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How coworker proactive behavior drives employee bootlegging: The roles of goal orientation and self-construal

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Abstract

Unauthorized, proactive innovative behavior (i.e., bootlegging) is increasingly recognized as an important driver of innovation. Although existing research has predominantly focused on explaining the emergence of bootlegging through formal influences (e.g., leadership and organizational practices), less attention has been paid to the impact of informal influences, particularly proactive coworkers. Integrating social comparison theory and goal orientation literature, we propose that coworker proactive behavior can drive bootlegging through assimilation and contrast mechanisms. Specifically, assimilation occurs in individuals with an interdependent self-construal, fostering a learning goal orientation (LGO). The contrast mechanism operates in individuals with an interdependent self-construal, activating a performance-avoid goal orientation (PAGO). We conducted (i) an experimental–causal chain design (Study 1A, $N = 389$; Study 1B, $N = 173$; and Study 1C, $N = 225$) and (ii) a three-wave, time-lagged study (Study 2, $N = 295$) to test the full theoretical model. The results show that the interactive effect of coworker proactive behavior and interdependent self-construal fosters LGO, leading to

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bootlegging. The interactive effect of coworker proactive behavior and independent self-construal triggers PAGO, resulting in bootlegging. The paper concludes with a discussion of theoretical and practical implications and recommends directions for future research.

KEYWORDS

bootlegging, coworker proactive behavior, learning goal orientation, performance-avoid goal orientation, self-construal

INTRODUCTION

Employees' unauthorized innovation has long played a pivotal role in driving technological and organizational breakthroughs (Augsdorfer, 2023; Mainemelis & Sakellariou, 2023). Innovations such as BMW's 12-cylinder engine (Augsdorfer, 2008), 3M's tape slitter (Garud et al., 2011), and Nickia's LED lamp (Johnstone, 2007) emerged outside formal managerial oversight, underscoring the significance of bootlegging, that is, informal and covert innovation initiated by employees through unauthorized, proactive efforts, without official support from management, aimed at benefiting the organization (Augsdorfer, 2005; Criscuolo et al., 2014). Although such informal initiatives may disrupt formal innovation trajectories (Masoudnia & Szwejczewski, 2012) and complicate organizational decision-making (Globocnik et al., 2022), they also yield substantial benefits, including mitigated fear of innovative failure (Globocnik, 2019), novel product development (Augsdorfer, 2005), and improved innovative performance (Criscuolo et al., 2014). Recognizing these implications, scholars and practitioners emphasize the need to investigate the factors that facilitate bootlegging to enable organizations to regulate its occurrence in line with their strategic objectives (Augsdorfer, 2023).

Bootlegging's informal and covert nature distinguishes it from innovation, as its drivers, constraints, and risks diverge significantly from those of conventional innovation processes (Mainemelis & Sakellariou, 2023). Research on bootlegging antecedents has evolved from an initial emphasis on individual traits, such as curiosity and risk propensity (Augsdorfer, 1996, 2012; Tenzer & Yang, 2023), to broader organizational factors, including organizational practices (Globocnik et al., 2022; Globocnik & Salomo, 2015) and leadership styles (Li & Ye, 2021; Qu, Khapova, et al., 2023), highlighting an increasing recognition of interpersonal influences on bootlegging. Although prior research has examined how peer-related contextual factors, such as competition among peers and teamwork climate, shape employee bootlegging (Augsdorfer, 2023), recent studies have begun to explore more specific forms of peer influence (Qu et al., 2024; Qu, Shao, et al., 2023; Qu, Tims, et al., 2023). Nevertheless, relatively few studies have examined how and under what conditions coworker behaviors influence employee bootlegging. This research oversight is problematic given that coworkers, through their frequent and informal interactions with employees during daily work activities (Chiaburu & Harrison, 2008), exert a salient influence on bootlegging, which by definition occurs outside formal channels (Mainemelis & Sakellariou, 2023). Through these regular interactions, coworkers may directly shape employee psychological states and behavioral tendencies (Tims & Parker, 2020). Not fully exploring these factors limits our full understanding of bootlegging antecedents. Practically, given the increasing prevalence of collaborative work structures in

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workplace behavior (Santana & Cobo, 2020), exploring how coworkers impacted bootlegging is an intriguing research prospect.

Research indicates that coworker proactivity plays a critical role in shaping adaptive and emergent work role behaviors, particularly in today's dynamic and uncertain work environments, where formalized roles are often insufficient to meet evolving demands (Griffin et al., 2007). Accordingly, this study focuses on coworker proactive behavior, which challenges the organizational status quo and shapes future practices (Crant, 2000). Although prior research suggests that coworker proactivity can either stimulate or inhibit innovation (Ni & Zheng, 2024), its implications for bootlegging remain unexplored. On the one hand, proactive coworkers who identify opportunities and take initiative may inspire employees to engage in innovative activities (Crant, 2000). Qu, Tims, et al. (2023) conceptualize coworker proactivity as a job resource that enhances work engagement, fostering bootlegging. Similarly, Qu, Shao, et al. (2023) introduce coworker proactivity as an antecedent of bootlegging, examining its interaction with transformational leadership. On the other hand, coworker proactivity, a tendency to initiate change and exert control over the environment, can threaten employees' sense of autonomy in innovation. For instance, Qu et al. (2024) frame coworker innovative behavior as a workplace stressor, employing stress appraisal theory to explain how and when it induces bootlegging. Consequently, we extend this perspective by investigating coworker proactive behavior as a dual-faceted influence on bootlegging, thus capturing its informal and covert nature.

To conceptualize the relationship between coworker proactive behavior and bootlegging, we draw on social comparison theory (Festinger, 1954) and goal orientation literature (Vandewalle et al., 2019). Employees frequently perceive proactive coworkers as dominant (Parker et al., 2019; Sun et al., 2021), triggering upward social comparisons that can generate either an assimilation effect or a contrast effect. Assimilation shifts individuals' self-evaluations toward the comparison target, whereas contrast shifts individuals' self-evaluations away from the comparison target (Matthews & Kelemen, 2025; Mussweiler, 2003). The likelihood of assimilation or contrast effects depends on self-construal, which refers to individuals' perceptions of their interdependence or independence relative to others (Cross et al., 2000). Employees with an interdependent self-construal are more likely to experience assimilation effects, integrating others into their self-concept and fostering a shared identity (Stapel & Koomen, 2001). Conversely, those with an independent self-construal tend to highlight self-other distinctions, making contrast effects more probable (Mussweiler et al., 2004).

Further, we examine how assimilation and contrast effects influence bootlegging through distinct motivational pathways. Specifically, we propose that for individuals with interdependent self-construal, exposure to proactive coworkers triggers an assimilation effect wherein they align their self-perceptions with these role models (Cross et al., 2000; Mussweiler et al., 2004). This alignment fosters a learning goal orientation (LGO), characterized by an emphasis on competence development and skill acquisition (Vandewalle et al., 2019). This LGO inspires bootlegging, as it serves as a means of developing innovation competence outside organizational boundaries, allowing individuals to circumvent organizational constraints while enhancing their skills (Augsdorfer, 2023). Conversely, for those with independent self-construal, exposure to proactive coworkers elicits a contrast effect, creating psychological distance from these proactive coworkers (Cross et al., 2000; Mussweiler et al., 2004). This dynamic cultivates a performance-avoid goal orientation (PAGO), marked by a focus on mitigating perceived threats to their competence (Vandewalle et al., 2019), which captures the anxiety and fear of incompetence when faced with proactive coworkers. Thus, this PAGO motivates employee bootlegging,

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as its covert nature enables them to innovate informally, avoiding direct performance evaluations and alleviating frustration when exploring new ideas (Mainemelis & Sakellariou, 2023).

This study aims to make three contributions to the literature on bottom-up innovation, specifically, to the emerging body of research on bootlegging. First, we advance the literature on bootlegging by explaining how and when coworker proactive behavior influences employee bootlegging through dual motivational pathways. Prior research has identified coworker proactive behavior as a key predictor and has shown that it can stimulate employee bootlegging via work engagement, especially among individuals high in uncertainty avoidance (Qu, Tims, et al., 2023). Extending this line of research, the present study theorizes two distinct motivational mechanisms (i.e., LGO and PAGO) through which coworker proactive behavior influences employee bootlegging. By theorizing how coworker proactive behavior, through frequent, informal, and often spontaneous workplace interactions, can exert a dual-faceted influence on employee bootlegging, we respond to recent calls to incorporate social–contextual factors into bottom-up innovation research (Augsdorfer, 2023). In doing so, we offer evidence that advances the understanding of the mechanisms through which coworkers shape bottom-up innovation.

Second, we enrich the interactionist perspective on bootlegging (Augsdorfer, 2012; Globocnik, 2019) by explicating the psychological mechanisms through which coworker behavior interacts with individual self-construal to influence bootlegging. Drawing on social comparison theory (Festinger, 1954; Mussweiler, 2003), we demonstrate that proactive coworkers may trigger either assimilation or contrast effects depending on whether employees hold an interdependent or independent self-construal. These comparative responses shape employees' goal orientations (i.e., LGO and PAGO), which in turn predict bootlegging engagement. This contribution refines our understanding of how bottom-up innovation is not only socially situated but also psychologically filtered, and it introduces self-construal as a theoretically meaningful boundary condition that clarifies when and how coworker behavior facilitates or impedes informal innovation efforts.

Third, we contribute to the literature on goal orientation and innovation by offering a counterintuitive perspective on the role of PAGO in bottom-up innovation. Although prior studies have largely treated PAGO as detrimental to innovation due to its risk-averse nature (Vandewalle et al., 2019), we show that in the context of covert and informal innovation (i.e., bootlegging), PAGO can serve as a motivating force. Specifically, PAGO employees may be driven to engage in bootlegging as a means of avoiding scrutiny and reputational risk while still pursuing innovation under the radar. These findings challenge conventional assumptions about the uniformly negative effects of PAGO and invite a more consideration of how different motivational orientations may lead to diverse expressions of innovative behavior. More broadly, it contributes to emerging conversations about the heterogeneity of bottom-up innovation pathways and the psychological trade-offs embedded in informal innovation strategies.

THEORY AND HYPOTHESES

Motivational dynamics perspective of social comparison theory

Social comparison theory operates through two primary cognitive mechanisms: assimilation, where individuals align their self-perceptions with comparison targets, and contrast, where individuals differentiate themselves from comparison targets (Festinger, 1954; Mussweiler, 2003). Integrating social comparison theory with goal orientation literature, we

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conceptualize goal orientation as dynamic motivational states that emerge from social comparison processes. Goal orientations reflect distinct patterns of cognitive, affective, and behavioral responses in achievement settings (Vandewalle et al., 2019). Specifically, LGO aligns closely with an assimilation-based motivation mechanism, driving individuals to actively pursue competence development and mastery, whereas PAGO aligns with a contrast-based motivation mechanism, motivating individuals to focus on preventing negative competence judgments (Griffin et al., 2007; Mussweiler et al., 2004; Vandewalle et al., 2019). Observing proactive coworkers often elicits upward social comparisons, LGO when employees assimilate with proactive exemplars, and PAGO when they contrast to avoid unfavorable self-evaluations. Through this lens, social comparison serves as the psychological conduit through which contextual cues, such as coworker proactivity, influence motivational states (i.e., LGO and PAGO), which then shape behavioral outcomes. This integrated framework enables us to map the psychological journey from the perception of others' behaviors to motivational activation and behavioral expression.

Coworker proactive behavior and employee bootlegging

Bootlegging represents the bottom-up innovation wherein employees engage in non-programmed activities without official authorization and formal support and aims to benefit both the organization and the individual (Augsdorfer, 2005; Criscuolo et al., 2014). It serves as a proactive approach that allows individuals to navigate the tension between autonomy to explore innovative ideas and accountability to adhere to organizational rules and regulations (Globocnik et al., 2022). Central to bootlegging is its informal and covert nature, characterized by the absence of authorization, and its non-programmed, underground nature (Criscuolo et al., 2014). Bootlegging differs from proactive behavior, which refers to actions individuals take to challenge the status quo and shape their future (Crant, 2000). Although bootlegging is a specific form of innovative behavior, proactive behavior encompasses a broader range of actions, including organizational citizenship behavior, which aims to promote the efficient and effective functioning of an organization (Crant, 2000), and voice, which seeks to improve organizational or unit performance through verbal communication (Morrison et al., 2011). Furthermore, bootlegging is distinct from innovation itself, which entails the processes involved in implementing new ideas that address organizational needs, including problem identification, opportunity recognition, introduction, adoption, modification, promotion, and implementation of new ideas (Hughes et al., 2018). Notably, innovation is overt and officially authorized, whereas bootlegging is covert and unauthorized (Mainemelis & Sakellariou, 2023).

Drawing on the social comparison theory, we propose that bootlegging serves as a functional behavioral response to coworker proactive behavior. Social comparison theory posits that individuals seek contextual information and compare their characteristics with those of others to assess their relative standing (Buunk & Gibbons, 2007). Coworker proactive behavior can induce employees to perceive a decrease in control over valued resources and a sense of being dominated by these coworkers, resulting in proactive coworkers becoming a target of upward social comparison (Sun et al., 2021). This, in turn, triggers assimilation and contrast effects (Mussweiler et al., 2004). First, coworker proactive behavior can stimulate the assimilation effect in employees, leading to increased motivation to engage in bootlegging. Prior research has shown that social comparison can induce the assimilation effect (Mussweiler, 2003). This encourages individuals to compare themselves to the comparison target to confirm similarity and demonstrate comparable levels of competence and performance (Gerber et al., 2018;

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Matthews & Kelemen, 2025). Inspired by coworker proactive behavior, the assimilation effect cultivates an environment where employees may strategically turn to bootleg. Because of its informal and non-programmed nature, bootlegging allows employees to explore creative ideas, solve problems, and distinguish themselves by coming up with innovations (Augsdorfer, 2023). Consequently, individuals influenced by the assimilation effect may choose bootlegging to be perceived as competent and to align themselves with their proactive coworkers.

Second, coworker proactive behavior can also stimulate a contrast effect, leading to increased bootlegging behaviors. Prior research has shown that social comparison can trigger a contrast effect (Mussweiler, 2003), leading individuals to perceive themselves as inferior to the comparison target. This perceived displacement is seen as threatening and results in stress (Sun et al., 2021). In response, individuals may strategically choose to channel their energy into creative pursuits that help them cope with the stress and perceived threat from the contrast effect (Campbell et al., 2017; Matthews & Kelemen, 2025). Bootlegging, in this context, offers individuals the freedom to explore and experiment beyond organizational norms and innovation policies, providing flexibility, space, and time to safely experiment with their innovative ideas (Augsdorfer, 2023). Furthermore, the underground nature of bootlegging (Criscuolo et al., 2014) enables employees to realize their innovative ideas with less competition and less fear of threat. To secure their standing in social comparisons with coworkers' proactive behavior and to avoid triggering additional proactive behavior among them (Matthews & Kelemen, 2025), individuals may strategically choose to engage in bootlegging, which allows them to concentrate on developing new, innovative ideas while also managing the stress and threats that arise from comparing themselves to their proactive coworkers. Thus, we propose:

Hypothesis 1. Coworker proactive behavior is positively related to bootlegging.

The interactive effect of coworker proactive behavior and employee self-construal on goal orientation

The role of goal orientation

To explain how coworker proactive behavior instigates bootlegging, we examine the role of goal orientations. Existing literature distinguishes three types of goal orientation: LGO refers to the desire to increase one's competence by understanding or mastering something new; PAGO refers to the desire to avoid demonstrating incompetence on performance indicators relative to others; and performance-prove goal orientation (PPGO) refers to the desire to demonstrate competence on performance indicators (Vandewalle et al., 2019). Goal orientation can be treated as a state influenced by contextual information, including teacher influence (Dweck & Leggett, 1988), information seeking, and leadership (Dragoni, 2005). LGO individuals prioritize experimentation and learning without external constraints, whereas PAGO individuals seek to avoid perceptions of incompetence and mitigate the risk of potential failure in formal innovation processes (Vandewalle et al., 2019). These align with informal and covert innovation, such as bootlegging (Mainemelis & Sakellariou, 2023). In contrast, PPGO individuals focus on proving their abilities and gaining favorable evaluations of their competence. They evaluate performance in terms of outperforming others and rely on normative rather than absolute standards (Buunk & Gibbons, 2007), which aligns more closely with formal and overt innovation. Thus, we focus on LGO and PAGO.

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Drawing on the social comparison theory and goal orientation literature, we intend to explore how and when coworker proactive behavior inspires bootlegging. Specifically, upward comparisons with proactive coworkers may motivate employees through two distinct mechanisms: the assimilation effect and the contrast effect (Matthews & Kelemen, 2025). The assimilation effect occurs when employees align their self-perceptions with proactive role models, fostering competence-building and self-development, a process consistent with LGO. The contrast effect arises when employees differentiate themselves from these models to avoid negative ability appraisals, aligning instead with PAGO (Cross et al., 2000; Vandewalle et al., 2019). Furthermore, the second stage of upward comparison involves emotional and behavioral reactions to the results of the social comparisons. Employees with LGO, emphasizing experimentation and unrestricted learning, tend to exhibit the assimilation effect by emulating proactive role models and pursuing self-directed, covert innovation. Conversely, those with PAGO, driven by the desire to evade perceptions of incompetence and mitigate formal process failures, demonstrate the contrast effect by resorting to bootlegging as an informal innovation that allows them to manage risks while preserving their competence (Mainemelis & Sakellariou, 2023; Vandewalle et al., 2019).

The interactive effect of coworker proactive behavior and interdependent self-construal on LGO

Drawing on social comparison theory, we propose that coworker proactive behavior can inspire LGO in employees with an interdependent self-construal through an assimilation effect (Matthews & Kelemen, 2025; Mussweiler et al., 2004). LGO reflects the desire to develop one's capability (Vandewalle et al., 2019). Proactive coworkers often lead to positive outcomes, such as high performance (Sun et al., 2021) and career success (Valls et al., 2020), indicating strong work abilities, positive work attitudes, and a willingness to contribute (Parker et al., 2019). Comparing oneself to proactive coworkers can prompt employees to assimilate their behaviors and attitudes with those of proactive coworkers. Individuals are motivated and inspired by targets when they believe they can achieve a similar situation (Zhou et al., 2025). When individuals engage in upward social comparison with proactive coworkers, they are encouraged to develop their competence. This motivation drives them to emulate the comparison targets, enhancing their skills and confirming their similarity to others (Matthews & Kelemen, 2025; Mussweiler et al., 2004). Thus, coworker proactive behavior may positively relate to LGO.

Furthermore, self-construal plays a significant role in determining whether the effects of social comparison are assimilation or contrast (Stapel & Koomen, 2001). It significantly influences one's relationship with the social world (Kim et al., 2022). Research conceptualizes self-construal as a continuum with two poles—interdependent and independent—where higher scores reflect a stronger independent self-construal or a weaker interdependent self-construal (Brockner et al., 2000). Interdependent self-construal is characterized by viewing the self as interdependent with close others, defined by important roles and situations. This perspective shapes how individuals process information from others, either by differentiating themselves or by incorporating others into their self-concept, thus increasing the relevance of others in constructing self-evaluations (Lee et al., 2000; Rook et al., 2025). Specifically, individuals with an interdependent self-construal define themselves through their connections to important roles, group members, or relationships (Cross et al., 2000). This mindset fosters an integration approach, emphasizing similarities between the self and others and aligning self-perceptions

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with those of others. Individuals with an interdependent self-construal value their affiliation with social groups and often assimilate their self-perceptions to those of others (Simpson et al., 2020). Thus, when coworkers behave proactively, interdependent self-construal individuals are inspired to engage in similar actions, resulting in LGO. By contrast, individuals with an independent self-construal define themselves based on their unique attributes rather than group affiliations (Rook et al., 2025). They prioritize maintaining personal distinctiveness (Stapel & Koomen, 2001). This differentiation tendency makes them less likely to perceive coworker proactive behavior as personally relevant for self-improvement, weakening the effect of coworker proactive behavior on LGO. That is, the interactive effect of interdependent self-construal and coworker proactive behavior enhances the assimilation effect of social comparison, leading to increased LGO. Thus, we propose:

> **Hypothesis 2.** Coworker proactive behavior and employee interdependent self-construal will interact to influence employee LGO, such that the relationship will be positive for employees with interdependent (vs. independent) self-construal.

LGO and bootlegging

Drawing on goal orientation theory, we further expect that LGO motivates employees to engage in bootlegging through two distinct yet complementary pathways: *competence development and effort compensation*. As an unauthorized innovation activity that occurs spontaneously and without formal organizational support (Augsdorfer, 2005), bootlegging enables employees to develop new products (Augsdorfer, 2005), troubleshoot quickly (Globocnik, 2019), and enhance innovation performance (Criscuolo et al., 2014). These characteristics align with LGO individuals' intrinsic motivation for self-improvement, making bootlegging an especially attractive avenue for their growth. First, LGO individuals actively pursue challenging tasks as a competence development pathway to develop their skills and abilities (Vandewalle et al., 2019). This pursuit of challenges facilitates heightened levels of aspiration, cognitive engagement, and task immersion (Miron-Spektor et al., 2022). Characteristically, they employ deep-processing strategies to systematically master complex tasks and acquire new knowledge (Janssen & Van Yperen, 2004). Consequently, LGO motivates their engagement in bootlegging as a means to enhance technical expertise and capabilities (Criscuolo et al., 2014). Second, LGO individuals also believe that effort is the more important determinant of performance outcomes (Vandewalle et al., 2019). This belief manifests in their disproportionate investment of effort, time, and resources into bootlegging—particularly crucial given the lack of formal organizational support for such initiatives (Globocnik, 2019). The effort expenditure by LGO individuals significantly improves the feasibility of bootlegging endeavors, enabling both competency development through uncharted territory exploration and strategic delay in novel idea evaluation (Mainemelis & Sakellariou, 2023).

Combining these arguments with the proposed interactive effect of coworker proactive behavior and employee interdependent self-construal on LGO, we propose:

> **Hypothesis 3.** LGO will mediate the interactive effect of coworker proactive behavior and employee interdependent self-construal on bootlegging, such that the indirect effect will be stronger for employees with interdependent self-construal than those with independent self-construal.

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The interactive effect of coworker proactive behavior and independent self-construal on PAGO

Drawing on social comparison theory, we propose that coworker proactive behavior may inspire employees with an independent self-construal to develop PAGO through a contrast effect. This effect focuses on differences from the comparison target and the potential threat of losing desired organizational resources (Matthews & Kelemen, 2025; Mussweiler et al., 2004). PAGO reflects the motivational state of avoiding the demonstration of incompetence to others (Vandewalle et al., 2019). Proactive coworkers often obtain more control and dominance in organizations, making them the targets of upward social comparison for other employees. This may trigger a contrast effect (Parker et al., 2019; Sun et al., 2021). Influenced by the contrast effect, employees may perceive coworkers' proactive behavior as threatening, leading to feelings of pressure about appearing inferior or incompetent. This may motivate them to engage in activities that help avoid being judged as incompetent compared to proactive coworkers (Gerber et al., 2018; Zhou et al., 2025), leading to a PAGO motivation to avoid mistakes and failures.

Furthermore, independent self-construal involves individuals perceiving themselves as autonomous and separated from others (Cross et al., 2000). This shapes how these individuals process information from others, emphasizing the differentiation of the self from others rather than incorporating or conforming to them (Rook et al., 2025). As a result, those with an independent self-construal are more likely to prioritize their uniqueness and autonomy, often seeking to distinguish themselves from their coworkers. This differentiation mindset leads to more pronounced contrast effects when comparing themselves to proactive coworkers (Kim et al., 2022). When observing coworkers behaving proactively, individuals with an independent self-construal are motivated to shift their self-evaluations away from these comparison targets, resulting in higher PAGO. In contrast, individuals with interdependent self-construal are more inclined to integrate social information into their self-concept (Cross et al., 2000; Rook et al., 2025). This values their affiliation with social groups, reducing the likelihood of perceiving coworker proactive behavior as a threat. Interdependent self-construal individuals are less likely to perceive coworker proactive behavior as an evaluative standard that threatens their competence (Stapel & Koomen, 2001). This diminished sense of competition weakens the contrast effect, diminishing the effect of coworker proactive behavior on PAGO, inasmuch as an interactive effect of independent self-construal and coworker proactive behavior enhances the contrast effect of social comparison, leading to increased PAGO. Thus, we propose:

> **Hypothesis 4.** Coworker proactive behavior and employee independent self-construal will interact to influence employee PAGO, such that the relationship will be stronger for employees with independent self-construal than those with interdependent self-construal.

PAGO and bootlegging

Drawing on goal orientation theory, we further expect that PAGO will motivate employees to engage in bootlegging to avoid others perceiving them as incompetent and to avoid negative judgments. First, bootlegging provides individuals with the opportunity to test innovative ideas

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in a hidden or unrevealed manner (Criscuolo et al., 2014), creating a safe environment for PAGO individuals to experiment. This allows them to avoid appearing incompetent if the test results are negative. PAGO individuals, who are highly concerned with avoiding mistakes and managing others' perceptions of their competence (Payne et al., 2007), can use bootlegging to privately test innovative ideas before revealing them publicly. This strategy allows them to mitigate the risk of failure and manage the pressure to avoid mistakes and maintain a competent appearance (Vandewalle et al., 2019). Thus, bootlegging becomes a valuable approach for PAGO individuals to reduce the likelihood of appearing incompetent to others. Second, since bootlegging often occurs "underground" and remains unnoticed until successful, it offers individuals an opportunity to avoid negative evaluations in the event of failure (Augsdorfer, 2023). PAGO individuals are primarily concerned with negative evaluations (Vandewalle et al., 2019). They also tend to be adept at rehearsing and automating job components and tasks, which can help individuals perform their work efficiently and effectively (Steele-Johnson et al., 2000). As a result, they do not need to justify their decisions or inform others about their actions, even if the bootlegging project does not yield the expected results (Mainemelis & Sakellariou, 2023). In this way, bootlegging could be a way for PAGO individuals to avoid negative judgment. Thus, we propose:

> **Hypothesis 5.** PAGO will mediate the interactive effect of coworker proactive behavior and employee independent self-construal on bootlegging, such that the indirect effect will be positive for employees with independent (vs. interdependent) self-construal.

The overall conceptual model in our research is presented in Figure 1.

Overview of studies

We adopted a multimethod design to test the theoretical model,[1] including a scenario-based experimental design and a field study design, to enhance both internal and external validity (Aguinis & Bradley, 2014). In line with Spencer et al. (2005), Studies 1A–1C followed an experimental causal chain design to unpack the sequential psychological mechanisms underlying the proposed relationships. Specifically, Study 1A manipulated coworker proactive behavior to examine whether it induces LGO and PAGO, and Studies 1B and 1C independently manipulated LGO and PAGO to assess their effects on bootlegging. This design allows for a clearer identification of each mediating process and minimizes potential confounding effects that may arise in a single integrated experiment (Spencer et al., 2005). Study 2 conducted a three-wave

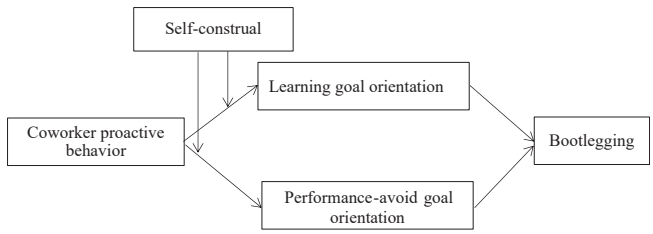

FIGURE 1 Theoretical model of the current research.

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field study to replicate and validate the full model, thereby maximizing external validity and providing robust causal evidence for the full model. This design increased both internal and external validity (Ren et al., 2024; Zhou et al., 2025).

STUDY 1A

Participants

We recruited 389 participants from a property management group in China to attend this experiment. Based on the results of G*Power analysis, we initially aimed to recruit 180 participants, with a preference for a larger sample size. With the support of the HR department, we successfully increased the sample to 389. Invitations and experiment details were conveyed to all participants via WeChat, a multipurpose messaging application with over 1 billion active users (see Qin et al., 2020 for a similar approach). Participants accessed the survey through a provided link on the Chinese crowd-sourcing survey platform Wenjuanxing. HR staff shared the link with department managers, who then distributed it to employees in their units through existing internal WeChat workgroups. Each participant received a 2-RMB digital red envelope as an incentive, which Wenjuanxing disbursed automatically through its internal payment system, ensuring complete anonymity. To limit participants' evaluation apprehension and social desirability (Podsakoff et al., 2012), we assured participants of the anonymity of their responses and clarified that their participation would not result in any personal benefits. Of these 389 participants, 54.8% were female, the average age was 36.17, 47.6% had a bachelor's degree, and the average organizational tenure was 7.8 years.

Procedure and experiment design

In line with prior research (Fay et al., 2023; Wu et al., 2018), we employed a 2 (independent self-construal vs. interdependent self-construal) × 2 (high coworker proactive behavior versus low coworker proactive behavior) design. Participants were randomly assigned to one of the four conditions. Each condition was given one scenario to read, all of which began with an identical introductory paragraph describing the firm and its products. Participants were asked to read materials on self-construal and coworker proactive behavior. The latter parts varied according to the experimental condition assigned. Details of the coworker proactive behavior and self-construal manipulation can be found in Appendix 1.

Measures

LGO and PAGO

We assessed LGO using a five-item scale and PAGO using a four-item scale developed by VandeWalle (1997). A sample item for LGO was "I would look for opportunities to develop new skills and knowledge now" ($\alpha = .95$). A sample item for PAGO was "I would avoid taking on a new task if there was a chance that I would appear rather incompetent to others now" ($\alpha = .84$).

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Coworker proactive behavior check

To run the manipulation checks of coworker proactive behavior, we assessed it with a seven-item scale based on conceptualizations of the personal initiative construct (Frese et al., 1997). We replaced the subject of the original scale from "I" with "My coworker," emphasizing proactive rather than reactive behavior. A sample item was "My coworker actively attacks problems" ($\alpha = .97$).

Self-construal manipulation check

To conduct this manipulation check, we followed the procedure outlined by Hsieh et al. (2021). Participants responded to a self-construal manipulation check question. For the independent scenario, the item was "The tasks encourage me to focus on myself." A higher score on this item indicates a more independent self-construal. For the interdependent scenario, the item was "The tasks encourage me to focus on ourselves." A higher score on this item indicates a more interdependent self-construal.

Results

Descriptive statistics and correlations are presented in Table 1.

One-way analysis of variance (ANOVA) test indicated a successful manipulation of coworker proactive behavior ($M_{low} = 2.73$, $SD = 0.91$ vs. $M_{high} = 3.93$, $SD = 0.62$, $F[1, 388] = 231.92$, $p < .001$, $\eta p^2 = .38$). Also, one-way ANOVA test indicated a successful manipulation of self-construal ($M_{inde} = 3.59$, $SD = 0.95$ vs. $M_{inter} = 2.40$, $SD = 0.92$, $F[1, 388] = 159.22$, $p < .001$, $\eta p^2 = .29$).

The interactive effect of coworker proactive behavior and self-construal in predicting LGO was significant ($F[1, 388] = 4.00$, $p < .05$, $\eta p^2 = .01$). Figure 2 shows the plot of the interactive effect of coworker proactive behavior and self-construal, supporting Hypothesis 1.

We also found the interactive effect of coworker proactive behavior and self-construal in predicting PAGO was significant ($F[1, 388] = 9.41$, $p < .05$, $\eta p^2 = .02$). Figure 3 shows the plot of the moderating effects of self-construal, supporting Hypothesis 3.

Study 1A provided preliminary evidence of the interactive effect of self-construal and coworker proactive behavior on LGO and PAGO. An experimental–causal chain design (Spencer et al., 2005) was then used to conduct Study 1B, which manipulated LGO to test its effect on bootlegging, and Study 1C, which manipulated PAGO to test its effect on bootlegging.

TABLE 1 Correlations and descriptive statistics in Study 1A.

Variable	Mean	*SD*	1	2	3	4
1. Coworker proactive behavior	0.51	0.50	–			
2. Self-construal	0.53	0.50	0.06	–		
3. Learning goal orientation	3.74	0.73	0.32***	0.10*	(0.95)	
4. Performance-avoid goal orientation	3.16	0.77	−0.00	−0.01	0.22***	(0.84)

Note: $N = 389$, $N = 199$ in the high coworker proactive behavior condition; $N = 190$ in the control condition; $N = 207$ in the high self-construal condition; $N = 182$ in the control condition. Conditions: 0 = low; 1 = high.
*$p < .05$.**$p < .01$.***$p < .001$.

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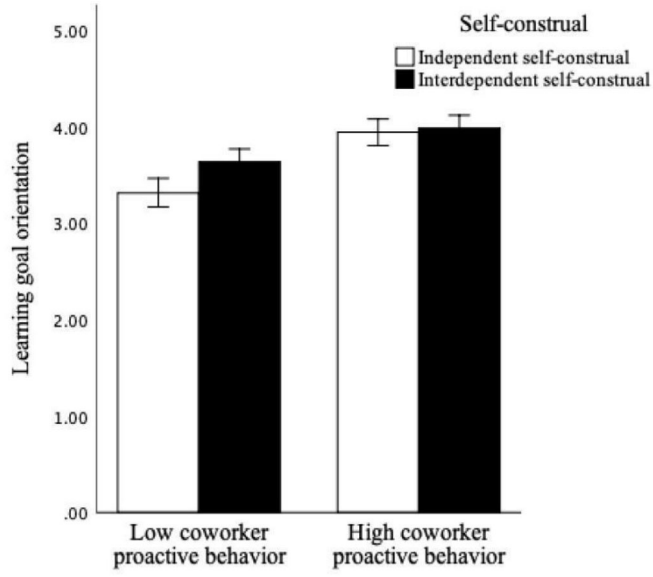

FIGURE 2 The interactive effect of coworker proactive behavior and self-construal on LGO.

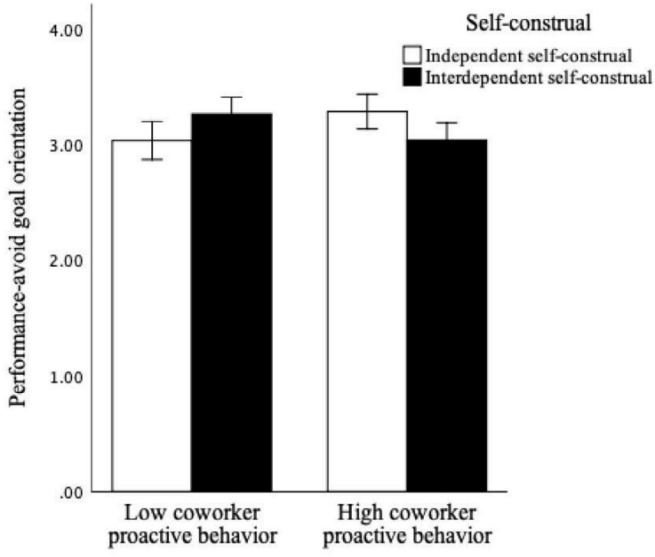

FIGURE 3 The interactive effect of coworker proactive behavior and self-construal on PAGO.

STUDY 1B

Participants

We recruited 173 participants working in a bank operating in China. Based on the results of G*Power analysis, we initially aimed to recruit 176 participants. With the support of the HR department, we recruited 173 participants, resulting in a 98.3% response rate. As in Study 1A,

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participants received invitations and experiment details via WeChat and completed the survey on Wenjuanxing. Each participant received a 2-RMB red envelope. Of these 173 participants, 70.5% were female, the average age was 36.58, 78.6% had a bachelor's degree, and 65.9% had more than 6 years of organizational experience.

Procedure and experiment design

We manipulated LGO to create a two (high vs. low) factorial design. Participants were asked to read materials about their LGO, followed by completing a manipulation check and bootlegging measures. Details of the LGO manipulation can be found in Appendix 2.

Measures

Bootlegging

We assessed this variable with a five-item scale developed by Criscuolo et al. (2014). To reflect the state nature of this construct, we asked participants to rate the extent to which they feel at present. A sample item was "I would have the flexibility to work my way around my official work plan, digging into new potentially valuable business opportunities right now" ($\alpha = .89$).

LGO manipulation check

To run this manipulation check, we used the same conceptualization of LGO as in Study 1A ($\alpha = .92$). More details for Appendix 2.

Results

One-way ANOVA test indicated a significant effect for the LGO manipulation. Results indicated successful manipulation of LGO ($M_{low} = 3.70$, $SD = 0.92$ vs. $M_{high} = 4.23$, $SD = 0.62$, $F[1, 171] = 22.67$, $p < .001$, $\eta p^2 = .12$).

Table 2 displays the means, standard deviations, and correlations for all focal measures by experimental condition. LGO was positively correlated with bootlegging ($r = .41$, $p < .001$). This finding provided basic support for our hypotheses.

TABLE 2 Correlations and descriptive statistics in Study 1B.

Variables	Mean	*SD*	1	2
1. Learning goal orientation	0.49	0.50		
2. Bootlegging	3.93	0.73	0.23**	(0.89)

Note: $N = 173$, $N = 85$ in the performance-avoid goal orientation condition; $N = 88$ in the control condition. Conditions: 0 = low; 1 = high.
*$p < .05$.**$p < .01$.***$p < .001$.

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Consistent with our predictions, the results showed that participants high in LGO were more willing to engage in bootlegging than those in low LGO ($M_{low} = 3.77$, $SD = 0.78$ vs. $M_{high} = 4.10$, $SD = 0.64$, $F[1, 172] = 9.69$, $p = .002$, $\eta p^2 = .05$). Study 1B supports the idea that LGO leads to bootlegging. Together, Studies 1A and 1B document the interactive effect of coworker proactive behavior and interdependent self-construal on bootlegging through LGO, using the experimental causal chain approach.

STUDY 1C

Participants

We recruited 225 participants from a real estate company in China. Based on the results of G*Power analysis, we initially aimed to recruit 176 participants, with a preference for a larger sample size. With the support of the HR department, we successfully increased the sample to 225. As in Studies 1A and 1B, participants received invitations and experiment details via WeChat and completed the survey on Wenjuanxing. Each participant received a 2-RMB red envelope. Of these 225 participants, 56.4% were female, the average age was 36.28, 58.2% had a bachelor's degree, and 39.5% had more than six years of organizational experience.

Procedure and experiment design

We manipulated PAGO to create a two (high vs. low) factorial design. Participants were asked to read materials about their PAGO, followed by completing a manipulation check and bootlegging measures. Details of the PAGO manipulation can be found in Appendix 3.

Measures

Bootlegging

We measure bootlegging as in Study 1B ($\alpha = .94$).

PAGO manipulation check

To run this manipulation check, we used the same conceptualization of PAGO as in Study 1A ($\alpha = .82$).

Results

One-way ANOVA test indicated a significant effect for the PAGO manipulation. Results indicated successful manipulation of PAGO ($M_{low} = 2.86$, $SD = 1.13$ vs. $M_{high} = 3.43$, $SD = 0.68$, $F[1, 234] = 21.18$, $p < .001$, $\eta p^2 = .09$).

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TABLE 3 Correlations and descriptive statistics in Study 1C.

Variables	Mean	*SD*	1	2
1. Performance-avoid goal orientation	0.55	0.50		
2. Bootlegging	3.63	0.97	0.27**	(0.94)

Note: $N = 225$, $N = 123$ in the performance-avoid goal orientation condition; $N = 102$ in the control condition.
Conditions: 0 = low; 1 = high.
*$p < .05$.**$p < .01$.***$p < .001$.

Table 3 displays the means, standard deviations, and correlations for all focal measures by experimental condition. PAGO was positively correlated with bootlegging ($r = .41$, $p < .001$). This finding provided basic support for our hypotheses.

Consistent with our predictions, the results showed that participants high in PAGO were more willing to engage in bootlegging ($M = 3.87$, $SD = 0.64$) than those in low PAGO ($M_{low} = 3.34$, $SD = 0.12$ vs. $M_{high} = 3.87$, $SD = 0.64$, $F[1, 124] = 10.10$, $p < .001$, $\eta p^2 = .09$). Study 1C supports the idea that PAGO leads to bootlegging. Together, Studies 1A and 1C document the interactive effect of coworker proactive behavior and independent self-construal on bootlegging through PAGO, using the experimental causal chain approach.

The experimental causal chain design provided evidence for the causality underlying the proposed directions and enhanced the generalizability of the findings (Spencer et al., 2005). By conducting Studies 1A–1C, we were able to manipulate the mediators, which is superior to measuring them and then testing their effects on the outcomes. Measuring the mediators can introduce bias in participants' reporting of the outcomes (Ren et al., 2024; Zhou et al., 2025). However, external validity was lacking. To address this limitation and provide robust evidence, we conducted a multiwave field study.

STUDY 2

Participants and procedures

We conducted a three-wave survey from the R&D departments of a listed Chinese company in the artificial intelligence field. To ensure high-quality data, the author personally met with the human resources managers to provide a thorough explanation of the research objectives. All surveys were administered and collected on-site using paper-and-pencil questionnaires during working hours, with the assurance that all responses would be used exclusively for research purposes and kept confidential. Each participant received a gift worth 10 RMB, which constituted a small portion of their total wages and was unlikely to influence their behavior or compromise the integrity of the research. Completed questionnaires were collected directly by the author or a research assistant on-site.

Following established recommendations to balance risks of memory effects and attrition (Ployhart & Vandenberg, 2010; Podsakoff et al., 2012), we implemented a 1-month interval between waves, consistent with methodological guidelines in recent organizational behavior research (e.g., Li & Tangirala, 2022). For Wave 1, we provided questionnaires to 400 participants on coworker proactive behavior and their demographic variables; 349 employees completed the questionnaire (87.3% response rate). One month later, for Wave 2, we invited the remaining 349 participants to fill out another questionnaire measuring LGO, PAGO, and self-construal; 310 participants completed the questionnaires (88.83% response rate). To match responses

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across waves while maintaining anonymity, participants were asked to provide an identification code themselves (Liao et al., 2010; Qu et al., in press). Attrition analyses showed no differences in key variables between completers and dropouts, indicating that attrition did not bias the results. Another month later, for Wave 3, we sent these 310 participants the third survey to assess bootlegging. After removing the incomplete and mismatched responses, the final sample consisted of 295 participants. 64.4% were male, 61% were aged 25–35, 57.3% possessed a bachelor's degree, and 58.6% had more than 3 years of organizational tenure.

Measures

The measures used in this study were all taken from existing literature. Participants indicated their responses on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). To ensure conceptual consistency, we followed the translation and back-translation procedure recommended by Brislin (1980). We invited two bilingual researchers to translate the questionnaires from English into Chinese and back-translate them into English.

Coworker proactive behavior

We measured coworker proactive behavior in the same way as in Study 1A ($\alpha = .88$).

LGO and PAGO

We measured LGO ($\alpha = .86$) and PAGO in the same way as in Study 1A ($\alpha = .83$).

Self-construal

Following Brockner et al. (2000), we assessed this variable with a five-item scale developed by Singelis and Sharkey (1995). Sample items included "My personal identity independent of others is very important to me," and "I enjoy being unique and different from others in many ways." Higher scores reflect a stronger independent self-construal or a weaker interdependent self-construal; lower scores reflect a stronger interdependent self-construal or a weaker independent self-construal (Brockner et al., 2000) ($\alpha = .81$).

Bootlegging

We measured bootlegging in the same way as in Study 1B ($\alpha = .79$).

Control variables

Research showed that individuals' gender, organizational tenure, and education level might be related to social comparison (Gerber et al., 2018). According to human capital theory, older

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people with longer organizational tenure may accumulate more knowledge and be more familiar with the work process, which may be correlated with innovation (Ng & Feldman, 2013). Therefore, we controlled for gender, age, education level, and organizational tenure. Based on recommendations from goal orientation research, we controlled for PPGO with a four-item scale developed by VandeWalle (1997). A sample item was "When working with the coworker, I would be more concerned about whether I perform better than him/her." ($\alpha = .85$).

Data analysis

We conducted confirmatory factor analyses (CFAs) to confirm the discriminant validity of the core variables included in this study. We then used an unmeasured latent method factor (Williams et al., 1989) to test the potential common method variance (CMV) bias. All hypotheses were tested using Mplus 8.3, and the bootstrap method with 5000 instances was employed. We used Edwards and Lambert's (2007) moderated path analysis technique to test the moderating effects.

Results

CFAs

We conducted CFA to examine the distinctiveness of five core variables in our study (i.e., coworker proactive behavior, LGO, PAGO, bootlegging, and self-construal). The results (Table 4) indicate that the measurement model with five factors had a better fit to ($\chi^2 = 503.83$, $df = 289$, $\chi^2/df = 1.74$, $CFI = 0.93$, $TLI = 0.92$, $RMSEA = 0.05$, $SRMR = 0.06$) than the

TABLE 4 Confirmatory factor analyses in Study 2.

Model		χ^2	df	χ^2/df	$\Delta\chi^2$	Δdf	CFI	TLI	RMSEA	SRMR
Five-factor model	CPB;LGO; PAGO;BO;SC	503.83	289	1.74	-	-	0.93	0.92	0.05	0.06
Four-factor model	CPB;LGO + PAGO;BO; SC	1010.49	293	3.45	506.66***	4	0.76	0.74	0.09	0.12
Three-factor model	CPB + LGO + PAGO;BO; SC	1326.56	296	4.48	822.73***	7	0.66	0.63	0.11	0.11
Two-factor model	CPB + LGO + PAGO+BO; SC	1506.18	298	5.05	1002.35***	9	0.60	0.57	0.12	0.11
One-factor model	CPB + LGO + PAGO+BO +SC	1778.87	299	5.95	1275.04***	10	0.51	0.47	0.13	0.12

Note: $N = 295$.

Abbreviations: BO, bootlegging; CPB, coworker proactive behavior; LGO, learning goal orientation; PAGO, performance-avoid goal orientation; SC, self-construal.

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alternative models, such as a four-factor model with LGO and PAGO combined into one factor ($\chi^2 = 1010.49$, $df = 293$, $\chi^2/df = 3.45$, $CFI = 0.76$, $TLI = 0.74$, $RMSEA = 0.09$, $SRMR = 0.12$), and one-factor model with all variables combined into one factor $\chi^2 = 1778.87$, $df = 299$, $\chi^2/df = 5.95$, $CFI = 0.51$, $TLI = 0.47$, $RMSEA = 0.13$, $SRMR = 0.12$).

CMV

As we collected data from the same source, common method variance may be a concern (Podsakoff et al., 2012). We assessed the CMV bias using the unmeasured latent method factor technique. The results indicated that the latent common method factor explained 10.13% of the variance, below the 25% threshold (Williams et al., 1989). Thus, the CMV bias does not significantly threaten the validity of this study.

Descriptive statistics and correlations

Table 5 presents the means, standard deviations, reliabilities, and correlations among the variables in this study. Correlations of the controlled variables with bootlegging were nonsignificant. We included these variables and PPGO in our initial analyses as control variables. However, their inclusion did not meaningfully influence the pattern of results observed. Following the recommendations of Bernerth and Aguinis (2016) on judicious control variable usage, we report models excluding control variables.[2]

Hypothesis testing

Hypothesis 1 predicted that coworker proactive behavior is positively related to bootlegging. As presented in Table 6, the results in Model 5 show that coworker proactive behavior in predicting bootlegging was significant ($\beta = .38$, $p < .001$), supporting Hypothesis 1.

Hypothesis 2 predicted that the interactive effect of coworker proactive behavior and interdependent self-construal is positively related to LGO. As presented in Table 6, Model 2 showed that the interaction between coworker proactive behavior and interdependent self-construal was significantly related to LGO ($\beta = -.18$, $SE = 0.09$), supporting Hypothesis 2. Additionally, following Aiken et al. (1991), we plotted the interactive effect of coworker proactive behavior and interdependent self-construal on LGO. Figure 4 shows the plot of the interactive effect. The bootstrapping analysis results showed that both the high slope (*simple slope* = 0.33, $SE = 0.15$, $p < .05$) and low slope (*simple slope* = 0.70, $SE = 0.13$, $p < .001$) were significant. The difference between the two slopes was also significant ($\beta = -.37$, $SE = 0.18$, $p < .05$), supporting Hypothesis 2.

Hypothesis 3 predicted that LGO will mediate the interactive effect of coworker proactive behavior and employee interdependent self-construal on bootlegging. Following previous research (e.g., Hayes, 2018; Li & Tangirala, 2022; Qu et al., in press), conditional indirect effects were estimated using Mplus 8.3 at one standard deviation above and below the mean of self-construal. As presented in Table 7, the results of Bootstrap 5000 indicated that under high interdependent self-construal, the indirect effect of LGO was significant (*indirect effect* = 0.11, $SE = 0.03$, 95% $CI = [0.024, 0.107]$). Under low interdependent self-construal, the indirect effect of LGO was also significant (*indirect effect* = 0.05, $SE = 0.02$, 95% $CI = [0.054, 0.188]$). The difference between the high and low interdependent self-construal was significant (*difference effect* = −0.06, $SE = 0.03$, 95% $CI = [-0.133, -0.003]$). The index of this effect was also significant (*effect* = −0.03, $SE = 0.02$, 95% $CI = [-0.067, -0.006]$), supporting Hypothesis 3.

Hypothesis 4 predicted that the interactive effect of coworker proactive behavior and independent self-construal is positively related to PAGO. As presented in Table 6, Model 4 showed

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TABLE 5 Correlations and descriptive statistics in Study 2.

Variables	Mean	*SD*	1	2	3	4	5	6	7	8	9	10
1. Gender	0.36	0.48	1									
2. Age	2.16	0.74	−0.11	1								
3. Education	1.96	0.73	0.03	0.14*	1							
4. Organizational tenure	2.85	1.07	−.07	.42***	.20**	1						
5. Performance-prove goal orientation	3.54	0.82	−0.00	0.01	0.01	0.08	(0.85)					
6. Coworker proactive behavior	3.92	0.69	−0.05	−0.07	0.06	0.08	0.36***	(0.88)				
7. Learning goal orientation	3.83	0.61	−0.08	0.02	−0.02	0.11	0.24***	0.38***	(0.85)			
8. Performance-avoid goal orientation	4.25	0.60	0.02	−0.02	0.09	0.03	0.61***	0.29***	−0.01	(0.83)		
9. Bootlegging	3.28	0.90	−0.00	−0.02	−0.01	0.07	0.34***	0.44***	0.35***	0.31***	(0.79)	
10. Self-construal	3.76	0.68	0.04	−0.10***	−0.10	−0.08	0.41***	0.32***	0.34***	0.34***	0.44***	(0.81)

Note: $N_{\text{individual}} = 295$.
*$p < .05$.**$p < .01$.***$p < .001$.

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TABLE 6 The results of the hypothesis test in Study 2.

	Learning goal orientation				Performance-avoid goal orientation				Bootlegging			
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Variables	***β***	***SE***	***β***	***SE***	***β***	***SE***	***β***	***SE***	***β***	***SE***	***β***	***SE***
Coworker proactive behavior	.33***	0.09	.52***	0.11	.37***	0.09	.22	0.12	.38***	0.08	.24**	0.07
Learning goal orientation											.25**	0.07
Performance-avoid goal orientation											.16***	0.04
Self-construal			.94*	0.38			−.51	0.40				
Coworker proactive behavior × Interdependent self-construal			−.18*	0.09								
Coworker proactive behavior × Independent self-construal							.20*	0.10				

Note: $N = 295$. The reported values are unstandardized estimates.
*$p < .05$.**$p < .01$.***$p < .001$.

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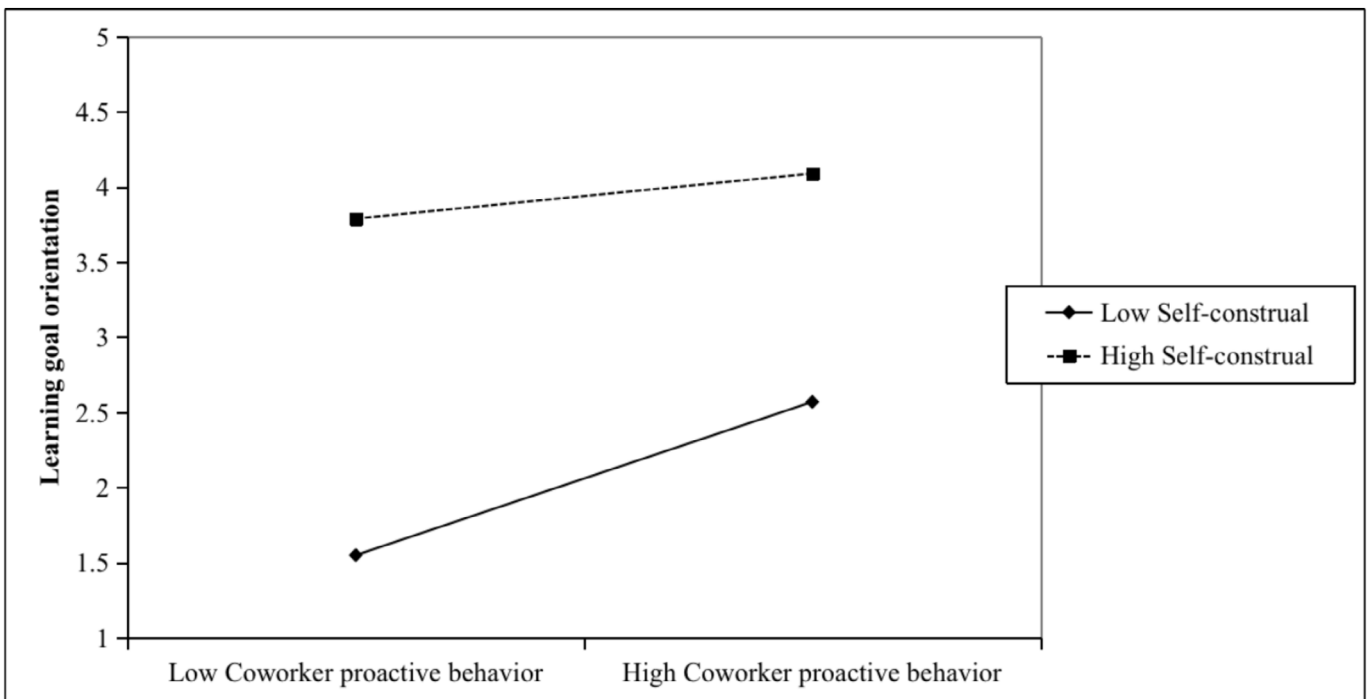

FIGURE 4 The moderating role of self-construal on the relationship between coworker proactive behavior and LGO.

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TABLE 7 The results of the conditional indirect effect of self-construal in Study 2.

Moderator		X → M → Y			
		First (P_{MX})	Second (P_{YM})	Indirect effect	95% CI
Interdependent self-construal	High W (+1 *SD*)	0.33 (0.15)	0.15 (0.04)	0.05 (0.02)	[0.024, 0.107]
	Low W (−1 *SD*)	0.70 (0.13)	0.15 (0.04)	0.11 (0.03)	[0.054, 0.188]
	Difference	−0.37 (0.18)	0.15 (0.04)	−0.06 (0.03)	[−0.133, −0.003]
Independent self-construal	High W (+1 *SD*)	0.42 (0.17)	0.14 (0.03)	0.06 (0.03)	[0.027, 0.129]
	Low W (−1 *SD*)	0.02 (0.14)	0.14 (0.03)	0.00 (0.02)	[−0.041, 0.040]
	Difference	0.40 (0.20)	0.14 (0.03)	0.06 (0.03)	[0.007, 0.133]

Note: $N = 295$. In the interdependent self-construal condition, the mediator = LGO; in the independent self-construal condition, the mediator = PAG.
Abbreviations: LGO, learning goal orientation; PAGO, performance-avoid goal orientation.

that the interaction between coworker proactive behavior and independent self-construal was significantly related to PAGO ($\beta = .20$, $SE = 0.10$, $p < .05$), supporting Hypothesis 4. We also plotted the interactive effect of coworker proactive behavior and self-construal on PAGO. Figure 5 shows the plot of the interactive effect. The bootstrapping analysis results showed that the high slope (*simple slope* = 0.42, $SE = 0.17$, $p < .05$) was significant, and the low slope (*simple slope* = 0.02, $SE = 0.14$, $p = .90$) was nonsignificant. The difference between the two slopes was also significant ($\beta = .40$, $SE = 0.20$, $p < .05$), supporting Hypothesis 4.

Hypothesis 5 predicted that PAGO will mediate the interactive effect of coworker proactive behavior and employee independent self-construal on bootlegging. As presented in Table 7, the results of Bootstrap 5000 indicated that under high independent self-construal, the indirect effect of PAGO was significant (*indirect effect* = 0.06, $SE = 0.03$, 95% $CI = [0.027, 0.129]$). Under low independent self-construal, the indirect effect of PAGO was nonsignificant ($\beta = .00$, $SE = 0.02$, 95% $CI = [-0.041, 0.040]$). The difference between the high and low independent self-construal was significant (*difference effect* = 0.06, $SE = 0.03$, 95% $CI = [0.007, 0.133]$). The index was also significant (*effect* = 0.03, $SE = 0.02$, 95% $CI = [0.004, 0.060]$), supporting Hypothesis 5.

DISCUSSION

Bootlegging has become increasingly valuable in promoting organizational competitiveness and ensuring survival (Augsdorfer, 2023). Given the intertwined nature of employee proactive behaviors (Crant, 2000) and the prevalence of collaborative working and coworking arrangements (Santana & Cobo, 2020), coworker proactive behavior has the potential to significantly influence bootlegging. However, previous research has overlooked this effect. Drawing on social comparison theory, we adopted an experimental causal chain design (Spencer et al., 2005) and a three-wave, time-lagged field study to show that the interactive effect between coworker proactive behavior and self-construal instigates bootlegging by triggering LGO and PAGO.

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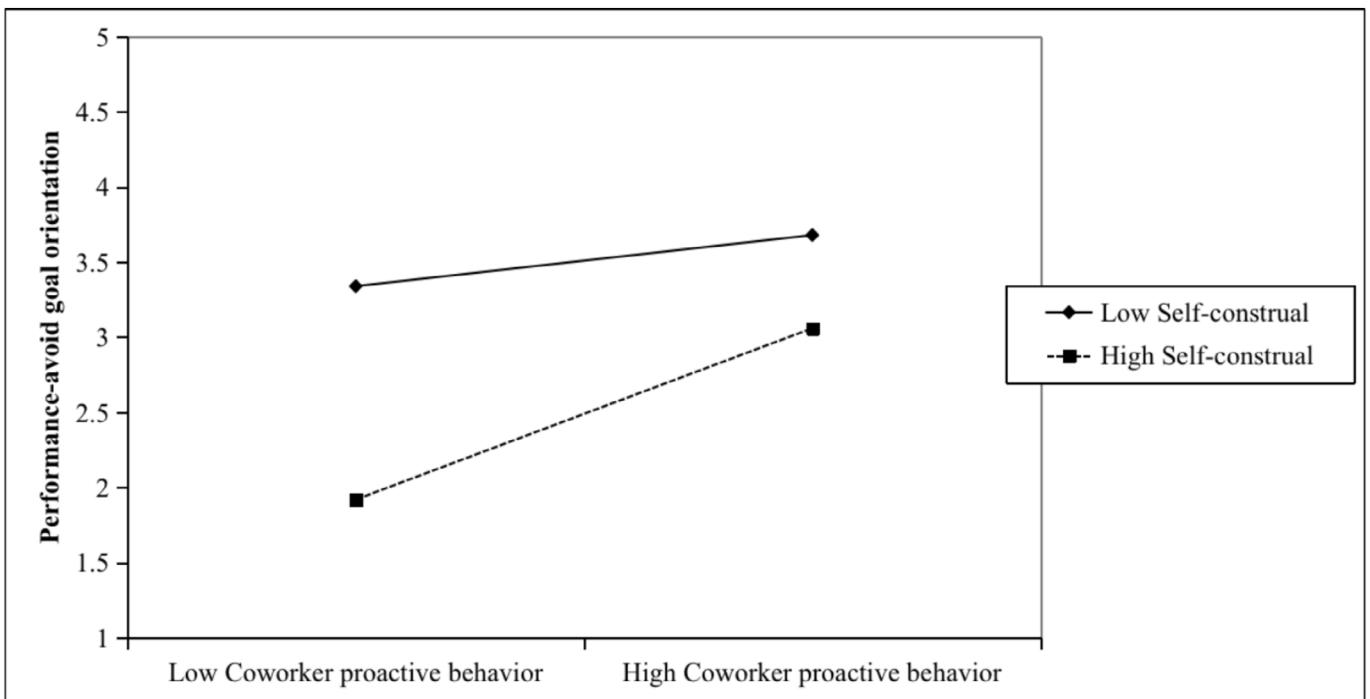

FIGURE 5 The moderating role of self-construal on the relationship between coworker proactive behavior and PAGO.

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Specifically, LGO mediates the interactive effect of coworker proactive behavior and employee interdependent self-construal on bootlegging, whereas PAGO mediates the interactive effect of coworker proactive behavior and employee independent self-construal on bootlegging.

Theoretical implications

Our study makes three theoretical contributions. First, this research extends prior research, which has primarily examined the antecedents of bootlegging in relation to its innovative characteristics, by addressing its informal and covert nature (Mainemelis & Sakellariou, 2023). Specifically, we introduce coworker proactive behavior as an informal catalyst, exploring how and when coworker innovative behavior fosters bootlegging and responding to calls for social-contextual analyses (Augsdorfer, 2023). Previous studies have largely focused on individual traits, such as curiosity, maverick tendencies, and risk propensity (Augsdorfer, 2012; Globocnik, 2019; Tenzer & Yang, 2023), along with organizational factors including formal management practices (Globocnik & Salomo, 2015), innovation strategy (Globocnik et al., 2022), coworker dynamics (Qu et al., 2024; Qu, Shao, et al., 2023; Qu, Tims, et al., 2023), and leadership styles (Li & Ye, 2021; Qu, Khapova, et al., 2023) as key antecedents of bootlegging. Although these studies have contributed to our understanding of bootlegging's innovative aspects, they have not fully captured its informal and covert dimensions (Augsdorfer, 2023; Mainemelis & Sakellariou, 2023). Building on the work of Qu and colleagues (Qu et al., 2024; Qu, Shao, et al., 2023; Qu, Tims, et al., 2023), we shift the focus to the role of coworkers, going a step further by examining the informal effects of coworker interactions. We explore that coworker proactive behavior can inspire the informal and covert nature of innovation (i.e., bootlegging), via two distinct motivational mechanisms (i.e., LGO and PAGO), thus shedding light on the core dynamics of bootlegging and offering insights into its complex nature and potential intervention strategies (Augsdorfer, 2023).

Second, drawing on social comparison theory, which highlights that self-related cognition depends on whether social comparison effects are assimilative or contrastive, we contribute to the interactionist perspective on bootlegging by examining self-construal as a key boundary condition that contextualizes the links between coworker proactive behavior on LGO and PGO, which in turn lead to bootlegging. Previous research has examined how different forms of self-construal influence the assimilation or contrast effect in social comparison (Matthews & Kelemen, 2025; Stapel & Koomen, 2001). However, the potential contribution of these individual differences to the impact of coworker proactive behavior on bootlegging has remained unexplored. Our study is crucial for exploring the nuanced dynamics of social comparison, shedding light on how self-construal shapes responses to coworker behavior and, ultimately, influences employees' goal orientations and bootlegging. Our study provides insights into the complex interplay of individual differences and social comparison mechanisms in bootlegging.

We also shed light on the mechanisms underlying the role of LGO and PAGO. Previous research has primarily focused on mechanisms such as employee altruism (Masoudnia & Szwejczewski, 2012), relational energy (Qu, Khapova, et al., 2023), and formal management practice (Globocnik & Salomo, 2015). However, our study differs by suggesting that bootlegging can be motivated by coworker proactive behavior. Specifically, drawing on social comparison theory, our analysis shows that engaging in upward social comparison with coworker proactive behavior can trigger an assimilation effect, motivating employees to develop LGO, which boosts bootlegging. Conversely, it can also trigger a contrast effect, leading employees to develop

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PAGO, which also promotes bootlegging. That is, coworker proactive behavior inspires bootlegging via LGO and PAGO, serving as two parallel mediators. This finding advances our understanding of how coworkers instigate bootlegging via LGO and PAGO.

Third, this study provides evidence for the role of PAGO in employees' innovation activities. Previous research has shown that individuals' goal orientation can influence innovative behavior by determining their self-regulatory tactics, including learning strategies, persistence, and effort (VandeWalle et al., 2019). PAGO has been associated with a reduced inclination to engage in innovation-related endeavors due to the perceived risks inherent in creativity and innovation (Hughes et al., 2018). Our study extends these findings by demonstrating that PAGO can serve as a motivational factor for employees to engage in bootlegging. This aligns with the idea that PAGO individuals are motivated to avoid demonstrating incompetence and unfavorable judgment (VandeWalle et al., 2019). When coworker proactive behavior triggers PAGO, individuals may refrain from conventional innovation efforts. However, this does not mean that they are not innovative at all. Instead, they would engage in covert and informal innovation-related efforts (i.e., bootlegging; Mainemelis & Sakellariou, 2023) to bring their ideas to fruition while avoiding unfavorable evaluations. Our study enhances the understanding of the intricate dynamics of bootlegging, highlighting bootlegging as a strategy for PAGO individuals to realize innovation.

Practical implications

This research has several practical implications. First, this research highlights that organizations can create an environment that is conducive to employee proactive behavior, motivating them to take initiative actions, explore creative solutions, and contribute innovative ideas. For example, if the organization's attitude to bootlegging is open, managers can actively encourage employees to be proactive. This approach enables managers to implement more effective management actions that align with the organization's bootlegging profile.

Second, this research suggests that managers should protect and satisfy employees' needs to realize novel ideas. Even if bootlegging alleviates the inherent structural strain on innovation resources (Criscuolo et al., 2014), it cannot fundamentally resolve it. Managers could consider various channels to alleviate the structural strain on innovation resources. For example, managers could choose to encourage bootlegging motivators to protect internal innovation needs, but we suggest they focus more on proactive employees.

Third, this research also provides concrete insights into innovative managerial practices. For employees with an interdependent self-construal, organizations can design collaborative innovation programs and peer learning initiatives to channel their motivation into structured innovation efforts. Conversely, for employees with an independent self-construal, organizations can implement recognition systems that value both independent and collaborative innovation, providing platforms where employees can test ideas without bypassing formal channels. By aligning innovation strategies with employee self-construal, organizations can transform bootlegging into a strategic advantage that fosters both autonomy and collaboration.

Limitations and future research

This research has several limitations that may inform future research. First, although we used multiple analytical methods to explore how and when coworker proactive behavior inspires

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bootlegging, we relied on self-reported data from employees in our studies, which can induce CMV bias (Podsakoff et al., 2003). To address this limitation, future research should consider collecting data from multiple sources or adopting a longitudinal design to test the full model (Podsakoff et al., 2012). We also acknowledge that the causal chain approach requires multiple studies and cannot test the full causal sequence in a single experiment; future research could also employ an integrated experimental design to provide a more comprehensive test of the proposed mechanism (Spencer et al., 2005).

Second, the antecedent of coworker proactive behavior on bootlegging requires further exploration. Our explanation focuses on the general proactive behavior exhibited by coworkers, representing a common manifestation of coworker conduct (Crant, 2000). However, we have not delved into other coworker behaviors, such as proactive innovative behavior or support behavior. We suggest that future studies can delve into those more specific coworker proactive behaviors, facilitating a more nuanced examination of the role of coworkers in impacting bootlegging.

Third, this mechanism of how coworker proactive behavior inspires bootlegging requires further exploration. Although our explanation draws on social comparison theory (Mussweiler, 2003) and goal orientation literature (Vandewalle et al., 2019), other perspectives remain underexplored. For example, coworker proactivity may also be perceived as pressure (Ni & Zheng, 2024). Future research could adopt challenge–threat appraisal frameworks to better understand when and how such behavior leads to bootlegging. Additionally, mediators such as intrinsic motivation or perceived threat warrant further examination to offer a more comprehensive account and to rule out alternative explanations.

Fourth, further examination of the contexts in which bootlegging occurs can contribute interesting insights. This study takes an initial step toward exploring the social comparison impact of coworker proactive behavior on the facilitation of different goal orientations in the context of different self-construals. Future research could also explore the moderating role of cultural tightness or employee workload pressure in the link between coworker proactive behavior and bootlegging, as those contexts have been found to have implications for rule-breaking behaviors or creativity (Qin et al., 2021; Shao et al., 2019).

Fifth, although our research was conducted in the Chinese samples, all studies examine Western-originated concepts and theories, such as bootlegging, coworker proactive behavior, goal orientation, and self-construal. However, cultural differences may influence the effects, antecedents, or outcomes of these constructs (Triandis, 1989). Therefore, future studies should aim to establish the generalizability of our findings by conducting research in other cultural settings or replicating our results in different Asian and Western countries (Taylor et al., 2008).

Sixth, our research focused exclusively on bootlegging as an outcome of social comparison processes triggered by coworker proactive behavior, without empirically comparing how these same processes might simultaneously influence employees' formal innovative behaviors (Ni & Zheng, 2024). This represents a promising avenue for future research to examine both formal and informal innovative behaviors as parallel outcomes, potentially revealing how social comparison differentially channels motivational responses toward overt versus covert innovation pathways.

Finally, although we established conceptual linkages between coworker proactive behavior and employee bootlegging through the lens of goal orientations (Mainemelis & Sakellariou, 2023; VandeWalle et al., 2019), we acknowledge that our current study does not fully unpack the underlying mechanisms through which these motivational states translate into

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concrete bootlegging behaviors. This represents a fruitful avenue for future research to explore how different state goal orientations shape the cognitive, emotional, and behavioral pathways that ultimately lead to bootlegging.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

The project was reviewed and approved by the Institutional Review Board of the university where the first author received the PhD (Approval No. RUC-SLHR20230008). All participants provided informed consent prior to their participation, and their responses were collected anonymously.

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ENDNOTES

[1] The project was evaluated and approved by the Institutional Review Board committee with the number RUC-SLHR20230008.

[2] We also ran analyses with the control variables (e.g., gender, age, education, organizational tenure, and PPGO), and the significance of the results remained consistent in our model. Detailed results are available from the authors upon request.

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APPENDIX

MATERIALS FOR STUDY 1A

Coworker proactive behavior manipulation. We drew on experimental research on proactive behavior and the proactive behavior scale (Fay et al., 2023; Frese et al., 1997) to manipulate coworker proactive behavior. All participants were asked to imagine that they work in a research and development (R&D) department responsible for developing robots and other automation equipment. Their team has an important task that must be completed on time. Recently, a new employee joined the group and required training. Participants were told that they had to finish their workload of the important task while also sparing time to train the new employee, resulting in high pressure due to time scarcity and extra workload. Participants were then divided into two conditions, each reading a different scenario.

In the high coworker proactive behavior scenario, participants received the following instructions: In this case, your coworker proactively solves the problem and organizes a meeting to talk about the pressure, investigates the problems, and tries to find the solution. The coworker suggests that the group should be divided into several subgroups to take turns in training the new employee. Meanwhile, the coworker always proactively takes on the extra workload, intends to explore new ways to improve efficiency and productivity, and puts new ideas into practice.

Conversely, in the low coworker proactive behavior condition, participants were informed: In this case, your coworker does not proactively solve the problems and has no intention of talking about it. The coworker does not mention the new employee's requirements. Meanwhile, the coworker just does the job and does not want to do more or explore new ways to improve efficiency and productivity and does not put new ideas into practice.

Self-construal manipulation. In line with established experimental studies of self-construal (Brewer & Gardner, 1996), we used a pronoun prime task that manipulated the self-construal-adopted by participants. Participants read a hypothetical scenario in which they were asked to assume that they were R&D employees of a company engaged in robotics and other automation equipment. The instructions asked participants to read a short paragraph describing the "introductory manual for a new technology" and to list all the pronouns it contained. Participants were then asked to count and report the total number of pronouns. The paragraphs for the independent and interdependent conditions were structurally identical, the only difference being the pronouns used. For the interdependent condition, the pronouns included "we," "us," "our," and "ourselves." In contrast, in the independent condition, the pronouns included "I," "me," "my," and "myself."

The interdependent scenario was as follows: "Our new technology prides itself on offering professional services to you and your families. We highly value our relationship with our guests

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and have meticulously designed a diverse array of facilities and amenities for you to select from. We recognize the importance of having a sanctuary where you can reconnect with yourself and your loved ones, prioritizing shared moments and experiences. As a cherished member of our family, please do not hesitate to inform us of any opportunities we have to enhance our service."

The independent scenario was as follows: "The new technology I have developed provides exceptional, personalized services to my customers. I highly value my relationship with my guests and have meticulously designed a diverse array of facilities and amenities for you to select from. I recognize the importance of having a sanctuary where you can reconnect with yourself and your loved ones, prioritizing shared moments and experiences. As a cherished member of my family, please do not hesitate to inform me of any opportunities I have to enhance my service."

APPENDIX

MATERIALS FOR STUDY 1B

LGO manipulation. Following Ni et al. (2024), we manipulated state LGO via a scenario approach based on the scale of VandeWalle (1997). Like in Study 1A, we asked participants to assume the role of an R&D employee in a company engaged in robot devices. Participants were then divided into two conditions, each reading a slightly different scenario.

In the high LGO condition, participants were provided with the following scenario: "You often attempt to choose **challenging tasks** where you can learn a lot. You intend to look for **opportunities to develop new skills and learn new knowledge**. You also **enjoy challenging tasks where you can learn new skills.** You feel it is important to **develop your workability.** You feel that you would enjoy working on projects that **require high skills and abilities**."

In the low LGO condition, participants were provided with the following scenario: "You **sometimes** attempt to choose challenging tasks where you can learn a lot. You **sometimes** intend to look for opportunities to develop new skills and learn new knowledge. You also **sometimes** enjoy challenging tasks where you can learn new skills. You **sometimes** feel it is important to develop your workability. You **sometimes** feel that you would enjoy working on projects that require high skills and abilities."

APPENDIX

MATERIALS FOR STUDY 1C

PAGO manipulation. The same as Study 1B, we developed the scenarios to manipulate state PAGO. In the high PAGO condition, participants were given the following scenario: "I often think I am the person who would rather stay away from new and challenging tasks if they could make me look incompetent to others. I worry so much about how I perform, which might reveal that I am incapable when taking on a task. As a result, I dislike undertaking any new or strange assignments. Moreover, I usually attempt to avoid any situations at work where I may not perform well. For example, I seldom ask any questions that others might find 'dumb.' When it comes to learning new things at work, I pay much attention to lessening or avoiding making mistakes. In a nutshell, I am a person who tries very hard to avoid any negative appraisals of my abilities by others."

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The low PAGO scenario was as follows: "I often think I am a person who would hardly avoid new and challenging tasks, even if they could make me look incompetent to others. I worry little about how I perform if it might reveal that I am incapable when taking on a task. As a result, I do not mind undertaking any new or strange assignments. Moreover, I rarely attempt to avoid any situations at work where I may not perform well. For example, I sometimes ask questions that others might find 'dumb.' When it comes to learning new things at work, I pay less attention to lessening or avoiding making mistakes. In a nutshell, I am a person who seldom minds negative appraisals of my abilities by others."

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