Moral metaphorical effect of cleanliness on immoral workplace behaviors: Environmental cleanliness or self-cleanliness?

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Abstract
Cleanliness connotes cleanness, hygiene, and beauty. Physical cleanliness is also a metaphor for moral purity, as proposed in recent literature. However, cleanliness means not only physical cleanliness but also environmental cleanliness. The article proposes that environmental cleanliness and physical self-cleanliness may metaphorically influence immoral behaviors in the workplace, and their effects may be different. The current study conducted a 2 (environmental cleanliness: clean vs. dirty) × 3 (self-cleanliness: hands-cleansing vs. face-cleansing vs. non-cleansing) between-subjects field experiment with employees as participants in a Chinese enterprise. One-hundred-seventy-seven employees volunteered to participate in the experiment. It was found that a clean workplace, rather than physical self-cleansing, renders harsh moral judgment regarding immoral workplace behaviors. The participants were less willing to accept immoral workplace behaviors in a clean environment than in a dirty environment, while self-cleanliness (hands-cleansing or face-cleansing vs. non-cleansing) had no significant influence on employees’ moral judgments of immoral workplace behaviors. In addition, the significant effects of environmental cleanliness were found in all the ten dimensions of immoral workplace behaviors. The findings reveal the metaphorical association between environmental cleanliness and the concept of higher social moral norms, and confirm that environmental cleanliness is a key factor leading to moral metaphorical effects. This result provides unique insight to the social significance of environmental cleanliness, and has important implications to prevent immoral workplace behaviors. A theoretical framework is proposed to explain why environmental cleanliness is more likely to affect moral judgment involving organizational interests than self-cleanliness. Considering most previous research has been done with samples of college students, this study is especially valuable through a field experiment on actual employees.

Keywords
environmental cleanliness, self-cleanliness, immoral workplace behaviors, moral judgment, moral metaphor, hands-cleansing, face-cleansing

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Introduction
Morality refers to judgments about what is right or wrong (Haidt & Algoe, 2004). And moral judgment is proposed to be the result of an individual’s reasoning and reflection processes (Kohlberg, Levine, & Hewer, 1983). However, in recent years, there has been increasing evidence contradicting rationalist models, such as the social intuitionist model (SIM) (Haidt, 2001) and the dual-process model of moral judgment (Greene, Nystrom, Engell, Darley, & Cohen, 2004).
The Macbeth Effect is widely concerned. It indicates that a threat to people’s moral purity leads them to seek and cleanse themselves. In other words, physical cleanliness has the metaphorical role of moral purity (Zhong & Liljenquist, 2006). Although follow-up studies confirmed the Macbeth Effect, a set of studies reported evidence that the Macbeth Effect could not be replicated. While there is some controversy regarding what the Macbeth Effect consists of, some researchers argue that there might be a Macbeth Effect under certain conditions. Thus, more work is needed to clarify the scope and robustness of the original results (Earp, Everett, Madva, & Hamlin, 2014; Siev, Zuckerman, & Siev, 2018). A further study revealed that physical cleansing, even hand-washing alone, was associated with severe judgment on morally contested issues such as abortion and pornography, implying that a clean self can render harsh moral judgment. It confirmed the existence of a metaphorical mental link between self-cleansing and moral purity that leads people to perceive their own bodily cleanliness as moral purity and changes their judgments regarding moral issues, causing them to consider immoral behavior less acceptable (Zhong, Strejcek, & Sivanathan, 2010).

Metaphor is an important element in the embodied cognition perspective. The conceptual metaphor theory (CMT) (Lakoff & Johnson, 1980, 1999) argues that conceptual metaphors are not only linguistic expressions but also important cognitive mechanisms that shape the way individuals think and act. From the viewpoint of embodied cognition, most of a human abstract thinking utilizes metaphorical reasoning, allowing one to understand unfamiliar concepts by referencing familiar concepts (Landau, Meier, & Keefer, 2010). From a perspective of anthropology, the concept of “pollution” not only involves the literal meaning, which contrasts to hygiene and health, but also carries the symbolic moral meaning of “impurity” (Douglas, 1966). The difference between cleanliness and uncleanliness is determined by the order and position of factors in a system. That is, dirt represents something that is disordered or out of place, and is therefore not preferable. In contrast, cleanliness represents order and is preferable. Such symbolic ideas have permeated human society, where moral “purity” and “impurity” correspond to “cleanliness” and “dirtiness.”

In everyday communication, the morality–purity metaphor is often associated with specific body parts. For example, the expression “dirty hands” is sometimes used to describe a thief who takes others’ possessions, and “dirty mouth” is used to describe a person who insults others with inappropriate words. Does this mean that saying dirty words with one’s mouth and performing bad behaviors with one’s hands will encourage people to cleanse the body parts associated with these behaviors? Lee and Schwarz reported differences in moral metaphorical effects corresponding to different body parts (Lee & Schwarz, 2010). Additionally, Zhong et al. (2010) reported that hand-cleansing led to harsher moral judgments. Lee, Tang, Wan, Mai, and Liu (2015) found that face-cleansing has specific moral metaphorical effects for East Asians. When immoral experiences are encountered, face-cleansing is more effective than hand-cleansing for reducing guilt and regret, and further decreasing prosocial behavior. It is well known that “face” has special meanings in Chinese culture; it not only refers to an important body part but also has psychological meanings and represents one’s self-image. The concept of “face” is also a basic social norm in Chinese culture (Ho, 1976). And it has been proven that being morally upright brings an intense feeling of “having face” and incidents of negative morality were experienced with an intense feeling of “having no face” (Hwang, 2006). Given the important role that “face” plays in Chinese culture, it is predicted that the main body part associated with metaphorical moral effects for Chinese individuals differs from that for Western individuals.

Recent studies have found that such metaphorical mental links may not only be triggered by physical cleanliness but also potentially by environmental factors such as brightness, temperature, and smell. People exposed to contrasting environmental conditions (e.g., darkness vs. brightness; cold vs. warmth; clean scents vs. disgusting scents) will display different moral judgments and behaviors (Liljenquist, Zhong, & Galinsky, 2010; IJzerman & Semin, 2009; Meier, Robinson, & Clore, 2004; Meier, Robinson, Crawford, & Ahlvers, 2007; Schnall, Haidt, Clore, & Jordan, 2008; Williams & Bargh, 2008; Zhong, Bohns, & Gino, 2010; Zhong & Leonardielli, 2008), but there is some controversy over the conclusions of these studies (Corke, Lynott, Wortman, Connell, Donnellan, Lucas, et al., 2014; Lynott, Coker, Wortman, Connell, Donnellan, Lucas, et al., 2014; Williams, 2014).

It is common sense that “cleanliness” implies not only physical cleanliness but also environmental cleanliness. Does environmental cleanliness have a moral metaphorical effect on people’s moral judgment in the same way as physical cleanliness? In everyday life, people typically find that their tolerance and assessment of immoral behavior differs according to whether they are in a clean or dirty environment. In a clean environment, people are less tolerant of immoral behaviors such as spitting or littering than in a dirty environment. In clean environments, people’s judgment regarding such behaviors is harsher. The broken windows theory suggests that there is a relationship between a disordered environment and delinquency.
If a window in a building is broken and not fixed in a timely fashion, then another window in the building will be broken soon. This is because the broken window indicates that no one cares about the building, and people will assume that breaking another window will not have negative repercussions. Some social moral behaviors, such as littering, graffiti, fighting, excessive drinking, and begging in public settings, are similar to the broken window; if these behaviors are not corrected, other social moral behaviors may be aggravated and lead to crime. In the mid-1990s, the broken windows theory was successfully applied to public security and crime control in the New York subways and received great social response and praise (Cullen, 1997; Nifong, 1997). In an earlier study, an association between bad behaviors and negative inductive environments was also found (Zimbardo, 1969). And a recent study also found that participants working in a clean environment tended to regard countenactive work behavior (CWB) as less acceptable than did those working in a dirty environment (Huangfu et al., 2017).

As for immoral behaviors in the workplace, typical immoral behaviors generally refer to violating organizational rules and hurting organizational interests, which include unethical behavior, workplace deviance, and CWB. Although the three concepts show some overlap, they differ from each other (Kish-Gephart, Harrison, & Treviño, 2010; Treviño, Weaver, & Reynolds, 2006). In Zhong et al.’s (2010) study, moral judgment primarily addressed individuals’ moral misconduct, such as smoking, using drugs, pornography, profane language, littering, adultery, abortion, and masturbation. Most of these behaviors belong to the domain of personal moral rules. In contrast, immoral workplace behaviors such as unethical behavior, workplace deviance, and CWB all belong to the domain of organizational moral norms.

In conclusion, these considerations raise the question of whether environmental cleanliness can affect the moral judgment on immoral workplace behaviors involving organizational interests, and whether self-cleanliness can also lead to harsher moral judgment on immoral workplace behaviors just as before (Zhong et al., 2010), or they may have different effects on moral judgment.

Based on the above analysis, which aspect of cleanliness influences the moral judgment regarding immoral workplace behaviors, self-cleanliness, or environmental cleanliness? And does cleanliness’s effect differ in response to different body parts? To answer these questions, this study employed experiments to specify the effects of cleanliness on the moral judgment of immoral workplace behaviors.

Method
With the support of a manufacturing company in China, we conducted an experiment at a real workplace to investigate the effects of environmental cleanliness and self-cleanliness (including hand-cleansing and face-cleansing) on the moral judgment of immoral workplace behaviors.

Participants
G*Power analysis indicated that at least 158 subjects (27 for each group) were required to detect effects with an effect size $f = .25$, alpha $= .05$, and power $= .80$ when using ANOVA. To meet this requirement, we recruited 177 employees (45 females, $M_{working-years} = 14.88$, 50 are 30 years old or under, 106 are between 31 and 45 years old, 21 are 46 years old or over) from the company to participate in this study as volunteers. All of them gave informed consent prior to participation in the study and were told to abort the experiment at any time if they wanted.

Measures
The independent variable of environmental cleanliness was manipulated by dividing it into two conditions: a clean environment and a dirty environment. Given that people have different subjective criteria regarding environmental cleanliness, the participants were asked to rate the cleanliness of the experimental room to examine the effect of manipulating the independent variable. A questionnaire including four items was designed to allow the participants to rate the cleanliness of the room on a 7-point scale (7=very clean, 1=very dirty). Another independent variable was self-cleanliness (of three levels: hands-cleansing, face-cleansing, non-cleansing).

Dependent variable data regarding the participants’ moral judgment were collected by measuring their willingness to accept immoral workplace behaviors. The moral judgment issues covered organizational retaliation behavior, workplace aggression, deviant behavior, and CWB.

Spector, Fox, Penney, Bruursema, Goh, and Kessler’s (2006) CWB Checklist (CWB-C) includes five dimensions: sabotage (e.g., purposely damaging a piece of equipment or property); withdrawal (e.g., taking a longer break than permitted); production deviance (e.g., purposely working slowly when things need to get done); theft (e.g., taking supplies or tools home without permission); and abuse (e.g., starting or continuing a damaging or harmful rumor at work). Skarlicki and Folger’s (1997) Organizational Retaliation Behavior (ORB) scale was used to evaluate active ORB (e.g., disobeying a supervisor’s
instructions) and passive ORB (e.g., spending time on personal matters while at work). Douglas and Martinke’s (2001) Workplace Aggression scale was employed to evaluate social aggression in the workplace (e.g., insulting someone at work). Bennett and Robinson’s (2000) Deviant Behavior scale measures interpersonal deviance (e.g., making fun of someone at work) and organizational deviance (e.g., discussing confidential company information with an unauthorized person). After combing some similar items and modifying several items to better reflect workplace behaviors in the Chinese context, the final immoral workplace behaviors issues comprised 10 dimensions with 47 items (see Supplemental material). The participants were asked to assess whether the immoral workplace behaviors items are acceptable from a moral perspective, on a 7-point scale from 1 (highly acceptable) to 7 (highly unacceptable). The inter-reliability results showed that the Cronbach’s $\alpha$ was either above or close to .70 for each issue of the moral judgment scale, indicating the scale had good inter-reliability (sabotage, $\alpha=.608$; withdrawal, $\alpha=.701$; production deviance, $\alpha=.679$; theft, $\alpha=.639$; abuse, $\alpha=.831$; active ORB, $\alpha=.868$; passive ORB, $\alpha=.702$; workplace aggression, $\alpha=.819$; interpersonal deviance, $\alpha=.826$; organizational deviance, $\alpha=.784$).

### Experimental settings and procedures

A 2 (environmental cleanliness: clean vs. dirty) $\times$ 3 (self-cleanliness: hands-cleansing vs. face-cleansing vs. non-cleansing) between-subjects quasi-experiment was conducted in the workplace to study the effects of environmental cleanliness and self-cleanliness. For the environmental cleanliness manipulation, two workrooms were used. One workroom was thoroughly cleansed before the experiment started and served as the clean environment. The other workroom had not been in use for a long time and was dusty with stains on the floor and instruments. This workroom served as the dirty environment. Participants were assigned randomly to one of these two different workrooms. After they entered the workroom, they were randomly distributed to one of the three different self-cleanliness conditions: non-cleansing, hands-cleansing, and face-cleansing.

Among the 177 participants, 57 (16 females) with an average working experience of 14.77 years were assigned to the condition without any self-cleanliness manipulations (29 in a clean environment and 28 in a dirty environment). The participants were told to rate immoral workplace behaviors issues, followed by an environmental cleanliness questionnaire after they entered the workroom. 59 participants (23 females) with an average working experience of 14.71 years were assigned to the hands-cleansing condition (30 in a clean environment and 29 in a dirty environment). The participants were asked to cleanse their hands with the hand sanitizer and dry them with antiseptic tissues. Participants in the clean workroom were told that they should cleanse their hands to keep the room as clean as possible, while participants in the dirty workroom were told to cleanse their hands because the room was dirty. Afterwards, the participants were asked to rate the same immoral workplace behaviors issues presented, and then rate the workplace’s cleanliness. 61 participants (6 females) with an average working experience of 15.15 years were assigned to the face-cleansing condition (30 in a clean environment and 31 in a dirty environment). The participants were asked to cleanse their faces with the facial cleanser and dry them with antiseptic tissues. Participants in the clean workroom were told that they should cleanse their faces to keep the room as clean as possible, while participants in the dirty workroom were told to cleanse their faces because the room was dirty. Afterwards, the participants were asked to rate the same immoral workplace behaviors issues presented, and then rate the workplace’s cleanliness.

### Results

#### Manipulation check results

The rating of workroom cleanliness in the clean environment ($M=6.51$, $SD=.52$) was significantly higher than the rating in the dirty environment ($M=1.55$, $SD=.52$; $t[175]=-63.49$, $p<.001$), indicating that manipulation of the independent variable was effective (i.e., subjects in the clean environment felt that the environment was clean, and subjects in the dirty environment felt that the environment was dirty).

#### Descriptions of moral judgment in different groups

The descriptions of moral judgments on immoral workplace behavior issues of the six groups are shown in Table 1. The results showed consistent harsher moral ratings in clean environments than in dirty environments (see Figure 1), but mixed comparison results between different self-cleanliness groups (see Figures 2 and 3). In detail, for the environment groups (without any self-cleanliness manipulations) ($M=1.99$, $SD=.64$), the mean moral rating was 1.74 ($SD=.57$) for the clean environment compared to 2.25 ($SD=.62$) for the dirty environment. As for the hands-cleansing groups ($M=1.93$, $SD=.61$), the average moral rating was 1.68 ($SD=.59$) for the clean environment compared to 2.18 ($SD=.53$) for the dirty environment. In face-cleansing groups ($M=1.84$, $SD=.60$), the mean
was 1.57 (SD=.49) in the clean environment compared to 2.09 (SD=.60) in the dirty environment.

**Effects of environmental cleanliness and self-cleanliness on moral judgment**

ANOVA results showed that the main effect of environmental cleanliness \( (F[1, 171] = 35.43, p<.001, \eta^2=.17) \) on employees’ judgment about immoral workplace behaviors was significant, and neither the main effect of self-cleanliness \( (F[2, 171] = 1.23, p=.30, \eta^2=.014) \) nor interaction of environmental cleanliness and self-cleanliness \( (F[2, 171] = .009, p=.99, \eta^2=.000) \) was significant (see Table 2). The result demonstrated that physical self-cleanliness (whether cleansing hands or cleansing face) did not significantly affect moral
Figure 2. Hands-cleansing and non-cleansing participants’ moral judgments of immoral workplace behaviors in the clean environment and dirty environment. Moral judgment of different immoral workplace behaviors is generally harsher in the clean environment than in the dirty environment as shown in the left half and right half of Figure 2. And no significant differences were found between the hands-cleansing group and non-cleansing group. Bars represent individuals’ average acceptability of different immoral workplace behaviors with error bars and lower bars meaning harsher moral judgement. Different colors of the bars represent different self-cleansing groups, light bars for judgment of the hands-cleansing group and dark ones for that of the non-cleansing group.

Figure 3. Face-cleansing and non-cleansing participants’ moral judgments of immoral workplace behaviors in the clean environment and dirty environment. Moral judgment of different immoral workplace behaviors is generally harsher in the clean environment than in the dirty environment as shown in the left half and right half of Figure 3. And no significant differences were found between the face-cleansing group and non-cleansing group. Bars represent individuals’ average acceptability of different immoral workplace behaviors with error bars and lower bars meaning harsher moral judgement. Different colors of the bars represent different self-cleansing groups, light bars for judgment of the face-cleansing group and dark ones for that of the non-cleansing group.
judgment on immoral workplace behaviors; the participants in the clean environment morally rated immoral workplace behaviors more harshly compared with those in the dirty environment, although all participants’ judgments of immoral workplace behaviors in both the clean environment and dirty environment were morally unacceptable. Hence, the findings revealed that environmental cleanliness, rather than bodily self-cleanliness, could lead to harsher moral judgment of immoral workplace behaviors.

Further analysis about the effects of environmental cleanliness and self-cleanliness on different issues of immoral workplace behaviors showed that the effects of environmental cleanliness were all significant, and the effects of self-cleanliness were not, except for the organizational deviance issue with significant main effect ($F(2, 171) = 4.34, p = .048$) and no interactional effect ($F(2, 171) = .36, p = .70, \eta^2 = .004$). Multiple comparison results based on LSD showed that the participants who cleansed their faces gave significant harsher moral ratings of organizational deviance ($M = 1.67, SD = .72$ vs. $M = 2.02, SD = .81, p = .006$) than those who did not. And similarly, there was significant difference in the organizational deviance issue between hands-cleansing participants ($M = 1.76, SD = .65$) and non-cleansing participants ($M = 2.02, SD = .81, p = .041$). But no significant difference was found between the moral judgment of the face-cleansing group and hands-cleansing group on the organizational deviance issue.

**Discussion**

This study showed that environmental cleanliness significantly influences employees’ judgments of immoral workplace behaviors, whereas the effect of self-cleanliness does not. The participants in the dirty environment were more tolerant of immoral workplace behaviors, while those in the clean environment were less likely to accept immoral workplace behaviors. The results suggested that environmental cleanliness is a key factor leading to harsher moral judgment regarding immoral workplace behaviors, and thus confirmed the metaphorical link between cleanliness and moral cognition. However, the moral metaphorical effect primarily derived from environmental cleanliness, but not from self-cleanliness. Neither cleansing hands nor cleansing the face had significant effects on moral judgment regarding immoral workplace behaviors for Chinese employees, except for their effects on the organizational deviance issue.

All in all, the findings did not support the results from Zhong et al. (2010) that a clean self can render harsh moral judgment, the conclusion that face-cleansing has specific moral metaphorical effects for East Asians (Lee, Tang, Wan, Mai, & Liu, 2015), or the conclusion from Schnall, Benton, and Harvey (2008) that cleanliness lessens the severity of moral judgment. Nevertheless, it is worth noting that Study 1 of Schnall, Benton, and Harvey (2008) abstractly primed cleanliness-related concepts, and it is unclear whether the prime implicated the self or the target (Zhong et al., 2010). Furthermore, on the surface these results contradict the conclusion that disgust induced in Schnall et al.’s (2008) Experiment 2 by working in a disgusting room (old and dirty) can increase the severity of moral judgments. However, the research of Schnall et al. focused on the effect of disgusting emotion on moral judgment. The disgusting experimental room was set up to look rather disgusting to invoke participants’ feelings of disgust so as to investigate its effect on moral judgment while our dirty

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**Table 2. ANOVA results of moral judgment‡**

| Immoral workplace behaviors | Environmental cleanliness | Self-cleanliness | Interaction |
|----------------------------|---------------------------|-----------------|-------------|
|                            | $F(1,171)$ | $\eta^2$ | $F(2,171)$ | $\eta^2$ | $F(2,171)$ | $\eta^2$ |
| Sabotage                   | 14.40*** | .08     | .52        | .01      | 2.52        | .03      |
| Withdrawal                 | 63.51*** | .27     | 2.60        | .03      | .11        | .00      |
| Production deviance        | 15.79*** | .09     | 1.48        | .02      | .70        | .01      |
| Theft                      | 18.65*** | .10     | .87        | .01      | .03        | .00      |
| Abuse                      | 21.66*** | .11     | .36        | .00      | .15        | .00      |
| Active ORB                 | 20.03*** | .11     | .48        | .01      | .24        | .00      |
| Passive ORB                | 26.97*** | .14     | 1.19        | .01      | .04        | .00      |
| Workplace aggression       | 18.88*** | .10     | 1.42        | .02      | .41        | .01      |
| Interpersonal deviance     | 18.71*** | .10     | .21        | .00      | .73        | .01      |
| Organizational deviance    | 30.72*** | .15     | 4.34***     | .05      | .36        | .00      |
| Overall                    | 35.43*** | .17     | 1.23        | .01      | .01        | .00      |

‡ The table shows ANOVA results of different immoral workplace behaviors. Asterisk (*) represents the error probability: * for less than .05 and ** for less than .01.
workroom was only set up dirty rather than disgusting. In addition, if the target of disgust is changed to immoral workplace behaviors, then the research becomes to investigate whether unacceptable and unpleasant feelings caused by immoral workplace behaviors are different in different environments (clean or dirty). Based on the results above, this study suggests that the clean environment holds a greater contrast with immoral workplace behaviors than the dirty environment, and it is reasonable to infer that individuals have more unacceptable and unpleasant (even disgusting) feeling towards immoral workplace behaviors.

Based on embodied accounts of human cognition and evolutionary theory, humans often use the structure inherent in fundamental aspects of their physical worlds to develop higher-level concepts. Scaffolding processes broaden the scope of human thought while tethering those thoughts to the physical environment in which they occur (Tooby & Cosmides, 1992). Fauconnier (1997) argues that features of abstract concepts are mapped onto specific perceptual features of concrete concepts, and through these mappings, higher-order concepts are constructed. In the strongest possible characterization of the embodiment hypothesis, human action is determined and constrained by the physical environment (Wilson, 2002). The existing research suggests that higher mental processes are grounded on experience of the physical world, and develop through scaffolding processes. Thus priming people with fundamental sensory and perceptual experiences has downstream effects on higher-order judgments (Williams, Huang, & Bargh, 2009)—for example, the role of physical environment cleanliness cues in this study. Previous studies have shown that disorder in the physical environment may induce human delinquency and criminal behavior. Disorder in a community, such as dirtiness, littering, graffiti, and old and damaged communal facilities, may increase the frequency of violations (Keizer, Lindenberg, & Ster, 2008; Wagers, Sousa, & Kelling, 2016).

Therefore, this study argues that there may be different mechanisms underlying the moral metaphors of environmental cleanliness and self-body cleanliness, just as lightness and darkness, warmth and cold, cleanliness and dirtiness are not only physical environmental states but also normative concepts through which one senses the environment. There is the metaphorical link between the concept of physical environmental cleanliness and the concept of higher mental moral norms. Environmental cleanliness not only connotes cleanliness, hygiene, and beauty, but also creates metaphorical mental links between physical cleanliness and social moral norms. Social norms let members of a society know what can and cannot be done and constrain people’s behaviors directly or indirectly (Cialdini, Kallgren, & Reno, 1991; Mayers, 2005; Stephen & Timothy, 2007). Thus, individuals primed with a clean environment will experience an enhanced awareness of social moral norms, which can influence their moral judgment, as demonstrated by harsher judgment and more normalized behavior. In contrast, when people are primed with a dirty environment, their awareness of social moral norms can decrease, as demonstrated by their ignoring immoral conduct and exhibiting relatively weak moral judgment. Therefore, it is suggested that environmental cleanliness may directly impact moral consciousness through the metaphorical link between environmental cleanliness and social moral norms. The resulting enhancement in one’s own moral norm consciousness, in turn, influences moral judgment.

There is a close relationship between environment and human behavior. Previous studies in environmental psychology have shown that the built environment has many significant influences on human behaviors (Chang, 2000). People are all in a variety of environments all the time. Cleanliness is a fundamental feature of the environment, and it is a direct feeling when people encounter a certain environment shown to influence their mindful responses and judgments. Thus, environmental cleanliness may remind us of social norms through metaphor at any time. Kohlberg’s moral development theory (1981, 1984) states that most adults’ moral development levels remain at the pre-conventional or conventional stage, in which people are generally aware of the importance of social order, encourage adherence to laws and social rules, and consider social norms to be a standard for moral judgment. Only a minority of adults reach the post-conventional stage of morality, in which one transcends the restriction of real moral rules and attains complete self-discipline.

So, this study contends that the moral metaphorical effect of environmental cleanliness should be more salient and substantial than that of self-cleanliness because of the close relationship between environment and behavior, and a clean workplace environment, not self-cleanliness, can lead to harsher judgment of immoral workplace behaviors against a code of professional ethics. This can be considered as the moralization effect of environmental cleanliness.

In Zhong et al.’s (2010) study, the moral judgment mainly involves the domain of personal moral rules. In contrast, the current study focuses on moral judgment regarding immoral workplace behaviors belonging to the domain of organizational moral norms. A person with higher personal moral integrity does not have to be the one who will preserve the interests of an
organization or society. Self-cleanliness is more of an individual issue than environmental cleanliness. Environmental cleanliness is more likely to affect behaviors in organizational and social context. Thus, environmental cleanliness may have a more significant effect than self-cleanliness on moral regulation for organizational interests.

This study recruited employees from a Chinese company as participants and conducted experiments in real organizational settings; the dependent variable was moral judgment of immoral workplace behaviors that intentionally harm an organization. Though moral judgments regarding immoral workplace behaviors are not a direct proxy for actual acts of immoral workplace behaviors, it can be hypothesized that a close relationship exists between the two. Although research on the antecedents of CWB is now abundant (Marcus & Schuler, 2004), this experiment provides new evidence that workplace cleanliness may be an embodiment of factors that can influence immoral workplace behaviors, including CWB, and that environmental cleanliness is a more important factor than self-cleanliness. This finding expands our understanding of the factors that may influence immoral workplace behaviors and may help enterprises take steps to decrease these behaviors.

This study has important practical implications, especially for developing countries’ enterprises. It reminds that while the enterprises advocate and promote employees’ “craftsmanship spirit,” elements unrelated to employees’ personal qualities, such as workplace cleanliness, will influence job performance and should not be ignored. In addition, the results of this study suggest that improving environmental cleanliness may strengthen individuals’ awareness of social moral norms, thereby potentially regulating people’s moral behavior and further improving the social moral order.

While moral judgment and moral behavior are closely related, moral action may be independent to moral judgment (Francis, Howard, Howard, Gummerum, Ganis, Anderson, et al., 2016). This study only shows that environmental cleanliness may be a potential antecedent of immoral workplace behaviors. Further studies are required to test this association. This study reveals several avenues for future research. If metaphors of environmental cleanliness increase awareness of social moral norms and thus increase the harshness of moral judgment, could awareness of social moral norms mediate the relationship between environmental cleanliness and moral judgment? Is awareness of social moral norms a mediating variable? These questions should be examined further. On the other hand, whether differences exist between Chinese and Westerners as to the body parts that generate moral metaphors is worthy of further investigation.

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Authors contributions
All the authors developed the study concept. The literature search was conducted by G. Huangfu. G. Huangfu and L. Li carried out the experimental design and experiments. L. Li and C. Sheng performed the data analysis and interpretation. G. Huangfu drafted the manuscript, and L. Li and Z. Zhang provided critical revisions. All the authors approved the final version of the manuscript for submission.

Data availability statement
The dataset analyzed during the current study is available from the OSF database using the following URL: https://osf.io/q5gt2.

Declaration of conflicting interests
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval
All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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Informed consent
Informed consent was obtained from all individual participants included in the study.

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Supplemental material
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References
Bennett, R.J., & Robinson, S.L. (2000). Development of a measure of workplace deviance. Journal of Applied Psychology, 85(3), 349–360. doi: 10.1037/0021-9010.85.3.349.
Chang, K. (2000). The impact of perceived physical environments on customers’ satisfaction and return intentions. Journal of Professional Services Marketing, 21(2), 75–85. doi:10.1300/J090v21n02_06.
Schnall, S., Haidt, J., Clore, G.L., & Jordan, A.H. (2008). Disgust as embodied moral judgment. *Personality and Social Psychology Bulletin, 34*(8), 1096–1109. doi:10.1177/0146167208317771.

Siev, J., Zuckerman, S.E., & Siev, J.J. (2018). The relationship between immorality and cleansing: A meta-analysis of the Macbeth Effect. *Social Psychology, 49*(5), 303–309. doi:10.1027/1864-9335/a000349.

Skarlicki, D.P., & Folger, R. (1997). Retaliation in the workplace: The roles of distributive, procedural, and interactional justice. *Journal of Applied Psychology, 82*(3), 434–443. doi:10.1037/0021-9010.82.3.434.

Spector, P.E., Fox, S., Penney L.M., Bruursema, K., Goh A., & Kessler, S. (2006). The dimensionality of counterproductivity: Are all counterproductive behaviors created equal? *Journal of Vocational Behavior, 68*(3), 446–460. doi:10.1016/j.jvb.2005.10.005.

Stephen, P.R., & Timothy A.J. (2007). *Organizational behavior* (12th edition). Upper Saddle River: Prentice Hall.

Tooby, J., Cosmides, L. (1992). The psychological foundations of culture. In Barkow, J., Cosmides, L., Tooby, J. (eds.). *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 19–136). New York: Oxford University Press.

Trevino, L.K., Weaver, G.R., & Reynolds, S.J. (2006). Behavioral ethics in organizations: A review. *Journal of Management, 32*(6), 951–990. doi:10.1177/0149206306294258.

Wagers, M., Sousa, W., & Kelling, G. (2016). Broken windows: The core ideas. In Wortley, R.K., Townsley, M. (eds.). *Environmental criminology and crime analysis* (pp. 247-262). New York: Routledge.

Williams, L.E. (2014). Improving psychological science requires theory, data, and caution: Reflections on Lynott et al. (2014). *Social Psychology, 45*(4), 321–323. doi: 10.1027/1864-9335/a000205.

Williams, L.E., & Bargh, J.A. (2008). Experiencing physical warmth promotes interpersonal warmth. *Science, 322*(5901), 606–607. doi:10.1126/science.1162548.

Williams, L.E., Huang, J.Y., & Bargh, J.A. (2009). The scaffolded mind: Higher mental processes are grounded in early experience of the physical world. *European Journal of Social Psychology, 39*(7), 1257–1267. doi: 10.1002/ ejsp.665.

Wilson, J.Q., & Kelling, G.L. (1982, March). Broken windows: The police and neighborhood safety. *The Atlantic Monthly, 249*, 29.

Wilson, M. (2002). Six views of embodied cognition. *Psychonomic Bulletin & Review, 9*, 625–636. doi: 10.3758/ BF03196322.

Zhong, C.B., Bohns, V.K., & Gino, F. (2010). Good lamps are the best police: Darkness increases dishonesty and self-interested behavior. *Psychological Science, 21*(3), 311–314. doi:10.1177/0956797609360754.

Zhong, C.B., & Leonardelli, G.J. (2008). Cold and lonely: Does social exclusion literally feel cold? * Psychological Science, 19*(9), 838–842. doi: 10.1111/j.1467-9280.2008.02165.x.

Zhong, C.B., & Liljenquist, K.A. (2006). Washing away your sins: Threatened morality and physical cleansing. *Science, 313*(5792), 1451–1452. doi:10.1126/science.1130726.

Zhong, C.B., Strejcek, B., & Sivanathan, N. (2010). A clean self can render harsh moral judgment. *Journal of Experimental Social Psychology, 46*(5), 859–862. doi:10.1016/j.jesp.2010.04.003.

Zimbardo, P.G. (1969). The human choice: Individuation, reason, and order versus deindividuation, impulse, and chaos. *Nebraska Symposium on Motivation, 17*, 237–307. doi:1971-08069-001.