



# CHICAGO JOURNALS

**Journal of Consumer Research, Inc.**

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Author(s): Katie Baca-Motes, Amber Brown, Ayelet Gneezy, Elizabeth A. Keenan, and Leif D. Nelson

Reviewed work(s):

Source: *Journal of Consumer Research*, (-Not available-), p. 000

Published by: [The University of Chicago Press](#)

Stable URL: <http://www.jstor.org/stable/10.1086/667226>

Accessed: 28/08/2012 19:49

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# Commitment and Behavior Change: Evidence from the Field

KATIE BACA-MOTES  
AMBER BROWN  
AYELET GNEEZY  
ELIZABETH A. KEENAN  
LEIF D. NELSON

Influencing behavior change is an ongoing challenge in psychology, economics, and consumer behavior research. Building on previous work on commitment, self-signaling, and the principle of consistency, a large, intensive field experiment ( $N = 2,416$ ) examined the effect of hotel guests' commitment to practice environmentally friendly behavior during their stay. Notably, commitment was symbolic—guests were unaware of the experiment and of the fact that their behavior would be monitored, which allowed them to exist in anonymity and behave as they wish. When guests made a brief but specific commitment at check-in, and received a lapel pin to symbolize their commitment, they were over 25% more likely to hang at least one towel for reuse, and this increased the total number of towels hung by over 40%. This research highlights how a small, carefully planned intervention can have a significant impact on behavior. Theoretical and practical implications for motivating desired behavior are discussed.

Population growth and modern industrialization have increased human impact on the natural environment. Climate change, pollution, and water scarcity are just a few of the ongoing issues in resource conservation. Energy-related activities account for over 85% of our human-generated greenhouse gas emissions, and it is estimated that at least 36 states will face water shortages by 2013 (US Environ-

mental Protection Agency 2011a, 2011b). These realities are hard to escape.

Growing environmental concern has led to the emergence of conservation-minded consumers and businesses alike. In turn, the market has experienced an increased demand for eco-friendly products and services (Carlson, Grove, and Kangun 1993; Laroche, Bergeron, and Barbaro-Forleo 2001; Roberts 1996; Vandermerwe and Oliff 1990). For example, in the lodging industry, eco-friendly customers are more likely to express intent to stay in a green hotel (Gustin and Weaver 1996; Han et al. 2011), although this preference is not limited to nonbusiness travelers—40% of business travelers surveyed said they were willing to pay more for hotels with green amenities, and 95% believe the industry needs to become more sustainable (Weissenberg, Redington, and Kutyla 2008; see also Travelzoo 2010). These stated preferences suggest that hotels choosing to go green may see a subsequent increase in occupancy. Consequently, firms often incorporate green strategies into their business model (Henriques and Sadorsky 1996; Menon and Menon 1997), and data show a positive correlation between environmental effort and financial performance (Menon and Menon 1997; Miles and Covin 2000; Russo and Fouts 1997). Importantly, however, research has yet to establish the implied causal relationships by which environmental efforts improve performance.

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Authors contributed equally and are listed alphabetically. Katie Baca-Motes (baca@disneyresearch.com) is senior research associate, Walt Disney Research, Glendale, CA 91201. Amber Brown (amber@disneyresearch.com) is senior research scientist, Walt Disney Research, Glendale, CA 91201. Ayelet Gneezy (agneezy@ucsd.edu) is assistant professor of marketing, Rady School of Management, University of California, San Diego, La Jolla, CA 92093. Elizabeth A. Keenan (elizabeth.keenan@rady.ucsd.edu) is PhD candidate, Rady School of Management, University of California, San Diego, La Jolla, CA 92093. Leif D. Nelson (leif\_nelson@haas.berkeley.edu) is associate professor of marketing, Haas School of Business, University of California, Berkeley, Berkeley, CA 94720. Correspondence: Ayelet Gneezy. The authors thank Kelsey Hunt and Steve Ruffner for their assistance during this project. This material is based on work supported by National Science Foundation grant 1124610.

*Mary Frances Luce served as editor and Joel Huber served as associate editor for this article.*

*Electronically published July 3, 2012*

## Conservation in Hotels

The hospitality industry presents a case for potential significant environmental and financial impacts. In addition to their environmental benefits, water- and energy-saving measures reduce hotels' operating costs. For example, a 10% reduction in energy use is estimated to save \$750 million per year in the US hospitality industry, while simultaneously cutting greenhouse gas emissions by 6 million tons (Energy Star 2010).

One area of environmental-related savings for hotels comes from towel and linen reuse programs, which are estimated at \$6.50 per occupied room per night (Griffin 2001; National Association of Institutional Linen Management 2001). This number equates to an annual savings of over \$460,000 for an average-size hotel with 66% average occupancy (Smith Travel Research 2011). Independent of the benefits to the environment, these numbers help explain the prevalence of these programs (Goldstein, Cialdini, and Griskevicius 2008), which typically encourage patrons to do their part by reusing their towels and sheets rather than having them changed each day.

## Motivating Green Behavior

Despite the potential benefits of towel-reuse programs, data show that hotel guests' compliance with them ranges between 30% and 38% (Cialdini 2005; Goldstein, Griskevicius, and Cialdini 2007; Goldstein et al. 2008). Note that the common use of in-room signs and messages operates on the assumption that environmental pleas will increase awareness, change attitudes, and induce conservation-minded behavior. Attitude change does not always equate to behavior change (Ajzen and Fishbein 1977), however, and even the most knowledgeable and environmentally conscious individuals may sometimes fail to recycle and are no more likely to conserve energy (Bickman 1972; Costanzo et al. 1986; De Young 1988; Geller 1992). Changing attitudes toward conservation may never be as effective as operating on conservation behavior more directly (Thaler and Sunstein 2008).

Recent research has highlighted a couple of effective strategies. One is simply to capitalize on reciprocity concerns. Telling guests that the hotel had already made a donation to charity in return for anticipated towel reuse increased towel hanging to 44%. A second tactic demonstrates that signs referencing social norms positively influence guest behavior (Goldstein et al. 2007, 2008; Schultz, Khazian, and Zaleski 2008). Signs appealing to descriptive (e.g., "the majority of other guests reuse their towels") and provincial (e.g., "the majority of guests in this room reuse their towels") norms increased towel hanging from 35% to 44% and from 37% to 49%, respectively.

This intriguing result suggests the potential effectiveness of interventions with hotel guests (with plenty of room for improvement—between 49% and 100%). One concern with the social-norm interventions, however, is that they are predicated on describing norms falsely—the majority of guests did not actually reuse their towels. The current research aims

to capitalize on the observation that individuals' personal values better predict future behavior than do beliefs in external norms (Viscusi, Huber, and Bell 2011). If those personal values can be engaged, we may be more successful in our attempts to influence behavior.

In this article, we propose a novel approach for increasing guests' participation in towel-reuse programs. Our investigation, which hinges on theories of self-signaling, commitment, and consistency, takes the *nudge* approach and prescribes a simple yet effective mechanism for increasing individuals' compliance with environmental appeals in an applied setting. Specifically, we suggest that allowing guests to actively express their interest in joining the hotel's effort by reusing their towels would increase their likelihood of doing so. Results of a large field experiment (31 days,  $N = 2,416$ ) support our proposition.

## THEORETICAL DEVELOPMENT

### Commitment and Consistency

The principle of consistency derives from cognitive dissonance theory, which suggests that individuals have an internal need to keep attitudes and beliefs in harmony (Festinger 1957). Typically, conflicting thoughts create internal discomfort, which motivates behavior that will restore balance (1957). A ramification of cognitive dissonance theory is that commitments set the stage for subsequent consistent behavior (Cialdini 2007, 67). Freedman and Fraser (1966) showed that getting individuals to agree to a small request, such as placing a small driver safety sign in the front windows of their homes, were more likely to later comply with a larger request (i.e., installing a large, ugly driver-safety sign on their front lawn). Similarly, when asked to participate in an AIDS awareness project, individuals who indicated their decisions actively (opting in) were more likely to show up than individuals making a passive decision (choosing not to opt out; Cioffi and Garner 1996). Finally, commitments have also been shown to foster environmentally friendly behaviors. Residents who made a written commitment were more likely to participate in curbside recycling programs or save household energy (Katzev and Johnson 1984; Pallak and Cummings 1976; Werner et al. 1995). Applying the concept of commitment to the current work, it is reasonable to predict that guests who commit to practice sustainable behavior while staying at a hotel would subsequently be more likely to do so than guests who do not make such a commitment (Cialdini 2007).

### Strengthening Commitment via Signaling

Individuals manage their image via social signaling—they behave in ways that communicate to others what kind of a person they are or what kind of a person they wish others to think they are (Andreoni and Bernheim 2009; Ariely, Bracha, and Meier 2009; Griskevicius, Tybur, and Van den Bergh 2010). Importantly, our behavior and choices also serve as self-signals—informing our self-perceptions and

guiding subsequent behavior to be in line with our perceived self-identity (Ariely and Norton 2008; Bem 1972; Bénabou and Tirole 2004, 2011; Bodner and Prelec 2003; Gao, Wheeler, and Shiv 2009; Greenwald 1980; LeBoeuf, Shafir, and Bayuk 2010; Ross 1989). It is therefore plausible to expect that an initial commitment to a certain cause would signal to the individual that she cares about that cause and increase the likelihood that she will behave consistently.

Combining the concepts of commitment and self-signaling, we propose that hotel guests' participation in a towel-reuse program would increase if they initially commit to it, presumably because the initial commitment would signal to the individual that she cares about the environment, which would increase the likelihood she will behave consistently. Importantly, when expressed publicly, commitments are particularly effective in ensuring compliance (Cialdini and Goldstein 2004; Cialdini and Trost 1998). For instance, publicly displaying the names of residents that commit to save energy led to a significant decrease in energy consumption, compared to private commitment and control groups (Pallak and Cummings 1976). By extension, we predicted that allowing hotel guests to publicly express their commitment to the environment would likely reinforce their commitment and further increase compliance.

### Message Specificity

Past work suggests specific messaging can increase commitment rates and performance relative to general, nonspecific messaging (Locke and Latham 2002; Locke et al. 1981; Wright and Kacmar 1994). Asking people to do their best is often ineffective, arguably because "do-your-best goals have no external referent and thus are defined idiosyncratically, allowing for wide range of acceptable performance levels" (Locke and Latham 2002, 706). Specifically defined goals, however, reduce the ambiguity about what needs to be accomplished (Hollenbeck and Klein 1987; Locke and Latham 1990, 2002; Locke et al. 1989). For example, a fear-inducing appeal (for vaccination) was generally ineffective by itself but substantially effective when presented in combination with a map to the health center (Leventhal, Singer, and Jones 1965). Incorporating the principles of message specificity with our investigation, we propose that hotel guests who commit to practice environmentally friendly behavior would be more likely to do so if their commitment specifies the steps required to achieve such behavior, as opposed to a more general commitment to "be good."

## RESEARCH OVERVIEW

Partnering with an Orange County, California, hotel, we conducted a field experiment (Danziger, Levav, and Avnaim-Pesso 2011; Levitt and List 2007) to examine how guests' initial pledges to practice sustainable behavior influenced their subsequent behavior. We implemented our manipulations during the check-in process, primarily to ensure exposure to them. Individuals often engage in automatic behaviors without devoting much thought or attention to

them (Langer 1989). For example, individuals who were asked to write automatically while engaging in another task that required their attention were unable to recall the words they wrote, despite being certain they had written "something" (Langer, Blank, and Chanowitz 1978; Solomons and Stein 1896). Similarly, we believe hotel guests approach in-room environmental messaging rather mindlessly—they have seen these messages before and need not do so again. We therefore expected that integrating our manipulation with the check-in process would increase the likelihood that guests would notice it.

Our main measure of compliance was towel reuse—hanging a towel to be reused the next day. We also looked at second-order effects on energy-saving behavior and guest satisfaction. Specifically, we collected data on three energy-related behaviors when exiting the room: turning off the lights, turning off the television, and turning off the air conditioning. As a follow-up, we collected poststay survey responses to learn whether the manipulations had a substantial influence on guest satisfaction and as a simple check of our primary manipulations. Finally, we used towel-reuse data to calculate potential financial and environmental savings.

## FIELD EXPERIMENT: ECO-FRIENDLY BEHAVIOR IN A HOTEL

Upon arrival, hotel guests were directed to the reception desk. At the end of the check-in process, a trained hotel employee presented guests with a card stating the hotel's commitment to the environment, followed by a commitment message with an option to join the hotel's environmental efforts. We used two types of commitments: general (be environmentally friendly during hotel stay) or specific (reuse towels during hotel stay). To further induce signaling and reinforce the commitment, after receiving the completed commitment card, the hotel employee handed a Friend of the Earth pin to some guests who chose to commit. Notably, branded pins are highly valued by the majority of this hotel's guests, and wearing them is a tradition. In fact, hotel guests often wear multiple pins using a branded lanyard and tend to "check out" each other's collections. Consequently, we expected those receiving pins to actually wear them during their stay.

This resulted in a 2 (commitment specificity: general, specific)  $\times$  2 (symbol: pin, no pin) between-participants design. We also included three control conditions. In the first, message only, guests were exposed to the hotel's environmental-commitment message but were not presented with an option to commit. Guests in the pin-only condition received a Friend of the Earth pin without messaging or an option to commit. The third, no manipulation, condition followed the standard check-in procedure at the hotel. In total, we had seven experimental conditions. All guests were also exposed to the standard in-room towel-reuse appeal.

### Method

Over the course of 31 days, guest parties ( $N = 4,345$ ) at a popular California hotel were randomly assigned to one

of seven conditions. Each condition ran for at least 4 days and included a weekend day (see app. A for randomization and cell-size information). Guests were unaware of their participation in the study.

Toward the end of the check-in process, guests were asked to read the hotel's statement about its commitment to the environment and then return the card to the hotel employee (see app. B for images of message cards). The card read: "(Hotel Name) has long been a steward of the environment. Here at (hotel name), we have a number of efforts in place to care for our planet ranging from water and energy conservation, recycling and low-emission vehicles to eco-conscious options for resort guests."

In the commitment conditions, guests read a [specific] commitment: "I care about the environment at home and when I travel. As a friend to the earth, I will do my best to practice environmentally-friendly behavior [save water and energy by re-using my towels] during my stay." Guests then indicated whether they commit (checking yes or no) while the front-desk staff completed the check-in process.

Guests in the commitment + pin conditions who checked yes received pins for each member in their party. Guests in all four commitment conditions who checked yes were also invited, together with their group members, to sign the hotel's Friend to the Earth Book.

Guests in the message-only condition read just the hotel message. Guests in the pin-only condition received the Friend to the Earth pin at the end of the check-in process and were told, "Please accept this (hotel name) Friend of the Earth Pin." Finally, guests in the no-manipulation condition went through the standard check-in process and were not exposed to any experimental manipulation (see app. C for scripts used and app. D for a graphic representation of the experimental procedure).

At the end of their stay, we invited all guests to complete a survey that measured their overall hotel-stay satisfaction. Shortly before check out, we left a voice mail on guests' in-room phones, inviting them to participate in a short survey in exchange for a tote bag. Guests called a number designated for this purpose and were surveyed by a trained staff member. Upon completion, guests were invited to pick up their tote bag at the front desk.

## Data Collection

Measuring towel use and reuse is surprisingly difficult. Guest rooms were unpredictably left unoccupied, which meant the coding staff had to wait for the right moment to visit the room—always before housekeeping. For our main dependent measure, towel reuse, we trained data collectors to count all towels (*a*) used, (*b*) unused, and (*c*) hung for reuse. Used towels on hooks, towel racks, clotheslines, shower bars, and hangers were considered hung for reuse. Used towels draped on furniture, vanities, tubs, doors, or on the floor were not considered hung for reuse. Additional measures collected were whether the lights, television, and air conditioning were off. Data collectors reentered all rooms after housekeeping serviced them to check for housekeeping

compliance (i.e., whether they left towels hung for reuse, or replaced them with new ones). Data collectors were blind to experimental conditions and predictions. Our measures and analyses are reported in compliance with the suggestions laid out in Simmons, Nelson, and Simonsohn (2011).

## CHECK OF THE MANIPULATIONS

Ninety-eight percent of guests checked yes in the general commitment condition, and 83% checked yes in the specific commitment condition. Our analyses include all guests assigned to each condition, not merely those who checked yes.

Nine hundred and sixteen guest parties (21% response rate) agreed to participate in the poststay survey in exchange for a reusable tote bag. Although the response rate was low, it was similar across all conditions ( $n > 100$  per condition; see table 1). The results of the poststay survey confirmed that guests who received a pin were more likely to report wearing it during their stay. In a logistic regression, we regressed self-reported pin wearing on commitment specificity (general vs. specific) and symbol (pin vs. no pin). We found a main effect for symbol such that guests who received a pin were more likely to report wearing one ( $M = 81.4\%$ ) compared to guests who did not receive a pin ( $M = 69.6\%$ ; Wald(1) = 6.79,  $p < .01$ ). When asked whether the pins they wore expressed an environmental message, guests in both commitment conditions were more likely to report wearing environmental pins compared to any other condition. Specifically, although 84.6% of guests in the pin-only condition reported wearing pins, only 44.2% of these indicated the pin had an environmental message. In contrast, 74.4% of guests in the general commitment condition ( $\chi^2(1, N = 277) = 9.86, p < .01$ ) and 78.9% in the specific commitment condition indicated wearing environmental pins ( $\chi^2(1, N = 256) = 13.48, p < .01$ ).

## RESULTS AND DISCUSSION

Our primary analysis focused on a 2 (commitment specificity: general, specific)  $\times$  2 (symbol: pin, no pin) design plus the three control conditions (message only, pin only, and no manipulation). Guest parties ( $N = 4,345$ ; 14,498 individuals) were randomly assigned to one of the seven conditions described above. We included only guest parties staying more than one night (85.3% of guests). Additionally, there were instances when housekeeping cleaned a room before data collectors arrived and other cases in which guests did not leave their room or hung a "do not disturb" sign. Because they offered no data, we also dropped these instances from our analyses, leaving us with a final sample of 2,416 guest parties, each with an average of 3.38 individuals.

### Participation: Towel Use and Towel Reuse

Data collectors visited guest rooms before housekeeping and recorded (*a*) the number of towels in the room, (*b*) the number that had been used, and (*c*) the number that were

**TABLE 1**  
POSTSTAY SURVEY RESULTS

Condition	Response rate	Company cares about the environment	I was environmentally friendly during my stay	I enjoyed being part of the company's effort to reduce water use	I consider a hotel's environmental practices in choosing a hotel	Me or my family wore pins during our stay (%)	Did any of those pins express an environmental message? (%)	My visit to specific hotel exceeded expectations	My visit to the resort exceeded expectations
Specific commitment:									
Pin (n = 579)	163 (28%)	6.55 (.058) <sup>ab</sup>	6.30 (.083) <sup>a</sup>	6.50 (.092) <sup>a</sup>	4.90 (.156) <sup>a</sup>	75.50	78.9 <sup>a</sup>	6.25 (.083) <sup>a</sup>	6.18 (.087) <sup>a</sup>
No pin (n = 813)	165 (20%)	6.55 (.059) <sup>ab</sup>	6.19 (.083) <sup>ab</sup>	6.49 (.091) <sup>a</sup>	4.29 (.155) <sup>b</sup>	60.00	20.2 <sup>c</sup>	6.10 (.082) <sup>a</sup>	6.09 (.087) <sup>a</sup>
General commitment:									
Pin (n = 580)	144 (25%)	6.67 (.062) <sup>a</sup>	6.20 (.088) <sup>ab</sup>	6.46 (.097) <sup>a</sup>	4.85 (.166) <sup>a</sup>	84.00	74.4 <sup>a</sup>	6.29 (.088) <sup>a</sup>	6.30 (.093) <sup>a</sup>
No pin (n = 492)	109 (22%)	6.69 (.077) <sup>a</sup>	6.05 (.102) <sup>abc</sup>	6.38 (.113) <sup>a</sup>	4.51 (.190) <sup>ab</sup>	78.90	20.9 <sup>c</sup>	6.07 (.101) <sup>a</sup>	6.22 (.106) <sup>a</sup>
Control:									
No manipulation (n = 535)	110 (21%)	6.47 (.077) <sup>b</sup>	5.95 (.101) <sup>bc</sup>	6.36 (.111) <sup>a</sup>	4.42 (.189) <sup>ab</sup>	70.90	20.5 <sup>c</sup>	6.18 (.100) <sup>a</sup>	6.28 (.106) <sup>a</sup>
Message only (n = 776)	102 (13%)	6.40 (.080) <sup>b</sup>	6.04 (.105) <sup>abc</sup>	6.50 (.118) <sup>a</sup>	4.44 (.197) <sup>ab</sup>	68.60	14.3 <sup>c</sup>	6.15 (.104) <sup>a</sup>	6.22 (.110) <sup>a</sup>
Pin only (n = 570)	123 (22%)	6.44 (.073) <sup>b</sup>	5.94 (.096) <sup>c</sup>	6.34 (.106) <sup>a</sup>	4.42 (.179) <sup>ab</sup>	84.60	44.2 <sup>b</sup>	6.20 (.095) <sup>a</sup>	6.08 (.100) <sup>a</sup>

NOTE.—Standard errors are in parentheses. Some guests in no-pin conditions reported wearing an environmental pin. Since many guests purchase and wear pins at this hotel, even those who did not receive a pin as part of the experiment are likely to have worn some pin during their stay that could possibly qualify as environmental (e.g., World Wildlife Fund). It is also possible that some guests did not understand the question—having no way to discriminate between these possibilities, we acknowledge this potential shortcoming. Different superscripts are significantly different ( $p < .05$ ).

hung for reuse. We focus on three (related) measures of towel reuse (see table 2). First, we consider the percentage of rooms that hung at least one towel. We refer to this variable as hanging likelihood. Second, we consider the number of towels hung for reuse in each room. We refer to this variable as towels hung. Third, we consider the number of used towels hung for reuse. We refer to this variable as hanging percentage. We limit our analyses to guests' first night stay for two reasons. The first reason is practical: if housekeeping removed hung towels (an unfortunate common occurrence), guests might be less inclined to continue hanging their towels. The second consideration is logical: those staying only one night would have no opportunity to reuse their towels.

**Hanging Likelihood.** First, we consider how the manipulations influence the likelihood that guests would hang any towels for reuse, starting with a 2 (commitment specificity)  $\times$  2 (symbol) comparison. In a logistic regression, we regressed hanging likelihood on commitment specificity, symbol, and their interaction. We find a main effect of commitment specificity such that guests in the specific commitment condition were more likely to hang a towel ( $M = 66.6\%$ ) than were guests in the general commitment condition ( $M = 61.0\%$ ; Wald(1) = 4.49,  $p < .05$ ). The regression further revealed a main effect of symbol—guests were more likely to hang a towel after receiving the pin ( $M_{\text{pin}} = 68.0\%$ ,  $M_{\text{no pin}} = 59.6\%$ ; Wald(1) = 10.02,  $p < .01$ ). The interaction was nonsignificant (Wald(1) = 2.68,  $p = .102$ ; see fig. 1).

It is plausible that hanging likelihood is driven by a consistent difference in the number of room occupants per condition. When added to the regression, room occupancy was a marginally significant predictor of hanging likelihood (additional occupants increased the likelihood of a towel being hung; Wald(1) = 2.75,  $p = .097$ ). We further observed differences in the average number of room occupants per condition ( $M_{\text{general}} = 3.48$ ,  $M_{\text{specific}} = 3.27$ ;  $p < .001$ ) and average number of guests in rooms assigned to the pin condition ( $M_{\text{pin}} = 3.43$ ,  $M_{\text{no pin}} = 3.32$ ;  $p < .05$ ). Controlling for room occupancy, all results hold: commitment specificity main effect (Wald(1) = 5.48,  $p < .05$ ), symbol main effect (Wald(1) = 9.60,  $p < .01$ ), and marginally significant interaction (Wald(1) = 2.81,  $p = .093$ ).

An additional concern is the nature of our randomization. Each day in the experiment was assigned to one condition, rather than pure randomization across participants. Accordingly, day-of-the-week effects (which might covary with experimental condition) could artificially produce a result. We therefore created seven dummy variables to control for such effects. These controls weaken the statistical significance of each of the effects reported above. Commitment specificity has the same directional, but now nonsignificant, effect (Wald(1) = 1.21,  $p = .271$ ); the symbol main effect was marginally significant (Wald(1) = 3.60,  $p = .058$ ); and there was a similar nonsignificant interaction (Wald(1) = 2.33,  $p = .127$ ).

Finally, we compared these hanging likelihood figures to

TABLE 2

HANGING LIKELIHOOD, TOWELS HUNG, HANGING PERCENTAGE, AND ENERGY USE BY CONDITION

Condition	Hanging likelihood %	Towels hung	Hanging %	% turned lights off
Specific commitment:				
Pin ( $n = 258$ )	73.0	1.87	35.4	66.7
No pin ( $n = 458$ )	60.3	1.40	28.7	58.5
General commitment:				
Pin ( $n = 318$ )	63.0	1.41	26.3	55.3
No pin ( $n = 287$ )	59.0	1.22	23.2	45.3
Control:				
No manipulation ( $n = 309$ )	57.0	1.33	24.4	48.9
Message only ( $n = 445$ )	59.8	1.28	24.8	60.9
Pin only ( $n = 341$ )	54.0	1.13	19.5	52.5

NOTE.— $N = 2,416$  reflects all cases used in the analyses; however, there were 17 missing cases in the hanging % data (17 rooms did not use towels at all).

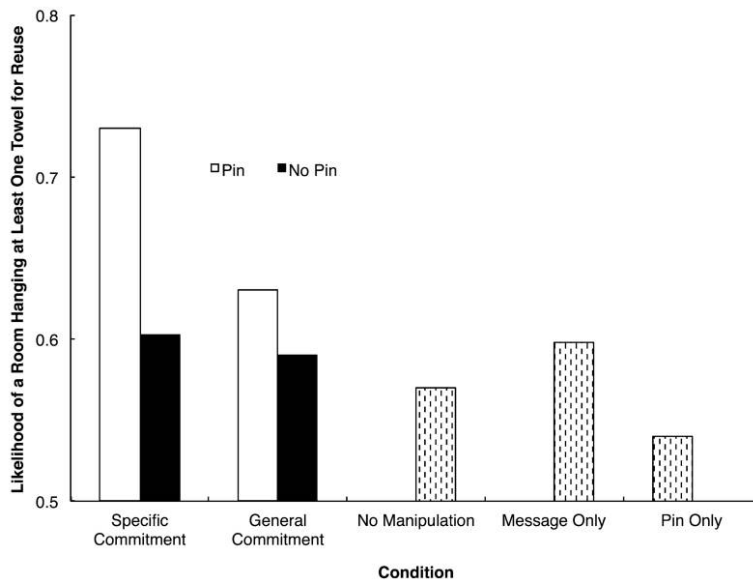
those of the three control conditions, using a one-way ANOVA and Fisher's least significant difference (LSD) to test paired comparisons. Specific commitment + pin guests were more likely to hang a towel than were guests in any of the control conditions ( $p < .001$ ), and guests in the general commitment + pin were only more likely to hang a towel than were guests in the pin-only condition ( $p < .05$ ). Interestingly, guests in the pin-only condition were significantly less likely to hang any towels relative to guests in the specific commitment + pin and general commitment + pin. We revisit this observation later. When using a Bonferroni correction for multiple comparisons, the specific commitment + pin condition differed from all other conditions. There were no other significant differences.

**Towels Hung.** Next, we analyzed the total number of towels hung for reuse in each room as a function of commitment specificity (general vs. specific) and symbol (pin vs. no pin). Consistent with the hanging likelihood results, a 2  $\times$  2 ANOVA revealed a main effect of commitment specificity—specific commitment guests hung significantly more towels relative to those in the general commitment condition ( $M_{\text{specific}} = 1.64$ ,  $M_{\text{general}} = 1.32$ ;  $F(1, 1,317) = 13.47$ ,  $p < .001$ ). The analysis also revealed a main effect for symbol—specific commitment guests who received the pin hung significantly more towels relative to those in the general commitment condition ( $M_{\text{pin}} = 1.64$ ,  $M_{\text{no pin}} = 1.31$ ;  $F(1, 1,317) = 14.07$ ,  $p < .001$ ). The interaction was nonsignificant ( $F(1, 1,317) = 2.55$ ,  $p = .110$ ; see fig. 2).

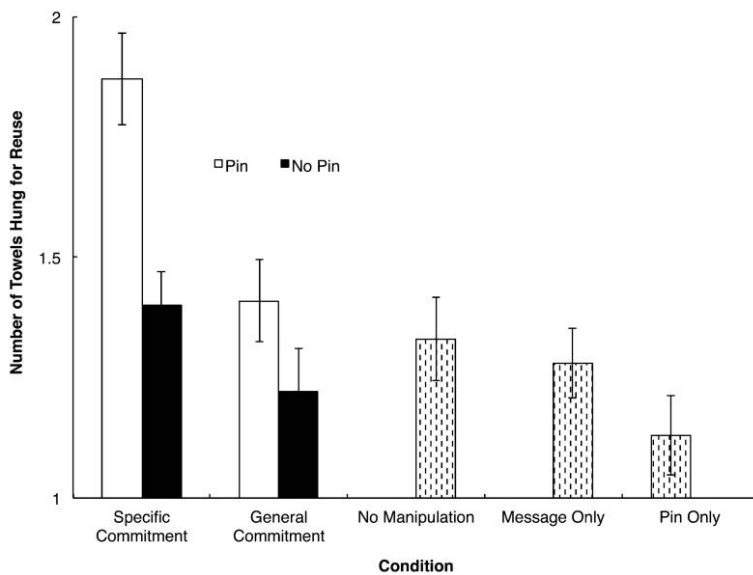
Again, room occupancy affected the number of towels hung ( $F(1, 1,316) = 19.32$ ,  $p < .01$ ). However, controlling for room occupancy, a second ANOVA revealed similar main effects for commitment specificity ( $F(1, 1,316) = 18.57$ ,  $p < .001$ ) and symbol ( $F(1, 1,316) = 12.86$ ,  $p < .001$ ). The interaction became marginally significant ( $F(1, 1,316) = 2.92$ ,  $p = .088$ ).

As with the hanging-likelihood analysis, we added con-

**FIGURE 1**  
HANGING LIKELIHOOD



**FIGURE 2**  
NUMBER OF TOWELS HUNG



trols for day of the week. The effects were all similar: a main effect of commitment specificity ( $t = 2.89, p < .01$ ), a marginal main effect of symbol ( $t = 1.72, p = .085$ ), and a marginal interaction ( $t = 1.91, p = .056$ ).

Next, we used a one-way ANOVA and Fisher LSD to

include the three control conditions and test paired comparisons. Specific commitment + pin guests hung more towels than did guests in all other conditions ( $p < .01$ ). The general commitment + pin and specific commitment without pin conditions differed from the pin-only condition ( $p$



= .025 and .002, respectively). The general commitment condition did not differ from any of the control conditions.

**Hanging Percentage.** For our last measure, we calculated the percentage of used towels that were hung for reuse as a function of commitment specificity and symbol (we excluded 17 rooms that did not use any towels). Consistent with the results observed so far, a  $2 \times 2$  ANOVA revealed that specific commitment guests hung more used towels than did guests in the general commitment condition ( $M_{\text{specific}} = 32.0\%$ ,  $M_{\text{general}} = 24.8\%$ ;  $F(1, 1,307) = 19.60$ ,  $p < .001$ ). Guests who received a pin hung more of their towels than did those who did not receive a pin ( $M_{\text{pin}} = 30.8\%$ ,  $M_{\text{no pin}} = 26.0\%$ ;  $F(1, 1,307) = 8.73$ ,  $p < .01$ ). The interaction was nonsignificant (see fig. 3). Finally, room occupancy was not a significant predictor of hanging percentage ( $F = .001$ ) and did not influence the above results when included as a covariate. When controlling for day of the week, the effects were identical in direction but weaker in terms of statistical significance. We found a main effect of commitment specificity ( $t = 3.26$ ,  $p = .001$ ), a marginal main effect of symbol ( $t = 1.95$ ,  $p = .051$ ), and a nonsignificant interaction ( $t = 1.07$ ,  $p = .284$ ).

Finally, we compared these results to the three control conditions using a one-way ANOVA and post hoc Fisher LSD analysis for the paired comparisons. Hanging percentage in both specific commitment conditions (with and without pin) differed significantly from all control conditions ( $p < .01$ ). Hanging percentage in the two general commitment conditions (with and without pin) did not differ significantly from the no-manipulation and message-only

conditions. Again, participants in the pin-only condition hung up the smallest percentage of used towels relative to those in any other condition ( $p < .097$ ).

## Second-Order Effects: Energy Use

Energy-saving measures include whether the lights, television, and air conditioning were turned off when guests left their rooms. These measures allowed us to see whether guests' environmental behavior extended beyond the targeted towel reuse. It was uncommon for guests to leave the television on: only about 1% of our sample. In addition, there was an unobserved variation in the thermostat settings when guests checked into rooms. We therefore limited our analyses to lights (see fig. 4) and focused on the experimental conditions of commitment specificity and symbol. A logistic regression revealed main effects for both factors. Guests in both specific commitment conditions were more likely to turn the lights off when leaving the room than were those in the general commitment condition ( $M_{\text{specific}} = 62.6\%$ ,  $M_{\text{general}} = 50.3\%$ ; Wald(1) = 19.21,  $p < .001$ ). Furthermore, guests who received the pin were more likely to turn the lights off ( $M_{\text{pin}} = 61.0\%$ ,  $M_{\text{no pin}} = 51.9\%$ ; Wald(1) = 10.64,  $p < .001$ ). The interaction was nonsignificant (Wald(1) = .05,  $p = .814$ ).

Room occupancy influenced the likelihood of turning off the lights such that the more people who were in the room, the less likely they were to turn off the lights (Wald(1) = 4.53,  $p < .05$ ). All the above results hold when controlling for room occupancy—specific commitment increased the

FIGURE 3

### HANGING PERCENTAGE

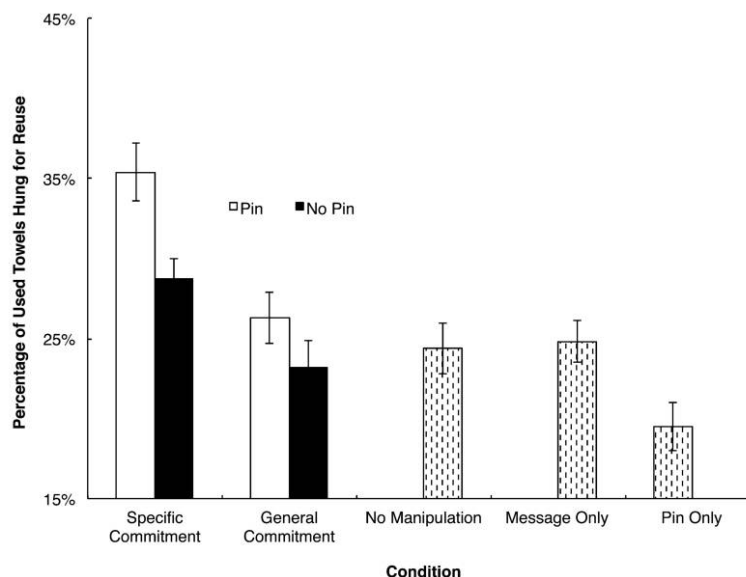
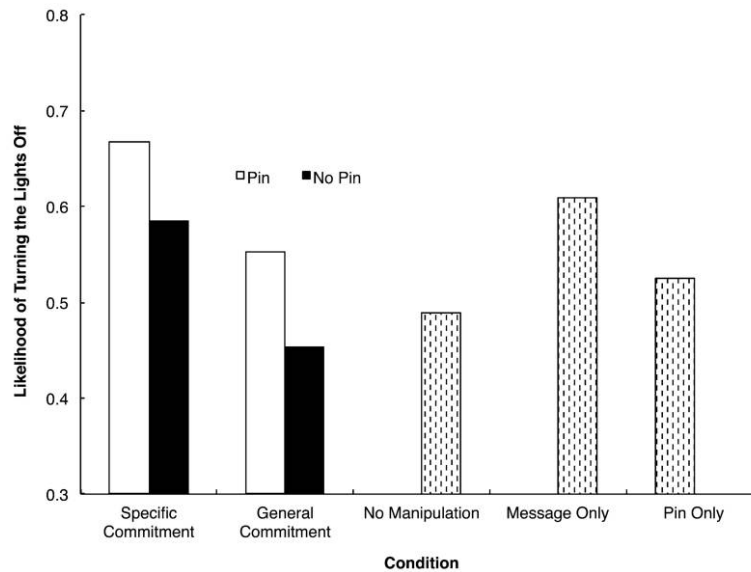


FIGURE 4

ENERGY USE: LIKELIHOOD OF TURNING LIGHTS OFF



likelihood of turning the lights off (Wald(1) = 16.29,  $p < .001$ ), as did receiving a pin (Wald(1) = 11.25,  $p < .01$ ). The interaction remained nonsignificant (Wald(1) = .079,  $p = .78$ ).

Controlling for day of the week seemed to have a relatively large influence on results. There was still a main effect of commitment specificity (Wald(1) = 12.33,  $p < .001$ ), but the main effect of symbol was substantially reduced (Wald(1) = 1.25,  $p = .263$ ). The interaction remained nonsignificant (Wald = 1.03,  $p = .310$ ).

A comparison of these results with the control conditions (using a Bonferroni correction) revealed that specific commitment guests and guests in the pin conditions were less likely to leave their lights on than were guests in the no-manipulation and pin-only conditions ( $p < .05$ ), but they did not differ significantly from message-only guests. Guests in the general commitment condition who did not receive a pin were more likely to leave their lights on compared to message-only guests ( $p < .05$ ) but not compared to the other two controls.

Light behavior was correlated with towel-hanging behavior—guests who turned off the lights were more likely to hang a towel ( $\chi^2(1, N = 2,416) = 18.58, p < .001$ ), hang more towels ( $r = -.101, p < .001$ ), and hang a higher percentage of used towels ( $r = -.129, p < .001$ ). If we treat light behavior as a covariate instead of as a dependent variable (as suggested by a reviewer), however, the primary towel-hanging results remain unchanged.

### Poststay Survey

The primary objective of the poststay survey was to test whether our manipulations had an adverse effect on guests'

satisfaction with their stay. As reflected in table 1, there were no differences in satisfaction across conditions.

## GENERAL DISCUSSION

The results of a large field experiment propose an effective alternative for increasing hotel guests' participation in towel-reuse programs. When guests made a specific commitment to practice sustainable behavior and received a pin to symbolize that commitment, their subsequent behavior was significantly more eco-friendly. Specifically, these individuals were over 25% more likely to reuse their towels and hung over 40% more used towels compared to the guests in the no-manipulation condition. These individuals were also more likely to turn off the lights when they left their rooms. Notably, the commitment itself was entirely symbolic—once guests completed the check-in process, they were able to exist in anonymity and behave as they wished.

As evidenced by our data, although the general commitment generated an impressive commitment rate (98%), it was rather ineffective in motivating behavior. Instead, we observed an increase in desired behavior only when the commitment was detailed and action oriented. Guests can easily endorse a diffused commitment, but the commitment does not lead to much behavior change. Endorsing a specific commitment seems more difficult (83% did so), but it substantially influences behavior. Furthermore, the exchange of a trivial symbolic representation influences initial commitment. When people accept (and possibly wear) the environmental pin, it likely serves as a signal that the commitment was meaningful and should be upheld. The environmental pin could exert influence in several ways. First, it likely

serves as a reminder of one's commitment, thereby reinforcing the commitment. Our signaling account also suggests that the pin served as a signal to the self and others (and possibly back to the self via others). Although pin wearing is idiosyncratic to this hotel, we can imagine situations in which individuals are likely to use other symbols (e.g., LIVESTRONG wristbands, religious "fish" stickers) that would consequently reinforce their commitments.

To a great extent, we can only speculate about much of this underlying psychology, but the consequences themselves are important to consider on their own. The major contributions of this article are as practical as they are theoretical. Consumer research often draws on work in psychology and economics, two disciplines that increasingly emphasize the importance of field experimentation (Cialdini 2009; Levitt and List 2008), such as in our hotel setting. When hotel guests made a specific commitment and received a pin, they hung up more towels more often. The results represent actual behavior of real consumers and need not be interpreted or extrapolated (Cialdini 2009, 6).

Notably, the current investigation further provides important implications regarding our approach to the challenges of driving behavioral change. Consumer research has discussed the role of consistency and self-signaling, but our study is among the first to examine them in the field and, to the best of our knowledge, the first to examine them in tandem. These conceptual variables suggest how our findings might extend well beyond the specific context. For example, consider an office manager charged with the goal of increasing employee paper recycling. Our results suggest that because specificity is important, seeking commitments for paper recycling would be more productive than promoting recycling more generally. Furthermore, our results suggest that people are more compliant when they receive a symbolic representation of their commitment (a pin). The office manager might therefore consider offering a small (but public) token for the commitment.

## Two Notable Observations

*Observation 1.* Guests were more likely to commit in the general commitment condition than in the specific commitment condition (98% vs. 83%). This finding suggests that individuals may intuitively know a specific commitment is more binding, which might affect commitment likelihood. It might also explain the larger impact on behavior observed in the specific commitment + pin condition relative to the general commitment + pin condition. Although merely speculative, this explanation may be worthy of further investigation. Future research could also consider the potential trade-offs between commitment rate and effects on behavior.

Our analysis takes the conservative approach. We include all rooms, regardless of whether guests committed at check-in. At the same time, knowing how commitment decisions influenced behavior may be valuable. Perhaps not surprisingly, guests who chose not to commit were substantially less likely to hang up their towels (see table 3). To independently confirm this simple form of consistency between

**TABLE 3**

HANGING LIKELIHOOD, TOWELS HUNG, AND HANGING PERCENTAGE BY COMMITMENT

Condition/commitment response	Count	Hanging likelihood %	Towels hung	Hanging %
<b>Specific commitment:</b>				
Pin ( <i>n</i> = 258):				
Yes	186	<b>80</b>	<b>2.14</b>	<b>41</b>
No	42	55	1.07	17
Missing	30	57	1.33	26
No pin ( <i>n</i> = 458):				
Yes	323	<b>64</b>	<b>1.53</b>	<b>31</b>
No	57	44	.93	16
Missing	78	58	1.22	27
<b>General commitment:</b>				
Pin ( <i>n</i> = 318):				
Yes	262	<b>63</b>	<b>1.38</b>	<b>26</b>
No	4	50	1.25	16
Missing	52	65	1.56	29
No pin ( <i>n</i> = 287):				
Yes	241	<b>59</b>	<b>1.25</b>	<b>23</b>
No	5	40	.60	13
Missing	41	59	1.10	26

NOTE.—Commitment data are missing for some guest parties, but we have their towel reuse behavior, and they were therefore included in all analyses. Bold numbers indicate that guests who made a yes commitment were more likely to engage in towel reuse behavior than were those who made a no commitment.

stated intention and behavior, we ran a subsequent experiment in a different hotel of the same chain. Guest parties were exposed to different options to commit to hanging towels for reuse in their rooms. Guest bathrooms contained a card allowing them to make a commitment to reuse their towels by moving an arrow to "yes" (indicating they planned to reuse towels) or to "no" (indicating they did not wish to reuse towels) or by leaving the arrow in its neutral position. A comparison of hanging likelihood as a function of commitment showed that guest parties (*N* = 158) who committed to yes were more likely to hang a towel (*M* = 90.9%; 40 of 44) than were those who committed to no (*M* = 52.7%; 29 of 55, *p* < .01) and those who left the arrow in the neutral position (*M* = 64.4%; 38 of 59, *p* < .01). The difference between the neutral and the no groups was non-significant (*p* > .1).

*Observation 2.* Recall that pin-only guests hung a smaller percentage of their used towels compared to guests in all other conditions. We interpret these observations in the context of recent findings showing that when an initial prosocial behavior is costly, individuals are more likely to subsequently behave consistently, resulting in another prosocial behavior. In contrast, when the initial prosocial behavior is costless, individuals are subsequently more likely to behave selfishly, a phenomenon referred to as moral licensing (Gneezy et al. 2012). The authors propose that when an initial prosocial act is costly to the individual, it serves as a signal to the self that she is a prosocial person, which in turn increases the likelihood that she will behave in ways consistent with that self-image. Similarly, we propose that

guests in the pin-only condition received an environmentally friendly symbol without incurring a cost, whereas guests in both commitment conditions had to read the hotel’s statement, choose to opt in, and only then received the symbol—making the initial commitment costly.

**Business and Environmental Implications**

In our hotel alone, estimated savings from increased towel reuse in the specific commitment + pin manipulation is 147,000 towels per year (2,500 loads of laundry, \$51,000, and nearly 700,000 gallons of water). Although tangential to our primary investigation, we note housekeeping compliance with guests’ behavior. The request for housekeeping compliance data came from the hotel’s management in order to better quantify housekeeping response to guests’ towel hanging, as past experience showed that even when guests hung towels to be reused, housekeeping tended to replace them with new towels. During our experiment, housekeeping replaced 43% of towels hung for reuse with new towels (68,000 towels per year; 1,285 loads of laundry, \$26,000, and nearly 350,000 gallons of water). In addition to the economic impact, a lack of housekeeping compliance possibly decreases the likelihood that guests will hang towels on subsequent days.

From the perspective of hotels and other entities attempting to motivate certain behaviors, our approach offers a simple alternative that hinges on individuals’ self-identity. Adding one small step to the check-in process significantly increased guests’ eco-friendly behavior, leading to savings of both scarce resources and money.

**APPENDIX A**

**CONDITION RANDOMIZATION AND CELL SIZE TABLES**

**TABLE A1**

CONDITION RANDOMIZATION

	Date	Condition	Comment
Monday	3/8/2010	Training/setup	
Tuesday	3/9/2010	Training/setup	
Wednesday	3/10/2010	Message only	
Thursday	3/11/2010	Message only	
Friday	3/12/2010	Message only	

**TABLE A1 (Continued)**

	Date	Condition	Comment
Saturday	3/13/2010	Pin only	
Sunday	3/14/2010	GC + pin	
Monday	3/15/2010	GC + pin	
Tuesday	3/16/2010	GC	
Wednesday	3/17/2010	GC	
Thursday	3/18/2010	SC	
Friday	3/19/2010	SC	
Saturday	3/20/2010	SC + pin	
Sunday	3/21/2010	SC + pin	
Monday	3/22/2010	SC + pin	
Tuesday	3/23/2010	SC + pin	
Wednesday	3/24/2010	Pin only	
Thursday	3/25/2010	C	
Friday	3/26/2010	C	
Saturday	3/27/2010	SC	
Sunday	3/28/2010	SC	
Monday	3/29/2010	C	
Tuesday	3/30/2010	C	
Wednesday	3/31/2010	GC + pin	
Thursday	4/1/2010	GC + pin	
Friday	4/2/2010	GC	
Saturday	4/3/2010	GC	
Sunday	4/4/2010	Pin only	
Monday	4/5/2010	Pin only	
Tuesday	4/6/2010	Message only	
Wednesday	4/7/2010	Message only	Makeup day
Thursday	4/8/2010	Message only	Makeup day
Friday	4/9/2010	SC	Makeup day

NOTE.—GC = general commitment; SC = specific commitment; C = control.

**TABLE A2**

CELL SIZE: NUMBER OF OBSERVATIONS PER CONDITION

Condition code	Condition	No. of guest party check-ins	No. of days
Message only	Message only	776	6
SC + pin	Specific commitment + pin	579	4
GC + pin	General commitment + pin	580	4
SC	Specific commitment	813	5
GC	General commitment	492	4
Control	Control	535	4
Pin only	Pin only	570	4

NOTE.—In order to minimize staff confusion, the hotel management requested that we randomize treatments in blocks; however, we made an extra effort to include at least 1 weekend day in each condition. Guest parties are all guests booked together and staying in one room.

**APPENDIX B**  
**MESSAGE CARDS**

*General Commitment*





 has long been a steward of the environment. Here at  we have a number of efforts in place to care for our planet ranging from water and energy conservation, recycling and low - emission park vehicles to eco - conscious options for Resort Guests.

*I* care about the environment at home and when I travel. As a friend to the earth, I will do my best to practice environmentally-friendly behavior during my stay.

Yes       No, Thank you

*Specific Commitment*





 has long been a steward of the environment. Here at  we have a number of efforts in place to care for our planet ranging from water and energy conservation, recycling and low - emission park vehicles to eco - conscious options for Resort Guests.

*I* care about the environment at home and when I travel. As a friend to the earth, I will do my best to save water and energy by re - using my towels during my stay.

Yes       No, Thank you

*Message Only*





 has long been a steward of the environment. Here at  we have a number of efforts in place to care for our planet ranging from water and energy conservation, recycling and low - emission park vehicles to eco - conscious options for Resort Guests.

### APPENDIX C SCRIPTS PER CONDITION

*Control.* No front-desk manipulation.

*Hotel Message Only.* “Here is a statement about our commitment to the environment at the (hotel name). Please read it over and return the card to me.”

*Specific Commitment and General Commitment (No Pin).* “Here is a statement about our commitment to the environment at the (hotel name). Please read it over, check ‘yes’ or ‘no’ and return the card to me.”

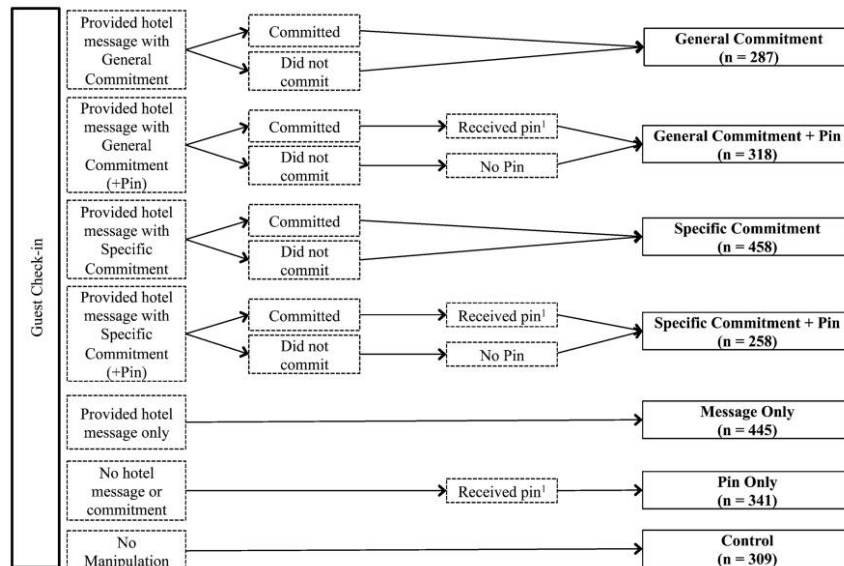
If the guest checks yes: “I would like to invite you and your group to sign our ‘(hotel name) Friend to the Earth Book’ to symbolize your commitment to the environment.

*Specific Commitment and General Commitment (with Pin).* “Here is a statement about our commitment to the environment at the (hotel name). Please read it over, check ‘yes’ or ‘no’ and return the card to me.”

If the guest checks yes: “Please accept this (hotel name) ‘Friend of the Earth Pin’ to symbolize your commitment to the environment and I would like to invite you and your group to sign our ‘(hotel name) Friend to the Earth Book.’”

*Pin Only.* “Please accept this (hotel name) ‘Friend of the Earth Pin.’”

### APPENDIX D EXPERIMENTAL PROCEDURE



<sup>1</sup>Friend of the Earth lapel pin was given to only those guest parties who made the decision to commit in the commitment + pin conditions, as well as to guests in the pin-only condition.

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