In broad daylight, we trust in God! Brightness, the salience of morality, and ethical behavior

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Based on metaphorical associations between light and goodness, we hypothesized that experiencing brightness increases the salience of moral considerations and the likelihood of engaging in ethical behavior. The results of three experiments supported these predictions. In Experiment 1, participants in a well-lit room acted less selfishly in the dictator game and were more likely to return undeserved money than were those in a moderately or a dimly lit room. In Experiment 2, participants' monetary donations were positively associated with environment lighting. In Experiment 3, participants in a well-lit room volunteered to code more data sheets than did participants in moderate brightness. Experiments 2 and 3 used implicit and explicit measures of the salience of morality to self to demonstrate that the relationship between brightness and ethical behavior is driven by an increased mental accessibility of morality. Control over environment lighting may be an effective approach to increasing ethical behavior.

God saw that the light was good, and he separated the light from the darkness ~ Genesis 1:4

1. Introduction

Imagine you are hearing/reading a news story reporting that a person was murdered in broad daylight while sitting on a park bench. Why does “broad daylight” attract your attention? Is it that people believe that good deeds happen when the sun is out? In contrast to the association between darkness and evil, light has always been a symbol of goodness. The metaphorical relationship between light and goodness is ubiquitous in popular films, dramas, and religious materials in both Western and Eastern cultures (for related exemplars, see Banerjee, Chatterjee, & Sinha, 2012; Meier, Robinson, & Clore, 2004). If light has the potential to embody goodness, brightness may be associated with virtues that lead people to perform ethical deeds. Extant research in the domain of environmental psychology has focused primarily on connections between environment lighting and perceived safety (e.g., Blöbaum & Hunecke, 2005; Boyce, Eklund, Hamilton, & Bruno, 2000; Hanyu, 2010; Johansson, Rosén, & Käller, 2011; Nasar & Jones, 1997) and fear of crime (e.g., Fisher & Nasar, 1992; Loewen, Steel, & Suedfeld, 1993; Nasar & Fisher, 1993; Pain, MacFarlane, Turner, & Gill, 2006) in the exterior environment. Appleton’s (1975) prospect-refuge theory argues that there is an evolutionary advantage in being able to effectively survey the environment (prospect) and a preference for environments that offer shelter (refuge). Based on this notion, a recent study (Haans & de Kort, 2012) experimentally demonstrated that three kinds of proximate physical cues mediated the effect of street lighting on perceived safety: those related to prospect (having an overview of the environment), escape (perceived escape possibilities), and refuge/concealment (perceived hiding places for offenders). However, previous studies have neither investigated the effect of the brightness of the immediate environment on ethical behavior nor have they empirically examined the possible mechanisms underlying this relationship. We report on three experiments that demonstrate the connection between brightness and ethical behavior and clarify the mediating role of the salience of morality in this relationship.

Sensations contribute to initial understandings of more abstract concepts and may also render concepts relevant to metaphorical associations accessible (Barsalou, 1999; Landau, Meier, & Keefe, 2010). Recent advancements in embodied cognition have shown that a concrete sensory experience can be influenced by a metaphorically associated concept. For example, Meier et al. (2004) showed that people automatically assume that bright objects are good and dark objects bad when making evaluations. Similarly, Sherman and Clore (2009) first documented the mental Stroop effect by showing that the speed of color naming was faster when words in black concerned immorality (e.g., cheat) rather than morality,
and when words in white concerned morality (e.g., charity) rather than immorality. A recent study by Banerjee et al. (2012) indicated that recalling moral behavior may influence perceptions of brightness. In one experiment, participants who recalled an ethical deed perceived their immediate surroundings to be brighter than did those who recalled an unethical deed. In another experiment, participants who recalled their own unethical deeds preferred products that would make the room brighter. The aforementioned research supports an association between the experience of brightness and the sense of morality and suggests that the effect of brightness on ethical behavior merits investigation.

In principle, people whose self-concept is organized around their moral beliefs are highly likely to translate those beliefs into action (Damon & Hart, 1992). Just as the active-self account for behavioral priming proposes that prime-to-behavior effects occur when one's corresponding self-concepts are activated (Wheeler, DeMarree, & Petty, 2007), we argued that the salience of morality to self should mediate the connection between experiencing brightness and ethical behavior. Following Williams and Bargh (2008), who showed that tactile experiences of physical warmth can activate concepts or feelings of interpersonal warmth and lead to prosocial behavior, we contend that the experience of brightness may promote the salience of morality and thereby increase the inclination to perform ethical deeds.

We tested predictions regarding the link between brightness and ethical behavior in three studies. Experiment 1 examined the extent to which participants acted selfishly in a dictator game (i.e., altruism) and returned undeserved money (i.e., honesty) in a room with varying levels of illumination. Experiment 2 examined whether participants in a brighter environment donated more money to charity. We also employed the Stroop task to examine whether brightness increased the salience of morality, thereby eliciting greater Stroop interference in naming the colors of morality-related words presented in black versus in white. Experiment 3 examined whether participants in a well-lit room would be more likely to code data than those in a moderately bright room. Our final study used an explicit measure to assess the salience of morality (i.e., the self-importance of morality) to replicate the perceptual–symbol association between light and goodness. The mediating role of the salience of morality was tested in both Experiments 2 and 3.

2. Experiment 1: the dictator game and honesty

2.1. Method

Eighty-one undergraduates (41 females, 40 males, mean age = 20.7 years) attending a public university in southern Taiwan were tested in a between-subjects experiment. This experiment was disguised as a decision-making test. Participants had the opportunity to earn NT $160 (approximately US $5.33).

After providing consent, every three participants were assigned to one of three study conditions (high, medium, low brightness) via a block-randomized method to manipulate the lighting of the setting of the Stroop task (see Fig. 1). The test room (13 ft × 15 ft) was illuminated by 12 fluorescent lights mounted on the ceiling under the high-brightness condition (well-lit room), eight fluorescent lights under the medium-brightness condition (moderately lit room), and four fluorescent lights under the low-brightness condition (dim room). Participants in the dim room could see the experimental material, and the experimenter apologized for some of the lights being out.

Each participant then played a one-shot, anonymous version of the dictator game (Hoffman, McCabe, Shachat, & Smith, 1994). The experimenter led participants to believe that they had been randomly paired with another person in a different room. Participants were told: “This game includes two roles: initiator and recipient. The initiator has NT $160 to allocate between him/herself and the recipient. Initiators keep whatever they do not offer to the recipients. Recipients can choose to accept or reject the offer, but their choices do not affect the initiator’s outcomes.” Although participants were told they had been randomly assigned to a role, all served as the initiator and played against the experimenter via a computer program. After the game, participants were asked to judge the brightness of the room on a 7-point scale (1 = low, 7 = high) and then completed a filler five-item questionnaire measuring perceived anonymity. Participants indicated their agreement with each item on a 7-point scale (1 = strongly disagree, 7 = strongly agree, adapted from Zhong, Bohns, & Gino, 2010; e.g., “I was anonymous during the study”, “I was watched during the study” [reverse scored]; α = .91). This measure was used to rule out an association between perceived anonymity and the brightness manipulation and ethical behavior.

The experiment ended after this survey. During the probe process, none of the participants suspected that the lighting and the dictator game were related. Payment in the amount that participants kept for themselves in the dictator game was then given to participants in unsealed envelopes. The experimenter asked participants to make sure they had received the payment they deserved and exited the room. However, additional money (one NT $50 coin) was given to each participant. Our indicator of honesty was whether participants returned this undeserved money.

2.2. Results and discussion

Analysis of variance (ANOVA) on perceptions of the test room’s lighting showed significant differences in the effect of the level of

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Fig. 1. Photographs of three levels of lighting in the test room as seen from where the participants sat. The left photo was the image under the high-brightness condition, the middle photo was the image under the medium-brightness condition, and the right photo was the image under the low-brightness condition.
lighting in the room on perceived brightness, \(F_{\text{linear}}(1, 78) = 154.68, p < .001, \eta^2_p = 0.66\), indicating a successful manipulation. Participants under the high-brightness condition judged the room as brightest (\(M = 5.85, SD = 1.13\)), whereas participants under the low-brightness condition judged the room as least bright (\(M = 2.11, SD = 0.97\)); those under the medium-brightness condition placed in the middle (\(M = 4.26, SD = 1.20\)).

As predicted, amount of money offered was associated with brightness, \(F_{\text{linear}}(1, 78) = 18.09, p < .001, \eta^2_p = 0.19\) (Table 1). Planned contrasts showed that participants in the well-lit room offered more money (\(M = NT \$69.6\)) than those in the moderately lit room (\(M = NT \$58.6\)), \(t(78) = 2.11, p < .04\), Cohen’s \(d = 0.23\), and participants in the dim room offered less money (\(M = NT \$47.4\)) than those in the moderately lit room, \(t(78) = -2.15, p < .04\), Cohen’s \(d = 0.24\). Furthermore, the likelihood of returning underserved money was positively associated with brightness, Cramer’s \(V = 0.30, p < .03\) (Table 1). We found that participants in the well-lit room were most likely to be honest (85.2%, 23 of 27), participants in the dim room were least likely to be honest (51.9%, 14 of 27), whereas participants under the low-brightness condition judged the room as least bright (51.9%, 14 of 27), and those under the medium-brightness condition placed in the middle (51.9%, 14 of 27).

Although participants in the dim room felt somewhat more anonymous (\(M = 5.52, SD = 0.88\)) than did those in the moderately lit room (\(M = 5.19, SD = 0.92\)) and well-lit (\(M = 5.07, SD = 0.87\)) rooms, these differences among the groups did not reach statistical significance, \(F(2, 78) = 1.82, p = .17\). Moreover, perceived anonymity was not related to amount of money offered, \(r = -0.17, p = .13\), or likelihood of returning underserved money, \(r = -0.14, p = .23\). Thus, these findings rule out the possibility that the link between brightness and ethical behavior derives from perceived anonymity.

This study supports the link between brightness and ethical behavior. We showed that brighter surroundings can induce people to act less selfishly and increase the likelihood of honesty.

3. Experiment 2: the moral Stroop effect and charity

The second study tested whether brightness was related to charitable behavior and whether the moral Stroop effect is sensitive to changes in brightness that may affect the salience of morality. In the typical Stroop task (Stroop, 1935), a color word is displayed in a font color that is either congruent (e.g., the word “green” in green font) or incongruent (e.g., the word “green” in red font). Attention to the meaning of a color word may interfere with naming the color in which it is written, resulting in a longer reaction time (i.e., Stroop interference) as the semantic processing disrupts performance in the color-naming task. In the moral Stroop task, the usual color words were replaced with morality-related words. As color naming is slower when word and color are incongruent (e.g., “honest” in black font) and faster when they are congruent (e.g., “helpful” in white font), one would expect that the more one associates morality with white, the longer it should take to identify the color of moral words when they appear in black rather than white. Given that morality–whiteness associations are part of the moral–brightness metaphor (Sherman & Clore, 2009), these associations would be more evident in a well-lit than in a moderately or dimly lit environment. That is, the brightness manipulations that increase the salience of morality should also evoke morality–whiteness associations, manifested in taking more time to name the color in which morality-related words are presented in black versus white. We also used this measure to test the mediating role of the salience of morality.

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### 3.1. Method

Participants were 87 undergraduates (43 females, 44 males; mean age = 21.1 years) recruited via campus posters. We applied luminance contrast to strengthen the brightness manipulation. Participants were first greeted in a moderately lit room which was illuminated by eight fluorescent lights mounted to the ceiling and were then asked to complete the experimental task in a test room with one of the three levels of illumination. Participants were randomly assigned to one of three brightness conditions (high, medium, low). The test room’s brightness manipulation was similar to that used in Experiment 1. Each subject was paid NT $120 (approximately US $4.0) in NT $10 coins for participation. This ensured that participants had money to donate.

In the test room (12 ft × 16 ft), each participant completed a computerized Stroop task in which nine morality-related words (caring, compassionate, fair, friendly, generous, helpful, hardworking, honest, kind) were adapted from the Self-importance of Morality Scale (Aquino & Reed, 2002) and nine neutral words (aspect, calm, concert, east, forecast, motion, recall, sum, distant) that were adapted from a study investigating the color of sin (Sherman & Clore, 2009). Participants were presented with words in either black or white and were instructed to indicate the color of each word as quickly and accurately as possible. Each word appeared twice in black or white on a light gray background (50% gray scale) for a total of 36 trials (color and order assigned randomly). Four practice trials were given.

At the end of this experiment, participants rated the perceived brightness of the test room on a 7-point scale (1 = low, 7 = high) as a manipulation check and answered demographic questions. As the experimenter exited the test room, he mentioned that the laboratory was taking donations for the University Student Fund and provided the following information about the opportunity to donate: “If you would like to donate, great; if not, don’t worry about it. It’s completely up to you. If you would like to donate, drop your donation off in the box by the door on your way out.” Participants were left alone to donate or not.

A post-experimental probe indicated that no participants were aware of the environmental lighting as a prime or the research hypotheses.
Follow-up questioning indicated that none of the participants suspected that the environmental lighting was related to both the Stroop task and the opportunity to donate money.

3.2. Results and discussion

Our brightness manipulation was successful. The ANOVA on perceptions of the room’s brightness revealed a robust linear effect, $F(1, 84) = 169.38, p < .01, \eta^2_g = 0.66$, showing that participants under the high-brightness condition judged the room as brightest ($M = 5.79, SD = 1.11$), whereas participants under the low-brightness condition judged the room as dimmest ($M = 2.03, SD = 0.94$), and those under the medium-brightness condition placed in between ($M = 4.07, SD = 1.22$).

The ANOVA on donations showed a significant effect of brightness, $F_{linear}(1, 84) = 30.91, p < .001, \eta^2_g = 0.27$ (Table 1). Planned contrasts showed that participants in the well-lit room donated more money ($M = NT \410$) than did those in the moderately lit room ($M = NT \286.8$), $t(84) = 3.18, p < .01$, Cohens’ $d = 0.35$, and participants in the dim room donated less money ($M = NT \193.3$) than did those in the moderately lit room, $t(84) = -2.38, p < .02$, Cohens’ $d = 0.26$. Additionally, participants donated more money as perceived brightness increased, $r = 0.53, p < .01$.

Replicating the findings of Sherman and Clore (2009), we found the moral Stroop effect. The mean RT for morality-related words was faster ($M = 477.74$ ms, $SD = 83.12$) than it was for neutral words ($M = 496.73$ ms, $SD = 82.61$), $t(86) = -3.31, p < .01$, Cohens’ $d = 0.35$, when both appeared in white. The mean RT for morality-related words was slower ($M = 534.28$ ms, $SD = 88.81$) than it was for neutral words ($M = 590.84$ ms, $SD = 97.60$), $t(86) = 5.52, p < .01$, Cohens’ $d = 0.59$, when both appeared in black. We also found that the salience of morality, as reflected in the Stroop interference of incongruent (i.e., morality-related words in black) and congruent (morality-related words in white) trials, was associated with brightness, $F_{linear}(1, 84) = 22.71, p < .001, \eta^2_g = 0.21$ (Table 1). Participants in the well-lit room showed more Stroop interference ($M = 77.24$ ms) than did those in the moderately lit room ($M = 55.66$ ms), $t(84) = 2.54, p < .02$, Cohens’ $d = 0.27$; those in the dim room showed less Stroop interference ($M = 36.72$ ms) than did those in the moderately lit room, $t(84) = -2.23, p < .03$, Cohens’ $d = 0.24$.

A similar trend was found for perceived brightness, as evidenced in its positive associations with Stroop interference, $r = 0.52, p < .01$.

To further explore whether the salience of morality mediated the experimental effect, we created two dummy variables (the first for the medium-brightness condition and the second for the high-brightness condition) for our three-group independent variable, treating the low-brightness condition as the reference. Following Hayes and Preacher (2013), the indirect effects of the two dummy variables on the amount of money donated, mediated by the salience of morality, were tested using bootstrapping and were significant. For the dummy variable for the medium-brightness condition: $B = 7.89, SE = 3.26$, confidence interval: [1.36, 14.19]; dummy variable for the high-brightness condition: $B = 8.99, SE = 3.57$, confidence interval: [1.93, 16.07]).

As predicted, participants donated more money as brightness increased. The effect of brightness on charitable behavior was mediated by the salience of morality. In the final study, we examined whether the increased likelihood of ethical behavior as a function of brightness would apply to volunteering. We used an explicit measure of the salience of morality rather than the implicit measure employed in Experiment 2 (i.e., the Stroop task) for convergent validation.

4. Experiment 3: self-importance of morality and volunteerism

4.1. Method

Sixty-eight undergraduates (33 females, 35 males; mean age = 20.5 years) participated in this experiment for course credit. Participants were asked to help with the development of personality inventories and were randomly assigned to either a moderate- or high-brightness condition. Luminance contrast was also applied to the brightness manipulation in this experiment. Under the moderate-brightness condition, the test room (11 ft x 13 ft) was illuminated by six fluorescent lights mounted to the ceiling. Under the high-brightness condition, participants entered the same room; however, after giving an introduction and receiving consent, the experimenter turned on another six fluorescent lights before these participants started to answer questions. A manipulation check measuring perceived brightness (identical to that in the first two experiments) was included among demographic questions. The Internalization subscale of the Self-importance of Moral Identity Scale (Aquino & Reed, 2002) was also embedded in the questionnaire. Participants were told to visualize someone who embodies nine characteristics (i.e., caring, compassionate, fair, friendly, generous, hardworking, helpful, honest, and kind) and then to rate how much they wanted to be like this person on five items (e.g., “I strongly desire to have these characteristics”; $a = .83$ in the present study) using a 5-point scale (1 = strongly disagree, 5 = strongly agree). Higher scores indicate that morality is more salient to the self. In the ostensible survey, participants also completed the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988); positive affect: $a = .85$, negative affect: $a = .87$.

Finally, the experimenter entered the test room and explained that she was a graduate student looking for help coding data. Participants were told that each data sheet required approximately 5 min, and they were left alone to provide their contact information and indicate how many sheets, if any, they would code. Follow-up questioning revealed that no participants guessed the real purpose of this experiment or suspected that the environmental lighting was related to both the measure of morality salience and the volunteer request.

4.2. Results and discussion

Participants under the high-brightness condition judged the lighting of the room as brighter ($M = 5.88, SD = 1.09$) than did those under the moderate-brightness condition ($M = 4.32, SD = 1.07$), $t(66) = 5.95, p < .01$. Cohens’ $d = 0.73$. Neither positive affect (range: 1–5; $M = 2.62, SD = 0.54$) nor negative affect (range: 1–5; $M = 1.69, SD = 0.30$) was different between the two study conditions, $t(115), p > .35$. The number of data sheets volunteered to code were not associated with both positive affect ($r = 0.13, p > .31$) and negative affect ($r = -0.19, p > .12$). Therefore, mood states were not used as control variables in subsequent analyses, and they did not appear to mediate the connection between the brightness manipulation and the measure of volunteerism.

As hypothesized, participants in the well-lit room volunteered to help code more data sheets ($M = 7.59$) than did those in the moderately lit room ($M = 5.65$), $t(66) = 2.50, p < .02$, Cohens’ $d = 0.31$ (Table 1). Participants in the well-lit room rated the salience of morality to be higher ($M = 3.74$) than did those in the moderately lit room ($M = 3.35$), $t(66) = 2.63, p < .01$, Cohens’ $d = 0.32$ (Table 1). Additionally, higher levels of perceived brightness were associated with greater morality salience ($r = 0.45, p < .01$) and increased volunteerism ($r = 0.43, p < .01$). These
findings are congruent with those of Experiment 2, indicating an association between brightness and morality. We examined whether the salience of morality mediated the effect of brightness on the number of data sheets participants volunteered to code, treating the moderately bright condition as the reference (0 = moderate brightness, 1 = high brightness). Being in the well-lit room predicted the number of data sheets participants volunteered to code when we did not control for the salience of morality ($\beta = 0.29, t = 2.50, p < .02$), but it was not a significant predictor when we controlled for salience ($\beta = 0.09, t = 0.99, p > .33$). A bootstrap analysis (Preacher & Hayes, 2008) showed that the 95% bias-corrected confidence interval ([0.41, 2.60]) for the indirect effect ($B = 1.32, SE = 1.30$) excluded zero, suggesting a significant indirect effect (MacKinnon, Fairchild, & Fritz, 2007; see Fig. 2).

Findings regarding volunteerism provide strong evidence that much brighter surroundings elicit an increased tendency toward ethical behavior. Using an explicit measure of the salience of morality, the final study provided further support for the notion that brightness may enhance the salience of morality to the self.

5. General discussion

Based on research about embodiment and metaphor revealing psychological correspondences between sensorimotor experience and abstract concepts (e.g., Ackerman, Nocera, & Bargh, 2010; Bargh & Shalev, 2012; Jostmann, Lakens, & Schubert, 2009; Zhong & Leonardielli, 2008), we suggest that brightness may enhance the self-importance of morality and thereby increase ethical behavior. The metaphorical relationship between light and goodness was supported by both implicit (the moral Stroop effect in Experiment 2) and explicit (subjective ratings of the self-importance of morality in Experiment 3) measures of the salience of morality. Additionally, the connection between sensory experiences of environment brightness and ethical behavior was evident across multiple facets of ethical behavior. We found that a well-lit environment promoted the likelihood of ethical behavior, as reflected by a decreased tendency toward selfishness (Experiment 1), a higher likelihood of returning undeserved money (Experiment 1), a greater amount of money donated (Experiment 2), and a greater likelihood of helping (Experiment 3). Furthermore, we showed that the salience of morality mediated this virtue-promoting effect of brightness (Experiments 2 and 3). We provide the first experiment evidence showing that brightness appears to heighten the salience of morality to the self, thereby leading people to perform ethical deeds.

Our findings contribute to the literature in several important ways. First, Experiments 2 and 3 showed that perceived brightness was positively associated with implicit and explicit measures of the salience of morality. These results provide empirical evidence for notions within perceptual symbol theory (Barsalou, 2008; Lakoff & Johnson, 1980) suggesting that conceptual thought is based on sensory experience. Second, Banerjee et al. (2012) demonstrated that participants who were recalling ethical behavior judged a room to be brighter than did those who were recalling unethical behavior. Our findings indicate reverse causality by showing that a well-lit environment can increase the likelihood of ethical behavior. The results also suggest that the metaphorical association between light and goodness may be symmetrical. Third, participants in the dim environment in all three experiments showed a decreased tendency toward ethical behavior. These findings are congruent with those reported by Zhong et al. (2010) showing that the experience of darkness can induce a sense of anonymity that disinhibits morally questionable behaviors. However, indicators of altruism and honesty in Experiment 2 were not associated with perceived anonymity. Arguing from the perspective of approach-avoidance differences in moral self-regulation (Janoff-Bulman, Sheikh, & Hepp, 2009), we suggest that the metaphorical association between brightness and morality may be sensitive to positive outcomes and considerations of what we should do, whereas the metaphorical association between darkness and immorality (e.g., Sherman & Clore, 2009; Zhong et al., 2010) may be sensitive to negative outcomes and considerations of what we should not do. Finally, the Stroop task may be useful for researchers who seek to unobtrusively and reliably assess the extent and nature of associations between environmental cues and the accessibility of corresponding mental constructs. The RTs of individuals who have thought about a given topic were typically slow in color-word Stroop tasks involving naming the color of a word that was itself of interest and presumably accessible because that word captured their attention and interfered with their ability to respond more rapidly. We hope the Stroop paradigm will be used to test the effects of environmental interventions on psychological consequences.

The results of these experiments should be interpreted with caution given the following limitations. Under the low-brightness condition of Experiment 1, the experimenter apologized for some of the lights being out. This may have called attention to the lighting condition. However, during the probe process, none of the participants suspected that the lighting and the dependent measure (i.e., the dictator game) were related. Thus, it is unlikely that the results were confounded by factors related to demand effects (e.g., physical incivilities; Pitner, Yu, & Brown, 2012). With respect to experimenter expectancy bias, all experimenters were blind to the real purpose of the experiments and to the condition that the participant was going to experience. Moreover, our dependent measures were not affected by the experimenters. In Experiment 1, participants played the dictator game via a computer program. In Experiment 2, participants were left alone to donate or not donate. In Experiment 3, participants were left alone to indicate how many sheets, if any, they would code. Hence, expectancy effects were hardly relevant in the three experiments. Finally, we acknowledge that the variable of brightness was manipulated in a categorical fashion and that our findings focus on the immediate effects of brightness in an indoor laboratory environment. The duration of the effect of brightness on increased ethical behavior requires further examination in naturalistic settings or outdoor spaces.

The present findings raise several interesting avenues for future research. Given the observed link between brightness and increased sense of morality, does the increased salience of morality activated by brightness increase the harshness of moral judgments about others? People in different eras and cultures commonly represent (in language, myth, etc.) optimism in terms of brightness or light (e.g., “A bright future!”; Adams & Osgood, 1973; Eliade, 1996). This begs questions related to whether exposure to bright light can induce a more optimistic mindset or arouse a feeling of confidence. As recent research in social neuroscience has shown the functional contribution of the amygdala and ventromedial prefrontal cortex to morality (Blair, 2007), the identification of the
shared neural substrates related to ethical behavior and brightness perception will have universal significance. Environmental psychologists have recently supplemented their traditional focus on person-environment transactions with considerable attention to group-environment transactions at the neighborhood level (Stokols, 1995, 2006). The link between the lighting in a neighborhood and residents’ active involvement in prosocial or ethical behavior is worth investigating.

As implied by the title of Harry MacLean’s (1988) famous crime book, In Broad Daylight, crimes committed in broad daylight receive harsher denouncement from the public, implying that bright surroundings and virtuous (rather than wicked) acts is a paired associate. On the negative side, Zhong et al. (2010) showed that darkness may increase morally questionable behavior, suggesting that “good lamps are the best police”. On the positive side, some previous research has suggested that environmental lighting has the potential to combat crime (see Pease, 1999; for a related review). A recent meta-analysis indicated that adequate street lighting can reduce crime rates on that street (Welsh & Farrington, 2008). Our review found that brightness may act as an embodiment of morality that is exemplified by ethical deeds. Perhaps “light tactics” will constitute the next advance in promoting altruism and prosocial behavior. In this way, we may be able to say “In broad daylight, we trust in God!”

Conflict of interest

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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