

Why cyberloafing can be socially learned in the workplace: the role of employees' perceived certainty of formal and informal sanctions

Why
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Abstract

Purpose – This study investigated why employees' cyberloafing behavior is affected by their coworkers' cyberloafing behavior. By integrating social learning theory and deterrence theory, the authors developed a model to explain the role of employees' perceived certainty of formal and informal sanctions in understanding the effect of coworkers' cyberloafing behavior on employees' cyberloafing behavior.

Design/methodology/approach – The authors conducted a survey that involved a two-stage data collection process (including 293 respondents) to test our developed model. Mplus 7.0 was used to analyze the data.

Findings – The results revealed that employees' cyberloafing was positively affected by their coworkers' cyberloafing both directly and indirectly. The indirect effect of coworkers' cyberloafing on employees' cyberloafing was mediated by the employees' perceived certainty of formal and informal sanctions on cyberloafing. Employees' perceived certainty of formal and informal sanctions were found to mediate the relationship both separately (each type of sanctions mediates the relationship individually) and in combination (the two types of sanctions form a serial mediation effect).

Originality/value – The study reveals an important mechanism – employees' perceived certainty of formal and informal sanctions – that underlies the relationship between coworkers' cyberloafing and employees' cyberloafing, thus, contributing to the cyberloafing literature. It also demonstrates the importance of negative reinforcement (perceived sanctions) in the social learning process, which contributes to the literature on social learning theory because previous studies have primarily focused on the role of positive reinforcement. Lastly, the study reveals a positive relationship between employees' perceived certainty of formal sanctions and informal sanctions, which has important implications for deterrence theory.

Keywords Cyberloafing, Perceived formal sanctions, Perceived informal sanctions, Social learning theory, Deterrence theory

Paper type Research paper

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1. Introduction

Cyberloafing, which refers to employees' use of Internet resources for non-work-related purposes during working hours, is an important concern for organizations (Cheng *et al.*, 2020). Anecdotal evidence suggests that cyberloafing is currently the way in which employees most frequently waste time at work. A recent study reports that employees spend 1–2 h every workday on cyberloafing, accounting for 10–30% of their work time (Jiang *et al.*, 2021). Given its prevalence in the workplace, cyberloafing is often considered a counterproductive or deviant workplace behavior that harms organizational productivity (D'Abate and Eddy, 2007; Wu *et al.*, 2020; Jiang *et al.*, 2020). It has been estimated that, in the United States, cyberloafing can reduce employee productivity by 30–40% (Alharthi *et al.*, 2021), which costs organizations US\$183 billion per year (Jandaghi *et al.*, 2015), or costs organizations US\$4,500 per employee annually (Lim *et al.*, 2021). In addition to productivity loss, some cyberloafing activities, such as downloading malware, may result in information security risks to organizations (Cheng *et al.*, 2014; Jiang *et al.*, 2021; Liberman *et al.*, 2011).

Given the potentially negative consequences of employee cyberloafing, it is not surprising that numerous studies have examined its antecedents to seek appropriate measures to curb it (Jiang *et al.*, 2021). However, most previous studies on cyberloafing antecedents have focused on employees' subjective perceptions related to their organization (e.g. perceived injustice from the organization) or their job (e.g. job role ambiguity or role conflict) (Cheng *et al.*, 2020; Henle and Blanchard, 2008; Lim, 2002). The effect of other organizational members, such as coworkers, on employees' cyberloafing behavior has rarely been examined. This is an important omission because many forms of human behavior are influenced by the behaviors of an individual's immediate community members, such as coworkers (Bommer *et al.*, 2003).

Preliminary evidence suggests that coworkers' cyberloafing can have a direct effect on employees' cyberloafing (Askew *et al.*, 2018; Khansa *et al.*, 2017; Liberman *et al.*, 2011), and these studies explain that employees may perceive coworkers' cyberloafing as a norm of the organization, which may positively affect employees' cyberloafing. However, these studies have not empirically investigated the possible mediators between coworkers' cyberloafing and employees' cyberloafing. Consequently, the underlying mechanisms through which coworkers' cyberloafing can transmit to employees remain unclear from existing literature. We argue that empirically investigating the underlying mechanisms is important for organizations to take action to prevent the spread of cyberloafing from coworkers to employees. Khansa *et al.* (2017) mention that "If the organization does not make any formal attempt to contain coworkers' cyberloafing, it will likely become the new norm and spread organization-wide" (p. 152). The statement implies that organizational interventions (e.g. sanctions on cyberloafing) may play an important role in explaining the transmission effect of coworkers' cyberloafing on employees' cyberloafing.

Accordingly, our study aims to examine the role of organizational sanctions, which is an important type of organizational interventions for cyberloafing, in understanding the effect of coworkers' cyberloafing on employees' cyberloafing. We develop the research model by integrating social learning theory with deterrence theory (Akers, 1998; Gibbs, 1975). Social learning theory suggests that individuals' perceived reinforcement (rewards or sanctions) of a behavior plays an essential role in explaining why they learn the behavior from others (Akers, 2017; Lowry *et al.*, 2016; Tittle and Paternoster, 2000). The perceived rewards or removal of sanctions on a behavior may facilitate individuals' social learning of the behavior (Lowry *et al.*, 2016). Deterrence theory posits that individuals may increase a noncompliance behavior (e.g. cyberloafing) if they perceive decreased sanctions on the behavior (Helmut *et al.*, 2014; Zimring and Hawkins, 1983). Therefore, the integration of social learning theory and deterrence theory suggests that employees' perceived sanctions on cyberloafing (or lack thereof) can be important for understanding why employees "learn" their coworkers' cyberloafing behavior. By linking perceived reinforcement (social learning theory) with perceived sanctions (deterrence theory), our

research model proposes that employees' cyberloafing can be positively affected by their coworkers' cyberloafing, because the employees' observation of their coworkers' cyberloafing may decrease their perceived certainty of formal and informal sanctions on cyberloafing. The model was supported by empirical results, which were analyzed based on the data collected using a two-stage online survey.

Our study makes three important contributions to the literature. First, it reveals an important mechanism—employees' perceived certainty of sanctions—that underlies the relationship between coworkers' cyberloafing and employees' cyberloafing. The revealed mechanism fills an important research gap by explaining why employees' cyberloafing can be influenced by their coworkers' cyberloafing. Second, it contextualizes negative reinforcement, an important concept of social learning theory, to be the perceived certainty of formal and informal sanctions in the cyberloafing context. We empirically demonstrate the importance of negative reinforcement (perceived formal and informal sanctions) in the social learning process. This is an important contribution to the application of social learning theory because previous studies using this theory have primarily focused on the role of positive reinforcement (perceived rewards), and have largely neglected the role of negative reinforcement (Garduno, 2019; Lindström *et al.*, 2021) [1]. Third, our study reveals a positive relationship between employees' perceived formal sanctions and perceived informal sanctions in the context of cyberloafing. This finding is important for deterrence theory because the relationship between formal and informal sanctions has not been empirically examined in previous studies.

The remainder of the paper is organized as follows. Section 2 presents a brief review of previous studies on the antecedents of cyberloafing, demonstrating that the effect of coworkers' cyberloafing behavior has not been adequately examined. We also review the literature on social learning theory and deterrence theory that we use as our theoretical background. Section 3 presents our research model and hypotheses. Section 4 discusses our methodology and results. We conclude the paper by discussing the study's contributions and limitations.

2. Literature review and theoretical background

2.1 Previous studies on cyberloafing

Most previous studies on cyberloafing have focused on cyberloafing antecedents, investigating the factors that may influence employees' cyberloafing behavior. The cyberloafing antecedents that previous studies have identified can be generally classified into three categories: employees' perceptions of their organizations, employees' perceptions of their jobs, and employees' demographic and personality-related factors.

In research on employees' perceptions of their organization, several studies have found that employees' perceived injustice (from organizations) may result in cyberloafing because they may engage in cyberloafing as retaliation for unfair treatment from organizations (Blau *et al.*, 2006; Lim, 2002). According to Zoghbi-Manrique-de-Lara (2009), another possible explanation for this relationship is that employees may perceive a normative conflict due to perceived injustice from organizations, and they may engage in cyberloafing as an escape from the perceived norm conflict. Previous studies have also found a negative relationship between employees' affective commitment to the organization and cyberloafing (Usman *et al.*, 2021), because employees who are less committed to their organization are more likely to slack at work and cyberloafing can be a convenient means of slacking.

In research on employees' perceptions of their jobs, early studies found that perceived role ambiguity and role conflict can lead to cyberloafing (Henle and Blanchard, 2008; Sawitri and Cahyadin, 2012). This is because role ambiguity and role conflict can result in frustration, and cyberloafing can be a convenient means for employees to alleviate frustration (Henle and Blanchard, 2008). A recent study revealed that employees' perceived overqualification in performing job-related tasks can also result in cyberloafing (Cheng *et al.*, 2020). Perceived

overqualification may indicate an inappropriate fit between the employee and the job position; this may result in employees' negative perceptions, which decrease their work effort and eventually increase their cyberloafing behavior (Cheng *et al.*, 2020).

Other studies have examined the effect of employees' personality traits or demographic characteristics on their cyberloafing behavior. Several studies have examined the relationship between the Big Five traits and cyberloafing (Jia *et al.*, 2013; Jia and Jia, 2015). Demographic characteristics, such as gender, age, and educational level, have also been found to be associated with employees' cyberloafing behavior (Jia *et al.*, 2013; Vitak *et al.*, 2011).

Although the studies reviewed above have important implications for understanding employees' cyberloafing behavior, most of them have focused on the perceptions or characteristics of employees. Few studies have investigated whether and why employees' cyberloafing behavior can be influenced by their coworkers' cyberloafing behavior. This is an important research gap because many studies have revealed that individuals' behavior can be influenced by other members of the organization (Bauman *et al.*, 2016; Greenbaum *et al.*, 2018; ten Brummelhuis *et al.*, 2016). The behavior of other organizational members can be a very important proximal social context in which the employees' behaviors occur (Lieberman *et al.*, 2011). Although preliminary evidence suggests that coworkers' cyberloafing may influence employees' cyberloafing behavior (Askew *et al.*, 2018; Liberman *et al.*, 2011), previous studies have not empirically examined the underlying explanations for or the mechanisms that underlie this relationship. Investigating the theoretical explanations and the underlying mechanisms can help organizations take action to prevent the spread of cyberloafing from coworkers to employees.

2.2 Social learning theory and deterrence theory

As noted, our research model is based on the integration of social learning theory and deterrence theory. Social learning theory explains how individuals' behavior can be influenced by others (Davis *et al.*, 2019; Simons *et al.*, 1988), and it has been widely used to explain individuals' criminal or deviant behavior (Akers, 2017). According to the theory, there are four components of social learning: differential association, definitions, imitation and differential reinforcement (Akers, 1998; Akers and Jennings, 2009). Specifically, individuals' deviant behaviors are learned from interacting with others (associations), such as family members, friends, and coworkers (Akers and Jennings, 2009; Warr, 2002). Individuals are especially likely to learn behaviors from their peers with whom they frequently interact (Sutherland, 1947). The learning process can be direct because the individuals are exposed to the norm or attitudes that support a behavior (e.g. cyberloafing) when they observe that others engage in the behavior (Akers and Jennings, 2009). Consequently, the individuals may define the behavior as acceptable or desirable and imitate the behavior.

The learning process can also occur indirectly through vicarious reinforcement (Cochran *et al.*, 2017). When observing a behavior (e.g. cyberloafing) of others, the observers may witness or draw cues from others' behavior about the reinforcement (i.e. consequences such as rewards or sanctions) of the behavior (Brauer and Tittle, 2012). The observed or inferred reinforcement may further affect the observers' definition and engagement of the behavior (imitation). Accordingly, reinforcement is considered the central causal mechanism of the social learning process because all of the remaining cognitive or non-cognitive elements of social learning (imitation, definition) are largely shaped by the reinforcement process (Akers, 1998; Lowry *et al.*, 2016; Tittle and Paternoster, 2000). For example, employees and their coworkers are high-intensity associations because they have the same status and interact frequently. The observation of coworkers' cyberloafing may influence employees' estimation about the reinforcement (consequences) of cyberloafing, which in turn, affects employees'

definition and engagement of cyberloafing. Therefore, from the social learning perspective, investigating how coworkers' cyberloafing behavior affects employees' perceived reinforcement of cyberloafing is an important step towards understanding how or why coworkers' cyberloafing affects employees' cyberloafing.

According to deterrence theory and its applications in cyberloafing studies, an important negative reinforcement of employees' cyberloafing behavior is organizational sanctions (Cheng *et al.*, 2014; Ugrin and Pearson, 2013). Deterrence theory suggests that individuals are rational, and they are less likely to engage in a deviant behavior if the sanctions associated with the behavior become more certain, severe, and immediate (Gibbs, 1975). Therefore, we integrate deterrence theory with social learning theory to contextualize the "reinforcement" to be organizational sanctions. Integrating the two theories enables us to examine how coworkers' cyberloafing behavior influences employees' perceived sanctions on cyberloafing, which, in turn, influences employees' cyberloafing behavior.

Deterrence theory proposes three dimensions of sanctions: sanction certainty, sanction severity, and sanction celerity. Empirical studies have found that sanction certainty can effectively inhibit deviant behavior; however, the effects of sanction severity and sanction celerity have been relatively inconclusive (Buckenmaier *et al.*, 2021; Engel and Nagin, 2015; Kuo *et al.*, 2020; Li *et al.*, 2010b). For example, D'Arcy *et al.* (2009) found that sanction certainty, but not sanction severity, had a significant effect on curbing employees' information security noncompliance behavior. Buckenmaier *et al.* (2021) found that sanction celerity was not significantly related to deviant behaviors. Furthermore, a meta-analysis of security-risk behaviors demonstrated that sanction certainty had a larger mean effect size than sanction severity and celerity (Kuo *et al.*, 2020). In the context of cyberloafing, several studies have found that the deterrent effect of sanctions is mainly due to the certainty of sanctions rather than the severity and celerity of sanctions (Cheng *et al.*, 2014; Li *et al.*, 2010a). Thus, based on the findings of previous studies on deterrence theory, we focus on the role of sanction certainty in explaining the effect of coworkers' cyberloafing on employees' cyberloafing.

Early studies on deterrence theory primarily focused on formal sanctions (e.g. salary deductions, reprimands, and dismissal); however, recent studies have found that informal sanctions, such as loss of respect from important others or feelings of embarrassment or shame, may also produce a deterrence effect. For example, several studies found that informal sanctions such as social desirability pressure and moral beliefs were found to decrease individuals' technology misuse intention or behavior (D'Arcy and Devaraj, 2012; Kaviani *et al.*, 2020). Siponen *et al.* (2012) found that individuals' perceived shame had a significant negative effect on their software piracy behavior.

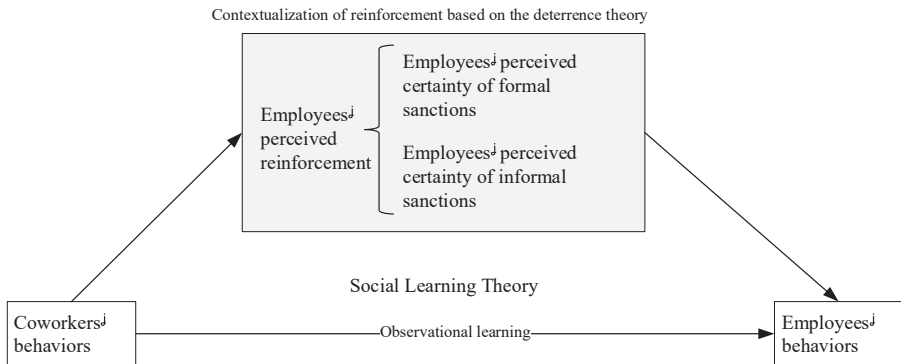
In summary, employees' perceived reinforcement may play an important role in understanding their social learning of coworkers' behavior, and perceived certainty of sanctions is an essential type of organizational reinforcement. Figure 1 depicts the integration of the two theories – social learning theory and deterrence theory – we used to investigate how their coworkers' cyberloafing may influence employees' cyberloafing through employees' perceived certainty of formal and informal sanctions.

3. Research model and hypotheses

3.1 The direct effect of coworkers' cyberloafing on employees' cyberloafing

In the process of engaging in social interactions, people often unintentionally and unconsciously imitate the behavior of others (Paukner *et al.*, 2009), because those behaviors are part of the social environment from which individuals draw cues about acceptable behavior (Bommer *et al.*, 2003). Individuals' attitudes and behaviors tend to be similar to their close associates, such as family members, friends, and coworkers, because they spend relatively more time together (Laland, 2004). For instance, Bandura's (1977) early

Figure 1.
The integration of
social learning theory
and deterrence theory
in our study



study on children's violence showed that children who observed adults' aggressive behavior imitated this behavior. Akers *et al.* (1979) also found that the influence of peers and parents is an important factor in explaining adolescent drinking and drug behavior. A recent study found that employees' absenteeism can be influenced by the absenteeism of their coworkers (ten Brummelhuis *et al.*, 2016).

In the context of cyberloafing, employees' job performance in contemporary organizations increasingly relies on cooperation or collaboration among employees, and it is very common for employees to interact with their coworkers in the workplace (Harvey *et al.*, 2018). Consequently, employees may observe or perceive their coworkers' cyberloafing behavior (Kim *et al.*, 2016). Based on social learning theory, employees tend to learn and imitate the behavior of others who have a similar position or have the same status because they often share the same working environment (Burt, 1987; Fugas *et al.*, 2011; Miller and Morris, 2014; Skinner and Fream, 1997). If employees observe that their coworkers frequently engage in cyberloafing, they may perceive that this behavior is acceptable in the organization, or does not violate the organization's norms and values. For example, using data from a survey, Lim and Teo (2005) found that 88% of the respondents believed that cyberloafing was acceptable when everyone else engaged in it. Therefore, if employees observe that many of their coworkers engage in cyberloafing and (or) their coworkers frequently engage in cyberloafing, they may define cyberloafing as acceptable, and they may also engage in it. Thus, we propose the following hypothesis:

H1. Coworkers' cyberloafing is positively related to employees' cyberloafing.

3.2 Coworkers' cyberloafing and employees' perceived certainty of formal and informal sanctions

According to deterrence theory, employees' perceptions of deterrence (such as sanctions) entail a learning process (Thornberry, 1987). Employees may learn deterrence either directly from their own experience (being punished due to engaging in cyberloafing) or indirectly from others' experiences (observing that others have been punished for cyberloafing). This is in line with social learning theory, which suggests that the outcome expectations of a certain behavior can be shaped by the consequence of the behavior, and the consequences can be learned either through the experiences of the focal person or by observing others' experiences (Bandura, 1977). Thus, in the context of cyberloafing, we argue that coworkers' cyberloafing may influence employees' perceived consequences of cyberloafing.

Specifically, coworkers' cyberloafing behavior may influence employees' perceived certainty of formal sanctions on cyberloafing. Perceived certainty of formal sanctions refers

to the extent to which employees believe that punishments will be inevitably imposed by the organization (Johnston *et al.*, 2015). If coworkers engage in cyberloafing widely (i.e. many coworkers engage in cyberloafing) or frequently, employees may perceive a social cue that cyberloafing is unlikely to result in punishment from the organization. This is because, according to deterrence theory, coworkers are unlikely to widely or frequently engage in cyberloafing if the organization punishes them for doing so. When employees observe many of their coworkers engaging in cyberloafing or observe (at least some of) their coworkers engaging in cyberloafing frequently, they may perceive that the organization tolerates that behavior (Askew *et al.*, 2018) because coworkers' behaviors are part of the social environment from which individuals draw cues about acceptable behavior (Bommer *et al.*, 2003). Furthermore, punishing employees for their cyberloafing is often costly for organizations because it requires organizations to devote substantial resources to formulating sanction rules and detecting employees' cyberloafing behavior (Kleiman and Kilmer, 2009; Pierce *et al.*, 2015). Therefore, the prevalence of cyberloafing, as partly indicated by coworkers' cyberloafing, may increase the organization's cost of enforcing punishments, and eventually decrease the likelihood of the punishment execution. As a Chinese saying suggests, a law will not be enforced if it is blatantly violated by the majority of people.

In other words, if employees observe that their coworkers widely and (or) frequently engage in cyberloafing, they may believe that coworkers' cyberloafing behavior may not result in formal punishment from the organization (Kahan, 1997), either because cyberloafing is acceptable to (or tolerated by) the organization or because the organization fails to detect employees' cyberloafing and enforce the punishments. This belief may further lower employees' perceived certainty of formal sanctions on their own cyberloafing, because their status is similar to that of their coworkers and they engage in the same cyberloafing behavior (Burt, 1987; Weiss, 1977). Our arguments are consistent with previous studies in the field of Criminology. For example, Kahan (1997) found that, after observing neighbors' free trade in drugs or frequent tax evasion, individuals may lower their estimation of the risk associated with these behaviors and engage in the behaviors. Accordingly, we propose the following hypothesis:

H2a. Coworkers' cyberloafing is negatively related to employees' perceived certainty of formal sanctions on cyberloafing.

Coworkers' behaviors also represent important social cues about what is socially accepted by organizational members. Such cues may lower employees' perceived certainty of informal sanctions on the behaviors, which refers to the extent to which employees believe that punishments will be inevitably imposed by peers or managers (Johnston *et al.*, 2015). Individuals' perceived certainty of informal sanctions on a specific behavior is related to the attitude of important others towards the behavior, and others' attitudes towards a behavior may be reflected in their engagement in the behavior (Anderson *et al.*, 1977). Therefore, employees may interpret the wide and (or) frequent engagement of their coworkers in cyberloafing as the coworkers' positive attitude towards cyberloafing. Coworkers' positive attitudes towards cyberloafing may alleviate employees' concerns about the informal sanctions on their own cyberloafing from the coworkers, because in an organization where a specific behavior (e.g. cyberloafing) is rampant, individuals are unlikely to form moral aversions to the behavior (Kahan, 1997).

Employees may also interpret coworkers' cyberloafing behavior as managers' tolerance of the behavior, which may lower employees' perceived certainty of informal sanctions from managers. Even if managers may not hold a positive attitude towards cyberloafing, employees may rationalize their cyberloafing behavior by arguing that their coworkers do it as well. Such a rationalization may alleviate employees' concerns about the possible informal sanctions from their managers, because the more prevalent a behavior is in a particular

community, the less likely it is that someone will be condemned for engaging in it (Gordon, 1989; Kahan, 1997; Rasmussen, 1996). Therefore, observing coworkers' cyberloafing may reduce the employees' perceived certainty of informal sanctions on the behavior, such as loss of respect from coworkers or managers. Accordingly, we propose the following hypothesis:

H2b. Coworkers' cyberloafing is negatively related to employees' perceived certainty of informal sanctions on cyberloafing.

3.3 Parallel mediating roles of perceived certainty of formal and informal sanctions

We have discussed why coworkers' cyberloafing can decrease employees' perceived certainty of formal and informal sanctions on cyberloafing. According to deterrence theory, employees' perceived sanctions on a specific behavior may decrease their engagement in the behavior because individuals are "pain" averse, and sanctions are important instantiations of the "pain". Therefore, individuals' inclination to engage in a behavior may increase if they perceive that the behavior is unlikely to result in sanctions, especially if the behavior is attractive such as cyberloafing. The deterrence effect of sanctions applies to both formal and informal sanctions. For example, Xu *et al.* (2020) found that both perceived formal and informal sanctions are negatively related to computer-related deviant behavioral intention. Similarly, we argue that employees' cyberloafing behavior may increase if they perceive the decreased certainty of formal and informal sanctions due to their observations of their coworkers' cyberloafing behavior.

The above discussion suggests that employees' perceived certainty of formal and informal sanctions mediates the relationship between coworkers' and employees' cyberloafing. These mediating effects are in line with social learning theory (Akers, 1998; Akers and Jennings, 2009), which suggests that the outcome expectancy of a certain behavior is a central causal mechanism in the social learning process of the behavior (Brauer and Tittle, 2012). That is, outcome expectancy (or perceived reinforcement) plays a mediating role in the social learning process. In our study, the outcome expectancy of cyberloafing involves both formal and informal sanctions. That is, the reason that coworkers' cyberloafing may affect employees' cyberloafing, at least to some extent, is that witnessing their coworkers' engagement in cyberloafing may strengthen the employees' perception that they will not be formally or informally sanctioned for cyberloafing. Therefore, we propose the following hypotheses:

H3. Employees' perceived certainty of formal sanctions mediates the relationship between coworkers' cyberloafing and employees' cyberloafing.

H4. Employees' perceived certainty of informal sanctions mediates the relationship between coworkers' cyberloafing and employees' cyberloafing.

3.4 Serial mediation effect of perceived certainty of formal and informal sanctions

Previous studies have suggested that formal sanctions facilitate the formation of informal sanctions because formal sanctions can shape and reinforce the prevailing normative structure of individuals (Lazzarini *et al.*, 2004). Individuals who have received formal sanctions may also perceive the threat of informal sanctions for two reasons. First, behaviors subject to formal sanctions are often something that an organization cannot accept. Formal sanctions can strengthen and mobilize informal social disapproval. For example, Salem and Bowers (1970) found a significant positive relationship between formal sanctions on a specific behavior and social disapproval of the behavior. Individuals are likely to perceive informal sanctions when engaging in behaviors of which others disapprove, because informal sanctions are reflected in the negative attitudes of important others towards the behaviors (Kahan, 1997). Second, formal sanctions may represent a stigma, and those who receive

formal sanctions can be stigmatized (Hollinger and Clark, 1983). Prior research has suggested that formal sanctions may result in ridicule, disapproval, gossip, and loss of respect from others in the workplace (Cochran *et al.*, 2010). In a study on husbands' abusive behavior towards wives, Williams and Hawkins (1989) found that formal sanctions can increase informal sanctions because formal sanctions may facilitate the exposure of the husbands' abusive behavior, and other people may feel anger at and lose respect for husbands who abuse their wives (Williams and Hawkins, 1989).

We argue that the effect of perceived certainty of formal sanctions on perceived certainty of informal sanctions can also be present in the context of cyberloafing. Specifically, employees within an organization may share information to judge the conduct and reputation of an employee; thus, whether employees have been formally punished by the organization is an important issue determining whether others will judge them or gossip about them. Such judgments and gossip may result in employees' feeling shame or embarrassment (perceived informal sanctions). Hence, employees' perceptions that cyberloafing may be subject to formal sanctions from the organization may lead to their concerns about the perceived certainty of informal sanctions from coworkers or managers (e.g. reputation damage) (Warkentin *et al.*, 2012). Thus, we hypothesize the following:

- H5.* Employees' perceived certainty of formal sanctions on cyberloafing is positively related to their perceived certainty of informal sanctions on cyberloafing.

Based on social learning theory and deterrence theory, we have proposed that employees' perceived certainty of formal sanctions on cyberloafing can decrease as a result of observing coworkers' cyberloafing; in turn, the decrease of perceived formal sanctions may increase employees' cyberloafing. We further argue that the effect of perceived formal sanctions on cyberloafing can be both direct and indirect. On the one hand, the deterrence theory suggests that there can be a direct link between perceived formal sanctions and cyberloafing, because formal sanctions are important instantiations of the "pain" employees want to avoid. On the other hand, employees' perceived formal sanctions may also influence employees' cyberloafing through increasing their perceived informal sanctions on cyberloafing, because formal sanctions on cyberloafing may represent a stigma that can strengthen the social disapproval of cyberloafing. Therefore, those employees who receive formal sanctions from the organization due to cyberloafing may feel embarrassed and may be concerned that others will judge them or gossip about them. Based on deterrence theory, these feelings of embarrassment and concerns about gossip are important forms of informal sanctions, which can deter employees from engaging in cyberloafing.

In sum, employees' perceived certainty of formal sanctions plays a mediating role in the relationship between coworkers' and employees' cyberloafing. Part of the mediation effect can be indirect and be further mediated by employees' perceived certainty of informal sanctions. Hence, it is reasonable to propose the following hypothesis of a serial mediation effect:

- H6.* The relationship between coworkers' cyberloafing and employees' cyberloafing is mediated sequentially through employees' perceived certainty of formal sanctions and employees' perceived certainty of informal sanctions.

Figure 2 depicts our research model.

4. Method

4.1 Sample and data collection procedure

We conducted a survey via an online platform (www.wjx.com) to collect data and test our hypotheses. The platform is widely used for information systems (IS) research (Wu *et al.*,

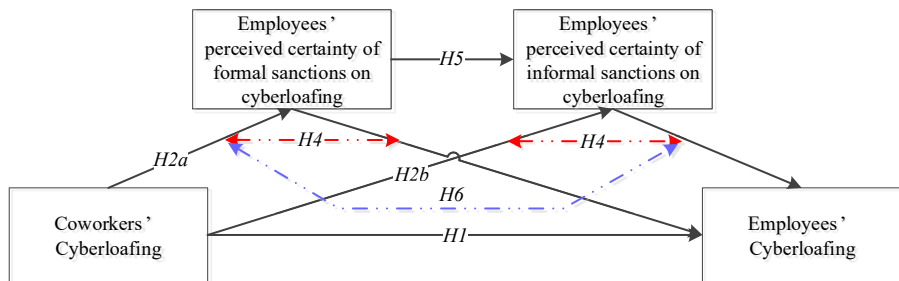


Figure 2.
Research model

Note(s): *H3*, the mediation of employees' perceived certainty of formal sanctions;
H4, the mediation of employees' perceived certainty of informal sanctions;
H6, the serial mediation of employees' perceived certainty of formal and informal sanctions

2020; Ma, 2022). To ensure respondents' representativeness, we targeted full-time employees working in different industries such as Internet businesses, hotels, tourism, manufacturing, and finance. Anonymity was ensured for all the respondents to avoid the potential social desirability issue (Wu *et al.*, 2017).

Our survey involved two stages to alleviate the potential common method bias (Podsakoff *et al.*, 2003). In the first stage, we collected data on coworkers' cyberloafing (asking respondents about their coworkers' cyberloafing in the past week) and the control variables (see details in the following section). We paid RMB 6 (approximate US\$0.95) to the platform for each respondent. Our questionnaires were randomly sent to the target participants using the online survey platform with a quick response (QR) code through WeChat, one of the most popular social media applications in China and across the world (Wu *et al.*, 2020). Before completing the questionnaire, the participants were informed about the purpose of the survey. It took about 2 minutes to answer all the questions. A total of 383 respondents participated in our first-stage survey. We excluded 32 questionnaires because the answers were incomplete (Pokorny *et al.*, 2001). Consequently, the responses from 351 participants were retained.

The second-stage data collection was conducted two weeks after the first stage, including the data on employees' cyberloafing (asking the respondents about their own cyberloafing in the past week) and their perceived certainty of formal and informal sanctions on cyberloafing. Of the 351 respondents retained in the first stage, 319 participated in the second survey. We paid RMB 12 (approximate US\$1.90) to the platform for each valid questionnaire for matching participants who returned valid questionnaires in the first stage. We eliminated 21 respondents because their answers to the questionnaire included missing values. After matching the usernames and IP addresses of the respondents in the two stages of data collection, 293 samples were reserved for further analysis. The participants came from 22 different provinces in China. Table 1 depicts the demographic information of the participants.

4.2 Measures

The measures of the constructs in our research model were adapted from previous studies. A seven-point Likert scale ranging from 1 (strongly disagree or very unlikely) to 7 (strongly agree or very likely) was used to rate the items. Specifically, the measurements of *coworkers' cyberloafing* (CCL) and *employees' cyberloafing* (ECL) were adapted from Blau *et al.* (2006). Sample items of CCL include "My coworkers have shopped online for personal goods" and

Variable	Item	Frequency	Percentage (%)
Gender	Male	127	43.3
	Female	166	56.7
Age	<30 years	46	15.7
	30–39 years	98	33.48
	40–49 years	114	38.9
	≥50 years	35	11.9
Educational level	Junior high school or below	1	0.3
	Senior or technical secondary school	10	3.4
	Bachelor or junior college degree	249	85
	Master degree or above	33	11.3
Monthly income (RMB)	≤3,000	32	10.9
	3,001–5,000	52	17.7
	5,001–7,000	85	29
	7,001–10,000	71	24.2
	> 10,000	53	18.1
Marital status	Unmarried	113	38.6
	Married	180	61.4
Work experience (years)	<3	54	18.4
	3–5	68	23.2
	5–7	66	22.5
	7–10	40	13.7
	≥10	65	22.2
Position	Non-manager	135	46.1
	Low-level manager	111	37.9
	Mid-level manager	40	13.7
	Top-level manager	7	2.4

Table 1.
Demographic
statistics ($N = 293$)

“My coworkers have visited investment-related websites”. The Likert scale used for measuring coworkers’ cyberloafing is from “strongly disagree” to “strongly agree”. In our questionnaires, we provided instructions for the measurement of each construct to guide respondents. For the measurement of coworkers’ cyberloafing, the instruction clarifies that “‘strongly agree’ means that your coworkers engage in the following cyberloafing activities widely (i.e. many coworkers engage in the cyberloafing activities) and (or) frequently, whereas ‘strongly disagree means that your coworkers rarely engage in the cyberloafing activities”. Sample items of ECL are “I have visited general new site” and “I have shopped online for personal goods”. The measurements of *perceived certainty of formal sanctions (CFS)* and *perceived certainty of informal sanctions (CIS)* were adapted from [Siponen and Vance \(2010\)](#). A sample item of CFS is “What is the chance you would receive sanctions if you used your company’s Internet access for non-work-related purposes on working time?” A sample CIS item is “How likely is it that you would lose the respect and good opinions of your coworker for using your company’s Internet access for non-work-related purposes on working time?”

Following previous studies ([Askew et al., 2018](#); [Kim et al., 2016](#); [Li et al., 2017](#); [Wu et al., 2020](#)), we included seven control variables in our model: gender (GED), age (AGE), education (EDU), income (INC), marriage (MAR), work experience (WEP), and position (PST).

5. Results

5.1 Preliminary tests of common method bias and confirmatory factor analysis

Before testing the hypotheses, we first conducted common method bias analysis and confirmatory factor analysis (CFA) using SPSS 22.0 and Mplus 7.0. Common method bias was

examined by two tests. First, we conducted Harman's single-factor test (Olsen *et al.*, 2019; Podsakoff and Organ, 1986). The results showed that one factor explained 40.3% of the variance, which is well below the recommended threshold of 50%. Second, we conducted CFA to further test for common method bias (Cheng *et al.*, 2019; Slater *et al.*, 2006). Table 2 shows that the fit of the 4-factor model was considerably better than that of the 1-factor model and other alternative models. Chi-square differences tests further revealed that the 4-factor model had a better fit than the other models (see Table 2). Therefore, we found no evidence of serious concerns about common method bias in the study.

A CFA of the scales with Mplus 7.0 was employed to assess the construct reliability and validity. As shown in Appendix (Table A2), the values of Cronbach's α and composite reliability for all constructs ranged from 0.83 to 0.91 and from 0.79 to 0.91, respectively, which are larger than the threshold of 0.7 and suggest satisfactory reliability of measurements.

We used the loadings and average variance extracted (AVE) to test the convergent validity. The results shown in Appendix indicate that the standardized loadings of all items were larger than 0.60 (ranging from 0.69 to 0.87), and the AVE of each construct was higher than 0.5 (ranging from 0.51 to 0.70). The results showed that the scales in this study had good convergent validity.

We further tested the discriminant validity by comparing the squared roots of the AVE of all constructs and the correlations between constructs. Table 3 presents the means, standard deviations, square root of the AVE, and correlations of variables. The square root of the AVE for all constructs is much greater than the correlations among the four constructs, suggesting that the constructs are distinct from each other.

The results in Table 3 also show that coworkers' cyberloafing is positively correlated with employees' cyberloafing ($r = 0.55, p < 0.001$) and negatively correlated with the perceived certainty of formal sanctions ($r = -0.36, p < 0.001$) and the perceived certainty of informal sanctions ($r = -0.37, p < 0.001$). Moreover, the perceived certainty of formal sanctions is positively correlated with the perceived certainty of informal sanctions ($r = 0.63, p < 0.001$) and negatively correlated with employees' cyberloafing ($r = -0.47, p < 0.001$). In addition, the perceived certainty of informal sanctions is negatively correlated with employees' cyberloafing ($r = -0.48, p < 0.01$). These results provide initial support for our hypotheses.

5.2 Hypotheses testing

Structural equation modeling (SEM) was subsequently conducted using Mplus 7.0 to test the hypotheses. Following the suggestion from Preacher and Hayes (2008), 5,000 bootstrap samples were used to test the significance of the indirect effects based on a 95% bias-corrected bootstrap confidence interval. When testing for these mediations, we included the

Model	χ^2	df	CFI	TLI	SRMR	RMSEA	$\Delta\chi^2(\Delta df)$
4-factor model	472.25	197	0.92	0.91	0.05	0.07	–
3-factor model ^{a1}	640.02	206	0.88	0.87	0.06	0.09	167.77(9)***
3-factor model ^{a2}	998.88	206	0.78	0.76	0.10	0.12	526.63(9)***
2-factor model ^{b1}	1057.10	208	0.77	0.74	0.08	0.12	584.85(11)***
2-factor model ^{b2}	1257.15	208	0.71	0.68	0.11	0.13	784.90(11)***
1-factor model	1597.20	209	0.62	0.58	0.11	0.15	1124.95(12)***

Note(s):

^{a1} This model combines CFS and CIS into one factor

^{a2} This model combines CCL and CFS into one factor

^{b1} This model combines ECL, CFS, and CIS into one factor

^{b2} This model combines CCL, CFS, and CIS into one factor

Table 2.
Results of
confirmatory factor
analysis

Variable	Mean	SD	GED	EDU	AGE	INC	MAR	WEP	PST	CCL	CFS	CIS	ECL
GED	1.57	0.50											
EDU	3.07	0.40	0.02										
AGE	2.47	0.90	-0.04	0.07									
INC	3.21	1.24	-0.14*	0.30***	0.08								
MAR	1.61	0.49	-0.14*	-0.05	0.01	0.37***							
WEP	2.98	1.41	-0.23***	-0.07	0.04	0.38***	0.67***						
PST	1.72	0.79	-0.14*	0.10	0.08	0.42***	0.31***	0.42***					
CCL	3.93	1.09	0.09	0.04	0.18**	-0.04	-0.12*	-0.16**	-0.04	0.74			
CFS	4.13	1.23	-0.02	-0.12*	-0.50***	-0.09	0.05	-0.03	0.02	-0.36***	0.84		
CIS	4.50	1.07	-0.07	0.01	-0.33***	-0.01	-0.01	-0.01	0.08	-0.37***	0.63***	0.79	
ECL	3.96	1.15	0.07	0.03	0.16**	-0.12*	-0.14*	-0.13*	-0.12*	0.55***	-0.47***	-0.48***	0.71

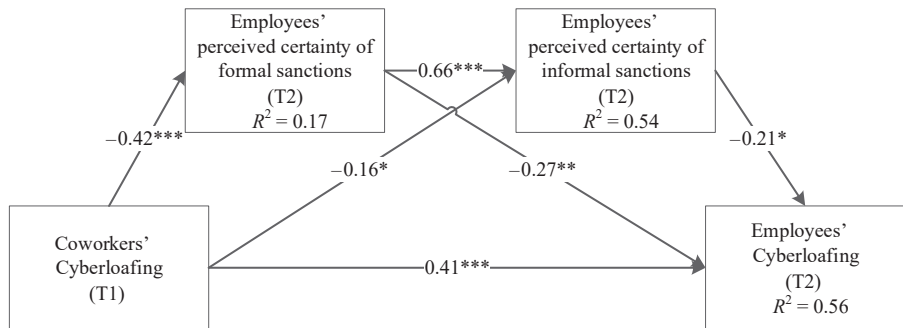
Note(s): Values in bold represent the square roots of AVE. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.
Means, standard
deviations,
correlations, and
square root of the AVE

direct relationship between coworkers' cyberloafing and control variables and employees' cyberloafing in the model. The fit indices suggested a good model fit ($\chi^2/df = 2.01$, $CFI = 0.91$, $TLI = 0.90$, $SRMR = 0.08$, $RMSEA = 0.06$).

Figure 3 shows the relationships among coworkers' cyberloafing, perceived certainty of formal sanctions, perceived certainty of informal sanctions, and employees' cyberloafing. Coworkers' cyberloafing was found to have a positive relationship with employees' cyberloafing ($\beta = 0.41$, $SE = 0.06$, $p < 0.001$) [2] and negative relationships with the perceived certainty of formal sanctions ($\beta = -0.42$, $SE = 0.06$, $p < 0.001$) and the perceived certainty of informal sanctions ($\beta = -0.16$, $SE = 0.06$, $p < 0.05$). Therefore, H1, H2a, and H2b were supported by the data. We also found that the perceived certainty of formal sanctions was positively related to the perceived certainty of informal sanctions ($\beta = 0.66$, $SE = 0.06$, $p < 0.001$), which supported H5.

Table 4 reports the mediation results. As we predicted, the mediation effects of the perceived certainty of formal sanctions (0.12; [0.05, 0.20]) and the perceived certainty of informal sanctions (0.04; [0.01, 0.07]) on the relationship between coworkers' cyberloafing and employees' cyberloafing were significant. Thus, both H3 and H4 were supported. The results also showed that indirect effects of coworkers' cyberloafing via employees' perceived certainty of both formal sanctions and informal sanctions (0.06; $CI = [0.03, 0.11]$) were significant because the 95% confidence intervals excluded zero. Thus, H6 was also supported.



Control Variables (T1) : Gender (-0.01^{ns}), Age (-0.09^{\dagger}), Income (-0.10^{\dagger}), Education (0.04^{ns}), Marriage (-0.05^{ns}), Work experience (0.01^{ns}), Position (-0.03^{ns})

Figure 3.
Results of the
hypotheses testing

Note(s): $\dagger p < 0.1$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$

T1 and T2 represent the first and second data collection, respectively

Mediating effect	Estimate	S.E.	LLCI	95% CI	ULCI
CCL → CFS → ECL	0.12**	0.04	0.05		0.20
CCL → CIS → ECL	0.04*	0.02	0.01		0.07
CCL → CFS → CIS → ECL	0.06*	0.03	0.03		0.11

Table 4.
Results of mediating
effects

Note(s): CCL, coworkers' cyberloafing; CFS, perceived certainty of formal sanctions; CIS, perceived certainty of informal sanctions; ECL, employees' cyberloafing. $*p < 0.05$, $**p < 0.01$

6. Discussion

Our study has examined the direct and indirect effects of coworkers' cyberloafing on employees' cyberloafing. The results show that coworkers' cyberloafing positively affects employees' cyberloafing. This effect can be partially explained by the underlying mechanism of coworkers' cyberloafing decreasing employees' perceived certainty of formal and informal sanctions on cyberloafing. Employees' perceived certainty of formal sanctions and informal sanctions, in turn, were both found to relate negatively to employees' cyberloafing. Our findings also reveal a serial mediating effect of employees' perceived certainty of formal and informal sanctions on the relationship between coworkers' cyberloafing and employees' cyberloafing.

6.1 Theoretical contributions

Our study makes three important theoretical contributions. First, although previous studies have shown that coworkers' cyberloafing and employees' cyberloafing are linked, we find no studies that have theoretically explained and empirically tested the possible mechanisms that may underlie this relationship (Askew *et al.*, 2018; Liberman *et al.*, 2011). Based on social learning theory and the deterrence theory, our study contributes to cyberloafing research by revealing an important underlying mechanism through which coworkers' cyberloafing affects employees' cyberloafing. That is, coworkers' cyberloafing can reduce employees' perceived certainty of formal and informal sanctions. Employees' perceived certainty of formal sanctions and informal sanctions were found to mediate the relationship both separately (each type of sanctions mediates the relationship individually) and in combination (the two types of sanctions form a serial mediation effect).

Second, our study contributes to the literature on social learning theory. Existing studies on social learning theory have primarily discussed the facilitating role of reward (positive reinforcement) in the behavioral learning process (Lian *et al.*, 2012; Weiss, 1977), and few studies have explored the inhibitory role of sanctions (negative reinforcement) in the behavioral learning process (Wang *et al.*, 2016). By integrating the deterrence theory with social learning theory, our study empirically demonstrates the importance of perceived formal and informal sanctions in explaining individuals' social learning behavior of cyberloafing. Both perceived rewards and perceived sanctions are important outcome expectations that can explain individuals' social learning behavior (Bandura, 1977).

Third, our study also has important implications for deterrence theory. Deterrence theorists began to discuss the role of formal and informal sanctions in deterring individuals' deviant behaviors decades ago (e.g. Anderson *et al.*, 1977). However, the aim of most previous studies on formal and informal sanctions was to compare the effects of formal and informal sanctions in deterring a specific type of deviant behavior (Anderson *et al.*, 1977; Silic *et al.*, 2017; Siponen and Vance, 2010; Xu *et al.*, 2020). Few studies have empirically examined the relationship between formal and informal sanctions (Hollinger and Clark, 1982; Williams and Hawkins, 1989; Yiu *et al.*, 2014). Our study reveals that employees' perceived certainty of formal sanctions is positively related to their perceived certainty of informal sanctions in the context of cyberloafing. This finding provides valuable evidence for the early arguments of deterrence theorists about the possible relationships between formal and informal sanctions (Zimring and Hawkins, 1983; Williams and Hawkins, 1986).

6.2 Practical implications

Our study has two important practical implications for organizations to understand and regulate cyberloafing. First, our results confirm the social learning effect between coworkers' cyberloafing and employees' cyberloafing. Therefore, when estimating the cost of cyberloafing, employers should consider both the direct cost, such as the productivity loss

of those who engage in cyberloafing, and the indirect cost of other employees' cyberloafing behavior due to the social learning effect. Given the substantial impact of coworkers' cyberloafing on employees' cyberloafing, employers should cultivate a collective atmosphere of anti-cyberloafing in the organization. For example, employers may develop education and training programs to improve employees' understanding of the potential negative effects of cyberloafing on organizational interests, so that other employees will not consider those who engage in cyberloafing as "role models" to imitate.

Second and more importantly, by revealing the important role of employees' perceived certainty of sanctions in understanding the social learning effect, our study suggests that organizations should increase the certainty of sanctions on cyberloafing to alleviate employees' social learning of cyberloafing. The sanctions should be exerted publicly as opposed to privately. Publicly exerting sanctions can help to shape the cyberloafing outcome expectations of other employees who observed the sanctions and eventually decrease their cyberloafing. In contrast, if sanctions are exerted privately, the deterrence effect on the cyberloafing behavior of those who are not sanctioned may be limited simply because these employees may not realize the sanction occurred.

6.3 Limitations and future research directions

There are several limitations of this study, some of which may point to opportunities for future research. First, the respondents of our survey were selected from China. The findings should be applied with caution in other countries due to cultural difference. For example, China is a collectivist country, and Chinese people are concerned with overall harmony, so the influence of coworkers on employees may be relatively stronger. Future studies may replicate our findings based on respondents from different regions across the globe. Second, we did not consider the relationship types between employees and their coworkers. For example, the primary relationship between employees and their coworkers could be cooperative or competitive, and how the different types of relationship influences employees' social learning behavior in terms of cyberloafing is an interesting question for future research to study. Third, we examined only the influence of coworkers' cyberloafing on employees' cyberloafing. In fact, employees may socially learn a behavior from other referents such as supervisors (Askew *et al.*, 2018), friends, or even family members. The underlying mechanisms through which supervisors' or friends' cyberloafing affects employees' cyberloafing may differ from the mechanisms of coworkers' cyberloafing behavior. We believe that understanding the effect of important referents' cyberloafing (in addition to coworkers' cyberloafing) on employees' cyberloafing behavior and the underlying mechanisms can be promising opportunities for future studies on cyberloafing as well as on social learning theory.

7. Conclusion

Drawing on social learning theory and deterrence theory, our study revealed both the direct and indirect effects of coworkers' cyberloafing on employees' cyberloafing behavior. We found that the indirect effect of coworkers' cyberloafing on employees' cyberloafing occurs through a decrease in employees' perceived certainty of formal and informal sanctions on cyberloafing. Employees' perceived certainty of formal and informal sanctions was found to mediate the relationship between coworkers' cyberloafing and employees' cyberloafing both separately (i.e. each type of sanctions mediate the relationship individually) and in combination (i.e. the two types of sanctions form a serial mediation effect). Our study has important implications for the literature on cyberloafing, social learning theory and deterrence theory.

Notes

1. A summary of prior studies on the reinforcement component of social learning theory is provided by [Table A1](#) in [Appendix](#).
2. Before testing the mediations, we also tested the main effect of coworkers' cyberloafing on employees' cyberloafing and found a significant relationship ($\beta = 0.63$, $SE = 0.08$, $p < 0.001$).

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Author	Reinforcement variables	Conclusion
Weiss (1977)	Behavior reward expectancies	Subordinates' behavior reward expectancies play an intermediary role in determining whether they imitate supervisors' behavior.
Deutsch and Lamberti (1986)	Socially rewards	When altruistic behavior is strengthened by socially rewards, the possibility of altruism in similar events in the future will increase.
Nicole <i>et al.</i> (1994)	Positive reinforcements	Positive reinforcement affect volunteers' decisions.
Jones <i>et al.</i> (2014)	Positive social feedback	Peer approval may motivate adolescents to take action, and all positive social reinforcements for adolescents have the same effect.
Dridi and Akçay (2017)	Social rewards	Reward processing and learning are key aspects of prosocial preferences.
Garduno (2019)	Positive reinforcement	Police who have a positive definition and positive reinforcement of corruption are more likely to engage in corruption.
Lindström <i>et al.</i> (2021)	Social rewards	Social rewards can predict the act of posting on a social media platform.

Table A1.
Summary of prior studies on the reinforcement component of social learning theory

Constructs and measurement	Standardized loading
<i>Co-workers' cyberloafing (AVE = 0.55, Composite reliability = 0.91, Cronbach α = 0.91)</i>	
In the last two weeks, my coworkers at work	
Shopped online for personal goods	0.77
Browsed online videos	0.75
Browsed general news websites	0.69
Browsed investment-related websites	0.80
Played online games	0.72
Chatted with other people in online chat rooms	0.73
Posted messages on non-work-related items in social software (e.g. pictures, videos, and thoughts)	0.72
Liked or commented on content posted by family or friends	0.75
<i>Employees' cyberloafing (AVE = 0.51, Composite reliability = 0.89, Cronbach α = 0.89)</i>	
In the last two weeks, I at work	
Shopped online for personal goods	0.76
Browsed online videos	0.71
Browsed general news websites	0.72
Browsed investment-related websites	0.74
Played online games	0.69
Chatted with other people in online chat rooms	0.70
Posted messages on non-work-related items in social software (e.g. pictures, videos, and thoughts)	0.71
Liked or commented on content posted by family or friends	0.70

Table A2.
Measurement Items and Measurement Model Results

Certainty of formal sanctions (AVE = 0.70, Composite reliability = 0.85, Cronbach α = 0.87)

(continued)

Constructs and measurement	Standardized loading	Why cyberloafing can be socially learned
What is the chance you would receive sanctions if you engage in cyberloafing during working hours?	0.87	<hr/>
What is the chance that you would be formally sanctioned if management learned you had used the Internet at work for non-work-related activities?	0.85	
What is the chance that you would be formally reprimanded if management learned you had used the Internet at work for non-work-related activities?	0.81	
<i>Certainty of informal sanctions (AVE = 0.63, Composite reliability = 0.79, Cronbach α = 0.83)</i>		
How likely is it that you would lose the respect and good opinion of your co-workers for engaging in cyberloafing during working hours?	0.73	
How likely is it that you would jeopardize your promotion prospects if management learned that you had engaged in cyberloafing during working hours?	0.86	
How likely is it that you would lose the respect and good opinion of your manager, if management learned that you had engaged in cyberloafing during working hours?	0.79	

Table A2.

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