

Promoting Energy Conservation Behavior in Public Settings:

The Influence of Social Norms and Personal Responsibility

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Abstract

How might social psychological science be utilized to encourage proenvironmental behavior in public settings? In two studies, interventions aimed at promoting energy conservation behavior in public bathrooms examined the influences of descriptive norms and personal responsibility. In Study 1, the light status (i.e., on or off) was manipulated before someone entered an unoccupied public bathroom, signaling the descriptive norm for that setting. Participants were significantly more likely to turn the lights off if they were off when they entered. In Study 2, an additional condition was included in which the norm of turning off the light was demonstrated by a confederate, but participants were not themselves responsible for turning it on. Personal responsibility moderated the influence of social norms on behavior; when participants were not responsible for turning on the light, the influence of the norm was diminished. These results indicate how descriptive norms and personal responsibility may regulate the effectiveness of proenvironmental interventions.

Keywords: proenvironmental behavior, social norms, personal responsibility

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Societal recognition of the importance of environmentally sustainable behavior has grown considerably over the past decade (Swim et al., 2011), with a particular emphasis on conserving energy. Whereas some conservation efforts have emphasized using more energy-efficient devices, others have focused on eliminating unnecessary usage (Gardner & Stern, 1996). For example, student-run organizations known as the “Power Police” patrol college campuses every night and turn off lights that have been left on in classrooms and public bathrooms (Nord, 2010). Could social psychological principles be used to encourage people to turn off the lights themselves, rendering such groups unnecessary? The present research examines the effects of social norm-based and personal responsibility-based interventions on electricity conservation behavior in public settings.

Social norms have been shown to exert a powerful influence on people’s behavior (e.g., Aarts & Dijksterhuis, 2003; Goldstein, Cialdini, & Griskevicius, 2006). Attempts to encourage proenvironmental behavior often rely on the delivery of messages about other people’s behavior, but this is not the only way normative information can be conveyed; features of the situation can also indicate what behavior is appropriate (e.g., Cialdini, Kallgren, & Reno, 1991). For instance, the light status (i.e., on or off) when a person enters an unoccupied public bathroom signals whether people typically turn the lights off, or leave them on, when exiting that bathroom. Therefore, the light status upon entry may influence whether a person turns the lights off upon exiting. Oceja and Berenguer (2009) unobtrusively manipulated the status of the lights (i.e., on or off) before someone entered a public bathroom, and found that participants were significantly

more likely to turn the lights off if they were off when they entered, as compared to if the lights were on.

Although the hypothesized influence of descriptive norms provides a plausible account for the observed pattern of behavior, it could also reflect a sense of personal responsibility, which has been shown to influence other instances of prosocial behavior (Berkowitz, 1972; Darley & Latane, 1968). Both social norm and personal responsibility concerns may have been activated by the “lights off” condition in Oceja and Berenguer (2009), as participants in this condition not only witnessed the light status in the bathroom as they entered it (demonstrating the social norm), but they also had to turn on the lights themselves (increasing a sense of personal responsibility). Because they were physically responsible for turning on the lights, they may have felt a greater sense of personal responsibility to turn the lights off when they left, compared to participants who entered the bathroom when the lights were already on (i.e., who had to do nothing). This rationale is consistent with the observation that the occurrence of an action has a stronger influence on a person’s self-perceptions and behavioral decisions than does an equally informative nonoccurrence of a behavior (e.g., Cioffi & Garner, 1996; Fazio, Sherman, & Herr, 1982). Based on these considerations, it seems plausible that this heightened sense of personal responsibility, and not the perceived social norm, may have guided participants’ behavior.

We conducted two field experiments in public bathrooms on a university campus in order to examine the influence of both social norms and personal responsibility on energy conservation. Given the value afforded from replicating new empirical findings (Open Science Collaboration, 2012), our first experiment provided a conceptual replication and extension of Oceja and Berenguer (2009), where the light status was unobtrusively manipulated before a

participant entered an unoccupied bathroom. We hypothesized that participants would be more likely to turn the lights off if they were off, as opposed to on, when they entered.

To extend this past research, in Study 1 we examined differences in conservation behavior across single- and multiple-user bathrooms, a distinction that was not considered by Oceja and Berenguer (2009). Participants would presumably feel a greater sense of responsibility for turning off the lights in a single-user bathroom as compared to a multiple-user bathroom, given the fact that in the single-user bathroom only the participant would be responsible for initially turning on the light (in the lights off condition), and nobody except the participant would be expected to turn off the light after the participant (as opposed to, for example, other people using the bathroom in a multiple-user bathroom). This factor provided an initial test of how personal responsibility might affect energy conservation behavior. We also examined differences in behavior between men and women. Although Oceja and Berenguer (2009) observed no differences between men and women, there is evidence that women are more likely to engage in some prosocial behaviors more frequently (e.g., Eagly, 2009), including proenvironmental behavior (e.g., Torgler, Garcia-Valiñas, & Macintyre, 2008). We set out to test this possibility as well. Finally, because Oceja and Berenguer (2009) conducted their study in Spain, Study 1 provides the first test of these hypotheses using a sample of participants from the United States.

Study 1: Method

Participants

447 people (233 females and 197 males)¹ who used one of six windowless public bathrooms (four multiple-user, two single-user) with manual light switches on the campus of a large university in the Midwestern United States.

¹ The gender of 27 participants using single-user bathrooms was indiscernible.

Procedure

Bathrooms were monitored in one-hour daytime shifts. While the bathroom was unoccupied, the researcher manipulated the light status (i.e., on or off) according to a schedule for alternating the experimental conditions. The researcher sat inconspicuously nearby until a participant entered the bathroom. After the participant exited, the researcher recorded the light status, along with the type of bathroom (i.e., single- or multiple-user), participant gender, and whether anyone entered the bathroom while the participant was inside.²

Study 1: Results and Discussion

We hypothesized that participants would be more likely to turn the lights off when they exited a public bathroom if the lights were off, as opposed to on, when they entered. Consistent with this hypothesis, participants in the “lights off” condition were significantly more likely to turn the lights off when they exited (32.4%) than those in the “lights on” condition (11.7 %); $\chi^2(1, N = 447) = 28.46, p < .001, d = .52$. Women were also more likely to turn off the lights (30.9%) than were men (9.6%), $\chi^2(1, N = 430) = 28.91, p < .001, d = .54$, as were participants in single-user compared to multi-user bathrooms (43.1% vs. 9.1%), $\chi^2(1, N = 447) = 71.23, p < .001, d = .87$.

A loglinear analysis tested whether gender and type of bathroom moderated the effect of the light status manipulation. The loglinear model converged on a solution that included the main effect of the light status manipulation, $\chi^2(1, N = 430) = 25.19, p < .001, d = .50$, and an

² Eighty-seven participants were excluded because another person entered the multiple-user bathroom after them, reducing the likelihood that they would turn the lights off upon exit, leaving the other person in the dark. One additional participant was excluded as he entered, but did not exit, the bathroom during the monitoring period.

independent interaction of gender and type of bathroom to predict whether or not participants turned off the lights, $\chi^2 (2, N = 430) = 7.54, p < .001, d = .27$; overall $\chi^2 (6, N = 430) = 1.60, p = .95$. This interaction revealed that although women were more likely than men to turn off the bathroom lights in both single- and multiple-user bathrooms, this difference was larger in multiple-user bathrooms. As illustrated in Figure 1, the effect of the light status manipulation on behavior was observed across men and women as well as both types of bathrooms.

Our results concerning gender are consistent with past research showing women tend to have more positive attitudes toward, and are more likely to engage in, proenvironmental behaviors, as compared to men (e.g., Torgler, Garcia-Valiñas, & Macintyre, 2008). The distinction between single-user bathrooms and multiple-user bathrooms also proved to be an important one, and we suspect that the difference in conservation behavior observed between the two settings may have arisen due to differences in the sense of personal responsibility elicited in each. It seems likely that being the only person in the single-user bathroom could have made people feel more responsible for turning the lights off, and thus more likely to do so.

Building on these considerations, in our second experiment we attempt to tease apart the influences of social norms and personal responsibility on energy conservation behavior. Both social norm and personal responsibility concerns may have been activated by our original “lights off” condition because the status of the lights signaled what behavior was typical for that setting and because participants had to turn the lights on themselves. In addition to the “lights on” and “lights off” conditions used in Study 1, a third experimental condition was added. In this condition, a confederate was positioned to leave the bathroom as the participant was entering; the confederate initially turned the lights off (thereby signaling normative behavior for the setting), but then turned the lights back on upon seeing the participant waiting to use the bathroom

(thereby reducing the responsibility placed on the participant to turn them off, since they did not turn them on themselves). In this new condition, normative behavior was demonstrated in the absence of participants being personally responsible for having turned the lights on. We expect that when personal responsibility is diminished, energy conservation behavior will also be diminished. Therefore, we hypothesize that participants will be more likely to turn off the lights if they were off when they entered the bathroom, as compared to if they were on, but only if the participant was responsible for turning the lights on themselves.

Study 2: Method

Participants

149 people (67 females, 65 males, 17 unknown) who used one of four windowless single-user public bathrooms with manual light switches on or around the same university campus as in Study 1.

Procedure

As in Study 1, bathrooms were monitored in one-hour daytime shifts. However, only single-user bathrooms were monitored in this study. In addition to the “lights on” and “lights off” conditions that were used in the original study, a third experimental condition was added. In this condition, which we refer to as “lights off-on”, a young male confederate was casually leaving the gender-neutral bathroom as the participant was entering it. The confederate initially turned the lights off, but then turned them back on upon noticing the participant waiting to use the bathroom. Once the participant entered the bathroom the confederate departed the area surrounding the bathroom, while a second researcher sat inconspicuously near the bathroom. After the participant exited, this second researcher recorded the light status. Once the participant departed, the second researcher summoned the confederate back to the bathroom area.

Study 2: Results and Discussion

Once again, participants in the “lights off” condition were significantly more likely to turn off the lights when they exited, as compared to participants in the “lights on” condition (74% vs. 39% respectively, $\chi^2(1, N = 94) = 11.70, p = .001, d = .75$). Results also revealed that participants were significantly more likely to turn the lights off in the “lights off” condition, compared to the “lights off-on” condition (74% vs. 29% respectively, $\chi^2(1, N = 98) = 19.84, p < .001, d = 1.01$). However, there was not a significant difference in likelihood of turning the lights off between the “lights off-on” and “lights on” conditions (29% vs. 39% respectively, $\chi^2(1, N = 106) = 1.21, p = .271, d = .21$). This pattern of results, displayed in Figure 2, highlights the importance of a person’s sense of personal responsibility; when personal responsibility concerns were diminished, energy conservation behavior was also substantially diminished. Although women did tend to be more likely to turn off the lights than did men, this difference was not significant (49% of women vs. 35% of men, $\chi^2(1, N = 132) = 2.60, p > .10, d = .28$). Additional analyses also revealed that gender did not interact with condition when predicting turning the lights off ($\chi^2(1, N = 132) = 6.69, p > .10, d = .46$).

General Discussion

Two studies provided behavioral evidence in support of the hypothesis that the light status when a person enters a public bathroom influences whether or not he or she turns the lights off when exiting. These results are consistent with psychological theory and research suggesting that small changes in one’s environment can influence behavior in important ways (Thaler & Sunstein, 2008). With these findings, we have not only replicated a finding initially observed in Spain (Oceja & Berenguer, 2009), but also found comparable, albeit slightly smaller, average effect sizes when comparing the “lights on” conditions versus the “lights off” conditions

(average $d = .82$ for Oceja and Berenguer and average $d = .64$ for the current studies).

Furthermore, we have extended this work by elaborating on the boundary conditions of this phenomenon. Specifically, our results indicate that a sense of personal responsibility for one's behavior can serve as an important moderator of the influence of social norms on people's behavior. In Study 2, when participants were not themselves responsible for turning the lights on, the impact of normative information was reduced to the level observed in the control condition. This finding is consistent with past research showing the influence of norms on prosocial behavior depends on the level of responsibility a person assumes for the behavior (Schwartz, 1973).

Although we believe that perceptions of personal responsibility offer a compelling explanation for our findings, we recognize that alternative explanations may exist. One potential alternative account for the effects found in Study 2 is that participants in the "off-on" condition might have turned off the lights less often because the presence of the confederate suggested that the bathroom saw higher amounts of traffic than in the other conditions and, thus, it was less appropriate to turn the light off. One might also wonder if participants in that condition were motivated to reciprocate the confederate's favor of turning the lights on for them by leaving the lights on for the next bathroom user. Although these two accounts are plausible, we believe they are difficult to reconcile with the confederate's behavior. In the critical condition, the confederate's first action was to turn the lights off; thus, the confederate first demonstrates that turning off the bathroom light after use is normative, and only breaks the norm when another individual is physically present and waiting to use the bathroom. Also, because the confederate's initial intention was to turn the lights off, it could be argued that a more appropriate form of reciprocation would be to return the lights to the off status, as the confederate had intended.

Although we are confident in our interpretation of the findings, future empirical work may choose to examine the viability of these alternative explanations more directly.

This research has important applied implications for efforts to encourage proenvironmental behavior. Through the simple act of turning the lights off in unused public spaces, individuals and organizations can influence others to do the same, thereby reducing electricity consumption. Thus, the efforts of groups such as the Power Police may be doubly impactful if done surreptitiously, in that their own actions, as well as the actions of others whom they influence, help to perpetuate energy conservation. Just knowing that the conservation choices we each make can influence the conservation behaviors of others is both intriguing and empowering.

Our research suggests that electricity conservation resulting from efforts to turn off lights in unused public spaces arises both through signaling social norms to people, and by instilling a sense of personal responsibility in them. Although we focused on descriptive norms in these studies, future research should consider the influence of personal responsibility on proenvironmental behavior when injunctive norms are rendered salient (e.g., Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2008; Smith, Louis, Terry, Greenaway, Clarke, & Cheng, 2012). Moreover, how best to leverage the current findings should be the focus of future research. For example, an intervention aimed at changing a person's behavior by cuing a social norm could be made more effective when delivered in the presence of a mirror or when paired with other strategies that have been shown to heighten a sense of self-awareness and personal responsibility. Given the results of these two field experiments, finding ways to lobby both social norms and personal responsibility might provide researchers with an effective way to increase energy conservation behavior in public settings.

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Figure captions

Figure 1. Status of the lights after the participant left the public bathroom in Study 1. Light status (on, off) was manipulated before the participant entered the bathroom. The overall results for the on and off conditions are reported on the left hand side of the figure. Results broken down separately by gender are in the middle of the figure and by single- versus multiple-user bathrooms are on the right side of the figure.

Figure 2. Status of the lights after the participant left the public bathroom in Study 2. Light status (on, off, off-on) was manipulated before the participant entered the bathroom.

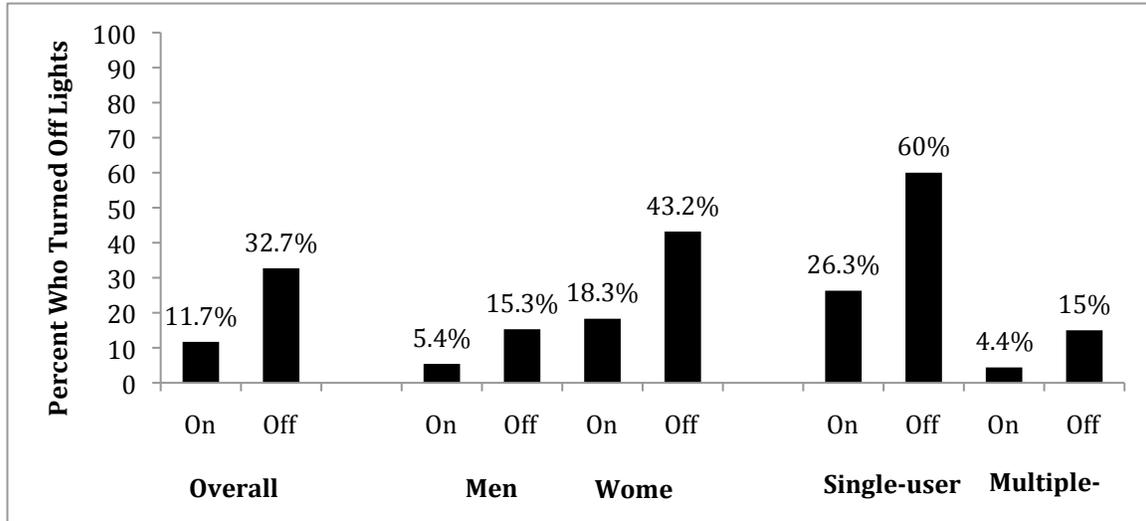


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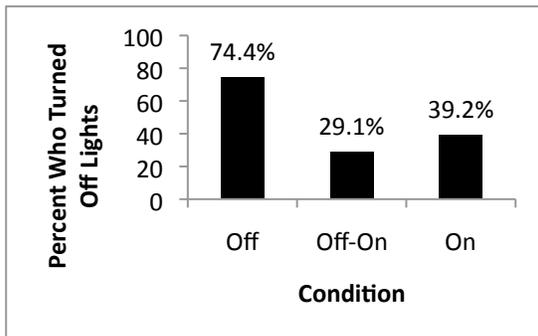


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