

# Replicating and Extending Our Understanding of How Managers Can Adjust the “Warm Glow Thermostat”

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Michael Giebelhausen<sup>1</sup> and HaeEun Helen Chun<sup>1</sup>

## Abstract

This article presents four studies that replicate and extend a recent article examining how guest participation in voluntary green programs (e.g., towel reuse) increases service satisfaction by evoking a “warm glow” response. Importantly for managers, we not only replicate across new hospitality and service contexts but also conceptualize alternative incentive paradigms, and test alternative mediators. In particular, we reconceptualize the “self-benefiting” versus “other-benefiting” incentive structure presented by Giebelhausen, Chun, Cronin, and Hult to consider “virtue,” “vice,” and “cash” incentives (i.e., three different types of self-benefiting incentives). The results provide managers with a better understanding of how they should promote and reward sustainable guest behavior. In addition to managerial implications, the present research also contributes to the academic literature on a growing phenomenon that has important implications for both business and society at large.

## Keywords

green marketing, warm glow, hospitality, sustainability

In their recent paper, Giebelhausen, Chun, Cronin, and Hult (2016, henceforth GCCH) provide evidence of a phenomenon whereby consumers who participate in a voluntary green program experience a positive emotional response (i.e., a “warm glow”) that heightens service encounter satisfaction. A voluntary green program is described as any initiative that (a) has a stated goal of improving the natural environment and (b) utilizes the voluntary efforts of the sponsoring organization’s customers. Examples include towel reuse programs, housekeeping opt-out, recycling, trash sorting, and voluntary reductions in resource consumption such as turning down your air conditioning or taking shorter showers.

Warm glow, a construct originating from the economics literature (Andreoni, 1995), is described as a bivalent emotional response. When people do a good deed, they experience a positive emotion akin to pride. When they do something bad (or fail to do something good), the emotional experience is characterized by feelings of guilt—a response described by Andreoni (1995, p. 1) as “cold-prickle of doing something bad” (Dahl, Honea, & Manchanda, 2005). In brief, what GCCH (2016) suggest is that, because satisfaction is influenced by emotions (Homburg, Koschate, & Hoyer, 2006; Mittal & Frennea, 2010; Oliver, 2010), the positive emotions resulting from green program participation will have a positive impact on satisfaction. Conversely, however, negative emotions resulting from a refusal to participate will have a negative impact on satisfaction.

This creates a problem for managers. On one hand, offering voluntary green programs will provide those who participate with a satisfaction boost. On the other hand, it also deflates the satisfaction of nonparticipating guests. In their studies, GCCH (2016) search for a solution to this problem by examining the effect of participation incentives—conceptualized as rewards given in exchange for participating. In particular, they examined “self-benefiting incentives,” “other-benefiting incentives,” and “mixed incentive bundles.” As per Imas (2014), a self-benefiting incentive is conceptualized as one that confers utility directly to the green program participant. Other-benefiting incentives, however, do not ostensibly benefit the program participant. Rather, they benefit some other entity. For example, a firm may offer to make a charitable donation each time someone participates in a green program. A mixed incentive bundle is operationalized by providing consumers with a selection of self-benefiting and other-benefiting incentives (henceforth a self/other bundle). It is worth noting that these self/other bundles are actually quite common. For example, loyalty

<sup>1</sup>Cornell University, Ithaca, NY, USA

## Corresponding Author:

Michael Giebelhausen, Assistant Professor of Marketing, School of Hotel Administration, Cornell University, 545 Statler Hall, Ithaca, NY 14853, USA.

Email: mdg234@cornell.edu

programs often allow members to either earn points for themselves or donate points/miles to charity.

What GCCH (2016) find is that, consistent with the predictions of the self-signaling literature (Bénabou & Tirole, 2006), a self-benefiting incentive reduces warm glow and satisfaction for green program participants. Put another way, people do not feel as proud of themselves if they are getting paid to participate. However, for the nonparticipants, an incentive appears to provide psychological cover, reducing the guilt associated with their refusal to participate. An “other-benefiting” incentive (e.g., a donation earned for charity) has the opposite effect. For this incentive type, relative to a self-benefiting incentive, participating consumers feel even greater warm glow and satisfaction while nonparticipating consumers feel even less. Thus, marketers find themselves in a “catch-22” with no type of incentive that works for *both* participants and nonparticipants.

Interestingly, there appears to be an effective solution in the form of self/other incentive bundles. It is well established that humans exhibit a confirmation bias whereby we are motivated to reach conclusions that benefit or protect our egos (Dunning, 2007; Kunda, 1990). In the context of self/other bundles, how this manifests is that participating consumers selectively focus on the other-benefiting features, while nonparticipating consumers selectively focus on the self-benefiting features—allowing both groups to maximize their satisfaction.

In the present research, we replicate and extend the four studies reported in GCCH (2016) to examine the effect of participation incentives on guests’ service encounter satisfaction. Study 1 (Appendix A) replicates the main effect of program participation in a hotel (vs. restaurant) field study. Study 2 (Appendix B) replicates the moderating effect of a self-benefiting incentive, but with a hotel scenario (vs. secondary hotel data) study to provide greater control. Study 3 (Appendix C) replicates the finding whereby adjusting incentive type can moderate the effect. Importantly, however, Study 3 demonstrates this moderating effect using a reconceptualized incentive framework, which is the primary theoretical contribution of the present research. In particular, we look at three different types of self-benefiting incentives (virtue, vice, cash). Study 4 (Appendix D) replicates the novel finding from GCCH (2016) whereby a mixed incentive bundle maximizes satisfaction for both green program participants and nonparticipants and also extends this finding to a hotel context. However, the present research demonstrates this effect using a mix of self-benefiting virtue and self-benefiting vice incentives (henceforth a “virtue/vice bundle”). For hospitality managers, these results provide additional insights into how they might incentivize participation in voluntary green programs. For academics, the results introduce an alternative approach to conceptualizing incentives used to motivate prosocial consumer behavior.

## Theoretical Development

The present research expects to generate the positive main effect of green program participation on service encounter satisfaction, mediation by warm glow, and moderation by the incentive type as demonstrated by GCCH (2016). We formally state these predictions as follows:

**Hypothesis 1 (H1):** There is a positive relationship between green program participation and service encounter satisfaction.

**Hypothesis 2 (H2):** The relationship between green program participation and service encounter satisfaction is mediated by warm glow.

**Hypothesis 3 (H3):** There is an interaction of self-benefiting incentives and participation in a voluntary green program. Individuals who participate are less satisfied with the service encounter when a self-benefiting incentive is provided as compared with when an incentive is not provided. Individuals who decline to participate are more satisfied when a self-benefiting incentive is provided compared to when an incentive is not provided.

### Reconceptualizing Incentive Types

The present research further seeks to expand on H3 by considering different types of incentives. As mentioned above, GCCH (2016) conceptualize incentives in terms of whether they benefit green program participants themselves (i.e., self-benefiting) or some third party such as a charity or the individual’s employer (i.e., other-benefiting). The argument put forth is that self-benefiting incentives interfere with the positive self-signal generated by volunteering to participate. In other words, when an incentive is offered, it is unclear whether participation is motivated by a desire to do a good deed or a desire to receive the incentive. Conversely, for nonparticipants, an incentive functions as psychological cover—allowing them to construe their refusal to participate as a rejection of the incentive. The present research further zeros in on the characteristics of a self-benefiting incentive (virtue, vice, and cash incentives) and how they might influence a self-signaling process.

*Virtue versus vice incentives.* Social norms are rules (either explicit or implicit) that a group uses to define desirable and undesirable behaviors. Norms come in different forms. In particular, researchers often draw a distinction between “injunctive” and “descriptive” norms. Descriptive norms describe the frequency of a behavior in a group (but not necessarily the valence of that behavior). Cialdini, Reno, and Kallgren (1990) put it this way: “In contrast to descriptive norms which specify what is done, injunctive norms specify what *ought* to be done” (p. 1015). We conceptualize

a vice incentive as one that is tempting to consume, but whose consumption is inconsistent with injunctive social norms regarding how people ought to behave. Examples might include “guilty pleasures” such as unhealthy food or expensive luxuries. Conversely, we conceptualize a virtue incentive as one whose consumption *is* consistent with injunctive norms. Examples include healthy food or gym passes. We should note that “other-benefiting” incentives such as donations to charity would qualify as virtuous. Indeed, we suggest that other-benefiting incentives are simply a particular type of virtue incentive that directly benefits someone other than the green program participant. The present research is designed to demonstrate that other types of virtuous incentives will produce similar results.

In particular, consumers who participate when a virtue incentive is offered will have complied with two injunctive norms and should experience doubly positive self-signals, higher levels of warm glow, and greater satisfaction. Conversely, those who participate when a vice incentive is offered might consider that their behavior is motivated by the vice. This negative signal counteracts the positive signal generated by their participation. Put another way, there is a positive and negative signal that will, to some extent, cancel each other out. The exact opposite effect will be occurring among nonparticipants. When a consumer rejects an offer to participate in a program paired with a vice incentive, they may rationalize that their behavior was motivated by a desire to avoid the vice. Thus, the positive signal of rejecting the vice will help cancel out the negative signal generated by refusing to participate in a good cause. However, refusing to participate when a virtuous incentive is present will be doubly bad. In summary, we propose that, as the incentive becomes more virtuous, consumers who voluntarily participate in green programs are more satisfied with the service experience. Conversely, consumers who refuse to participate will be more satisfied as the incentive becomes more of a vice—even when both types of incentives provide utility to the person (i.e., are self-benefiting).

**Cash incentives.** Transactions involving cash payments are particularly effective at evoking market norms (Heyman & Ariely, 2004). However, market and social norms are generally seen as incompatible with one another. In fact, it is argued that, when cash is involved, they cannot operate simultaneously (Ariely, 2008; Clark & Mills, 1979). Thus, compared with small tokens of appreciation in the form of either a virtue or vice, small cash payments should result in the lowest feelings of warm glow among participants and, conversely, the highest levels of warm glow among nonparticipants. In sum, we expect the absence/presence of rewards and the virtue/vice/cash characteristics of rewards to affect service encounter satisfaction as follows:

**Hypothesis 4a (H4a):** When an incentive is provided, individuals who choose to participate in a voluntary

green program are most satisfied with the service encounter when the incentive represents a virtue, less satisfied when the incentive represents a vice, and least satisfied when the incentive is a cash payment.

**Hypothesis 4b (H4b):** When an incentive is provided, individuals who choose *not* to participate in a voluntary green program are most satisfied with the service encounter when the incentive is a cash payment, less satisfied when the incentive represents a vice, and least satisfied when the incentive represents a virtue.

### Reconceptualizing the “Mixed Bundle”

GCCH (2016) created a “mixed bundle” by combining self-benefiting and other-benefiting incentives (what we refer to here as a self/other bundle). They found that green program participants were equally satisfied when incentivized with an other-benefiting or a self/other mix. Nonparticipants, however, were significantly *more* satisfied when incentivized with a self/other mix (compared with an other-benefiting incentive alone). The explanation for this finding is anchored in the literature on “motivated reasoning” (e.g., Dunning, 2007; Kunda, 1990). The basic premise is that individuals selectively interpret the bundle in the manner that most benefits their egos. Correspondingly, this means that a virtue/vice bundle will be perceived as relatively virtuous by those who participate in the green program because their egos benefit from focusing on the “virtue” aspect of the bundle. In other words, to the program participant, the virtue and virtue/vice incentives will look the same. Conversely, nonparticipants will be motivated to interpret a virtue/vice incentive bundle as a vice, enabling them to rationalize nonparticipation as simply avoiding the vice. As per this process, we hypothesize the following:

**Hypothesis 5a (H5a):** When an incentive is provided, individuals who choose to participate in a voluntary green program are equally satisfied with the service encounter regardless of whether the incentive represents a virtue or is a bundle consisting of virtue and vice incentives.

**Hypothesis 5b (H5b):** When an incentive is provided, individuals who choose *not* to participate in a voluntary green program are less satisfied with the service encounter when the incentive represents a virtue compared with when the incentive is a bundle containing both virtue and vice incentives.

### Study 1: Demonstrating the Main Effect in a Hotel Field Study

To test H1 and H2, we conducted a small-scale field study at an independent mid-scale hotel located in a suburban area of the Northeastern United States. During the study, which

lasted 1 month, guests checking in for a stay of more than one night were asked whether they would like to reduce the environmental impact of their stay by opting out of housekeeping services. All of these multinight guests then received a satisfaction survey in an envelope along with their key(s) and information packet. On the outside of the envelope was a hand-written note, thanking the guest for their help with the research. The top of the survey featured a university logo and text explaining that the survey was part of a university study related to the emotions experienced by hotel guests.

The survey measured service encounter satisfaction using two 9-point semantic differential items asking guests to rate the extent to which they were (a) very dissatisfied/very satisfied and (b) very displeased/very pleased ( $\alpha = .973$ ). Warm glow was then measured with four 9-point semantic differential items asking participants the extent to which they felt (a) unethical/ethical, (b) in the right/in the wrong, (c) wicked/virtuous, and (d) ashamed/proud. The survey also asked participants to indicate how many people were staying in the room, whether it was their first stay at the property, and the reason for their visit. We should note that participants were free to fill out this survey at any point during their stay. Thus, the satisfaction measure would have reflected their level of satisfaction at that particular point.

### Analysis

Of the 30 completed surveys, 15 were from individuals who had elected to participate in the housekeeping opt-out program. One individual who reported that she or he was staying at the hotel in conjunction with an Alcoholics Anonymous meeting was removed from the dataset as it was reasoned the warm glow that she or he experienced would be substantially affected by factors other than participation in the sustainability initiative. An initial ANOVA indicated a marginally significant effect of sustainability initiative participation,  $F(1, 27) = 2.527, p = .062$ . However, this analysis revealed an outlier that was 2.937 standard deviations away from the mean of their cell. This outlier the only person to report a level of satisfaction below neutral. To examine the effect of this dissatisfied individual on the results, we repeated the analysis with this individual excluded. This second ANOVA indicated a significant effect of program participation,  $M_{\text{no-participation}} = 7.367$  ( $SD = 1.493$ ),  $M_{\text{participated}} = 8.538$  ( $SD = 0.660$ );  $F(1, 26) = 6.818, p = .008$ , indicating that the dissatisfied guest had weakened this main effect. The Cohen's  $d$  for this effect was 1.014, well above the  $d = .8$  cutoff for a large effect (Cohen, 1988). The achieved power given the sample size and effect size was .832, above the .8 cutoff suggested by Cohen (1992). In summary, the results provide evidence of a main effect of participation on service encounter satisfaction and a preliminary indication that this effect may not extend to dissatisfied consumers.

The mediating process was evaluated using Preacher and Hayes's (2008) bootstrap method via Hayes's (2013) PROCESS SPSS macro. The procedure identified a significant path from participation to warm glow ( $t = 2.271, p = .017$ ) as well as a significant path from warm glow to satisfaction ( $t = 2.809, p = .005$ ). After controlling for this process, the initially significant relationship between participation and satisfaction ( $t = 2.248, p = .018$ ) became insignificant ( $t = 1.074, p = .148$ ), suggestive of indirect only mediation (aka "full" mediation). The 95% bias corrected confidence interval generated by the 1,000 bootstrap iterations did not include zero [0.0316, 1.7322], indicating the indirect effect was statistically significant. Three control variables (number of nights, number of people in the room, and whether it was the first stay at the property) were also included as covariates, but none were statistically significant ( $p = .527, .335, \text{ and } .591$ , respectively).

### Discussion

The Study 1 results supported our basic premise (H1) that consumers who chose to participate in a voluntary green program were more satisfied compared with those who chose not to participate. As with GCCH (2016) and in support of H2, the effect of participation was fully mediated by warm glow. Despite the encouraging results, Study 1 involved a small sample size and a removal of an outlier, which might raise questions regarding the validity of the findings despite the large effect size ( $d = 1.014$ ) and adequate statistical power ( $1 - \beta = .832$ ). As such, Study 2 was designed to replicate (H1 and H2) and extend these findings (H3).

### Study 2: Interaction of Participation and Incentives

Study 2 utilized a 2 (participation: did not participate, participated)  $\times$  2 (self-benefiting incentive: no, yes) quasi-experimental design with an additional control condition where there was no opportunity to participate in a green program. All individuals except for those in the control condition self-selected into the participation conditions. Two hundred ninety-two individuals, recruited from Amazon Mechanical Turk, completed the study. Participants were lead through a "storyboard" scenario procedure similar to recent work by (Chan, Kwortnik, & Wansink, 2017). Respondents were asked to imagine that they were spending a week at a hotel. They were then shown a picture of a hotel bathroom containing a towel, a bathmat, and a green tent card on the counter. In the "no opportunity" (control) condition, the card informed guests that the hotel had installed energy-efficient washers and dryers to save 100 gallons of water per week per room. In no incentive conditions, participants were told that their participation could save 100 gallons of water per week. In the incentive

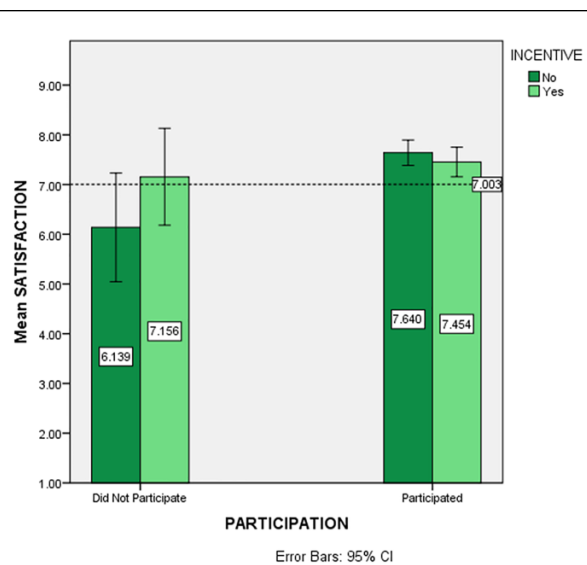


conditions, the card informed guests that if they chose to participate in the towel reuse program, they will receive a coupon good for a free drink at the hotel's "Green Dragon Lounge" located on the 18th floor. Participants were then asked to "click the button (white dot) on the bath tub if you would choose to place your towel in the bath tub, leave the bathmat on the floor, and get fresh replacements when housekeeping services your room" or to "click the button (white dot) on the shower curtain rod if you would choose to hang your towel and bathmat on the shower curtain rod (and reuse them both the following day)." To keep the conditions as comparable as possible, in the no opportunity control condition, participants were simply asked to indicate whether they would hang their towel up or place it in the tub. No environmental implications were mentioned with regard to this decision.

### Analysis

Of the 292 individuals who completed the study in its entirety, two participants failed one of the data quality check items asking whether they answered as honestly and accurately as possible, resulting in a final sample size of 290. Twenty-seven participants indicated they would not participate in the towel reuse program. In support of H3, a 2 (participation: did not participate, participated)  $\times$  2 (incentive: no, yes) ANOVA revealed a significant interaction of participation and incentives on satisfaction,  $F(1, 189) = 4.684$ ,  $p = .032$ . As with Study 1, in the nonincentivized conditions, there was a "large" effect of voluntary program participation on satisfaction,  $M_{\text{didnot}} = 6.139$  ( $SD = 1.720$ ),  $M_{\text{participated}} = 7.640$  ( $SD = 1.184$ ),  $d = 1.016$ . To test the specific effect of incentives on participation specified by H3, a planned contrast was conducted on the four groups. Contrast codes were again used to test a pattern whereby, in addition to a main effect of participation, an incentive reduced satisfaction for participants but increased it for nonparticipants (2, 1, -2, -1). This test again provided support for the hypothesized pattern ( $t = 2.917$ ,  $p = .009$ ; Figure 1).

To better understand the composition of the participation effect, we compared satisfaction scores against the control condition where participation was not an option. Among individuals who were not offered an incentive, green program participants reported significantly higher satisfaction compared to respondents in the control condition,  $M_{\text{participated\_noincentive}} = 7.640$  ( $SD = 1.184$ ),  $M_{\text{control}} = 7.003$  ( $SD = 1.450$ ),  $p = .001$ ,  $d = .481$ , whereas nonparticipants ( $M_{\text{didnot\_noincentive}} = 6.139$ ,  $SD = 1.720$ ) reported lower satisfaction than respondents in the control condition ( $p = .020$ ,  $d = .543$ ). In other words, the effect of participation on service encounter satisfaction results from the combination of an increase in satisfaction among those who participate and a decrease among those who do not. Among respondents who were offered an incentive, green program participants still reported higher



**Figure 1:**

#### Study 2 Results.

Note. The dashed line represents the "no opportunity" to participate control condition. CI = confidence interval.

satisfaction ( $M_{\text{participated\_incentive}} = 7.454$ ,  $SD = 1.330$ ) as compared with the control condition ( $p = .015$ ,  $d = .324$ ). Importantly, however, there was no significant difference between the control condition and those who declined to participate in an incentivized green program,  $M_{\text{didnot\_incentive}} = 7.156$  ( $SD = 1.759$ ),  $p = .345$ ,  $d = .095$ . This result replicates the finding of GCCH (2016) that an incentive can effectively counteract the decrease in satisfaction among program non-participants—an important managerial implication.

It could be argued that choosing to participate in a voluntary green program put people in a generic good mood (and vice versa) and that the warm glow and satisfaction measures simply picked up on changes in mood. Although we do not believe this to be the case, to evaluate this possibility, a moderated mediation analysis incorporating both warm glow and mood (Allen & Janiszewski, 1989) was conducted via Hayes's (2013) PROCESS macro. For mood, the 90% bias corrected confidence interval (a more conservative test for an anticipated null effect) included 0 in both the no incentive [-0.1282, 0.0941] and incentive [-0.0413, 0.1701] conditions; indicating that mood was not a viable mediator at either level of the moderating variable. For warm glow, the same analysis generated a confidence interval including 0 when an incentive was provided [-0.2550, 1.0460]. As expected, however, in the absence of an incentive, warm glow was found to mediate the effect of participation on satisfaction [0.4757, 1.9489]. Furthermore, in support of our proposed mechanism, the index of moderated mediation (-.7492) for warm glow did not include 0 [-1.6532, -0.0397].

## Discussion

The findings of Study 2 replicate the results of the GCCH (2016) Study 2 and, thus, provide additional confidence regarding the hypothesized moderating effect of self-benefiting incentives. This is particularly important given that the GCCH Study 2 utilizes a secondary dataset. Study 2 also provides support for H2 regarding how this effect is mediated by changes in warm glow—particularly when incentives are not provided. In addition, we were able to rule out mood as a potential alternative mechanism. Another useful feature of Study 2 is the inclusion of a control condition where environmental programs are present, but participation is not an option. The results of pairwise comparisons with this control group suggest that the difference between green program participants and nonparticipants results from the combination of a positive effect among those who participate and a negative effect among those who do not.

However, there do remain unanswered questions. One issue worthy of further examination is how altering the characteristics of the self-benefiting incentive might moderate its effect (H4). In addition, self-selection is a potential concern, and it is worth considering whether the results would replicate if individuals were randomly assigned to participate or not participate in the green program. Last, so far we have only examined one consumption context (hotels). Thus, the generalizability of our findings would benefit from a replication in an alternative environment. These considerations motivated the design of Study 3.

## Study 3: Teasing Apart Incentive Types in a Retail Context

For Study 3, participants recruited from Amazon Mechanical Turk were *randomly* assigned to a 2 (participation: did not participate, participated)  $\times$  4 (incentive type: none, virtue, vice, cash) between-subjects design with a no opportunity control condition. For this simulation, participants were asked to imagine they were running to the grocery store around lunch time. To set the stage for a virtue/vice manipulation, participants were also asked to imagine that they were planning on buying their lunch from the grocery store's salad bar because they needed to eat healthy that day. Underneath this scenario was a picture of a large promotional sign promoting a voluntary green program involving reusable shopping bags. In the virtue incentive conditions, the sign stated that customers who use their own shopping bag will get a free organic apple, an incentive consistent with their goal of eating a healthy lunch. In the vice incentive conditions, the sign stated that customers who use their own bags receive a free chocolate earth day cupcake. In the cash conditions, the sign indicated that a customer would receive 25 cents off their bill if they used their own shopping bag. In the

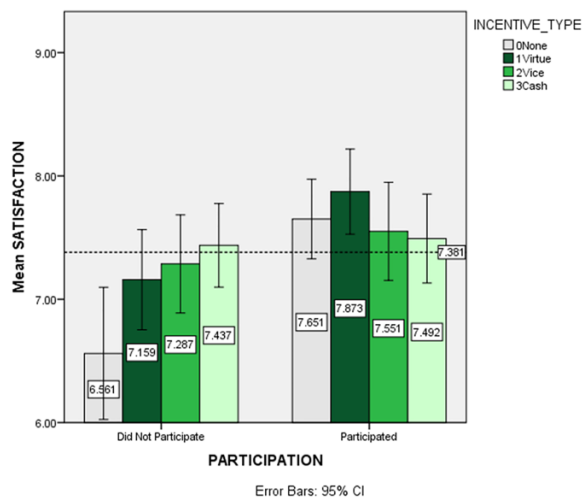
“no opportunity” control condition, the sign announced that the store had switched to 100% biodegradable bags. Next, respondents read that it occurred to them that there was a reusable shopping bag back in their car. In the “participated” conditions, above a picture of a parking lot full of cars, participants read that “you look back at the parking lot and decide that you will go ahead and get the reusable bag out of your car.” In the “did not participate” conditions, they read that they looked back at the parking lot and decided that they will go ahead and just use a store bag this time. Under the picture they were asked, “Briefly...what do you think was going through your head as you made this decision?” The following screens then collected the same measures collected in Study 2.

## Analysis

Out of 394 participants who completed the study, eight participants indicated that they did not answer the questions as honestly or accurately as possible and were removed. One duplicate response was also removed, resulting in a final sample size of 385. A 2 (participation: did not participate, participated)  $\times$  2 (incentive: no, yes) ANOVA indicated a significant interaction of participation and incentives,  $F(1, 339) = 5.508$ ,  $p = .020$ , in determining service encounter satisfaction. Consistent with H1, among those not incentivized, there was a significant effect of participation on satisfaction,  $M_{\text{didnot}} = 6.561$  ( $SD = 1.699$ ),  $M_{\text{participated}} = 7.651$  ( $SD = 1.036$ ),  $d = .775$ , with an effect size similar to those observed in Studies 1 and 2.

To examine the influence of incentive type consistent with H4, a planned contrast was used to evaluate differences in satisfaction between the virtue, vice, and cash incentive conditions across the two participation conditions. Contrast codes (3, 2, 1, -3, -2, -1) were used to specify the hypothesized pattern whereby virtue-incentivized participants would have the highest levels of satisfaction followed by vice and cash (and the opposite pattern for non-participants). The results, not assuming equal variances, provide support for the proposed effects of incentive type ( $t = 2.284$ ,  $p = .023$ ; Figure 2).

To further examine the results with regard to the control condition (where program participation was not an option), a directional one-way ANOVA was used to compare all of the individual groups. Among green program participants, only those who were compensated with a virtue incentive were significantly more satisfied than participants in the control condition ( $M_{\text{control}} = 7.381$ ,  $M_{\text{participated\_virtueincentive}} = 7.873$ ,  $p = .039$ ). Among those who did not participate, only those for whom an incentive was not offered were less satisfied than the respondents in the control condition ( $M_{\text{control}} = 7.381$ ,  $M_{\text{didnot\_noincentive}} = 6.561$ ,  $p = .002$ ). These results again suggest that the effect of participation on satisfaction results from the combination of an increase in satisfaction among those who participate and a decrease among those who do not.



**Figure 2:**

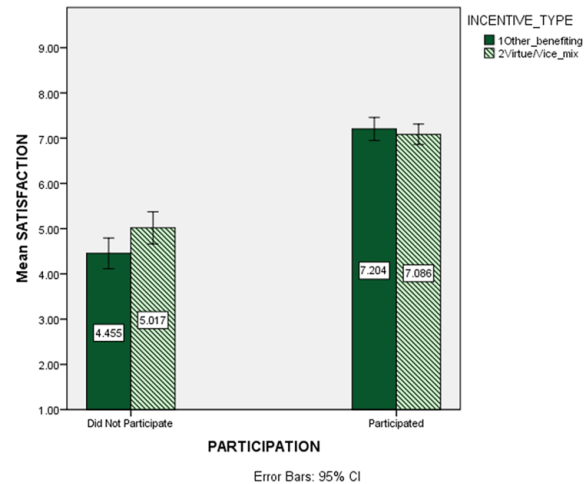
### Study 3 Results.

Note. CI = confidence interval.

As with Study 2, a moderated mediation analysis was conducted to evaluate the extent to which mood and/or warm glow might serve as a mediator. The bootstrap analysis for mood generated a confidence interval including 0 for both the no incentive  $[-0.0196, 0.1513]$  and incentive  $[-0.0250, 0.1093]$  conditions, indicating mood was not a viable mediator. In support of H2, the confidence interval for warm glow did not include zero for either the no incentive  $[0.6726, 1.5611]$  or incentive  $[0.1662, 0.5178]$  conditions. The index of moderated mediation for warm glow  $(-0.7962)$  also did not include 0  $[-1.2026, -0.4290]$ . This again suggests a process characterized better by warm glow than by general mood states.

### Discussion

Study 3, using random assignment, replicates the main effect of green program participation on service encounter satisfaction observed in Studies 1 to 3. As with Study 2, pairwise comparisons with a “no opportunity” control condition suggest that this effect resulted from a combined increase in satisfaction among green program participants and a decrease among nonparticipants. Study 3 also provides additional evidence that these effects are mediated by a self-signaling process characterized by warm glow. The fact that these replications occur using a common retail setting and random assignment to conditions (avoiding self-selection issues) provides greater confidence in both the validity and generalizability of the findings. In addition, (and importantly for managers), the Study 3 planned contrast provided support for H4 regarding how incentive type further moderates the effect of incentives on satisfaction. Consistent with a process whereby different types of incentives can either amplify or attenuate self-signals, this planned contrast indicates that



**Figure 3:**

### Study 4 Results.

Note. The dashed line represents the “no opportunity” to participate control condition. CI = confidence interval.

individuals who choose to participate in a voluntary green program are most satisfied with the service encounter when the incentive represents a virtue, less satisfied when the incentive represents a vice, and least satisfied when the incentive was a cash payment. The opposite is true for nonparticipants, whose satisfaction is increased most by cash incentives, followed by vice incentives. In Study 4, we examine the potential for a virtue/vice bundle to increase the satisfaction of nonparticipants without degrading the satisfaction of green program participants—the ideal situation for managers.

### Study 4: Virtue/Vice Bundles

Study 4 was designed to provide additional evidence regarding the key managerial outcome of GCCH (2016), that is, managers can increase the satisfaction of nonparticipants without harming the satisfaction of green program participants by offering a mixed bundle of self-benefiting and other-benefiting incentives (Figure 3). However, rather than the self/other mix utilized by GCCH (2016), this study used a bundle consisting of self-benefiting virtue and self-benefiting vice options—a different mix that we argue above should generate the same outcome. To compare this virtue/vice bundle against the most effective participation incentive demonstrated in GCCH (2016), Study 4 incorporated a condition where the incentive was other-benefiting. As mentioned above, we consider an other-benefiting incentive to be a particular type of virtue incentive. Last, to further address potential self-selection effects, we incorporated *both* self-selection (i.e., where individuals could choose whether or not to participate) and random assignment (i.e., where individuals were not given a choice) conditions.

As such, Study 4 is best described as a 2 (incentive: other-benefiting, self-benefiting virtue/vice bundle)  $\times$  2 (participation: did not participate, participated)  $\times$  2 (assignment method: random, self-selection) quasi-experimental design. A total of 804 individuals, recruited from Amazon Mechanical Turk, completed the study. Nine of these were dropped based on a data quality check asking them whether they responded accurately and honestly.

Respondents were asked to imagine they were spending three nights at a hotel as part of a work trip. They were then shown a picture of a hotel front desk featuring a large basket of snacks. The front desk staff explained that the basket was part of the hotel's new sustainability program (housekeeping opt-out). In the virtue/vice incentive bundle condition, participants were told that "For each day people participate they get to pick out two snacks they can munch on while watching TV in their room." What made this incentive "virtue/vice" was that the basket was filled with half healthy items (e.g., Mott's applesauce and Smartfood popcorn) and half unhealthy items (e.g., Snack Pack pudding and Dorritos). In the other-benefiting incentive condition, the staff explains that, "For each day people participate they get to pick out two snacks that will be donated to a program providing weekend lunches for low income school children." The same snack selection was used for both conditions. Respondents in the self-selection conditions indicated their willingness to participate while those in the random assignment condition were asked to imagine that they decided to participate (not participate) this time. Respondents then reported their satisfaction with the hotel and warm glow. To evaluate a second possible alternative mechanism, we also collected a measure of prosocial self-concept (Khan & Dhar, 2006). This scale asked participants to indicate, on a 7-point scale, the extent to which they see themselves as helpful, sympathetic, warm, and compassionate ( $\alpha = .739$ ).

### Analysis

To test our assertion that individuals will selectively interpret a virtue/vice incentive bundle to protect or enhance their self-concept, we also included a three-item measure asking respondents to rate the extent to which the snack selection was unhealthy/healthy, bad for you/good for you, and junk food/nutritious ( $\alpha = .963$ ). Presumably, individuals who refuse to participate in the program are motivated to interpret the selection as being relatively unhealthy (i.e., a vice that should be avoided). Conversely, green program participants are motivated to selectively interpret the same snack selection as healthier to protect the positive self-signal resulting from their participation. Consistent with this explanation, ANOVA indicated that green program participants rated the same snack selection as being significantly healthier than did nonparticipants in both the self-selection ( $M_{\text{participated}} = 3.662$ ,  $M_{\text{did\_not\_participate}} = 2.661$ ,  $p < .001$ ) and random assignment conditions ( $M_{\text{participated}} = 3.564$ ,  $M_{\text{did\_not\_participate}} = 2.843$ ,  $p < .001$ ).

Regarding service encounter satisfaction, ANOVA indicated a significant main effect of participation,  $F(1, 776) = 301.908$ ,  $p < .001$ , qualified by an interaction of participation and incentive type,  $F(1, 776) = 6.334$ ,  $p = .012$ . The three-way interaction with assignment method was insignificant,  $F(1, 776) = 1.318$ ,  $p = .251$ . In other words, the results were again the same regardless of whether an individual self-selected or was randomly assigned to participate in the green program. Thus, for the remaining analyses, these conditions were collapsed.

To examine the effect of the incentive type consistent with H5, a planned contrast was used to evaluate differences in satisfaction between the other-benefiting and virtue/vice incentive bundle conditions across the two participation conditions (participated vs. did not participate). Contrast codes were again used to specify the hypothesized pattern (2, 2, -3, -1). The result of this test, not assuming equal variances, was significant ( $t = 15.812$ ,  $p < .001$ ). In other words, we found support for the notion that virtue/vice incentive bundles have the ability to increase nonparticipant satisfaction without harming the satisfaction of participants.

For the mediation analysis, we sought to rule out prosocial identity (Khan & Dhar, 2006) as an alternative mediator. As was done to rule out mood in Studies 2 and 3, the moderated mediation analysis incorporated a measure of both warm glow and prosocial identity as potential mediators. For prosocial identity, the index of moderated mediation's 90% confidence interval (a more conservative test for an anticipated null effect) included 0 [-0.0085, 0.0867], suggesting prosocial identity was also not a viable mediator. Consistent with H2, for warm glow, the index of moderated mediation (-.3767) again did not include 0 [-0.6287, -0.2143]. Regarding the conditional effects, the confidence did not include 0 for either the virtuous [0.5011, 0.9725] or virtue/vice incentive bundle [0.1971, 0.4975] conditions.

### Discussion

The Study 4 analysis again demonstrated a main effect of participating in a green program qualified by an interaction of incentives, consistent with a self-signaling account. The pattern of the results was consistent with H5, whereby virtue/vice incentive bundles not only increased satisfaction for program nonparticipants but also left the heightened satisfaction of green program participants unharmed—a key managerial implication. An added benefit of Study 4 is that we find this interaction does not depend on whether individuals self-selected or were randomly assigned to the participation conditions. This finding further reduces concerns regarding potential self-selection effects.

### General Discussion

Replicating the four studies presented by GCCH (2016), we again demonstrate how consumers who downgrade their



service level by participating in a voluntary green program end up more satisfied with the service encounter. The fact that we provide additional confidence in this causal relationship is important, as this effect is contrary to the conventional wisdom of many hospitality managers (Hospitalitynet.org, 2012). In addition, the results of all four studies provide additional confidence that this effect is driven by a self-signaling process involving warm glow rather than mood or prosocial identity. One type of process evidence is the mediation analyses presented in all four studies. However, equally compelling evidence is provided by the interaction of participation and incentives observed in Studies 2, 3, and 4. In line with the notion that incentives can interfere (or augment) self-signals (Bénabou & Tirole, 2006), we observe predictable patterns whereby the presence of self-benefiting incentives can increase warm glow and satisfaction among program nonparticipants, but decrease them among those who participate. As such, we provide evidence of a process that can be generalized to a number of different contexts. Most importantly for the present research, we observe that changing the type of self-benefiting incentives (i.e., vice, virtue, cash, and virtue/vice) further moderates this effect in a way that is consistent with a self-signaling mechanism. This provides not only greater confidence in this moderating effect but also a more nuanced understanding of its generalizability.

The implications for managers are straightforward. For one, they should seek out opportunities to develop or expand voluntary green programs. Arguably, to increase satisfaction, they should persist with voluntary green programs even when there is little environmental or operational benefit. Furthermore, the present research reinforces the notion that managers should incentivize their voluntary green programs to maximize service encounter satisfaction. In particular, it suggests the best course of action is to incentivize participation with an incentive bundle containing both virtue and vice elements. As was seen in Study 4, these virtue/vice bundles can be selectively viewed as a virtue by program participants and as a vice by nonparticipants—providing the best of both worlds. This result mirrors the finding of GCCH (2016) involving mixed bundles of self-benefiting and other-benefiting incentives. However, the realization that virtuous self-benefits can be substituted for other-benefits is an important one for managers—given the greater variety and availability of virtuous self-benefits.

The present research makes a number of theoretical contributions as well. For one, it expands our understanding of how prosocial consumer behavior can impact outcomes related to consumer satisfaction. Second, we also make a theoretical contribution to the self-signaling literature. As mentioned above, there are few instances in the literature where a self-signaling phenomenon is subjected to a direct test of mediation. The present research suggests a self-signaling process that can be reliably captured with a measure of warm glow. In addition, we provide new insights regarding the effect of incentives on prosocial consumer behavior—a topic that has not received due attention in the academic literature.

However, there are also a number of ways the present research might be extended. For example, future research might explore other incentive characteristics. Another particularly interesting variable to examine would be the cost/sacrifice required for participation. One might expect an inverted-U shaped response whereby increasing the sacrifice/cost initially increases satisfaction for green program participants (via warm glow), but after a certain point starts to reduce satisfaction (via negative affect). The present research could also be extended by manipulating the extent to which the context evokes status goals (Griskevicius, Tybur, & Van den Bergh, 2010). For instance, the response to participation in a towel reuse program might be different at a luxury boutique hotel. Unraveling how consumers respond to sustainability initiatives is a complex task and many questions remain unanswered. However, it is our hope that the present research will help to advance this growing body of research.

## Appendix A

### Measures

*Satisfaction (Crosby, Evans, & Cowles, 1990). Field Studies—Regarding your overall experience at this (e.g., hotel) today:*

*Hypothetical Scenarios—Regarding your overall experience with this (e.g., hotel):*

I am very dissatisfied/I am very satisfied

I am very displeased/I am very pleased

This has been a very unfavorable experience/This has been a very favorable experience

*Satisfaction (J.D. Power and Associates, 2014). Taking into consideration all aspects of your guest experience, including the check-in/out, guest room, food and beverage services, facility and cost, how would you rate your . . . OVERALL Hotel Experience” (10-point scale anchored “unacceptable” and “outstanding”).*

Unacceptable/Outstanding

*Warm glow (Giebelhausen, Chun, Cronin, & Hult, 2016). Please indicate the extent to which you felt this way during (e.g., your time at this hotel):*

Ashamed/Proud

Irresponsible/Responsible

Wicked/Virtuous

Unethical/Ethical

Immoral/Moral

Selfish/Altruistic

In the wrong/In the right

## Appendix B

### Study 2: Stimuli

Imagine that you are single and live in an apartment. Unfortunately, your apartment building needs to be fumigated for termites and then cleaned, so you have to move out for a week (7 days). In exchange for the inconvenience, your landlord is only making you pay 1/2 of this month's rent. However, you still need someplace to stay, so you check into a reasonably priced hotel near where you live. After packing up all of your stuff and hauling it up to your hotel room, you are hot, sweaty, and need a shower before figuring out what to do about dinner.



You walk into the bathroom (pictured to the right) and look for the towels. You see that there is one white towel and one white bathmat folded and stacked together under the counter. On top of the counter you see a green card. It says:

Saving the environment with technology... We have installed brand new high-tech energy efficient washers and dryers that allow us to conserve water and electricity. Using these technologies, for every room, 100 gallons of water will be saved per week. (see below for close up of the card).



Now imagine you are finished with your shower (and your towel).

Click the button (white dot) on the shower curtain rod if you would hang your towel and bathmat on the shower curtain rod.

Click the button (white dot) on the bath tub if you would place your towel in the bath tub and leave the bathmat on the floor.

[click here when you are ready to proceed](#)

## Incentive conditions

Imagine that you are single and live in an apartment. Unfortunately, your apartment building needs to be fumigated for termites and then cleaned, so you have to move out for a week (7 days). In exchange for the inconvenience, your landlord is only making you pay 1/2 of this month's rent. However, you still need someplace to stay, so you check into a reasonably priced hotel near where you live. After packing up all of your stuff and hauling it up to your hotel room, you are hot, sweaty, and need a shower before figuring out what to do about dinner.



You walk into the bathroom (pictured to the right) and look for the towels. You see that there is one white towel and one white bathmat folded and stacked together under the counter. On top of the counter you see a green card. It says:

Please help save the environment by re-using your towels. A towel on the rack means "I'll use it again." A towel on the floor or in the tub means "please exchange." If you choose to participate in our towel re-use program, you will receive a coupon good for a free drink at our "Green Dragon Lounge" located on the 18th floor." (see below for close up of the card).



Now imagine you are finished with your shower (and your towel).

Click the button (white dot) on the shower curtain rod if you would choose to hang your towel and bathmat on the shower curtain rod (and re-use them both the following day).

Click the button (white dot) on the bath tub if you would choose to place your towel in the bath tub, leave the bathmat on the floor, and get fresh replacements when housekeeping services your room.

[click here when you are ready to proceed](#)

## No opportunity (control condition)

### Participation conditions

Imagine that you are single and live in an apartment. Unfortunately, your apartment building needs to be fumigated for termites and then cleaned, so you have to move out for a week (7 days). In exchange for the inconvenience, your landlord is only making you pay 1/2 of this month's rent. However, you still need someplace to stay, so you check into a reasonably priced hotel near where you live. After packing up all of your stuff and hauling it up to your hotel room, you are hot, sweaty, and need a shower before figuring out what to do about dinner.



You walk into the bathroom (pictured to the right) and look for the towels. You see that there is one white towel and one white bathmat folded and stacked together under the counter. On top of the counter you see a green card. It says:

Please help save the environment by re-using your towels. A towel on the rack means "I'll use it again." A towel on the floor or in the tub means "please exchange." If you choose to participate in the towel re-use program, you will save 100 gallons of water per week. (see below for close up of the card).



Now imagine you are finished with your shower (and your towel).

Click the button (white dot) on the bath tub if you would choose to place your towel in the bath tub, leave the bathmat on the floor, and get fresh replacements when housekeeping services your room.

Click the button (white dot) on the shower curtain rod if you would choose to hang your towel and bathmat on the shower curtain rod (and re-use them both the following day).

[click here when you are ready to proceed](#)

## Appendix C

### Study 3: Sample Stimuli

#### Participate/virtue incentive

Imagine that you are running to the grocery store around lunch time to pick up a couple items. The store has a really big salad bar (and you need to eat healthy today), so you are also planning on getting something healthy to-go for lunch. As you walk in the door you see the sign below. It reads: "Happy Earth Day! Each time someone uses their own shopping bag during checkout, that person will get a FREE organic apple!"

It occurs to you that there is a reusable shopping bag back in your car (parked outside).



## Next page

You look back at the parking lot and decide that you will go ahead and get the reusable bag out of your car.





*Do not participate/vice incentive*

Imagine that you are running to the grocery store around lunch time to pick up a couple items. The store has a really big salad bar (and you need to eat healthy today), so you are also planning on getting something healthy to-go for lunch. As you walk in the door you see the sign below. It reads, "Happy Earth Day! Each time someone uses their own shopping bag during checkout, that person will get a FREE Earth Day cupcake!"

It occurs to you that there is a reusable shopping bag back in your car (parked outside).



*No opportunity (control condition)*



Next page

You look back at the parking lot and decide that you will go ahead and just use a store bag this time.



**Appendix D**

*Study 4: Sample Stimuli*

The front desk staff member hangs up the phone, turns to you and says "Welcome to the Regent. How can I help you?"  
 You: "Well, I need to check in, but I was also wondering about this basket here."

Staff member: "Oh, that is part of our new sustainability program. In order to reduce water and chemical use, we are giving people the option to decline all housekeeping services during their stay, excluding day of departure. The day of departure is excluded because housekeeping always cleans each room after checkout."

At any rate, for each day that people participate they get to pick out two snacks that will be donated to a program that provides free bag lunches for the homeless."



*Cash incentive*



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## References

- Allen, C. T., & Janiszewski, C. A. (1989). Assessing the role of contingency awareness in attitudinal conditioning with implications for advertising research. *Journal of Marketing Research*, 26, 30-43.
- Andreoni, J. (1995). Warm-glow versus cold-prickle: the effects of positive and negative framing on cooperation in experiments. *The Quarterly Journal of Economics*, 1-21.
- Ariely, D. (2008). *Predictably irrational*. New York, NY: HarperCollins.
- Bénabou, R., & Tirole, J. (2006). Incentives and prosocial behavior. *American Economic Review*, 96, 1652-1678.
- Chan, E. K., Kwortnik, R., & Wansink, B. (2017). How Marketing Incentives Influence Healthy Food Choices, *Cornell Hospitality Quarterly*, 58(1), 6-22.
- Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, 58, 1015-1026.
- Clark, M. S., & Mills, J. (1979). Interpersonal attraction in exchange and communal relationships. *Journal of Personality and Social Psychology*, 37, 12-24.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Routledge.
- Cohen, J. (1992). A Power Primer. *Psychological Bulletin*, 112 (1), 155-159.
- Crosby, L. A., Evans, K. A., & Cowles, D. (1990). Relationship quality in services selling: An interpersonal influence perspective. *Journal of Marketing*, 54(3), 68-81.
- Dahl, D. W., Honea, H., & Manchanda, R. V. (2005). Three Rs of interpersonal consumer guilt: Relationship, reciprocity, reparation. *Journal of Consumer Psychology*, 15(4), 307-315.
- Giebelhausen, M., Chun, H. H., Joseph Cronin, Jr., J., & Hult, G. T. M. (2016). Adjusting the Warm-Glow Thermostat: How Incentivizing Participation in Voluntary Green Programs Moderates Their Impact on Service Satisfaction. *Journal of Marketing*, 80(4), 56-71.
- Griskevicius, V., Tybur, J. M., & Van den Bergh, B. (2010). Going green to be seen: Status, reputation, and conspicuous conservation. *Journal of Personality and Social Psychology*, 98, 392-404.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Press.
- Heyman, J., & Ariely, D. (2004). Effort for payment: A tale of two markets. *Psychological Science*, 15, 787-793.
- Homburg, C., Koschate, N., & Hoyer, W. D. (2006). The role of cognition and affect in the formation of customer satisfaction: A dynamic perspective. *Journal of Marketing*, 70(3), 21-31.
- Hospitalitynet.org. (2012, February 15). *Misconceptions about efficiency initiatives and impact on customer satisfaction deters U.S. hoteliers from investing in energy management*. Retrieved from <http://www.hospitalitynet.org/news/4054897.html>
- Imas, A. (2014). Working for the "warm glow": On the benefits and limits of prosocial incentives. *Journal of Public Economics*, 114, 14-18.
- J.D. Power and Associates (2014). *2014 North America Hotel Guest Satisfaction Index Study*. New York: McGraw-Hill.
- Khan, U., & Dhar, R. (2006). Licensing effect in consumer choice. *Journal of Marketing Research*, 43, 259-266.
- Kunda, Z. (1990). The case for motivated reasoning. *Psychological Bulletin*, 480-498.
- Oliver, R. (2010). *Satisfaction: A behavioral perspective on the consumer*. Armonk, NY: M.E. Sharpe.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40, 879-891.

## Author Biographies

**Michael Giebelhausen** is an assistant professor of services marketing at the Cornell University School of Hotel Administration (SHA). His research focuses on consumer behavior and signaling in service settings with a particular emphasis on the effects of green marketing.

**HaeEun Helen Chun** is an assistant professor of services marketing at the Cornell School of Hotel Administration (SHA). Her research focuses on managing and enhancing consumer experience in the service setting. Her broad domains of interests include service experience design, the role of emotions in consumer experience, sustainability-related services marketing issues, and branding.