., 2024; Tsai et al., 2016), and focusing on unpaid overtime can help us to explore the complexity of the potential exchange between employers and employees (Campbell, 2007).

The employment relationship is protected and governed by labor contracts during regular work hours and paid overtime. At

this time, FOB can undoubtedly be regarded as unethical behavior because it implies that the employee is not providing proper work efficiency, which constitutes a form of slacking. On the contrary, unpaid overtime in itself already implies that the work schedule does not meet the ethical and legal requirements (Cole et al., 2024; Shahidi et al., 2024); therefore, we are inclined to regard FOB at this time as an impression management tactic that the employee participates in order to cope with the organization’s unethical and illegal requirements, which is difficult to be defined as unethical behavior. Furthermore, unpaid overtime can be demonstrated in various forms, for example, commuting work and work connectivity during after-hours (Campbell, 2007). However, focusing on other forms of unpaid overtime can easily confuse FOB with other concepts. Therefore, we focus primarily on unpaid overtime for employees within the workplace.

Organizational culture context. Significantly, the emergence of FOB relies primarily on the organizational culture context in which unpaid overtime is institutionalized (Tseng, 2011). Both the Labor Contract Law in China, the Fair Labor Standards Act in the United States, and the Working Time Directive in the EU require organizations to pay a legal premium for overtime work and limit overtime hours (Kawaguchi and Kasai, 2016; Niu and Yang, 2022). Obviously, employees can resist unpaid overtime via legal complaints or collective bargaining without resorting to covert tactics like FOB. However, there are significant differences in employees’ responses to unpaid overtime in various cultural contexts (Kang et al., 2017).

Specifically, in cultural contexts with collectivism and high-power distance, such as China, organizations typically emphasize values such as harmony and respect for authority (He et al., 2019) and expect employees to comply with group norms (Chen et al., 2023). Thus, unpaid overtime may have symbolic, almost moral functions in Chinese organizations (Kang et al., 2017). Additionally, although such organizations typically claim unpaid overtime is not compulsory, employees are generally concerned that failing to adjust their work accordingly may result in losing current benefits or potential promotions (Qin and Zhang, 2024). As a result, when confronted with requests for unpaid overtime, employees in Chinese organizations typically use avoidance or passive coping tactics (namely, FOB) to prevent supervisor-subordinate relationships from being negatively impacted (He et al., 2019) rather than directly expressing dissatisfaction. In summary, the nature of FOB is an adaptive survival tactic for employees under the dual constraints of institutions and culture. Thus, it is primarily prevalent in organizations with weak labor protection, high-power distance, and collectivism.

Occupational group. As mentioned earlier, unpaid overtime is a prerequisite for employees to participate in FOB. Although unpaid overtime exists across most occupational groups (Campbell, 2007), it can vary significantly between industries. Generally, white-collar employees have a higher probability of working unpaid overtime than blue-collar employees (Ioannides et al., 2014; Papagiannaki, 2014) because the latter’s overtime hours are usually positively related to their demands for overtime compensation (Tseng, 2011).

Further, FOB is more likely to occur in tasks where performance cannot be easily appraised directly. This is understandable because supervisors can quickly appraise their overtime efficiency if employees’ performance can be monitored in real-time and accurately. Therefore, FOB usually occurs in white-collar/predominantly office work occupations and is unlikely to occur in blue-collar/predominantly physical labor occupations.

Performative work effort. We attempted to describe FOB as a performative behavior because such behaviors often hide employees' true/partially true selves beneath the facade (Goffman, 1959). The nature of unpaid overtime is that organizations require employees to increase their productivity without increasing their wage costs (Ioannides et al., 2014), and therefore, organizations usually expect employees to show work effort even in unpaid overtime. It is reflected in the view of SOS theory as the conflict between the personal self and the social self (Semmer et al., 2019); that is, the standard of the social self exceeds the personal self. Performative work effort may be a helpful coping tactic in the face of conflicting self-concepts. Performative work effort implies that employees superficially comply with the social self's demands, namely work effort, yet participate in behaviors consistent with the personal self, namely slacking off. In other words, performative work effort is the employee's compromise when faced with the threat of the social self (Ding and Kuvaas, 2023).

We are not denying that some employees participate in unpaid overtime for autonomous motivation (Beckers et al., 2008). For example, on the logic of social exchange theory, employees possibly express their gratitude to the organization via unpaid overtime (Papagiannaki, 2014), or employees with the trait of workaholism may also generate the impulse to work excessively, driven by self-reinforcing internal needs (Clark et al., 2020). However, when employees participate in unpaid overtime for autonomous motivation, it is usually for self-worth (Kawaguchi and Kasai, 2016). Further, if the social and personal selves are aligned, the employee would achieve harmony between exterior and interior. At that time, the work effort would no longer be performative but authentic employee behavior.

Construct definition. It is worth emphasizing that certain features of FOB are also reflected in several existing constructs. For example, "facades of conformity are false representations employees create to appear as if they embrace organizational values" (Hewlin, 2009), focusing on the conflict of values; "surface acting involves 'pushing down' one's authentic expression of self in favor of an emotional mask" (Brotheridge and Lee, 2003), emphasizing false expressions of emotion. These concepts all provide specific characteristics of employees' performative behaviors. Practitioners are more precise in their view that FOB refers to employees' excessive focus on the superficial to the detriment of the substantive in unpaid overtime, leading to inefficiency (People's Daily Online, 2021; Zhaopin, 2024). Taken together, we define FOB as employees' participation in performative work efforts during unpaid overtime.

FOB and related constructs

FOB and similar undesirable behavior. Given the nature of FOB as slacking behavior, its behavioral connotations are relatively similar to certain characteristics of work withdrawal, workplace cheating, and cyberloafing.

Work withdrawal refers to the actions taken by employees when they physically and/or psychologically detach from the organization (Nauman et al., 2021) and includes both behavioral and psychological withdrawal dimensions. Like FOB, work withdrawal is behavior that employees participate in while maintaining their organizational identity (Hanisch and Hulin, 1990) and exhibits behavioral connotations of slacking off. The manifestations of FOB are similar to psychological withdrawal, such as mind-wandering or daydreaming (Lehman and Simpson, 1992). However, FOB emphasizes the performative character of the behavior, which is not identical to psychological withdrawal. Moreover, behavioral withdrawal is a defensive response to stress

(Jo and Lee, 2022), manifesting as late, absenteeism, or leaving work early (Nauman et al., 2021). This contradicts the necessary premise of FOB because employees' behavioral withdrawal does not manifest as unpaid overtime.

Workplace cheating, a form of selfish, unethical behavior, refers to employees violating widely shared norms or rules to promote their interests at work (Kamran et al., 2022). Both workplace cheating and FOB stem from self-protective mechanisms triggered by employees' perceptions of performance or other stressors. However, workplace cheating aims to gain an unfair competitive advantage (Mitchell et al., 2018) and belongs to employee behaviors resulting from approach motivation. In contrast, FOB is primarily induced by avoidance motivation; in other words, FOB does not emphasize the self-interested tendency of the behavior. Furthermore, workplace cheating focuses on potentially illegal behaviors or violates society's ethical values (Kamran et al., 2022); however, as mentioned earlier, FOB is difficult to define as unethical behavior.

Cyberloafing is the behavior of employees who use the company's Internet resources for personal purposes during working hours (Lim, 2002), which possibly represents a specific behavioral manifestation in FOB, that is, characterized by covertness and lower work efficiency (Lim and Teo, 2024). However, employees' participation in cyberloafing is usually intended to dissipate the normal working hours expected by the organization, including regular working hours and paid overtime (Lim and Teo, 2024). Employees' participation in FOB is in response to the organization's illegitimate expectations, namely unpaid overtime, which differs from cyberloafing in critical prerequisites and temporal context. Furthermore, there is a significant difference between cyberloafing and FOB regarding behavioral purpose, with the former being to satisfy personal affairs needs (proactive behavior) and the latter being to cope with the stress associated with unpaid overtime (passive coping).

FOB and similar performative behavior. Considering that FOB is also an impression management tactic that emphasizes the performative character of the behavior, it is relatively similar to the behavioral manifestations of surface acting and facades of conformity.

Facades of conformity are false representations created by employees to appear to embrace the organization's values (Hewlin, 2003). Facades of conformity is the concept most similar to FOB in that both emphasize false surfaces and focus on external representations inconsistent with actual behavior. However, the original literature on facades of conformity also emphasizes the differences between it and impression management (Hewlin, 2003). Impression management recognizes that individuals' values potentially conflict with public expression but typically does not emphasize inhibiting the expression of values (Hewlin, 2003), focusing primarily on the acceptability of impression management tactics in audiences' perceptions (Bolino et al., 2016). Studies of facades of conformity are primarily concerned with whether expressed values are consistent with internal values, and only those behaviors in which internal values are suppressed while pretending to support the organization's values are called facades of conformity (Hewlin, 2003; 2009).

Surface acting is the process by which employees modify the expression of extrinsic emotions to create a desirable impression at work without changing their inner feelings (Ozcelik, 2013). Surface acting emphasizes only the false expression of internal emotions, in which the individual pretends to have emotions inconsistent with their internal feelings (Brotheridge and Lee, 2003). However, as mentioned earlier, FOB focuses primarily on the acceptability of external behaviors in the audience's perceptions.

Development of FOB's nomological network

Antecedents of FOB

Illegitimate unpaid overtime and negative emotions. On the one hand, unpaid overtime extends the working hours stipulated in the employment contract without any compensation; therefore, it undoubtedly exceeds the employees' expected scope of work (Shahidi et al., 2024); on the other hand, unpaid overtime implies that the employees' performances during the regular working hours are unable to satisfy the organization's expectations, which challenges the employees' professional identity (Ding and Kuvaas, 2023). Therefore, as a typical manifestation of illegitimate tasks, unpaid overtime exceeds the scope of the employee's expected work and offends their professional identity. Further, in the logic of SOS theory, one of the proximal consequences of illegitimate tasks is negative emotions (Ding and Kuvaas, 2023).

Negative emotions are subjective emotional experiences of employees' distress or unpleasantness at work, including anger, fear, anxiety, and many other low-pleasure, high-arousal emotions (Watson et al., 1988). Typically, stressful situations are the primary trigger for arousing negative emotions (Spector and Fox, 2005). First, when unpaid overtime lacks substantive significance, employees cannot perceive the contribution to their personal growth or organizational development from it, which reflects a threat to their identity. Through the lens of SOS theory, self-esteem is an important factor for employees to generate and maintain positive emotions (Ding and Kuvaas, 2023). Once unpaid overtime causes employees' self-esteem to be harmed, negative emotional responses, such as anger and disgust, are activated. Second, unpaid overtime means that employees must devote more time to their work, reducing their time for leisure and entertainment. Therefore, unpaid overtime is shown to be related to various negative states of employees (Shahidi et al., 2024). Most importantly, the compulsory requirement of unpaid overtime diminishes employees' autonomous work motivation (Qin and Zhang, 2024), which is one of the important factors inducing negative emotions. Therefore, we propose the hypothesis:

Hypothesis 1. Illegitimate unpaid overtime is positively related to negative emotions.

The mediating role of negative emotions. Negative emotions imply the loss of individual resources (Alberts et al., 2012). To preserve existing resources as much as possible, employees typically employ specific means to control negative emotions. Therefore, negative emotions are important factors that influence employee behavior and performance (Spector and Fox, 2005). First, based on the cultural context, Chinese organizations generally value interpersonal harmony, making employees express negative emotions more covertly (Cui et al., 2022). Thus, FOB, characterized by covertness, is a safer response than openly rebutting or confronting the supervisor. Second, employees with negative emotions typically appraise and perceive the work environment in negative ways, leading to the choice of short-term emotion regulation tactics (Alberts et al., 2012). As a result, employees are likely to stay away from work as much as possible through slacking behaviors, that is, FOB, to compensate for the depletion of psychological resources caused by negative emotions and to achieve recovery. Furthermore, as a functional mechanism, emotions can effectively energize or depress an individual's vitality, thereby inducing appropriate actions (Spector and Fox, 2002). Unlike positive emotions, negative emotions typically induce avoidance tendencies in employees.

Taken together, unpaid overtime as an offensive stressor typically accelerates employee resource loss (Zhao et al., 2022), thus leading to negative emotions. Therefore, employees are inclined to adopt negative coping tactics for self-protection (FOB

to preserve existing resources or minimize resource loss. Based on the above, we propose the following hypotheses:

Hypothesis 2. Negative emotions are positively related to formalistic overtime behavior;

Hypothesis 3. Negative emotions mediate the relationship between illegitimate unpaid overtime and formalistic overtime behavior.

The moderating role of colleagues' extra effort. Extra effort refers to employees putting in time and effort beyond the work requirements (Koster and Fleischmann, 2017). Individuals frequently appraise their abilities and performance by comparing themselves to others (Collins, 1996); therefore, when observing colleagues' extra effort, employees may unconsciously compare themselves to these colleagues (Sun, 2022). First, colleagues' extra effort could be perceived by employees as "Nei Juan" behavior, which means competing for limited resources by increasing inputs (Yin et al., 2023). As a result, employees may perceive stronger competitive stress through colleagues' extra effort (Hart et al., 2001) and attempt to prove value or maintain competitiveness by redoubling their efforts (Parker et al., 2019), further increasing role stress (Koster and Fleischmann, 2017), which in turn induces generation of negative emotions (Yin et al., 2023). Second, negative emotions are facilitated when colleagues' extra effort lacks substantive significance. For example, when colleagues' unpaid overtime is perceived as meaningless and only creates the illusion of "effort," employees may regard colleagues' extra effort as an attempt to gain an unfair competitive advantage, which may exacerbate negative emotions (Sun, 2022). Furthermore, if employees perceive that they are not competent or hardworking enough in the comparison process, this would directly threaten their self-appraisal and exacerbate negative emotions (Yin et al., 2023).

In summary, illegitimate unpaid overtime typically implies that working hours and performance are confused in organizations (Guo et al., 2021), and even working hours are regarded as a performance indicator. As a result, unreasonable institutional arrangements can contribute to employees' stronger perceptions of stress (Ding and Kuvaas, 2023) and enhance negative emotions. Further, in impression management theory, the gap between employees' current and desired impressions is the primary factor that induces impression management motivation (Bolino et al., 2016). Therefore, to cope with the organization's illegitimate expectations and the resulting negative emotions, employees possibly choose to surface unpaid overtime, that is, to satisfy external expectations through superficial time devotion rather than pursuing the actual work outcomes. Therefore, we propose the following hypotheses:

Hypothesis 4a. Colleagues' extra effort positively moderates the positive relationship between illegitimate unpaid overtime and negative emotions. Specifically, when colleagues' extra effort is stronger, the positive relationship between the two is stronger;

Hypothesis 4b. Colleagues' extra effort positively moderates the indirect effect of illegitimate unpaid overtime on formalistic overtime behavior via negative emotions. Specifically, this relationship is stronger when colleagues' extra effort is stronger.

Consequences of FOB

FOB and work-life conflict. Work-life conflict is when employees' work role demands prevent them from effectively fulfilling their life role demands (Gisler et al., 2018). According to the logic of SOS theory, role demands at work typically deplete employees' resources (such as time, emotional, and cognitive resources), thus leading to a state of resource shortage (Semmer et al., 2015). First, FOB directly encroaches on employees' non-work time so that

employees have inadequate time to fulfill the life role demands (Sirgy and Lee, 2018), and the lack of lifetime is one of the crucial factors that lead to work-life conflict (Skinner and Pocock, 2008). Second, according to impression management theory, FOB depends on whether impression management targets exist (Bolino et al., 2016), which means that the surface behavior exhibited by FOB is not continuous. Going further, the switching back and forth of impressions also contributes to the depletion of employees' psychological resources, resulting in a lack of sufficient energy to face the demands of their lives, thus exacerbating work-life conflict (Sirgy and Lee, 2018).

Furthermore, performative behavior creates stress for the employee because they need to be concerned about the success of impression management, that is, whether or not the supervisor perceives the FOB as a genuine work effort. Thus, concerns about external appraisals can exacerbate the depletion of employees' psychological resources, leading to work-life conflict (Skinner and Pocock, 2008). Therefore, we propose the hypothesis:

Hypothesis 5. Formalistic overtime behavior is positively related to work-life conflict.

The mediating role of work-life conflict. Positive affective work prospectation refers to employees' positive expectations and affective experiences of future work-related events (Rutten et al., 2022). Generally, future-oriented thoughts require the deployment of broader psychological states (Nurmi, 2005), as these deep thoughts typically consume more cognitive resources (Mazzoni, 2019). In other words, employees' available coping resources determine the affective tone of thoughts about the future (Rutten et al., 2022).

From the psychological perspective, work-life conflict depletes employees' emotional and cognitive resources, resulting in them feeling resource-poor (Gisler et al., 2018), which in turn directly reduces their psychological resource reserves before starting work on the next day and renders it difficult for them to develop a positive prospectation on work (Rutten et al., 2022). Furthermore, work-life conflict typically generates negative cognitive appraisals in employees, such as work meaninglessness or uncontrollability (Sirgy and Lee, 2018), which diminishes their internal work motivation and makes it difficult for them to generate positive work expectations the following day. Physically, work-life conflict compresses employees' sleep time (Gisler et al., 2018) and affects their sleep quality that night. Further, sleep deprivation disrupts employees' physiological rhythms, affecting their emotional regulation (Daniela et al., 2010) and causing them to experience more fatigue, poor concentration, and emotional volatility the next day (Meldrum and Restivo, 2014).

Furthermore, detachment from work is crucial for employee recovery (Sonnetag et al., 2022), and this positive recovery experience facilitates employees' positive appraisal of possible future consequences (Baumeister et al., 2018). However, work-life conflict typically causes employees to remain immersed in work-related thoughts and emotions after work (Gisler et al., 2018). As a result, the lack of detachment that night contributed to the inability of employees to recover their physiological and psychological resources adequately, thus rendering it difficult for them to generate a positive affective work prospectation (Rutten et al., 2022).

Hypothesis 6. Work-life conflict is negatively related to positive affective work prospectation;

Hypothesis 7. Work-life conflict mediates the relationship between formalistic overtime behavior and positive affective work prospectation.

Development of the FOB scale

Drawing on the scale development steps suggested by Hinkin (1998), we combined recommendations from several studies

(Carpenter, 2018; Morgado et al., 2018) to develop scientifically valid measures for FOB.

We conducted surveys on FOB in Chinese organizations, where unpaid overtime is more prevalent. All surveys in this study employed the *Credamo* platform (<https://www.credamo.com/#/>), which has proven more suitable for Chinese studies focusing on the highest data quality (Del Ponte et al., 2024). To ensure data quality, we restricted all participants to at least 100 historical responses and a 90% historical adoption rate and randomly embedded several attention-checking items (Ward and Meade, 2023). Furthermore, drawing on Klotz et al. (2023) translation/back-translation procedure, we translated the English scales from all subsequent studies into Chinese. Informed consent was obtained from participants for all surveys in this study.

Item generation. To make the initial item pool as complete as possible, we obtained extensive FOB-related material from web-based materials, open-ended questionnaires, semi-structured interviews, and existing scale items.

Web-based materials. FOB is already a popular topic in the Chinese media, with similar expressions such as "loafing overtime" and "showboating overtime." Therefore, we crawled FOB-related blogs, news, and comments from widely used websites and social media platforms.

Specifically, we crawled 14,582 materials from *Baidu* (<https://www.baidu.com/>), 9,236 materials from *Weibo* (<https://weibo.com/>), and 5,350 materials from *Zhihu* (<https://www.zhihu.com/>). Subsequently, the first author performed an initial screening of the above materials, removing duplicates and irrelevant to the theme, resulting in 23,750 materials. To ensure the relevance of the materials to the theme, we further organized two groups (two master's degree students each, both majoring in HRM) to perform a second screening of the materials. The two groups checked the above materials item by item and marked the items irrelevant to the theme. When both groups marked a certain material (2,856), we removed it; when the marking appeared only in one group, the second author performed a secondary judgment (1,362 removed). Finally, we obtained 19,532 valid materials related to the theme.

Open-ended questionnaires. We collected open-ended questionnaires through the *Credamo* platform and restricted participants to adult white-collar full-time employees from China. At the beginning of the open-ended questionnaire, we first introduced the participants to the conceptual connotations of FOB. Secondly, drawing on the content of the web-based materials, we listed several descriptions of FOB. For example, "During unpaid overtime, I would select tasks that enable my efforts to be noticed," and "During unpaid overtime, I would participate in or initiate insignificant work discussions". Finally, we encouraged participants to describe as much as possible about the FOB they had participated in or witnessed.

We obtained 206 responses, and 182 participants' responses were ultimately retained through quality screening measures. Participants included 101 females (55.50%), and 106 (58.24%) participants had a bachelor's degree or higher. On average, participants were 27.77 years old ($SD = 7.04$) and had a tenure of 6.03 years ($SD = 5.31$). Furthermore, through the same data screening procedure as for the web-based materials, we ultimately obtained 890 specific behavioral descriptions.

Semi-structured interviews. We collected and organized experts' comments on the interview outline through focus group interviews (including one professor, two Ph.D. candidates in the field

of HRM, and one HRM manager) before conducting the semi-structured interviews. After several rounds of discussion, we finalized an interview outline containing eight questions (for example, “Please talk about your views on unpaid overtime” and “Please talk about formalistic overtime behaviors that you have participated in or witnessed during your working life”).

We recruited participants for semi-structured interviews via social media platforms with the restrictive standards of a) adult white-collar full-time employees, b) experiencing at least four unpaid overtime periods in the last month, and c) frequent participation in FOB during the unpaid overtime period. We first pretested two participants and adapted the interview outline. At the beginning of the formal interview, we read the confidentiality agreement to the participants and obtained their informed consent. After that, we audio-recorded the interviews with the participants’ permission.

It is worth emphasizing that at the end of each interview, the researcher organized the interview materials and started the next interview only after they finished organizing it. In other words, we followed the idea of synchronizing data collection and analysis for this section. When the interview reached the 22nd employee, we found no more new ideas emerged. Subsequently, we invited three additional participants for interviews, but no new ideas emerged. Therefore, increasing the sample of interviews would not help generate additional themes, and this interview had reached the theoretical saturation point. Finally, the 22 formal interview participants contributed over 360,000 words of textual material.

Participants included 14 females (63.64%), and 20 participants had a bachelor’s degree or higher (90.91%). On average, participants were 27.23 years old ($SD = 3.98$) and had a tenure of 4.73 years ($SD = 3.47$). The average duration of the formal interview was 65.18 min ($SD = 18.60$).

Similar scales. We drew on several scale items that are conceptually similar to FOB. Examples include impression management behavior (Bolino and Turnley, 1999), interview faking behavior (Levashina and Campion, 2007), and work procrastination (Wang et al., 2021). Furthermore, we considered several concepts contrary to FOB and attempted to derive richer material from them. For example, work effort (De Cooman et al., 2009) and employee engagement (Byrne et al., 2016).

Content analysis. First, we formed two research groups to organize and summarize the above materials independently and to verify the summarized results. Each group included one Ph.D. candidate and one master’s student (both majoring in HRM). In case of disagreement, an external expert (a professor in HRM) was sought for joint discussion. At this phase, we obtained 202 FOB items.

Second, the first and second authors independently reviewed the items to confirm that they met the definition of FOB. In case of disagreement, whether these items were to be retained or not was discussed with the two research groups mentioned above. At this phase, we removed 141 items. Specifically, the removed items were either related to definitions of other concepts (for example, “During unpaid overtime, I let time pass without completing any work tasks”, which likely reflects connotations of work procrastination; “During unpaid overtime, I think about other things often while performing my work”, which likely relates to psychological withdrawal), or the items were not strongly characterized as “performative” (for example, “During unpaid overtime, I try to avoid tasks that don’t help my career development”). Furthermore, the Cohen’s Kappa between the two authors was 0.92, indicating acceptable inter-rater reliability.

Subsequently, the two authors further integrated those items that shared similar characteristics among the remaining 61 items above. For example, “During unpaid overtime, I purposely acted preoccupied or stressed, despite the tasks not being important” and “During unpaid overtime, I made tasks seem more time-consuming or difficult, despite the tasks being very simple” could be further combined into “During unpaid overtime, I deliberately acted as if I suffered significant stress, despite it not actually being so”. At this phase, we obtained 21 FOB items.

Finally, we sent the 21 items mentioned above to an HRM professor, an HRM manager, and employees who had participated in semi-structured interviews. We invited them to scrutinize their content adequacy according to the definition of FOB. Following their suggestions, we removed five poorly articulated items. As a result, we obtained 16 items as the initial item pool for FOB and conducted subsequent tests.

Content validation. Given scholars’ concerns about the scale development process (Carpenter, 2018; Morgado et al., 2018), we validated the content validity of the FOB scale through two studies (Studies 1a and 1b).

Following Colquitt et al.’s (2019) suggested guidelines for content validation, we employed sorting (Anderson and Gerbing, 1991) and rating (Hinkin and Tracey, 1999) approaches in Study 1a and Study 1b, respectively. Sorting and rating, respectively, represent two different but complementary approaches to content validation: a) definitional distinctiveness, that is, the degree to which the items correspond more to the focal construct’s definition than to the orbiting constructs, and b) definitional correspondence, that is, the degree to which the scale items correspond to the construct’s definition (Colquitt et al., 2019).

It is worth noting that both the sorting and rating approaches require using orbiting constructs to appraise the content validity of FOB. Based on Colquitt et al.’s (2019) criteria, we chose two orbiting constructs that fulfill the requirements: facades of conformity and surface acting. As mentioned earlier, these two are highly similar to FOB, differing in their focus. Facades of conformity emphasize values conflict more, whereas surface acting focuses more on emotional conflict. Therefore, we anticipated them to be strongly related to, but different from, FOB. Furthermore, we appraised the initial scales with the help of naïve judges, as suggested by Colquitt et al. (2019).

Measures. The FOB scale employs the 16 items mentioned earlier. Additionally, to keep FOB and orbiting constructs as consistent as possible in their representation, we equally restricted the temporal contexts of surface acting and facades of conformity.

Surface acting utilized the three-item scale developed by Brotheridge and Lee (2003). A sample item was, “During unpaid overtime, I would resist expressing my true feelings.”

Facades of conformity utilized the six-item scale developed by Hewlin (2009). A sample item was, “During unpaid overtime, I don’t share certain things about myself in order to fit in at work.”

Study 1a: sorting approach to content validation. We recruited 150 adult white-collar full-time employees from China through *Credamo*. After deleting one participant with incomplete responses due to a procedural error, Study 1a yielded a valid sample of 149, exceeding the recommended minimum sample size of 100 (Colquitt et al., 2019). Participants included 109 females (73.15%), and 132 participants had bachelor’s degrees or higher (88.59%). The average age of the participants was 29.68 years old ($SD = 8.08$).

We provided three boxes containing the definitions of FOB, facades of conformity, and surface acting, respectively.

Participants were required to place the 25 items randomly presented into the box that best matched them.

The sorting approach provided us with two indices: p_{sa} for evaluating the proportion of substantive agreement (0.72 or higher is moderate/acceptable) and c_{sv} for evaluating the substantive validity coefficient (0.51 or higher is moderate/acceptable). The results of the analyses indicated that item 06 (During unpaid overtime, I intentionally used an exaggerated tone or gesture in discussions; $p_{sa} = 0.36$, $c_{sv} = -0.28$) and item 13 (During unpaid overtime, I performed nonwork-related activities in a state of surface effort; $p_{sa} = 0.66$, $c_{sv} = 0.32$) had p_{sa} and c_{sv} values below the acceptability criterion. The remaining 14 items had a mean p_{sa} value of 0.86 and c_{sv} value of 0.71. These results imply that these items mentioned above are closer to the definition of FOB than orbiting constructs, providing support for the distinctiveness of the scale (Colquitt et al., 2019). Additionally, item 14 (During unpaid overtime, I slow down my work pace while appearing busy on the surface) has a p_{sa} that meets the criterion (0.74), yet its c_{sv} was slightly below the moderate criterion (0.49). Thus, we proceeded to replicate the validation of all items through the rating approach.

Study 1b: rating approach to content validation. We recruited 150 adult white-collar full-time employees from China through *Credamo*. Participants in Study 1b and Study 1a were not duplicated. Study 1b participants included 83 females (55.33%), and 93 participants had bachelor's degrees or higher (62.00%). The average age of the participants was 36.29 years old ($SD = 6.57$).

We provided participants with definitions of FOB, facades of conformity, and surface acting, which were used as the headings. Participants were required to rate the randomly presented 25 items on a scale of consistency between this item and the heading construct (1 = Item does an *EXTREMELY BAD* job of measuring the bolded concept provided above, 7 = Item does an *EXTREMELY GOOD* job of measuring the bolded concept provided above).

The rating approach also provided us with two indices: htc for evaluating correspondence (0.84 or higher is moderate/acceptable) and htd for evaluating distinctiveness (0.18 or higher is moderate/acceptable). The results of the analyses indicated that item 06 ($htc = 0.51$, $htd = 0.01$) and item 13 ($htc = 0.50$, $htd = 0.00$) had htc and htd values that again below the acceptability criterion, and we removed them. Additionally, Item 14 met the acceptability criterion ($htc = 0.87$, $htd = 0.42$) and we retained it. The remaining 14 items had a mean htc value of 0.88 and htd value of 0.44. These results imply that these items above have strong definitional correspondence and definitional distinctiveness.

Validation of the FOB scale

Study 2: exploratory factor analysis (EFA)

Participants and procedures. Study 2 recruited 400 adult white-collar full-time employees from China through *Credamo*. Additionally, we required participants to have experienced at least four unpaid overtime sessions in the last month (an average of at least one per week). In this phase, 42 participants were screened out. Subsequently, we ultimately retained 327 participants through quality screening measures, exceeding the recommended variable-to-sample ratio 1:20 (Carpenter, 2018; Morgado et al., 2018). Participants in Study 2 and Study 1 were not duplicated.

Participants included 213 females (65.14%), 179 were married (54.74%), 297 participants had a bachelor's degree or higher (90.83%), and 215 participants were employed in the private sector (65.75%). On average, participants were 30.25 years old ($SD = 6.80$) and had a tenure of 6.91 years ($SD = 6.16$). Participants had a wide range of occupational types, with higher

percentages in manufacturing ($N = 53$; 16.21%), information technology ($N = 49$; 14.99%), education ($N = 39$; 11.93%), and services ($N = 38$; 11.62%). The FOB scale uses the remaining 14 items from Study 1, and participants were required to rate the frequency with which they participated in FOB in the last month (1 = *never*, 5 = *always*). Additionally, EFA was performed with principal axis factoring extraction and Promax rotation provided by SPSS, as the factors were not uncorrelated (Carpenter, 2018).

Results. First, we conducted a reliability test on the FOB scale. The results indicated that the Cronbach's α for the FOB scale was 0.901 in Study 2. However, item 02 (During unpaid overtime, I post updates about my overtime work on social media) had a Corrected Item-Total Correlation (CITC) value of 0.39, less than the 0.50 criterion. The overall reliability of the scale improved after deleting item 02. Therefore, we deleted it, and the remaining 13 items had a reliability of 0.903. Additionally, the Kaiser-Meyer-Olkin (KMO) result of 0.94 and Bartlett's test of sphericity of $p < 0.001$ implied that the data could be factor analyzed.

Second, the results of the EFA indicated that the remaining 13 items were loaded on a single factor, and the scree plot also depicted a sharp dip between the first and second factors, suggesting that the data provided only one major factor. Furthermore, we applied stricter criteria (communities greater than 0.45 and factor loadings greater than 0.65; Gajendran et al., 2024) to ensure the rigor and brevity of the scale items, and seven items failed to meet the criteria at this phase (items 08, 04, 01, 10, 07, 05, and 15; communalities of 0.23, 0.30, 0.31, 0.35, 0.36, 0.41, and 0.42; and factor loadings of 0.48, 0.55, 0.56, 0.59, 0.60, 0.64, and 0.64). We reviewed interview materials to assess these items' contribution to the breadth of FOB content. We found that the seven items mentioned above slightly involve FOB's motivation, potentially leading to double-barreled issues. For example, "During unpaid overtime, I deliberately waited for the supervisor to leave before leaving work, to avoid the supervisor's prejudice against me". Consequently, these seven items were removed.

Finally, we obtained the FOB scale that included six items. The EFA results indicated that the six items were loaded on a single factor. This factor had an eigenvalue of 3.70 and explained 61.72% of the variance. Table 1 shows the content of the final six-item FOB scale and its factor loadings across all studies.

Study 3: confirmatory factor analysis (CFA)

Participants and procedures. Study 3 recruited 300 adult white-collar full-time employees from China via *Credamo* and adopted the same access criteria as Study 2, which excluded 24 participants. It is worth emphasizing that existing studies frequently randomly split data from the same sample into two for EFA and CFA, which typically results in a good fit for the data. However, this approach may also result in the loss of the additional intensity of the CFA (Morgado et al., 2018). Therefore, we requested that the surveys in Study 3 and Study 2 be separated by two weeks and that participants in both studies were not duplicated.

Through quality screening measures, Study 3 ultimately retained 249 participants. Participants included 164 females (65.86%), 154 were married (61.85%), 211 participants had a bachelor's degree or higher (84.74%), and 151 participants were employed in the private sector (60.64%). On average, participants were 31.40 years old ($SD = 6.97$) and had a tenure of 7.80 years ($SD = 6.32$). Participants had a wide range of occupational types, with higher percentages in manufacturing ($N = 63$; 25.30%), information technology ($N = 41$; 16.47%), and education ($N = 26$; 10.44%). Participants were required to rate the frequency with which they participated in FOB in the last month (1 = *never*, 5 = *always*).

Table 1 Items and factor loadings.

Item	Factor loading			
	Study 2 (EFA)	Study 3 (CFA)	Study 4	Study 5
During unpaid overtime, I pretend to move around the office frequently under the pretext of work.	0.70	0.75	0.67	0.69
During unpaid overtime, I deliberately make my work area appear very busy.	0.73	0.79	0.78	0.73
During unpaid overtime, I pretend to be busy or focused when others pass by.	0.73	0.75	0.78	0.74
I intentionally leave some daytime work until the unpaid overtime period.	0.75	0.72	0.76	0.77
During unpaid overtime, I slow down my work pace while appearing busy on the surface.	0.74	0.78	0.77	0.80
During unpaid overtime, I deliberately complicate simple work tasks.	0.77	0.83	0.74	0.69

Table 2 Study 4: Means, standard deviations, and correlations.

Item	M	SD	1	2	3	4	5	6
1. FOB	2.68	0.83	(0.88)					
2. PW	2.15	0.50	0.41***	(0.78)				
3. WC	2.16	0.65	0.55***	0.65***	(0.84)			
4. CL	2.62	0.71	0.52***	0.72***	0.69***	(0.92)		
5. FOC	3.22	0.69	0.56***	0.42***	0.56***	0.47***	(0.82)	
6. SA	2.99	0.81	0.60***	0.41***	0.55***	0.50***	0.80***	(0.77)

N = 208. Reliabilities are reported along the diagonal.

FOB formalistic overtime behavior, PW psychological withdrawal, WC workplace cheating, CL cyberloafing, FOC facades of conformity, SA surface acting.

***p < 0.001; two-tailed.

Results. In Study 3, the FOB scale demonstrated high reliability again, with a Cronbach’s α of 0.90. Then, we performed CFA on the FOB scale using Amos software. The fit indices suggested that FOB reflects a single latent factor ($\chi^2 = 18.71$, $df = 9$, CFI = 0.99, TLI = 0.98, SRMR = 0.02, RMSEA = 0.07).

Study 4: convergent and discriminant validity. We tested the convergent and discriminant validity of the FOB scale through the previously discussed related constructs, including work withdrawal, workplace cheating, cyberloafing, facades of conformity, and surface acting. We anticipated that FOB would be positively related to these constructs but conceptually and empirically different from them. Participants in Study 4 were not duplicated from all previous studies.

Participants. Study 4 recruited 300 adult white-collar full-time employees from China via *Credamo* and adopted the same access criteria as Study 2, which led to the exclusion of 41 participants. Through quality screening measures, Study 4 ultimately retained 208 participants. Participants included 126 females (60.58%), 124 were married (59.62%), 183 participants had a bachelor’s degree or higher (87.98%), and 139 participants were employed in the private sector (66.83%). On average, participants were 31.03 years old ($SD = 7.14$) and had a tenure of 7.51 years ($SD = 6.68$). Participants had a wide range of occupational types, with higher percentages in manufacturing ($N = 42$; 20.19%), information technology ($N = 41$; 19.71%), and real estate ($N = 24$; 11.54%).

Measures. Study 4 required participants to rate the frequency with which they participated in each behavior in the last month (1 = *never*, 5 = *always*).

We measured FOB using the six items in Table 1. In Study 4, Cronbach’s α for FOB was 0.88.

Work withdrawal was measured using Lehman and Simpson’s (1992) eight-item psychological withdrawal scale because psychological withdrawal is more similar to FOB than behavioral

withdrawal. The sample item was, “Put less effort into job than should have (Cronbach’s $\alpha = 0.78$).”

Workplace cheating was measured using Mitchell et al.’s (2018) seven-item scale. The sample item was “Lied about the reason you were absent (Cronbach’s $\alpha = 0.84$).”

Given that cyberloafing behaviors potentially vary considerably across countries, we chose the ten-item Chinese scale developed by Zhou et al. (2023), which has been more widely used in surveys of Chinese organizations. The sample item was, “At work, I tend to be drawn to and immersed by my computer or phone pop-ups (Cronbach’s $\alpha = 0.92$).”

Facades of conformity were measured using Hewlin’s (2009) six-item scale. The sample item was, “I say things that I don’t really believe at work (Cronbach’s $\alpha = 0.82$).”

Surface acting was measured using Brotheridge and Lee’s (2003) three-item scale. The sample item was “Hide my true feelings about a situation (Cronbach’s $\alpha = 0.77$).”

Convergent validity. Convergent validity is demonstrated when the focal scale is related to similar constructs (Campbell and Fiske, 1959). Table 2 provides the correlation coefficients between all the variables involved in Study 4. Results indicated that FOB was significantly and positively related to psychological withdrawal ($r = 0.41$, $p < 0.001$), workplace cheating ($r = 0.55$, $p < 0.001$), cyberloafing ($r = 0.52$, $p < 0.001$), facades of conformity ($r = 0.56$, $p < 0.001$), and surface acting ($r = 0.60$, $p < 0.001$).

Furthermore, when performing the convergent validity analysis, the Average Variances Extracted (AVE) and Composite Reliability (CR) values can also be referred to for validation. The AVE value of FOB was 0.56, more excellent than 0.50, and the CR value was 0.89, more excellent than 0.70. Therefore, the above results validate the convergent validity of FOB.

Discriminant validity. We tested FOB’s discriminant validity by demonstrating that it differs empirically from similar constructs. The first approach involves modeling the focal and similar constructs through one- and two-factor measurement models and determining whether the one-factor model fits significantly worse

Table 3 Results for χ^2 difference tests for Study 4.

Measurement model		χ^2 (df)	$\Delta\chi^2$	CFI	TLI	RMSEA	SRMR
FOB and PW	One-factor	303.10 (77)		0.77	0.73	0.12	0.11
	Two-factor	114.37 (76)	188.73***	0.96	0.95	0.05	0.05
FOB and WC	One-factor	315.63 (65)		0.79	0.75	0.14	0.10
	Two-factor	127.18 (64)	188.45***	0.95	0.94	0.07	0.06
FOB and CL	One-factor	587.59 (104)		0.74	0.70	0.15	0.11
	Two-factor	252.35 (103)	335.24***	0.92	0.91	0.08	0.06
FOB and FOC	One-factor	239.68 (54)		0.83	0.79	0.13	0.09
	Two-factor	96.69 (53)	142.99***	0.96	0.95	0.06	0.06
FOB and SA	One-factor	101.26 (27)		0.91	0.88	0.12	0.06
	Two-factor	43.33 (26)	57.93***	0.98	0.97	0.06	0.03

All χ^2 difference tests have one degree of freedom. All two-factor models fit comparably better than the corresponding one-factor models.

than the two-factor model through the fit indices and their difference values (Shaffer et al., 2016). For example, the chi-square difference value required significance, and CFI differences greater than 0.002.

In Study 4, FOB fits the data well ($\chi^2 = 10.69$, $df = 9$, $CFI = 0.99$, $TLI = 0.99$, $SRMR = 0.02$, $RMSEA = 0.03$). As shown in Table 3, the results of the convergent validity analysis indicate that a series of two-factor models fit significantly better than the corresponding one-factor models. These results provide support for the discriminant validity of FOB.

Furthermore, the focal construct can be considered to lack discriminant validity when the correlation between the focal construct and similar constructs reaches 0.85 or higher (Shaffer et al., 2016). As shown in Table 2, the correlation coefficients between FOB and all similar constructs were less than 0.85.

The second approach to providing evidence of discriminant validity is to evaluate the square root of the AVE of the focal construct (Fornell and Larcker, 1981). Generally, evidence about discriminant validity can be provided when the square root of the AVE for the focal construct is higher than the correlation coefficient between the focal and similar constructs. The square root of the AVE of FOB was 0.75, which exceeded the correlation coefficient of FOB with all other similar constructs (see Table 2). These results provide further evidence regarding the discriminant validity of FOB.

Study 5: test of FOB's nomological network. Study 5 aimed to test the previously proposed theoretical model. During this process, we tested the predictive validity of FOB; that is, when the theoretical correlation between FOB and the predicted constructs is also correlated in the empirical results, the predictive validity is verified. Furthermore, we also attempted to test the incremental validity of FOB. Specifically, FOB has incremental validity if, after controlling for the constructs related to FOB, FOB still significantly predicts these criterion variables.

Participants. Study 5 was conducted through *Credamo* to collect time-lag data from adult Chinese white-collar full-time employees. Participants in Study 5 were not duplicated from all previous studies. Furthermore, only participants who experienced unpaid overtime on the survey day were admitted to Study 5. Specifically, at the first time point (T1: after work on the survey day, namely, 18:00 to 24:00), participants completed reports of illegitimate unpaid overtime, colleagues' extra effort, negative emotions, FOB, and work-life conflict; at the second time point (T2: before starting work on the next day, namely, 06:00 to 10:00), participants reported on positive affective work prospection and demographic information.

Initially, 600 participants entered our survey, and we excluded 178 participants who had not experienced unpaid overtime on the

survey day. As a result, Study 5 collected 422 participants' data at T1 and retained 416 participants through quality screening measures; of these, 375 participants completed the survey at T2, and 368 participants were ultimately retained through quality screening measures.

Participants included 164 females (44.57%), 208 were married (56.52%), and 328 participants had a bachelor's degree or higher (89.13%). On average, participants were 30.23 years old ($SD = 6.31$) and had a tenure of 6.84 years ($SD = 6.14$). Participants had a wide range of occupational types, with higher percentages in information technology ($N = 78$; 21.20%), manufacturing ($N = 61$; 16.58%), real estate ($N = 36$; 9.78%), and education ($N = 34$; 9.24%).

Measures. Unless otherwise noted, all items in Study 5 were measured using a five-point Likert scale (1 = *never*, 5 = *always*).

Illegitimate unpaid overtime was adapted from the eight-item Bern Illegitimate Tasks Scale (BITS) developed by Semmer et al. (2010). The sample item was, "Does today's unpaid overtime keep you wondering if they make sense at all (Cronbach's $\alpha = 0.91$)."

Negative emotions were measured using the low pleasure-high arousal index scale developed by Van Katwyk et al. (2000), which consists of five items. The sample item was, "Today's unpaid overtime made me feel disgusted (Cronbach's $\alpha = 0.88$)."

Colleagues' extra effort was adapted from McClean and Collins' (2011) Employee Effort Scale, which consists of three items (1 = *strongly disagree*, 5 = *strongly agree*). The sample item was, "Today, my colleagues put in extra effort to do work outside their job description to benefit the firm (Cronbach's $\alpha = 0.78$)."

FOB was measured using the six items in Table 1 (Cronbach's $\alpha = 0.88$).

Surface acting utilized the three-item scale developed by Brotheridge and Lee (2003). The sample item was, "During today's unpaid overtime, how frequently do you resist expressing your true feelings (Cronbach's $\alpha = 0.84$)."

Facades of conformity utilized the six-item scale developed by Hewlin (2009). The sample item was, "During unpaid overtime, I withhold personal values that conflict with organizational values (Cronbach's $\alpha = 0.91$)."

Work-life conflict was measured using the five-item work interference with personal life scale developed by Fisher et al. (2009). The sample item was, "Today, my personal life suffers because of unpaid overtime (Cronbach's $\alpha = 0.84$)."

Positive affective work prospection was measured using the four-item scale developed by Rutten et al. (2022) (1 = *strongly disagree*, 5 = *strongly agree*). The sample item was, "Before I left for work, I was looking forward to the workday ahead of me (Cronbach's $\alpha = 0.89$)."

Table 4 Confirmatory factor analysis for Study 5.

Model	χ^2 (df)	$\Delta\chi^2$	CFI	TLI	RMSEA	SRMR
Seven-factor (FOB, IUO, NE, CEE, WLC, PAWP, Method factor)	572.66 (388)	94.19	0.97	0.96	0.04	0.04
Six-factor (FOB, IUO, NE, CEE, WLC, PAWP)	666.85 (419)		0.96	0.95	0.04	0.04
Five-factor (FOB + IUO, NE, CEE, WLC, PAWP)	1726.06 (424)	1059.21***	0.77	0.75	0.09	0.13
Five-factor (FOB + NE, IUO, CEE, WLC, PAWP)	1577.08 (424)	910.23***	0.80	0.78	0.09	0.09
Five-factor (FOB + CEE, IUO, NE, WLC, PAWP)	956.44 (424)	289.59***	0.91	0.90	0.06	0.06
Five-factor (FOB + WLC, IUO, NE, CEE, PAWP)	1042.74 (424)	375.89***	0.89	0.88	0.06	0.06
Five-factor (FOB + PAWP, IUO, NE, CEE, WLC)	1322.60 (424)	655.75***	0.84	0.83	0.08	0.07
One-factor (FOB + IUO + NE + CEE + WLC + PAWP)	4166.08 (434)	3499.23***	0.34	0.30	0.15	0.16

N = 368.
 IUO illegitimate unpaid overtime, NE negative emotions, CEE colleagues' extra effort, WLC work-life conflict, PAWP positive affective work prospection.

Table 5 Study 5: Means, standard deviations, and correlations.

Variable	M	SD	1	2	3	4	5	6	7	8	9
1. Gender	0.55	0.50									
2. IUO	3.73	0.74	0.13**	(0.91)							
3. NE	3.71	0.82	0.05	0.18***	(0.88)						
4. FOB	3.78	0.73	0.44***	0.16**	0.17***	(0.88)					
5. CEE	3.96	0.72	0.22***	0.20***	0.17***	0.25***	(0.78)				
6. WLC	3.68	0.74	0.38***	0.21***	0.03	0.48***	0.29***	(0.84)			
7. PAWP	2.39	0.92	-0.24***	-0.24***	-0.13*	-0.39***	-0.18***	-0.29***	(0.89)		
8. SA	3.39	0.94	0.24***	0.01	-0.05	0.32***	0.04	0.12*	-0.16**	(0.84)	
9. FOC	3.72	0.78	0.18***	0.32***	0.07	0.22***	0.22***	0.23***	-0.23***	0.16**	(0.91)

N = 368. Gender is coded as 0 = female and 1 = male. Reliabilities are reported along the diagonal.
 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; two-tailed.

Furthermore, we employed the gender of the participants as a control variable. Specifically, females tend to believe that performing well at work is sufficient for success; therefore, females are typically less active than males in their use of impression management (Bolino and Turnley, 2003). Additionally, males and females differ in their selection of impression management tactics. For example, females are likely to be more inclined than males to select forms of impression management that involve ingratiation and supplication (Bolino et al., 2016).

Results. As shown in Table 4, the results of CFA indicated that the six-factor model fit the data well ($\chi^2 = 666.85$, $df = 419$, $p < 0.001$, CFI = 0.96, TLI = 0.95, RMSEA = 0.04, SRMR = 0.04) and significantly superior to other competing models.

Furthermore, the results of Harman's single-factor test indicated that the contribution of variance explained by the first factor was 24.06%. This study also applied controlling for the effects of an unmeasured latent methods factor (ULMC) to test for common method bias. As shown in Table 4, the seven-factor model with the addition of the method factor does not show a significant improvement in the fit indices compared to the six-factor model. Therefore, there was no serious common method bias in Study 5.

As shown in Table 5, the results of correlation analyses indicated that illegitimate unpaid overtime was positively related to negative emotions ($r = 0.18$, $p < 0.001$) and negative emotions were positively related to FOB ($r = 0.17$, $p < 0.001$); FOB was positively related to work-life conflict ($r = 0.48$, $p < 0.001$) and work-life conflict was negatively related to positive affective work prospection ($r = -0.29$, $p < 0.001$). Therefore, the correlations between the main variables preliminary support our next step of hypothesis testing.

First, as shown in Table 6, the results of regression analyses indicated that illegitimate unpaid overtime was positively related to negative emotions (Model 1: $B = 0.19$, $p < 0.001$), and negative

emotions were positively related to FOB (Model 4: $B = 0.12$, $p < 0.01$). Hypotheses 1 and 2 were supported.

Second, as shown in Table 7, the results of mediation effects analysis indicated that the indirect effect of illegitimate unpaid overtime on FOB via negative emotions was significant [Effect = 0.02, SE = 0.01, 95% CI = (0.01, 0.05)]. The total effect was also significant [Effect = 0.10, SE = 0.05, 95% CI = (0.01, 0.19)]. Therefore, Hypothesis 3 was supported.

Subsequently, we tested the moderating effects in the hypothesized model. The results of regression analyses indicated (Table 6) that the interaction terms of illegitimate unpaid overtime and colleagues' extra effort were significantly and positively related to negative emotions (Model 2: $B = 0.15$, $p < 0.05$). Specifically, Hypothesis 4a suggests that colleagues' extra effort positively moderates the relationship between illegitimate unpaid overtime and negative emotions. We tested simple slopes for high levels of colleagues' extra effort (+1SD) and low levels of colleagues' extra effort (-1SD). When the level of colleagues' extra effort was low, the effect of illegitimate unpaid overtime on negative emotions was not significant [Effect = 0.04, SE = 0.08, $p > 0.05$, 95% CI = (-0.13, 0.20)]; when the level of colleagues' extra effort was high, the effect of illegitimate unpaid overtime on negative emotions was positively significant [Effect = 0.25, SE = 0.07, $p < 0.001$, 95% CI = (0.11, 0.39)]. We then explored the interaction effect using the Johnson-Neyman technique. As shown in Fig. 2, illegitimate unpaid overtime significantly and positively impacts negative emotions only when the value of colleagues' extra effort is greater than 3.81. These results further supported Hypothesis 4a.

Finally, we tested the moderated mediation model. As shown in Table 7, under conditions of low levels of colleagues' extra effort, the indirect effect of illegitimate unpaid overtime on FOB via negative emotions was not significant [Effect = 0.01, SE = 0.01, 95% CI = (-0.02, 0.02)]; under conditions of high levels of colleagues' extra effort, the indirect effect became significant

Table 6 Results of hierarchical regression analysis for antecedents and consequences of FOB^a.

Variable	NE		FOB		WLC	PAWP	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	B [SE]	B [SE]	B [SE]	B [SE]	B [SE]	B [SE]	B [SE]
Gender	0.05 [0.09]	-0.02 [0.09]	0.63 [0.07]***	0.62 [0.07]***	0.31 [0.08]***	-0.15 [0.10]	-0.11 [0.10]
IUO	0.19 [0.06]***	0.14 [0.06]*	0.10 [0.05]*	0.08 [0.05]			
	0.20 [0.06]***	0.14 [0.06]*	0.16 [0.05]**	0.13 [0.05]*			
CEE		0.21 [0.06]**					
		0.21 [0.06]**					
NE				0.12 [0.04]**			
				0.14 [0.05]**			
IUO × CEE		0.15 [0.07]*					
		0.15 [0.07]*					
FOB					0.39 [0.05]***	-0.45 [0.07]***	-0.39 [0.07]***
					0.49 [0.05]***	-0.49 [0.06]***	-0.41 [0.07]***
WLC							-0.15 [0.07]*
							-0.17 [0.07]*
R ²	0.03	0.06	0.21	0.23	0.26	0.16	0.17
	0.03	0.06	0.03	0.05	0.23	0.15	0.17
F	6.07**	6.08***	47.49***	35.23***	64.86***	34.53***	24.84***
	11.88***	8.12***	9.45**	9.03***	108.22***	66.39***	36.67***

^aBolded parts in the table are regression results without statistical controls. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; two-tailed.

Table 7 Results of mediation and moderation effects analysis.

Mediation model	Effect	Boot SE	[Boot LLCI, Boot ULCI]
IUO → NE → FOB			
Total effect	0.10	0.05	[0.01, 0.19]
Direct effect	0.08	0.05	[-0.02, 0.17]
Indirect effect	0.02	0.01	[0.01, 0.05]
FOB → WLC → PAWP			
Total effect	-0.45	0.07	[-0.58, -0.31]
Direct effect	-0.39	0.07	[-0.53, -0.25]
Indirect effect	-0.06	0.04	[-0.15, -0.01]
Moderated mediation model			
Low CEE (-1SD)	0.01	0.01	[-0.02, 0.02]
High CEE (+1SD)	0.03	0.01	[0.01, 0.06]
Difference between high and low	0.03	0.01	[0.01, 0.06]

[Effect = 0.03, SE = 0.01, 95% CI = (0.01, 0.06)]. Furthermore, the difference in the indirect effect was also significant in the high/low level of colleagues' extra effort conditions [Effect = 0.03, SE = 0.01, 95% CI = (0.01, 0.06)]. Therefore, Hypothesis 4b was supported.

Tests of predictive validity and incremental validity. The results of regression analyses indicated (Table 6) that, consistent with our hypotheses, FOB was positively related to work-life conflict (Model 5: $B = 0.39$, $p < 0.001$), and work-life conflict was negatively related to positive affective work prospection (Model 7: $B = -0.15$, $p < 0.05$). Therefore, Hypotheses 5 and 6 were supported. Additionally, as shown in Table 7, the indirect effect of FOB on positive affective work prospection via work-life conflict was significant [Effect = -0.06, SE = 0.04, 95% CI = (-0.15, -0.01)], and the total effect was also significant [Effect = -0.45, SE = 0.07, 95% CI = (-0.58, -0.31)], and Hypothesis 7 was supported. In summary, the correlation between FOB and criterion constructs was empirically established; that is, the predictive validity of FOB was supported.

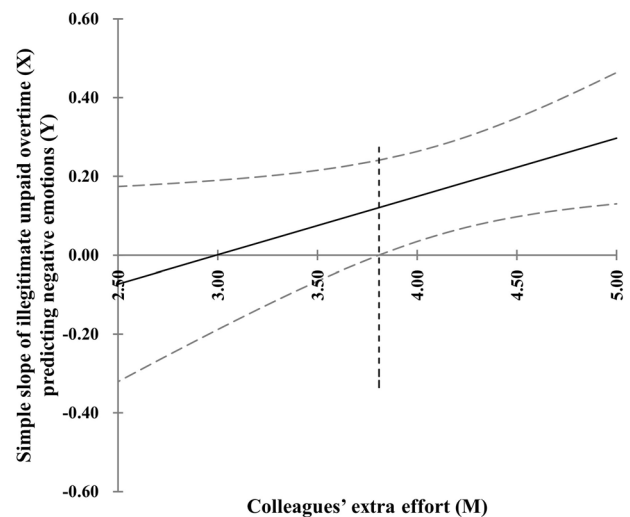


Fig. 2 Johnson-Neyman plot. The figure demonstrates the moderating effects of colleagues' extra effort on the relationship between illegitimate unpaid overtime and negative emotions.

Subsequently, we explored whether FOB explained incremental variance in the criterion variables after progressively controlling for gender and constructs similar to FOB (surface acting and facades of conformity). As shown in Table 8, after controlling for gender and similar constructs, FOB explained an additional 11% variance in work-life conflict (Model 3: $B = 0.39$, $\Delta R^2 = 0.11$, $p < 0.001$) and an additional 8% variance in positive affective work prospection (Model 6: $B = -0.41$, $\Delta R^2 = 0.08$, $p < 0.001$). Therefore, these results provide evidence supporting the incremental validity of FOB.

Discussion

To enrich the application of impression management tactics in a specific temporal context, this study systematically conceptualizes an impression management tactic that we term FOB: employees' participation in performative work efforts during unpaid

Table 8 Results of incremental validity analysis^a.

Variable	WLC			PAWP		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	B [SE]	B [SE]	B [SE]	B [SE]	B [SE]	B [SE]
Gender	0.56 [0.07]***	0.52 [0.07]***	0.30 [0.08]***	-0.44 [0.09]***	-0.35 [0.10]***	-0.12 [0.10]
SA		0.01 [0.04]	-0.06 [0.04]		-0.08 [0.05]	-0.02 [0.05]
FOC		0.07 [0.04]	-0.04 [0.04]		-0.12 [0.05]*	-0.02 [0.05]
FOB		0.16 [0.05]***	0.11 [0.04]**		-0.21 [0.06]***	-0.17 [0.06]**
		0.21 [0.05]***	0.13 [0.05]**		-0.25 [0.06]***	-0.17 [0.06]**
			0.39 [0.05]***			-0.41 [0.07]***
			0.47 [0.05]***			-0.44 [0.06]***
R ²	0.14	0.17	0.28	0.06	0.10	0.18
ΔR ²		0.06	0.25		0.07	0.18
		0.03**	0.11***		0.04***	0.08***
			0.19***			0.11***
F	60.66***	24.77***	35.12***	22.46***	13.49***	19.74***
		11.47***	39.68***		13.20***	25.76***

^aBolded parts in the table are regression results without statistical controls.

overtime. Although FOB has received widespread attention in practice, academic research still lacks focus. We drew on stress and impression management theories to establish a conceptual foundation for FOB and developed a six-item scale to stimulate studies in this area. The results of data analysis from five studies provide evidence for the reliability and validity of the FOB scale. Furthermore, we have developed the nomological network of FOB preliminarily. In the study of its antecedents, boundary conditions, and consequences, we found that illegitimate unpaid overtime exacerbates employees' negative emotions, especially for those who perceive high levels of colleagues' extra effort, leading to FOB. Moreover, FOB exacerbates employees' work-life conflict that night, diminishing positive affective work prospection before starting work the next day.

Theoretical contributions. This study provides several theoretical contributions. First, we enrich the study of unpaid overtime. Despite unpaid overtime already occupying the same important position as other working time contexts, researchers still pay insufficient attention to unpaid overtime. The limited relevant literature primarily focuses on the impact of unpaid overtime on employee well-being (Beckers et al., 2008; Kawaguchi and Kasai, 2016; Shahidi et al., 2024). However, the current studies have mostly stayed with this result and stopped short. We draw researchers' attention to the fact that stress in organizations is inevitable, yet the strength of stress is differentiated. Therefore, besides minimizing stress as much as possible, it is more important to focus on how employees respond to stress to alleviate its negative effects better (Glazer and Liu, 2017). This study highlights the importance of considering behavioral adaptations when exploring stressful situations caused by illegitimate work hours and urges researchers to focus on the unique work time context, such as unpaid overtime. Thus, by clarifying the connotation of FOB and how it differs from similar concepts, this study contributes to a deeper understanding of how employees balance organizationally expected work effort and unpaid work in real-world situations.

Second, this study contributes to the impression management literature. Previous studies have typically focused on impression management tactics that maximize expected rewards, such as ingratiation and self-promotion (Bolino et al., 2016). However, employees' impression management tactics typically are used in varying degrees of combination (Bolino and Turnley, 2003). By systematically exploring impression management behaviors like

FOB, which contain multiple impression management tactics and embody paradoxical characteristics, we respond to the recommendations of related studies on the combined application of impression management tactics (Bolino et al., 2016) and provide new insights into how employees flexibly apply and combine multiple impression management tactics in stressful situations. Furthermore, we emphasized FOB's deceptive affective undertones (Bolino et al., 2016) and revealed how employees use impression management tactics within a specific work time frame to shape their self-impression and thus cope with stress. Therefore, this study expands the application of impression management tactics in non-interview situations and provides new study directions for the further development of impression management theory.

Third, by preliminary building the nomological network of FOB, we explored why FOB occurs in the workplace and what impact it can have on employees. Findings suggest that FOB is more likely to occur in work contexts with illegitimate unpaid overtime, as work arrangements that offend employees create stronger negative emotions (Semmer et al., 2015), motivating them to participate in actions to protect their interests. This finding emphasizes that unpaid overtime may not directly lead to FOB and that illegitimate or meaningless unpaid overtime is the critical antecedent of FOB (Niu and Yang, 2022). Our results echo the literature on illegitimate tasks (Ding and Kuvaas, 2023), contribute to generating insights into organizations' competitive environment and illegitimate work arrangements, and examine the psychological mechanisms behind this relationship. Furthermore, this study's results emphasize the negative impact of FOB on employees. We demonstrate the depletion of employees' psychological resources by impression management tactics through empirical data, and this contributes to exploring the negative effects of impression management tactics on employees, which has received little attention in previous studies (Bolino et al., 2016).

In fact, FOB has already received widespread attention from the media and practitioners; however, scholarly attention to this surface behavior remains very limited. Starting from a practice context and using stress and impression management theories as conceptual foundations, we describe the behaviors that constitute FOB and highlight how these behaviors differ from related concepts, providing more solid evidence for the connotation of FOB in as rigorous and scientific approach as possible. Additionally, we sought to explore why FOB arises and why it

is related to negative consequences for employees. In the process, we utilize theory and empirical evidence to illuminate practice-relevant phenomena, contributing to bridging the widening gap between academic studies and practical situations.

Practical implications. This study's findings also have several practical implications. First, by clarifying the connotations of FOB and developing the measurements, we categorized FOB as a unique form of impression management tactic and emphasized that FOB has a deceptive affective undertone. As a result, this study contributes to managers' correct understanding of the nature of FOB, that is, slacking off under the guise of work effort, and a more comprehensive understanding of employee behavior during unpaid overtime, which in turn facilitates managers to pay attention to and identify the possible existence of FOB in the organization.

To help managers effectively identify FOB, organizations can conduct targeted training through case studies and workshops. For example, using real videos containing FOB or role-playing activities to make managers familiar with the manifestations of FOB. Meanwhile, organizations can introduce a multidimensional feedback mechanism (Niu and Yang, 2022), combining the integrated employee evaluation by their direct supervisors, colleagues, and customers to comprehensively measure employee performance. For example, organizations can establish an online feedback platform that allows multiple subjects to provide feedback on employees, thus evaluating employees' performance more comprehensively. Furthermore, based on this study's results, the primary reasons for employees' participation in FOB are that organizations consider working hours a critical indicator for performance appraisal and that employees' direct supervisors have excessive discourse power in performance appraisal (Guo et al., 2021). Therefore, organizations should optimize the performance appraisal system, weaken the focus on working hours, and establish an evaluation system centered on target achievement and task completion quality.

Second, by exploring the nomological network of FOB, we situate FOB in the particular time frame of unpaid overtime and systematically analyze the critical antecedents and potential negative consequences of FOB. In this regard, this study contributes to developing more reasonable working hours and overtime policies in organizations and guides managers to pay attention to employees' stress status and psychological health so that targeted approaches can be taken to optimize the HRM practices of companies. Specifically, organizations should formulate a clear policy on matching working hours with the content of tasks and rationally arranging working hours based on the importance and urgency of tasks to avoid unnecessary overtime (Yu and Leka, 2022). For example, in project management, work tasks can be broken down into short-term goals to ensure that employees can efficiently complete critical tasks within normal working hours, thus reducing overtime. Meanwhile, organizations can periodically evaluate and reward employees who complete high-quality tasks within regular working hours, establishing an organizational culture of "efficiency first" and weakening the stereotypical perception of "overtime = effort" (Kang et al., 2017). For example, setting up an "efficient employee award" to recognize and reward employees who complete their tasks within the specified time and do not rely on overtime work, which in turn motivates employees to focus more on work efficiency than overtime hours. Importantly, managers should also follow the principle of work-life balance and set a positive example for their employees by rationalizing work and rest time for themselves.

Furthermore, to balance the need for productivity with the ethical treatment of employees, organizations require establishing

the management principle of "employees first" and placing the rights and well-being of employees at the forefront. Employees are the basis for achieving production goals and the core driving force for organizational development (Yang and Zhang, 2025). To this end, organizations can optimize work processes and improve work efficiency to meet production needs rather than relying solely on increasing employees' working hours (Yu and Leka, 2022). For example, introducing advanced production technologies and management methods to rationally assign work tasks ensures that employees can complete their work efficiently during normal working hours. Additionally, organizations can enhance employees' job satisfaction and loyalty by increasing their sense of participation and decision-making power. For example, by inviting employee representatives to participate in senior management meetings or collecting employee feedback on work arrangements and overtime policies via questionnaires and suggestion boxes so that employees can experience that their voices are valued, thus enhancing organizational identification and ultimately achieving mutual growth and development of the organization and its employees.

Most importantly, we aim to awaken society's attention to unpaid overtime and FOB through this study. Chinese organizational culture has long been viewed as having high-power distance and collectivist tendencies (Chen et al., 2023), which tends to breed formalism and bureaucracy. Although the current climate in Chinese organizations is gradually becoming more egalitarian (Li and Yang, 2023), this study emphasizes that the nature of FOB results from a failure to reconcile conflicts and contradictions between managers and employees. Currently, managers in organizations are still primarily age-old, and older employees tend to react more positively to bureaucratic culture (Bellou, 2010), which leads to a collision of values between managers and employees (Kang et al., 2017). As mentioned earlier, FOB is prevalent in current Chinese organizations (Niu and Yang, 2022); however, to our knowledge, this work is the first paper to provide a systematic study of FOB. We hope this study will awaken society's attention to this "malformation" phenomenon. Commuting on time is a right that all employees should enjoy and is protected by law, but we would like to ask: At present, how many employees can get off work at 6 pm on time?

Limitations and future research directions. Like all studies, this study has some limitations. First, although this study systematically defines the conceptual boundaries of FOB and develops measures for it, its theoretical framework and empirical findings are primarily based on China's organizational context of high-power distance, collectivism, and the prevalence of unpaid overtime. It is worth emphasizing that, due to the prevalence of telecommuting technology and the development of the gig economy, unpaid overtime in Western organizations probably relies primarily on "flexible working" or "telecommuting," resulting in a shift in the occurrence of FOB from the physical environment to the online. For example, deliberately prolonging online status and frequently carbon copying emails. Furthermore, in low-power distance cultures, employees typically reject unpaid overtime directly, and in high-individualism cultures, FOB may manifest itself as a "performance pretense" (for example, exaggerating work outcomes). Thus, FOB may be influenced by differences in cultural values and mutate in Western organizational contexts. We encourage future studies to further test the cross-cultural applicability of FOB and to explore the differences in its manifestation in various cultural contexts.

Second, although our theoretical model emphasizes relational pathways linking work characteristics and competitive environments to FOB, there are probably other critical antecedent

mechanisms. For example, ambiguous performance appraisal systems are also likely to be a critical factor contributing to employee participation in FOB. When the performance appraisal system is unclear, employees are likely to focus more on work hours than work outcomes or view unpaid overtime as a sign of loyalty and effort. In other words, employees are forced to cater to their supervisors' expectations through FOB, even when it is clear that these behaviors are not meaningful. Therefore, future studies should enrich the potential antecedent mechanisms of FOB based on our theoretical model to develop a more comprehensive theoretical framework.

Third, future studies could examine the potential benefits of FOB. In this study, we focused more on the depletion of employees' internal resources due to FOB's "performative" characteristics; however, FOB is still essentially an impression management tactic. Therefore, we hypothesize that when the impression management target positively evaluates FOB, it probably contributes to employees' positive performance at regular work (Bolino et al., 2016). Furthermore, as a slacking behavior, FOB also promotes employees' detachment from their work during unpaid overtime (Lim and Teo, 2024), except the degree of detachment is probably lower than during breaks. Thus, future studies could focus on the positive effects of FOB on employees' resource recovery. Finally, given the covert character of FOB, this study relied primarily on employee self-report data. Future studies could incorporate multiple data sources, such as evaluations from colleagues and supervisors, to reduce common method bias. Additionally, the time-lagged and cross-sectional survey design did not allow us to rule out the possibility of reverse causality, especially regarding the antecedents and consequences of FOB. Therefore, future studies could use longitudinal or experimental designs to better capture the dynamic characteristics of FOB and thus provide more favorable causal evidence for the antecedents and consequences of FOB.

Conclusion

This study introduces employees' "performative" behaviors during unpaid overtime into the impression management literature and provides a clear conceptualization and scientific measurement of formalistic overtime behaviors. Furthermore, we explore how work characteristics and competitive environments, as common stressors, influence the mechanisms employees choose impression management behaviors as stress-coping tactics and the effects of such impression management behaviors on employees internally. This study contributes to managers and researchers more clearly identifying and examining impression management behaviors in particular temporal contexts. We hope this work can stimulate future studies to focus on this topic and provide a more comprehensive understanding of this important but neglected impression management behavior, and how to optimize working time and overtime policy arrangements in organizations.

Data availability

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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References

Alberts HJEM, Schneider F, Martijn C (2012) Dealing efficiently with emotions: acceptance-based coping with negative emotions requires fewer resources

- than suppression. *Cogn Emot* 26(5):863–870. <https://doi.org/10.1080/02699931.2011.625402>
- Anderson JC, Gerbing DW (1991) Predicting the performance of measures in a confirmatory factor analysis with a pretest assessment of their substantive validities. *J Appl Psychol* 76(5):732–740. <https://doi.org/10.1037/0021-9010.76.5.732>
- Baumeister RF, Maranges HM, Sjästad H (2018) Consciousness of the future as a matrix of maybe: pragmatic prospection and the simulation of alternative possibilities. *Psychol Conscious* 5(3):223–238. <https://doi.org/10.1037/cns0000154>
- Beckers DGJ, van der Linden D, Smulders PGW et al. (2008) Voluntary or involuntary? Control over overtime and rewards for overtime in relation to fatigue and work satisfaction. *Work Stress* 22(1):33–50. <https://doi.org/10.1080/02678370801984927>
- Bellou V (2010) Organizational culture as a predictor of job satisfaction: the role of gender and age. *Career Dev Int* 15(1):4–19. <https://doi.org/10.1108/13620431011020862>
- Bolino M, Long D, Turnley W (2016) Impression management in organizations: critical questions, answers, and areas for future research. *Annu Rev Organ Psychol Organ Behav* 3:377–406. <https://doi.org/10.1146/annurev-orgpsych-041015-062337>
- Bolino MC, Turnley WH (1999) Measuring impression management in organizations: a scale development based on the Jones and Pittman taxonomy. *Organ Res Methods* 2(2):187–206. <https://doi.org/10.1177/109442819922005>
- Bolino MC, Turnley WH (2003) More than one way to make an impression: exploring profiles of impression management. *J Manag* 29(2):141–160. [https://doi.org/10.1016/S0149-2063\(02\)00212-X](https://doi.org/10.1016/S0149-2063(02)00212-X)
- Bourdage JS, Roulin N, Tarraf R (2018) "I (might be) just that good": honest and deceptive impression management in employment interviews. *Percept Psychol* 71(4):597–632. <https://doi.org/10.1111/peps.12285>
- Brotheridge CM, Lee RT (2003) Development and validation of the emotional labour scale. *J Occup Organ Psychol* 76(3):365–379. <https://doi.org/10.1348/096317903769647229>
- Byrne ZS, Peters JM, Weston JW (2016) The struggle with employee engagement: measures and construct clarification using five samples. *J Appl Psychol* 101(9):1201–1227. <https://doi.org/10.1037/apl0000124>
- Campbell DT, Fiske DW (1959) Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychol Bull* 56(2):81–105. <https://doi.org/10.1037/h0046016>
- Campbell I (2007) Long working hours in Australia: working-time regulation and employer pressures. *Econ Labour Relat Rev* 17(2):37–68. <https://doi.org/10.1177/103530460701700203>
- Carpenter S (2018) Ten steps in scale development and reporting: a guide for researchers. *Commun Methods Meas* 12(1):25–44. <https://doi.org/10.1080/19312458.2017.1396583>
- Chen P, Xu Y, Sparrow P et al. (2023) Compulsory citizenship behaviour and work-family conflict: a moderated mediation model. *Curr Psychol* 42(8):6641–6652. <https://doi.org/10.1007/s12144-021-01973-4>
- Clark MA, Smith RW, Haynes NJ (2020) The Multidimensional Workaholism Scale: linking the conceptualization and measurement of workaholism. *J Appl Psychol* 105(11):1281–1307. <https://doi.org/10.1037/apl0000484>
- Cole M, Stuart M, Hardy K et al. (2024) Wage theft and the struggle over the working day in hospitality work: a typology of unpaid labour time. *Work Employ Soc* 38(1):103–121. <https://doi.org/10.1177/09500170221111719>
- Collins RL (1996) For better or worse: the impact of upward social comparison on self-evaluations. *Psychol Bull* 119(1):51–69. <https://doi.org/10.1037/0033-2909.119.1.51>
- Colquitt JA, Sabey TB, Rodell JB et al. (2019) Content validation guidelines: evaluation criteria for definitional correspondence and definitional distinctiveness. *J Appl Psychol* 104(10):1243–1265. <https://doi.org/10.1037/apl0000406>
- Cui L, Tang G, Huang M (2022) Expressive suppression, Confucian Zhong Yong thinking, and psychosocial adjustment among Chinese young adults. *Asian J Soc Psychol* 25(4):715–730. <https://doi.org/10.1111/ajsp.12529>
- Daniela T, Alessandro C, Giuseppe C et al. (2010) Lack of sleep affects the evaluation of emotional stimuli. *Brain Res Bull* 82(1–2):104–108. <https://doi.org/10.1016/j.brainresbull.2010.01.014>
- De Cooman R, De Gieter S, Pepermans R et al. (2009) Development and validation of the work effort scale. *Eur J Psychol Assess* 25(4):266–273. <https://doi.org/10.1027/1015-5759.25.4.266>
- Del Ponte A, Li L, Ang L et al. (2024) Evaluating SoJump.com as a tool for online behavioral research in China. *J Behav Exp Financ* 41:100905. <https://doi.org/10.1016/j.jbef.2024.100905>
- Ding H, Kuvaas B (2023) Illegitimate tasks: a systematic literature review and agenda for future research. *Work Stress* 37(3):397–420. <https://doi.org/10.1080/02678373.2022.2148308>
- Fisher GG, Bulger CA, Smith CS (2009) Beyond work and family: a measure of work/nonwork interference and enhancement. *J Occup Health Psychol* 14(4):441–456. <https://doi.org/10.1037/a0016737>
- Fornell C, Larcker DF (1981) Structural equation models with unobservable variables and measurement error: algebra and statistics. *J Mark Res* 18(3):382–388. <https://doi.org/10.2307/3150980>

- Gajendran RS, Mistry S, Tangirala S (2024) Managing Your Boss (MYB) as a proactive followership behavior: construct validation and theory development. *Pers Psychol* 77(2):375–410. <https://doi.org/10.1111/peps.12545>
- Gardner WL, Martinko MJ (1988) Impression management in organizations. *J Manag* 14(2):321–338. <https://doi.org/10.1177/014920638801400210>
- Gisler S, Omansky R, Alenick PR et al. (2018) Work-life conflict and employee health: a review. *J Appl Biobehav Res* 23(4):e12157. <https://doi.org/10.1111/jabr.12157>
- Glazer S, Liu C (2017) Work, stress, coping, and stress management. In: Oxford research encyclopedia of psychology. Oxford University Press. <https://doi.org/10.1093/acrefore/9780190236557.013.30>
- Goffman E (1959) The presentation of self in everyday life. Knopf Doubleday Publishing Group, New York
- Guo L, Mao JY, Chiang JTY et al. (2021) Working hard or hardly working? How supervisor's liking of employee affects interpretations of employee working overtime and performance ratings. *Asia Pac J Manag* 38(4):1561–1586. <https://doi.org/10.1007/s10490-020-09715-z>
- Hanisch KA, Hulin CL (1990) Job attitudes and organizational withdrawal: an examination of retirement and other voluntary withdrawal behaviors. *J Vocat Behav* 37(1):60–78. [https://doi.org/10.1016/0001-8791\(90\)90007-O](https://doi.org/10.1016/0001-8791(90)90007-O)
- Hart JW, Bridgett DJ, Karau SJ (2001) Coworker ability and effort as determinants of individual effort on a collective task. *Group Dyn -Theory Res Pr* 5(3):181–190. <https://doi.org/10.1037/1089-2699.5.3.181>
- He P, Peng Z, Zhao H et al. (2019) How and when compulsory citizenship behavior leads to employee silence: a moderated mediation model based on moral disengagement and supervisor-subordinate guanxi views. *J Bus Ethics* 155(1):259–274. <https://doi.org/10.1007/s10551-017-3550-2>
- Hewlin PF (2003) And the award for best actor goes to...: facades of conformity in organizational settings. *Acad Manag Rev* 28(4):633–642. <https://doi.org/10.5465/amr.2003.10899442>
- Hewlin PF (2009) Wearing the cloak: antecedents and consequences of creating facades of conformity. *J Appl Psychol* 94(3):727–741. <https://doi.org/10.1037/a0015228>
- Hinkin TR (1998) A brief tutorial on the development of measures for use in survey questionnaires. *Organ Res Methods* 1(1):104–121. <https://doi.org/10.1177/109442819800100106>
- Hinkin TR, Tracey JB (1999) An analysis of variance approach to content validation. *Organ Res Methods* 2(2):175–186. <https://doi.org/10.1177/10944281992004>
- Ioannides A, Oxouzi E, Mavroudeas S (2014) All work and no...pay? Unpaid overtime in Greece: determining factors and theoretical explanations. *Ind Relat J* 45(1):39–55. <https://doi.org/10.1111/irj.12041>
- Jo Y, Lee D (2022) Activated at home but deactivated at work: how daily mobile work leads to next-day psychological withdrawal behavior. *J Organ Behav* 43(1):1–16. <https://doi.org/10.1002/job.2563>
- Kamran K, Azam A, Atif MM (2022) Supervisor bottom-line mentality, performance pressure, and workplace cheating: moderating role of negative reciprocity. *Front Psychol* 13:801283. <https://doi.org/10.3389/fpsyg.2022.801283>
- Kang JH, Matusik JG, Barclay LA (2017) Affective and normative motives to work overtime in Asian organizations: four cultural orientations from Confucian ethics. *J Bus Ethics* 140(1):115–130. <https://doi.org/10.1007/s10551-015-2683-4>
- Kawaguchi A, Kasai T (2016) Effects of paid and unpaid overtime work on stress, earnings, and happiness. In: Tachibanaki T (ed) *Advances in happiness research*. Springer, Tokyo, p 183–203. https://doi.org/10.1007/978-4-431-55753-1_11
- Klotz AC, Swider BW, Kwon SH (2023) Back-translation practices in organizational research: avoiding loss in translation. *J Appl Psychol* 108(5):699–727. <https://doi.org/10.1037/apl0001050>
- Koster F, Fleischmann M (2017) Under pressure: an international comparison of job security, social security, and extra effort. *Int J Socio Soc Policy* 37(13/14):823–839. <https://doi.org/10.1108/IJSSP-03-2016-0031>
- Leary MR, Kowalski RM (1990) Impression management: a literature review and two-component model. *Psychol Bull* 107(1):34–47. <https://doi.org/10.1037/0033-2909.107.1.34>
- Lehman WE, Simpson DD (1992) Employee substance use and on-the-job behaviors. *J Appl Psychol* 77(3):309–321. <https://doi.org/10.1037/0021-9010.77.3.309>
- Levashina J, Campion MA (2007) Measuring faking in the employment interview: development and validation of an interview faking behavior scale. *J Appl Psychol* 92(6):1638–1656. <https://doi.org/10.1037/0021-9010.92.6.1638>
- Li X, Yang P (2023) Facilitate or diminish? Mechanisms of perceived organizational support on employee experience of new generation employees. *Psychol Rep*. <https://doi.org/10.1177/00332941231183621>
- Lim VKG (2002) The IT way of loafing on the job: cyberloafing, neutralizing and organizational justice. *J Organ Behav* 23(5):675–694. <https://doi.org/10.1002/job.161>
- Lim VKG, Teo TSH (2024) Cyberloafing: a review and research agenda. *Appl Psychol -Int Rev* 73(1):441–484. <https://doi.org/10.1111/apps.12452>
- Macdonald F (2024) Taking up the right to disconnect? Unsatisfactory working hours and unpaid overtime. <https://futurework.org.au/report/taking-up-the-right-to-disconnect-unsatisfactory-working-hours-and-unpaid-overtime/>. Accessed 30 Mar 2025
- Mazzoni G (2019) Involuntary memories and involuntary future thinking differently tax cognitive resources. *Psychol Res-Psychol Forsch* 83:684–697. <https://doi.org/10.1007/s00426-018-1123-3>
- McClellan E, Collins CJ (2011) High-commitment HR practices, employee effort, and firm performance: investigating the effects of HR practices across employee groups within professional services firms. *Hum Resour Manag* 50(3):341–363. <https://doi.org/10.1002/hrm.20429>
- Meldrum RC, Restivo E (2014) The behavioral and health consequences of sleep deprivation among US high school students: relative deprivation matters. *Prev Med* 63:24–28. <https://doi.org/10.1016/j.ypmed.2014.03.006>
- Mitchell MS, Baer MD, Ambrose ML et al. (2018) Cheating under pressure: a self-protection model of workplace cheating behavior. *J Appl Psychol* 103(1):54–73. <https://doi.org/10.1037/apl0000254>
- Morgado FFR, Meireles JFF, Neves CM et al. (2018) Scale development: ten main limitations and recommendations to improve future research practices. *Psicol -Reflex Crit* 30:3. <https://doi.org/10.1186/s41155-016-0057-1>
- Nauman S, Zheng C, Basit AA (2021) How despotic leadership jeopardizes employees' performance: the roles of quality of work life and work withdrawal. *Leadersh Org Dev J* 42(1):1–16. <https://doi.org/10.1108/LODJ-11-2019-0476>
- Niu L, Yang Z (2022) Impact of performance climate on overtime behaviors of new generation employees: the moderating effect of perceived employability and mediating role of job insecurity. *Psychol Res Behav Manag* 15:3733–3749. <https://doi.org/10.2147/PRBM.S390051>
- Nurmi JE (2005) Thinking about and acting upon the future: development of future orientation across the life span. In: Alan S, Jeff J (eds) *Understanding behavior in the context of time*. Psychology Press, New York, p 31–57
- Ozcelik H (2013) An empirical analysis of surface acting in intra-organizational relationships. *J Organ Behav* 34(3):291–309. <https://doi.org/10.1002/job.1798>
- Papagiannaki E (2014) Rising unpaid overtime: a critical approach to existing theories. *Int J Manag Concepts Philos* 8(1):68–88. <https://doi.org/10.1504/IJMCP.2014.059051>
- Parker SK, Wang Y, Liao J (2019) When is proactivity wise? A review of factors that influence the individual outcomes of proactive behavior. *Annu Rev Organ Psychol Organ Behav* 6:221–248. <https://doi.org/10.1146/annurev-orgpsych-012218-015302>
- People's Daily Online (2021) Who is harmed by “formalistic overtime”? <http://ln.people.com.cn/n2/2021/0226/c400014-34595081.html>. Accessed 30 Mar 2025
- Powell DM, Bourdage JS, Bonaccio S (2021) Shake and fake: the role of interview anxiety in deceptive impression management. *J Bus Psychol* 36(5):829–840. <https://doi.org/10.1007/s10869-020-09708-1>
- Qin G, Zhang L (2024) How compulsory citizenship behavior depletes individual resources—a moderated mediation model. *Curr Psychol* 43(2):969–983. <https://doi.org/10.1007/s12144-023-04386-7>
- Roulin N, Bangerter A, Levashina J (2015) Honest and deceptive impression management in the employment interview: can it be detected and how does it impact evaluations? *Pers Psychol* 68(2):395–444. <https://doi.org/10.1111/peps.12079>
- Rutten RL, Hülsheger UR, Zijlstra FRH (2022) Does looking forward set you back? Development and validation of the work prospection scale. *Eur J Work Organ Psychol* 31(6):922–939. <https://doi.org/10.1080/1359432X.2022.2080058>
- Semmer NK, Jacobshagen N, Meier LL et al. (2015) Illegitimate tasks as a source of work stress. *Work Stress* 29(1):32–56. <https://doi.org/10.1080/02678373.2014.1003996>
- Semmer NK, Tschan F, Jacobshagen N et al. (2019) Stress as offense to self: a promising approach comes of age. *Occup Health Sci* 3(3):205–238. <https://doi.org/10.1007/s41542-019-00041-5>
- Semmer NK, Tschan F, Meier LL et al. (2010) Illegitimate tasks and counter-productive work behavior. *Appl Psychol -Int Rev* 59(1):70–96. <https://doi.org/10.1111/j.1464-0597.2009.00416.x>
- Shaffer JA, DeGeest D, Li A (2016) Tackling the problem of construct proliferation: a guide to assessing the discriminant validity of conceptually related constructs. *Organ Res Methods* 19(1):80–110. <https://doi.org/10.1177/1094428115598239>
- Shahidi FV, Tracey M, Gignac MAM et al. (2024) Unpaid overtime and mental health in the Canadian working population. *Am J Ind Med* 67(8):741–752. <https://doi.org/10.1002/ajim.23622>
- Sirgy MJ, Lee DJ (2018) Work-life balance: an integrative review. *Appl Res Qual Life* 13(1):229–254. <https://doi.org/10.1007/s11482-017-9509-8>
- Skinner N, Pocock B (2008) Work-life conflict: is work time or work overload more important? *Asia Pac J Hum Resour* 46(3):303–315. <https://doi.org/10.1177/103841108095761>
- Sonntag S, Cheng BH, Parker SL (2022) Recovery from work: advancing the field toward the future. *Annu Rev Organ Psychol Organ Behav* 9:33–60. <https://doi.org/10.1146/annurev-orgpsych-012420-091355>

- Spector PE, Fox S (2002) An emotion-centered model of voluntary work behavior: some parallels between counterproductive work behavior and organizational citizenship behavior. *Hum Resour Manag Rev* 12(2):269–292. [https://doi.org/10.1016/S1053-4822\(02\)00049-9](https://doi.org/10.1016/S1053-4822(02)00049-9)
- Spector PE, Fox S (2005) The stressor-emotion model of counterproductive work behavior. In: Fox S, Spector PE (eds) *Counterproductive work behavior: investigations of actors and targets*. American Psychological Association, Washington, DC, p 151–174
- Statistics Canada (2023) Archived-employees working overtime (weekly) by occupation, annual, inactive (>1000). <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410030901>. Accessed 30 Mar 2025
- Sun S (2022) Is political skill always beneficial? Why and when politically skilled employees become targets of coworker social undermining. *Organ Sci* 33(3):1142–1162. <https://doi.org/10.1287/orsc.2021.1476>
- Tsai MC, Nitta M, Kim SW et al. (2016) Working overtime in East Asia: convergence or divergence? *J Contemp Asia* 46(4):700–722. <https://doi.org/10.1080/00472336.2016.1144778>
- Tseng FT (2011) Determinants of unpaid overtime: exploring this phenomenon from the perspective of the embeddedness theory. *Afr J Bus Manag* 5(34):13136–13145. <https://doi.org/10.5897/AJBM11.491>
- Van Katwyk PT, Fox S, Spector PE et al. (2000) Using the Job-Related Affective Well-Being Scale (JAWS) to investigate affective responses to work stressors. *J Occup Health Psychol* 5(2):219–230. <https://doi.org/10.1037/1076-8998.5.2.219>
- Wang J, Li C, Meng X et al. (2021) Validation of the Chinese version of the procrastination at work scale. *Front Psychol* 12:726595. <https://doi.org/10.3389/fpsyg.2021.726595>
- Ward MK, Meade AW (2023) Dealing with careless responding in survey data: prevention, identification, and recommended best practices. *Annu Rev Psychol* 74:577–596. <https://doi.org/10.1146/annurev-psych-040422-045007>
- Watson D, Clark LA, Tellegen A (1988) Development and validation of brief measures of positive and negative affect: the PANAS scales. *J Pers Soc Psychol* 54(6):1063–1070. <https://doi.org/10.1037/0022-3514.54.6.1063>
- Yang P, Zhang S (2025) Employee experience: conceptualization, scale development, and validation. *Hum Soc Sci Commun* 12:605. <https://doi.org/10.1057/s41599-025-04926-5>
- Yin J, Ji Y, Ni Y (2023) Does “Nei Juan” affect “Tang Ping” for hotel employees? The moderating effect of effort-reward imbalance. *Int J Hosp Manag* 109:103421. <https://doi.org/10.1016/j.ijhm.2022.103421>
- Yu J, Leka S (2022) Where is the limit for overtime? Impacts of overtime on employees’ mental health and potential solutions: a qualitative study in China. *Front Psychol* 13:976723. <https://doi.org/10.3389/fpsyg.2022.976723>
- Zhao L, Lam LW, Zhu JNY et al. (2022) Doing it purposely? Mediation of moral disengagement in the relationship between illegitimate tasks and counterproductive work behavior. *J Bus Ethics* 179(3):733–747. <https://doi.org/10.1007/s10551-021-04848-7>
- Zhaopin (2024) 2024 employment relationship trends report: reconstructing growth pathways in the new quality workplace. https://mp.weixin.qq.com/s/FA5SVLhE9KpMC3zG_VIgEQ. Accessed 30 Mar 2025
- Zhou B, Li Y, Hai M et al. (2023) Challenge-hindrance stressors and cyberloafing: a perspective of resource conservation versus resource acquisition. *Curr Psychol* 42(2):1172–1181. <https://doi.org/10.1007/s12144-021-01505-0>

Author contributions

PY: Conceptualization, Methodology, Validation, Formal analysis, Writing—Original Draft, Writing—Review & Editing, Funding acquisition. SZ: Investigation, Data Curation, Writing—Original Draft, Writing—Review & Editing, Funding acquisition, Visualization.

Competing interests

The authors declare no competing interests.

Ethical approval

All procedures performed in this study adhere to the ethical standards of the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

According to the Measures for the Ethical Review of Life Science and Medical Research Involving Human Beings (https://www.gov.cn/zhengce/zhengceku/2023-02/28/content_5743658.htm) promulgated by China (Article 32: Research that does not cause harm to humans, and does not involve sensitive personal information or commercial interests can be exempted from ethical review), the Institutional Review Board (IRB) of the School of Economics and Management, Shanxi University, confirmed the exemption. Specifically, this study does not involve special categories such as minors, individuals with disabilities, prisoners, or other vulnerable populations, and the questions in the questionnaire have no adverse effects on the mental health status of the respondents. Furthermore, this study uses anonymized data to conduct studies, causes no harm to the human body, and involves neither sensitive personal information nor commercial interests. Therefore, this study was reviewed and granted exemption from ethical approval by the Institutional Review Board of the School of Economics and Management, Shanxi University on October 31, 2024 (no exemption number was issued).

Informed consent

We performed all questionnaires involved in this study from November 2024 to January 2025 via the online survey platform Credamo (<https://www.credamo.cc/#/>). Informed consent was obtained through a confirmation question embedded at the beginning of the online questionnaire. On the first page of every online survey, we informed participants about the study’s purpose, the scope of data usage, the confidentiality and anonymity of the information offered, the voluntary of their participation, and the right to withdraw from the study at any time. Participants were required to read this information and confirm their consent before they were allowed to proceed with the survey. Therefore, the data for this study was obtained with the consent of the participants. Specifically, participants were assured that their anonymity and confidentiality would be strictly protected, with no personally identifiable information collected. At the same time, we informed all participants that their responses would be used solely for academic purposes and that the dataset would be strictly handled and stored by the authors, without any risk involved. Participants were fully informed that participation was entirely voluntary and that they could withdraw at any time without penalty. The consent covered participation in the study, use of collected data for research purposes, and permission to publish aggregated research findings. Furthermore, this study did not recruit any vulnerable individuals or minors. All data were de-identified during the collection and processing stages and were used solely for research analysis. Importantly, this study involved no interventions and therefore posed no risk to participants.

Additional information

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