

It's a pleasure to stay sustainably: Leveraging hedonic appeals in tourism and hospitality

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ABSTRACT

The tourism sector is actively exploring methods to reduce its adverse environmental impact. Our study introduces hedonic appeals as a novel approach to encourage guests to reduce their room cleaning requests. We contend that combining this approach with sustainable appeals is at least as effective as the previously identified most effective strategy, namely providing guests with financial incentives. The effectiveness of hedonic appeals is channeled through guest value creation. Our empirical evidence – involving a field experiment at a European hotel and a lab experiment – supports the proposed effects and explanation mechanisms. We also demonstrate that our new strategy is the most profitable by introducing a profitability index that considers room cleaning requests, monetary investments, and side effects. We therefore recommend hotels to adopt this cost-effective strategy to reduce room cleaning requests without affecting overall guest satisfaction.

1. Introduction

In light of climate change, overpopulation, and overconsumption, the calls for socially and environmentally sustainable economic growth are growing louder (United Nations, 2021). The tourism industry has substantially exacerbated these challenges, accounting for approximately 8–10% of global greenhouse gas emissions (Cevik, 2023; Gössling & Peeters, 2015). Hotel managers recognize their business harms the environment (Bohdanowicz, 2006). Thus, many hotels have implemented practical measures or interventions facilitating environmentally friendly guest behavior to minimize their negative impact. Examples include reducing room cleaning frequency, promoting towel and linen reuse, and low-emission food consumption (Dolnicar et al., 2019; Gössling et al., 2019; Knezevic Cvelbar et al., 2021). These practices, in turn, offer significant advantages to hotels. Doing so can enhance a hotel's reputation and appeal to environmentally conscious guests (Sharma et al., 2018) or substantially reduce costs by reducing water and energy consumption and minimizing waste (Becken & Dolnicar, 2016; Dolnicar et al., 2020; Kim et al., 2020).

Past research has primarily focused on a limited range of guest behaviors, such as towel reuse (e.g., Bohner & Schlüter, 2014), food waste reduction (e.g. Dolnicar et al., 2020), and water consumption (e.g., Joo et al., 2018), overlooking the significant environmental impact of room

cleaning (Demeter, Fechner, & Dolnicar, 2023). Moreover, many studies have examined normative or informational interventions, such as communicating the environmental impact of sustainable practices to guests (Dolnicar et al., 2018; Warren et al., 2017). However, reducing the frequency of room cleaning requests can yield advantages for both the hotel and its guests, as well as mitigate environmental consequences. By opting out of daily room cleaning, hotels can decrease their operational costs associated with cleaning, and guests can enjoy greater freedom and flexibility (Dolnicar, 2020). To date, incentive-based approaches that emphasize such guest benefits have been explored in only a limited number of tourism-related studies (Demeter, Fechner, & Dolnicar, 2023), Demeter, MacInnes, & Dolnicar, 2023 and they primarily focus on financial incentives (e.g., Chan et al., 2022; Dolnicar et al., 2017; Dolnicar et al., 2019; Morgan & Chompreeda, 2015). However, in a context where individuals primarily seek pleasure, adapting hedonic appeals, such as emphasizing guests' freedom and comfort during their vacation, can also effectively promote pro-environmental behaviors (Dolnicar, 2020; Dolnicar et al., 2020). Hedonic appeals aim to provide "a sense of pleasure and satisfaction to customers" (Deb & Lomo-David, 2020, p. 615). These appeals are self-directed (Deb & Lomo-David, 2020; Kousi et al., 2023; Vigneron & Johnson, 2004), meaning they specifically relate to the individual's personal experience. This contrasts with symbolic appeals, which are other-directed (Deb & Lomo-David,

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2020). Therefore, we introduce a novel incentive-based intervention centered around hedonic benefits for hotel guests.

Our paper makes four contributions to the literature. First, we investigate the influence of hedonic appeals on reducing room cleaning requests, combined with the most effective (financial incentives) and standard (sustainable information) interventions. We focus on a setting where guests are required to request room cleaning, as studies have shown this sustainable default, compared to the daily cleaning default, effectively promotes pro-environmental guest behavior (Knezevic Cvelbar et al., 2021). Second, we address the potential side effects of different interventions, such as a decrease in guests' sustainability rating of the hotel. Though relevant, these effects have often been overlooked in studies, particularly regarding guest retention and hotel image (Rodríguez & Cruz, 2007). Third, we examine the underlying mechanisms that explain the impact of our newly explored interventions on pro-environmental guest behavior. Using a value-creation approach, we show that benefits related to the guests themselves (hedonic and financial) guide their decision-making. Hedonic guest value mediates the positive influence of hedonic appeals on reducing room cleaning requests. Finally, we introduce an intervention profitability index. This index considers not only the percentage of room cleaning requests but also the costs incurred by the hotel (e.g., when providing monetary incentives) and potential side effects, such as sustainability assessment and guest satisfaction. Considering these factors, we demonstrate that hedonic appeals are the most profitable strategy.

2. Conceptual background

2.1. Environmental and financial impacts of room cleaning

The environmental impact of hotel room cleaning is substantial, particularly regarding water consumption (Dimara et al., 2017). For example, in a hotel with 100 rooms, opting out of daily cleaning can save about 3000 L of water (see Appendix 3). This saving is significant when compared to the average daily water use per person, which is 100 L in Europe and 500 L in the United States. On a global scale, if hotels worldwide reduced room cleaning by just 1%, the water saved could meet the basic annual needs of 5 million people (The University of Queensland, 2023). Dolnicar et al. (2019) also note that each cleaning session in a hotel room typically consumes 100 ml of cleaning chemicals and 1.5 kWh of electricity. Beyond environmental benefits, reducing room cleaning activities can also lead to significant cost savings for hotels, with costs for cleaning a room between \$10 and \$17 (Hospitalitynet, 2023; Hoteltechreport, 2023).

2.2. The effectiveness of no-room-cleaning defaults

To date, only a few studies have explored the effectiveness of strategies to encourage guests to waive daily room cleaning (e.g., Dolnicar et al., 2019; Knezevic Cvelbar et al., 2021). Among these strategies, implementing "no room cleaning" as the default option has been demonstrated to be highly effective, offering the potential to reduce the demand for room cleaning while maintaining guest satisfaction (Knezevic Cvelbar et al., 2021). Many large hotel chains have started implementing such opt-in practices in their room cleaning policies. For example, at Hilton's hotels, guests must contact the front desk if they want someone to clean their room (Forbes, 2021; The New York Times, 2023). Walt Disney World has introduced similar measures, reducing their room cleaning services under a policy that they term "light housekeeping." Likewise, Marriott typically provides room cleaning only upon request (CBS News, 2022). Building upon these research findings and real-world observations, we have adopted this condition as the basis for our work. In response to a recent call for investigating the combination of multiple interventions (Demeter, Fechner, & Dolnicar, 2023), our paper is the first to examine the synergy between this default option and various intervention approaches (sustainable, financial, and

hedonic).

2.3. The effectiveness of sustainable vs. financial interventions

Financial incentives outperform sustainable appeals. Sustainable appeals, including normative messages, informative messages, and pro-environmental nudges, are identified as the most prevalent intervention mechanisms in tourism (Demeter, Fechner, & Dolnicar, 2023). However, while research on sustainable marketing (e.g., Dunning, 2007; Mai et al., 2021; White et al., 2019), and environmental psychology (e.g., Bolderdijk et al., 2013) has shown that sustainable appeals are effective in the home context, they often fail to elicit behavioral change in tourism (Dolnicar & Demeter, 2024; Dolnicar et al., 2017). This is significant as many hotels still rely on these appeals to promote sustainable guest behaviors (Dolnicar, 2020; Dolnicar et al., 2019). One reason for this ineffectiveness could be the inherently hedonic nature of tourism (Demeter, MacInnes, & Dolnicar, 2023; Dolnicar et al., 2018; Dolnicar & Grün, 2009). While the home context also often possesses hedonic qualities (e.g., hobbies), Demeter, MacInnes, and Dolnicar (2023) empirically demonstrate that individuals perceive tourism as a more hedonically charged context compared to their everyday life. In hedonic settings, individuals often overlook non-hedonic (conflicting) goals they prioritize in daily life (Chen et al., 2016; Miao & Wei, 2013). Consequently, tourists may be less likely to engage in sustainable behaviors, as these could reduce hedonic experiences by requiring increased effort, reduced comfort, etc. (Dolnicar et al., 2018, 2019; Miao & Wei, 2013). Additionally, sustainable appeals usually trigger both positive emotions (e.g., pride) and negative ones (e.g., guilt) (Kaiser, 2006; van Zomeren et al., 2010; White et al., 2019). In general, both can lead to sustainable actions, stemming from individuals' tendencies to pursue positive experiences and avoid negative ones (Carrus et al., 2008; Koenig-Lewis et al., 2014; White et al., 2019). In the tourism setting, guests often process emotions differently than they do at home. Specifically, negative emotions tend to be managed through distinct regulation strategies instead of being immediately acted upon (Prebensen & Foss, 2011). These strategies encompass various approaches like distraction, savoring the moment, and rationalization (Heij & Cheavens, 2014; Juvan & Dolnicar, 2014; Thiruchselvam et al., 2012). Researchers therefore recognize that the effectiveness of sustainable appeals might be overestimated in the tourism context, leading them to turn their attention to financial incentives. Building upon research in sustainable consumption (e.g., Mai et al., 2021; White et al., 2019), recent tourism studies have indeed demonstrated that financial incentives are more effective than sustainable appeals (Chan et al., 2020; Dolnicar et al., 2019), with few of them in a towel reuse and room cleaning context (Dolnicar et al., 2019; Morgan & Chompreeda, 2015).

2.4. Leveraging guests' freedom as a hedonic appeal

In light of the high effectiveness of financial incentives, academia often overlooks the potential of other self-related interventions to foster sustainable guest behavior (Demeter, Fechner, & Dolnicar, 2023). Nevertheless, research in sustainable consumption (Green & Peloza, 2014; White et al., 2019) and tourism (Demeter, Fechner, & Dolnicar, 2023; Malone et al., 2014) suggests that offering non-financial incentives can be equally or even more effective than financial incentives. This is particularly relevant in tourism, where the hedonic nature of the experience can be leveraged as a non-financial benefit to encourage sustainable practices. Additionally, the theory of hedonic psychology (Kahneman, 1999) indicates a common human propensity for behaviors that deliver instant utility, thus allowing individuals to continue their participation in an activity. Experiencing pleasure is seen as a type of this positive utility (Kahneman, 1999). Given that tourism frequently revolves around seeking pleasure, enhancing pleasure could be an effective strategy that potentially has a significant influence on guest behaviors (Dolnicar, 2020).

Hedonic goal activation in tourism. Goal-framing theory can help understanding the effectiveness of hedonic appeals in tourism. Grounded in motivational and cognitive psychology, the central idea is that goals influence individuals' focus, attitudes, beliefs, and actions (Lindenberg, 2006; Lindenberg & Steg, 2007). It identifies three primary goals driving behaviors: Gain goals (maximizing utility and benefits), normative goals (evaluating the appropriateness of actions), and hedonic goals (emotional responses to situations) (Steg et al., 2014). Often, multiple (conflicting) goals, are activated in a single situation, with one typically prevailing (Lindenberg & Steg, 2007). In the tourism context, hedonic and gain-oriented goals frequently prevail (Dolnicar et al., 2017). The literature suggests that the relationship between individuals' goal orientation and their subsequent behavior is influenced by whether the goals activated in the environment are in alignment or conflict (Vansteenkiste et al., 2008). More specifically, the connection between people's life goals, their achievements, and their adjustment is determined by the match or fit between individuals' personally held life goals or values and the types of life goals or values promoted by the environment (Vansteenkiste et al., 2008). These effects have been identified under various labels, such as congruency effects (Sagiv & Schwartz, 2000), match perspective (Vansteenkiste et al., 2008, 2010), or person-environment fit (Amiot et al., 2006), and have been empirically investigated in related scientific fields, including social psychology (Sagiv & Schwartz, 2000) and sports psychology (Amiot et al., 2006). For instance, Sagiv and Schwartz (2000) illustrate that well-being is dependent on the alignment (or match) between personal values and the values emphasized in the environment. Therefore, when the environment corresponds with individual goals, people are more likely to act in accordance and, thus, to translate their goals into behavior (e.g., Sagiv & Schwartz, 2000; Vansteenkiste et al., 2008). Consequently, we expect that appeals resonating with the predominant goals in a tourism setting, especially those highlighting hedonic aspects or gains, will be more effective than non-matching appeals, such as sustainable ones.

The impact of hedonic appeals. Hedonic appeals, defined as self-directed enjoyment (Deb & Lomo-David, 2020; Tsai, 2005; Vigneron & Johnson, 2004), effectively activate individual hedonic goals. These appeals include aesthetic, experiential, and pleasure-related benefits from consumption (Chitturi et al., 2007, 2008; Dhar & Wertenbroch, 2000). While hedonic appeals are barely explored in tourism (Demeter, Fechner, & Dolnicar, 2023), they exhibit significant potential to increase sustainable tourist behavior (e.g. Dolnicar et al., 2020: reduction of food waste). Research in psychology (Corral-Verdugo et al., 2009; Steg et al., 2014) and marketing (Oliver & Rosen, 2010; Rezvani et al., 2018; White et al., 2019) validates their effectiveness in enhancing sustainable behaviors. For example, individuals are more likely to adopt (Kopplin et al., 2021) and maintain (Kim & Kim, 2020) sustainable behaviors when experiencing hedonic pleasure from their actions. Among other forms of hedonic benefits, providing consumers with freedom and flexibility are shown as effective in marketing and retailing (Childers et al., 2001; Chitturi et al., 2008). Reducing room cleaning requests can therefore provide guests with hedonic benefits as they gain more freedom and flexibility, allowing for uninterrupted privacy, independence, and personalized experiences.

Potential side-effects. In addition to the immediate effects of hedonic appeals on room-cleaning requests, we anticipate potential side effects related to guests' assessment of the hotel's overall sustainability. Considering these effects is of utmost importance, as they increase the guests' willingness to pay (Han et al., 2010; Holmes et al., 2021; Su & Li, 2022) and the hotel's general performance (González-Rodríguez et al., 2019; Rodríguez & Cruz, 2007). Traditional approaches in hotel room-cleaning practices, such as sustainable appeals or financial incentives, can unexpectedly backfire, potentially resulting in lower sustainability ratings from guests (e.g., Bolderdijk et al., 2013; Parguel et al., 2011). Two mechanisms can explain this effect. First, when hotels solely emphasize the positive environmental impact of a sustainable initiative, guests often show skepticism regarding the credibility of the

hotel's environmental assertions (Grazzini et al., 2018; Leonidou & Skarmeeas, 2017). They may question the hotel's intrinsic motivation and therefore perceive it as less sustainable (Lasarov et al., 2021; Parguel et al., 2011). This negative effect can be mitigated if hotels employ an additional appeal, such as a hedonic benefit. Second, by emphasizing only the financial benefits for guests, hotels might inadvertently undermine their self-perception as altruistic and morally good, potentially eliciting egocentric behaviors (Bolderdijk et al., 2013). Adding hedonic appeals can activate two congruent benefits - both hedonic and financial - which do not evoke conflicting motivational orientations for sustainable behavior (Maio et al., 2009). By incorporating hedonic appeals alongside financial benefits, the altruistic reasons for sustainability can fade into the background, allowing for a more balanced perception of sustainable behavior. Therefore, the negative impact of presenting financial incentives can be mitigated by incorporating hedonic appeals into the communication strategy.

Hypothesis 1. The presence of hedonic appeals leads to (a) a decrease in guests' room cleaning requests and (b) an increase in the guests' sustainability assessment of the hotel.

Previous research has established financial incentives as a highly impactful intervention in promoting sustainable behaviors of guests (Dolnicar, 2020; Dolnicar et al., 2020), also in the room cleaning context (Dolnicar et al., 2019). However, our study is the first to examine these effects within the context of an opt-in default policy. In line with *hypothesis 1*, which proposes that the presence of hedonic appeals reduces room cleaning requests, we believe that financial incentives, which also provide self-related benefits, are more effective than appeals solely focusing on sustainability. Consequently, when hedonic appeals are absent, we anticipate that other personal benefits, such as financial incentives, will continue to be more effective than approaches that solely emphasize pro-environmental factors. Importantly, while financial incentives incur costs for the hotel, hedonic benefits typically have minimal impact on daily hotel operations. This makes the profitability of hedonic benefits superior when compared. Moreover, based on *hypothesis 1*, we expect that if hedonic appeals are absent, only financial incentives lead to an increase in the sustainability assessment. Some research supports this counterintuitive assumption, as guests seem to mistrust companies that emphasize altruistic motivations, such as a pro-environment orientation, for their sustainable behavior (Parguel et al., 2011). Providing an economic, extrinsic explanation for the hotel's sustainable efforts may enhance guests' trust in the hotel's motivation and sustainable strategy, resulting in a higher sustainability rating. Based on these considerations, we propose the following hypothesis.

Hypothesis 2. When hedonic appeals are absent, only the presence of financial (vs. sustainable) appeals leads to (a) a decrease in guests' room cleaning requests and (b) an increase in the guests' sustainability assessment of the hotel.

2.5. The mediating role of guest value

Drawing from research on customer value, we expect that hedonic and financial appeals most effectively influence guest behavior if they provide a certain customer value to the guests (Woodall, 2003; Woodruff, 1997). After the concept of customer value was initially formulated as a relative evaluation of "giving" and "getting" elements (Zeithaml, 1988), many scholars have redefined and expanded this conceptualization over the years (Smith & Colgate, 2007; So et al., 2022). Within the domain of tourism and hospitality, customer value reflects guests' perceived preference and assessment concerning various hotel attributes, attribute performances, and outcomes derived from their (expected) stay experience (Woodruff, 1997). Therefore, we entitle this concept guest value. Researchers in the field of tourism have increasingly recognized the necessity for an approach to understanding value

that encompasses multiple dimensions. For instance, Zhang et al. (2019) investigated various dimensions of perceived value, including functional, social, and emotional value, all of which contributed to consumers' behavioral intention to pay premium prices for Airbnb accommodations. This study, in line with others, demonstrates that creating value for guests can significantly influence their perceptions and actions during their stay (Brady & Cronin, 2001; Gallarza & Saura, 2006; Williams & Soutar, 2009).

Following a categorization from Smith and Colgate (2007), we focus on the value dimensions which are directly associated with our investigated appeals. The hedonic value dimension relates to the extent to which a measure or a hotel attribute creates a valued experience or emotional value such as pleasure and enjoyment (Smith & Colgate, 2007). The functional value dimension relates to the extent to which a measure or a hotel attribute fulfills desired characteristics and leads to desired outcomes, such as financial benefits (Smith & Colgate, 2007). We therefore investigate the mediating role of perceived guest value (hedonic and financial) on the advertised behavior. Following prior research (Smith & Colgate, 2007; Williams & Soutar, 2009), we hypothesize, that emphasizing the hedonic (financial) benefits increases the perceived hedonic (financial) guest value that in turn facilitates the advertised behavior, namely reducing room cleaning requests.

Hypothesis 3a. The presence (vs. absence) of hedonic appeals increases the perceived hedonic value which in turn leads to a decrease in guests' room cleaning requests.

Hypothesis 3b. The presence of financial (vs. sustainable) appeals increases the perceived financial value which in turn leads to a decrease in guests' room cleaning requests.

2.6. Overview of studies

This paper reports a field experiment and a laboratory experiment that jointly explore our hypotheses (Fig. 1). Study 1 focuses on a field experiment that examines the influence of hedonic appeals on room cleaning requests and their potential impact on sustainability assessment and satisfaction. Additionally, it investigates how hedonic appeals interact with established interventions, such as financial incentives and sustainable appeals. Building on this, Study 2 uses an experimental design to delve into the underlying mechanisms, specifically guest value creation, which drive these effects. This provides further robustness to the field results by examining them in a controlled environment.

3. Study 1

This field study investigates the influence of hedonic appeals on room cleaning requests and potential side effects, as well as the interaction with other interventions (financial vs. sustainable).

3.1. Sample and procedure

We ran the study in a European midscale hotel in May 2023 for five

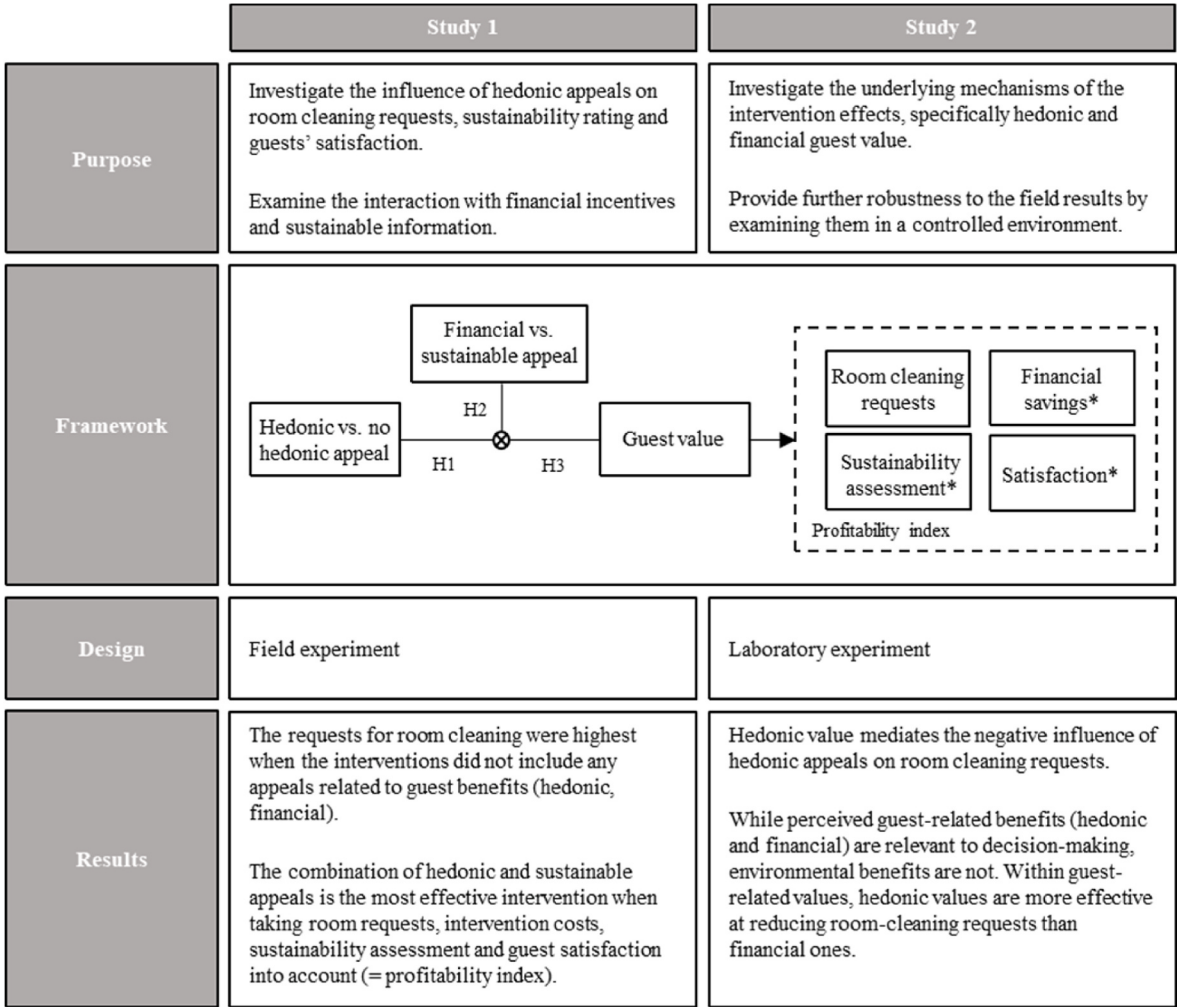


Fig. 1. Conceptual model.

consecutive weeks. We assigned 426 hotel stays to one of five different conditions (four manipulated conditions and a control condition). Specifically, 357 room stays were randomly assigned to four experimental conditions (i.e., hedonic-financial; no hedonic-financial; hedonic-sustainability; no hedonic-sustainability) and 68 to the control condition (counterfactual). To mitigate any systematic effects related to room types, we also employed randomization by assigning our treatment and control groups across the rooms on each floor. This approach ensured that the specific room type did not influence the results. We looked at the stays of at least four days to be able to measure the actual cleaning room requests.

At the end of the check-in process, a trained hotel employee presented guests with information letters and cards regarding a test of a new room-cleaning program. The guests were randomly assigned to one of four experimental conditions. For the letters, we used wording which was already successfully tested by Knezevic Cvelbar et al. (2021) and adapted it to our context. Depending on the condition, guests received different information letters and cards with varying information. Each letter included a standardized message to introduce the new room-cleaning concept to the guests. The message clarified that the hotel would adopt an on-request cleaning approach, meaning that the rooms would not be automatically cleaned daily, which included the changing of towels and bed linen. However, it was mentioned in the text that room cleaning would be possible upon request by placing a "Please clean my room today" sign on the outside handle of the door before 10 a.m.

Right below the text that introduces the new concept, guests either read a paragraph that introduces them to the hedonic benefits of the new program (present hedonic appeal conditions), or these benefits were not mentioned (absent hedonic appeal conditions). More specifically, the text in the *present hedonic appeals* conditions stated that the newly introduced room cleaning concept enhanced the guests' hedonic experience by giving them more freedom, flexibility, privacy, and independence. For example, guests would not need to worry about being interrupted by housekeeping. Privacy and independence were also stressed, as guests could request room cleaning whenever they wanted. Guests allocated to conditions with *absent hedonic appeals* did not read such a paragraph.

Subsequently, guests read either a text with pro-environmental appeals (sustainable appeal conditions) or financial appeals (financial appeal conditions). In the *sustainable appeals* conditions, a paragraph informed the guests about the environmental impact of room cleaning. This approach aligns with previous research that has tested the influence of environmental information on promoting behaviors such as bed linen reuse (Gössling et al., 2019; Leon & Arana, 2020), low-emission food consumption (Cozzio et al., 2021), or reduced water use (Günther et al., 2020). The message presented to the guests stated that each room cleaning would consume 100 ml of chemicals, 35 L of water, and 1.5 kWh of electricity. Guests were encouraged to make a difference and reduce the environmental burden of their stay by opting for room cleaning upon request. The message concluded with an appeal: "Please help us make a difference in the environment." In the *financial appeals* conditions, a paragraph informed the guests that room cleaning also saves the hotel money, and the hotel intends to share the savings with the guests. This manipulation is consistent with previous research on financial incentives to towel reuse (Morgan & Chompreeda, 2015) and waiving room cleaning (Dolnicar et al., 2019). The message displayed to the guests emphasized that saving water benefits the environment and the hotel's finances. It further stressed that the hotel wanted to share the financial savings with the guests by providing a 5 € voucher for a drink in the hotel restaurant for each skipped room cleaning.

The manipulated flyers are provided in the Appendix (Appendix 1). One trained admin was blind to the hypotheses and conditions and took the information on the cleaning requests. A pilot test was conducted to test for the manipulations used. Forty-two participants took part in the study ($M_{age} = 32$; 64% males). We randomly assigned the participants to one of four experimental conditions (i.e., hedonic-financial; no hedonic-

financial; hedonic-sustainability; no hedonic-sustainability). Then, they were asked to rate to what extent the message conveyed hedonic benefits or not, as well as financial incentives or sustainability goals. The results demonstrate the intended impact of our manipulations for the hedonic-framed message and the financial vs. sustainability appeal. Participants in the hedonic conditions significantly indicated a higher level of agreement regarding the appeal's emphasis on gaining additional free time ($M_{free} = 6.03$, $M_{no\ free} = 2.31$, $p < .01$). Similarly, participants in the financial incentive conditions significantly indicated a stronger belief that the message presented a monetary gain compared to those in the sustainability conditions ($M_{financial} = 5.40$, $M_{sustain} = 1.39$, $p < .01$).

3.2. Data analysis

Our dependent variable was guests' requests for room cleaning, corresponding to the number of days (calculated in percentage) when guests asked their room to be cleaned. Specifically, we measured the proportion of cleaning requests with respect to the total possible requests (service every day). For instance, if guests were requesting a service for two days out of four nights, the index for that room would have been 0.5 (1 would have corresponded to a request every single day). We also collected data on customers' satisfaction and sustainability perceptions at check-out. Sustainability perceptions were ascertained by asking guests: "On a scale of 1–10, how would you rate our hotel's sustainability efforts?" on a bi-polar scale ranging from 1 (extremely unsustainable) to 10 (extremely sustainable). Guest satisfaction was measured by asking guests: "On a scale of 1–10, how satisfied are you with your stay at our hotel?" ranging from 1 (extremely dissatisfied) to 10 (extremely satisfied).

Table 1 presents the main descriptive statistics from the field experiment, divided into our four conditions (i.e., hedonic-financial; no hedonic-financial; hedonic-sustainability; no hedonic-sustainability) and the control group. 33% of guests were female, while almost half of the customers were leisure guests (47%). The mean age of the sample was 42.32 years; 40% of guests traveled in groups (families, friends), and 48% were Italian (vs. Non-Italian). There were no significant differences regarding these variables between all groups.

First, we checked if any intervention was more effective in terms of room cleaning requests than no intervention at all. ANOVA results contrasting the four treatment groups with the control group reveal a significant effect ($F(1, 424) = 117.53$, $p < .001$). Compared to the room cleaning index value of "1" in the control group, meaning that rooms were cleaned every day, the mean value across all treatment conditions was .44 ($SD = 0.43$).

Table 2 presents the results of an OLS regression analysis, with guests' requests for room cleaning, sustainability rating, and overall satisfaction as dependent variables. For these analyses, we included only guests exposed to one of the four treatment conditions ($n = 357$). The explanatory variables in the full regression model include all the variables in Table 1. We included the interaction between absent hedonic appeals and sustainable information in the model to test for the moderation effects between these two factors. First, we examined the influence of the different appeals on the guests' requests for room cleaning. Results suggest that the absence of any incentive for the self (hedonic or financial) negatively influences guests' sustainable behavior (i.e., increase of room cleaning requests). In line with H2a, we found a significant interaction effect (Table 2, Model 2, $\beta = 0.20$, $p = .039$), while, contrary to H1a, there was neither a significant main effect of the presence of hedonic appeals (Table 2, Model 2, $\beta = 0.04$, $p = .572$), nor of the financial-sustainable appeal factor (Table 2, Model 2, $\beta = 0.00$, $p = .993$). Results (Table 1) show that the requests for room cleaning were the highest if no benefit for the self was communicated ($M_{NoHedonic/Sus} = 0.55$; $F(4, 421) = 32.87$, $p < .001$).

We employed the PROCESS add-on (v3.5.3, Hayes, 2017) to assess the interaction effect, using model 1 (with centralized continuous

Table 1
Descriptive Statistics for each experimental group.

Variable	Statistic	TOTAL	NO HEDO/SUST	HEDO/SUST	NO HEDO/FIN	HEDO/FIN	CON TROL	ANOVA
Room cleaning index	mean (SD)	.53 (.44)	.55 (.42)	.41 (.43)	.38 (.40)	.41 (.44)	1	F (4, 421) = 32.87, $p < .001$
Sustainability rating	mean (SD)	7.23 (1.56)	6.91 (1.84)	7.37 (1.14)	6.86 (1.80)	7.636 (1.30)	7.42 (1.49)	F (4, 421) = 4.20, $p = .002$
Guest satisfaction	mean (SD)	7.43 (1.28)	7.32 (.99)	7.29 (1.23)	7.39 (1.61)	7.59 (1.20)	7.57 (1.36)	n.s.

variables and bootstrapping of 5000 samples) for determining the conditional effects. Consistent with [Hypothesis 2](#), we examined the effects of the financial appeal (vs. sustainable appeal), conditioned on the hedonic treatment. In the absence of the hedonic appeal, the presence of the financial appeal (vs. sustainable appeal) had a significant influence on room cleaning requests ($\beta = -0.19$, $t = -2.90$, $p = .004$, CI95 [-0.313, -0.060]). However, when the hedonic appeal was introduced, the effect of the financial appeal was not significant ($\beta = 0.00$, $t = 0.01$, $p = .993$, CI95 [-0.124, 0.125]). Results suggest that the absence of hedonic and financial appeals has a detrimental effect on the guests' requests for room cleaning. The highest room cleaning index was achieved if guests were solely presented with sustainable appeals ($M_{\text{NoHedonic/Sus}} = 0.55$). Guests in this condition requested room cleaning more frequently than guests in the financial-no hedonic condition ($M_{\text{NoHedonic/Fin}} = 0.38$; $t(176) = 2.81$, $p = .005$), guests in the sustainability-hedonic condition ($M_{\text{Hedonic/Sus}} = 0.41$; $t(187) = 2.34$, $p = .020$), and guests that were exposed to flyers with financial and hedonic appeals ($M_{\text{Hedonic/Fin}} = 0.41$; $t(184) = 2.28$, $p = .023$). There was no significant difference between these three groups in terms of room cleaning requests. This pattern is in line with our hypotheses.

Next, we examined the influence of our interventions on guests' overall guest satisfaction and their rating of the hotel's sustainability. Regression analysis results reveal a significant main effect of the hedonic appeals on the sustainability rating ([Table 2](#), Model 4, $\beta = 0.24$, $p = .002$), supporting H1b. Notably, the sustainability assessment of guests was significantly higher for the conditions with hedonic appeals ($M_{\text{Hedonic/Sus}} = 7.37$; $M_{\text{Hedonic/Fin}} = 7.64$) than for the conditions without hedonic appeals ($M_{\text{NoHedonic/Sus}} = 6.91$; $M_{\text{NoHedonic/Fin}} = 6.86$; $F(4, 421) = 4.20$, $p = .002$). However, the mean values of these groups did not significantly differ from the sustainability assessment in the control group ($M_{\text{Control}} = 6.91$; $F(2, 245) = 1.01$, $p = .365$) ([Table 1](#)). The results, therefore, indicate a backfire effect when guests were presented with sustainable or financial appeals in the absence of hedonic appeals. In these cases, guests rated the hotel less sustainable than in the control condition or the conditions where hedonic appeals were present. Contrary to hypothesis 2b, there was no significant interaction effect on the sustainability rating of the hotel.

Furthermore, we did not find any significant difference in the guests' satisfaction assessment ($F(4, 421) = 1.03$, $p = .393$, [Table 1](#)). This is good news as introducing the new concept (no room cleaning default) did not decrease guest satisfaction. By including control variables in the regression analysis, we aimed to examine additional factors that might influence guests' requests for room cleaning. Among these variables, only gender had a significant influence, with females displaying a higher tendency to request room cleaning services ($p = .020$, [Table 2](#)).

3.3. Introducing the profitability index as a case example

To evaluate the effectiveness and profitability of the tested interventions, it is essential to consider various factors that go beyond the change of room cleaning requests. Following our results, we propose an evaluation based on three factors: the decrease in room cleaning requests, the incurred costs for incentivization, and the sustainability assessment provided by the guests. Guest satisfaction does not seem an issue here, as it is unaffected by the interventions. Therefore, we introduce a profitability index to demonstrate the advantages of hedonic interventions over sustainable and/or financial interventions to reduce

room cleaning requests.

The calculation of this index involves multiple steps. First, we calculated the financial savings per room as a percentage for each intervention. In this study, the hotel provided guests with a 5 EUR incentive for waiving room cleaning, representing 50% of the estimated room cleaning cost (10 EUR/day/room). Thus, for each skipped room cleaning, the hotel saved 10 EUR when guests were not financially incentivized and 5 EUR when they were incentivized. To determine the room cleaning profitability index for each condition, we multiplied the savings per room cleaning with the corresponding room cleaning index. The equation for this calculation is as follows:

$$\text{Average savings (AS)} = (1 - \text{Index}_{\text{RC}}) \times \text{Savings}_{\text{RC}} \quad 1$$

Notes. Savings_{RC} = 100% for NoFinancial and 50% for Financial. RC = Room cleaning requests.

[Fig. 2](#) (upper panel) illustrates the average savings in the sustainability-hedonic condition, which are the highest at 59%. On the other hand, both conditions involving financial appeals show the lowest savings. Despite the interventions being equally effective compared to the sustainability-hedonic condition, the hotel was only able to save half of the costs in the conditions where guests were presented with financial appeals. In the subsequent step, we incorporated the guests' sustainability assessment and satisfaction into the calculation. Thus, we utilized the following equation:

$$\text{Room cleaning profitability index} = \text{AS} \times \text{SUST} \times \text{SAT} \quad 2$$

Notes. AS = average savings, SUST = average sustainability assessment, ranging from 0 (extremely unsustainable) to 1 (extremely sustainable). SAT = average guest satisfaction, ranging from 0 (extremely dissatisfied) to 1 (extremely satisfied).

To calculate the room cleaning profitability index, we multiplied the financial savings (in %) by the sustainability rating (on a scale of 1–10) and guest satisfaction scores (on a scale of 1–10). As an example, for the sustainability-hedonic condition, we obtained an index score of $32 = 0.0591 (\text{savings}) \times 7.37 (\text{sustainability rating}) \times 7.29 (\text{guest satisfaction})$. As can be seen in [Fig. 2](#) (lower panel), the advantage of the sustainability-hedonic appeals over the other interventions even increases when taking the guest satisfaction and their rating of the hotel's pro-environmental actions into account.

4. Study 2

In Study 2, we test whether the observed effects are driven by the creation of guest value. We therefore investigate the mediating role of both hedonic and financial guest value in the relationship between our tested interventions and guests' room cleaning requests. By employing a laboratory experiment, we also offer further robustness to our results in a controlled environment.

4.1. Sample and procedure

Recruited through the platform prolific (average reward per hour: 9.89 USD), 157 individuals from the U.S. ($M_{\text{age}} = 54.14$, $SD_{\text{age}} = 13.99$; 42% female) participated in an online laboratory experiment with a two-factorial between-subjects design. We presented participants with a scenario that is similar to the one in the field study. We asked them to imagine they would check in at a hotel and would receive information

Table 2
OLS regression analysis results.

Dependent variable	Room cleaning				Sustainability assessment				Guest satisfaction			
	Model 1				Model 2				Model 3			
	β	t	p		β	t	p		β	t	p	
<i>Independent variables</i>												
Present vs. absent hedonic appeals					.04	.57	.572		.24	3.13	.002	
Financial vs. sustainable appeals					.00	.01	.993		.08	1.20	.273	
Interaction effect					.20	2.07	.039		.08	.84	.403	
<i>Control variables</i>												
Age	.02	.43	.665		.02	.36	.722		.01	.20	.844	
Gender ¹	.12	2.18	.030		.13	2.34	.020		-.02	-.32	.748	
Guest type ²	-.00	-.04	.967		-.01	-.11	.917		-.01	-.26	.796	
Group ³	.01	.15	.885		.01	.19	.854		.01	.16	.872	
Nationality ⁴	-.01	-.13	.895		-.03	-.49	.625		.04	.74	.461	
R ²		.014				.043				.044		

Notes. Ordinary least squares regression. ¹dummy-coded: 0 = male; 1 = female; ²dummy-coded: 0 = leisure; 1 = business; ³dummy-coded: 0 = group travelers; 1 = single; ⁴dummy-coded: 0 = non-Italians; 1 = Italians.

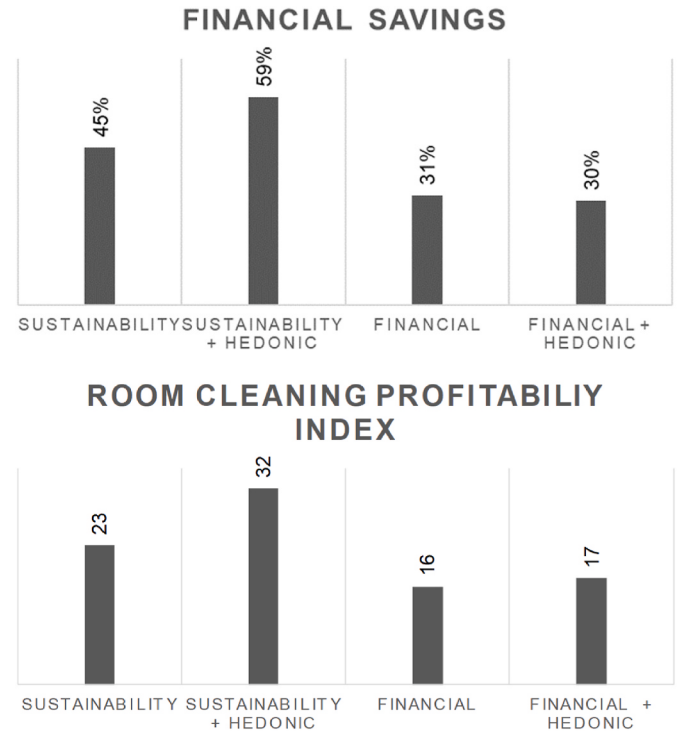


Fig. 2. Average financial savings and room cleaning profitability index per intervention.

letters regarding a test of a new room-cleaning program. As in the field study, the guests were randomly assigned to one of four experimental conditions. We used the same information letters as in the field study. Immediately following the manipulation, as our main dependent variable, we asked participants to imagine they would stay in the hotel for 5 days and to indicate how often they would ask for room cleaning during their stay ($M = 2.09$, $SD = 1.39$). To avoid confounding influences of the duration of 5 days that we proposed in the scenario, we also employed a more general measure of the guests' willingness to ask for room cleaning in this hotel on a 7-point Likert-scale as robustness check ("I would often ask for room cleaning in this hotel," $M = 3.38$, $SD = 1.92$). We then assessed our mediating variables. Consistent with research on customer value creation (Smith & Colgate, 2007), we assessed perceived financial guest value ("What I value in the new room cleaning policy of the hotel is that I can save money when waiving room cleaning," "... it is monetarily beneficial to me," $r = 0.93$ ($p < .001$), $M = 3.45$, $SD = 1.90$), hedonic guest value ("What I value in the new room cleaning policy of the hotel is that it is comfortable," "... it is joyful," $r = 0.70$ ($p < .001$), $M = 5.27$, $SD = 1.17$), and environmental guest value ("What I value in the new room cleaning policy of the hotel is that it is sustainable," "... it is environmentally friendly," $r = 0.90$ ($p < .001$), $M = 5.25$, $SD = 1.29$). To rule out the alternative explanation that guests may be reluctant to participate in the room cleaning program because it also benefits the hotel, we assessed another set of mediators. This assessment was also crucial to validate our assumption that only guest-related benefits – and not benefits to the environment or the hotel – are significant in this context. These mediators specifically address the perceived benefits for the guests. ("This room cleaning policy is beneficial to me," $M = 4.89$, $SD = 1.48$), for the environment ("This room cleaning policy is beneficial to the environment," $M = 5.45$, $SD = 1.16$), and for the hotel ("This room cleaning policy is beneficial to the hotel," $M = 5.27$, $SD = 1.17$). We assess all mediating variables on a seven-point Likert scale. Lastly, participants submitted socio-demographic information and were debriefed to ascertain they understood the study was for experimental purposes only.

4.2. Manipulation check

We asked participants to assess the extent to which the messages conveyed hedonic benefits, financial incentives, or environmental information. Participants in the hedonic condition indicate a significantly higher level of agreement regarding the appeal's emphasis on gaining additional free time ($M_{\text{free}} = 5.55$, $M_{\text{no free}} = 3.30$, $t(155) = 5.60$, $p < .001$). Similarly, participants in the financial incentive condition significantly indicate a stronger belief that the message presented a monetary gain compared to those in the sustainability condition ($M_{\text{financial}} = 5.98$, $M_{\text{sustain}} = 2.47$, $t(155) = 13.00$, $p < .001$).

5. Results

Testing the main effects. We ran hierarchical OLS regressions to analyze the effects of the experimental treatments on room cleaning requests. Model 1 in Table 3 includes only the socio-demographics as control variables to set the baseline. Neither age nor gender yield significant influence on room cleaning requests. Model 2 adds the experimental treatment. The presence of hedonic appeals has a significant negative influence on room cleaning behavior ($\beta = -0.17$, $p = .041$), supporting H1a. There is no main effect of the financial-sustainable appeal factor. Remarkably, the interaction effect is also not significant, which is not in line with the field study results and H1b (see Table 4).

Fig. 3 shows that room cleaning requests are the highest when hedonic appeals are absent ($M_{\text{NoHedonic/Sus}} = 2.42$, $SD = 1.52$; $M_{\text{NoHedonic/Fin}} = 2.28$, $SD = 1.40$). Conversely, conditions featuring hedonic appeals exhibit relatively lower rates of room cleaning requests ($M_{\text{Hedonic/Sus}} = 2.03$, $SD = 1.26$; $M_{\text{Hedonic/Fin}} = 1.67$, $SD = 1.21$).

We conducted an OLS regression using an alternative dependent variable as a robustness check. The results confirm our main findings, indicating a significant impact of hedonic appeals ($\beta = -0.16$, $p = .048$), with non-significant effects of the financial/sustainable factor and the interaction effect. Therefore, we can rule out that the duration of the stay confounded the results in our scenario.

Testing the mediation through guest value. Next, we investigated whether the effects on room cleaning requests are mediated by perceived guest value. We followed a three-step procedure as outlined by Baron and Kenny (1986) to conduct our mediation analysis. First, OLS regression results confirm that the financial/sustainable factor ($\beta = -.04$, $p < .001$) and the hedonic factor ($\beta = 0.15$, $p = .044$) significantly influence financial guest value, with no significant interaction effect detected. Additionally, the OLS regression results indicate a significant influence of the hedonic factor ($\beta = 0.17$, $p = .040$) on hedonic guest value, with no significant impact from the financial/sustainable factor or a significant interaction effect. Lastly, OLS regression results do not indicate significant influences for hedonic appeals, financial/sustainable

Table 4

Calculation example.

	Room cleaning rate	Cleaning cost (per room/day) ¹	Cost for skipped cleaning (per room/day)	Total costs for cleaning (per day)
Full room cleaning	100%	13€	0€	1300€
Opt-out room cleaning	71% ²	13€	0€	936€
Opt-in room cleaning				
+ sustainable appeals	55%	13€	0€	715€
+ financial appeals	38%	13€	5€	804€
+ sustainable and hedonic appeals	41%	13€	0€	533€

Notes. ¹hoteltechreport (2023); hospitalitynet (2023), ² Knezevic Cvelbar et al. (2021).

appeals, or the interaction effect on environmental guest value (Appendix 2). We illustrate the patterns of the effects, including mean values per condition in Fig. 3. Finally, a regression with the guest values as independent variables and room cleaning requests as a dependent variable reveals that only hedonic guest value significantly reduces room cleaning requests ($\beta = -0.26$; $p = .004$). Financial guest value ($p = .730$) and environmental guest value ($p = .876$) have no influence, partly supporting H3b. In the subsequent mediation analysis step (Table 3, Model 3), after introducing the mediators into the regression analysis, the direct impact of the hedonic appeals factor on room cleaning requests becomes non-significant. However, the influence of hedonic guest value on room cleaning remains significant ($\beta = -0.20$; $p = .035$), supporting H3a.

Post-hoc analysis. In the OLS regression results with the alternative set of mediators (guest benefits perception related to a) guests, b) the hotel, and c) the environment), only the hedonic factor demonstrates a significant influence on guest-related benefits ($\beta = 0.16$, $p = .044$). The financial-sustainable factor ($\beta = -0.14$, $p = .070$) and the interaction effect ($\beta = 0.01$, $p = .937$) do not exhibit significant effects. This reinforces our assumption that room cleaning request decisions are primarily driven by benefits that directly affect the guests.

5.1. Discussion

This study's findings closely align with those observed in our field study, with a notable exception: financial incentives, which were hypothetical in the lab, did not yield expected results. Individuals might hesitate to admit that monetary rewards solely motivate their behavior (social desirability bias). These deviations point at the intention-

Table 3
Hierarchical OLS regression results.

Dependent variable	Model 1			Model 2			Model 3		
	β	t	p	β	t	p	β	t	p
<i>Independent variables</i>									
Present vs. absent hedonic appeals				-.17	-2.06	.041	-.15	-1.86	.065
Financial vs. sustainable appeals				.09	1.18	.238	.14	1.59	.114
Interaction effect				.03	.34	.731	.04	.52	.603
<i>Mediators</i>									
Hedonic value							-.20	-2.12	.035
Monetary value							.11	1.20	.233
Sustainable value							-.08	-.91	.367
<i>Control variables</i>									
Age	.14	1.75	.082	.12	1.49	.141	.17	2.04	.042
Gender ¹	-.02	-.21	.837	-.02	-.23	.822	-.04	-.53	.593
R ²	.02			.06			.11		

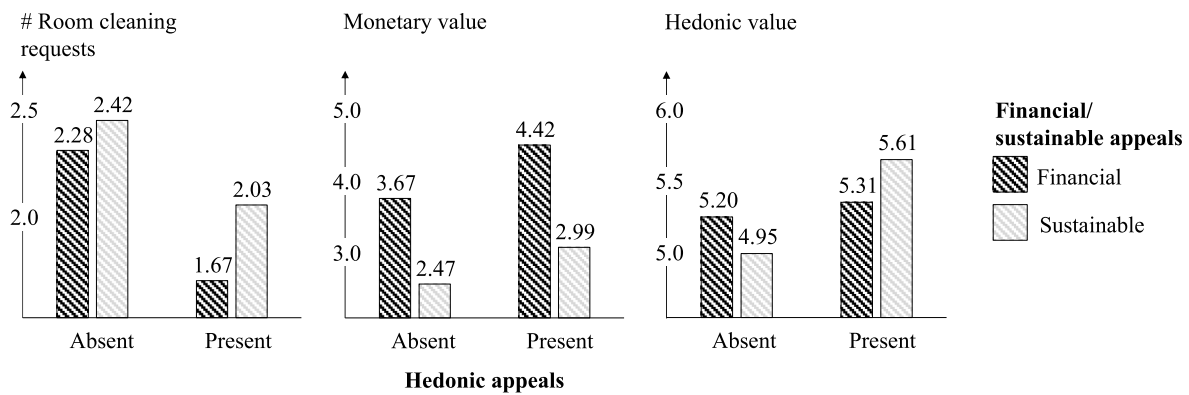


Fig. 3. The impact of Hedonic appeals.

behavior gap in tourism (Viglia & Acuti, 2023). Our mediation analysis reveals that guest decisions were primarily influenced by hedonic values. Interestingly, while in the lab, hedonic benefits outperformed financial incentives, our field study demonstrates their equal persuasiveness. In sum, our findings affirm that only benefits directly relevant to guests (financial and hedonic) increase their value, which impacts their behavior.

6. General discussion

Extensive research has been conducted on interventions promoting sustainable actions in the tourism and hospitality industry. Studies have explored various areas such as preferences for sustainable accommodations (Firth & Hing, 1999; Lee et al., 2010), sustainable tourism activities (Karlsson & Dolnicar, 2016), and sustainable behaviors during the stay (Ballantyne et al., 2009).

In the existing literature, most interventions to promote sustainable actions focus on changing beliefs, particularly by highlighting the environmental impact of guests' actions. Nevertheless, interventions that emphasize the benefits to guests are more effective (Demeter, Fechner, & Dolnicar, 2023). Previous research has focused mainly on financial incentives, neglecting other potential benefits such as freedom, comfort, and autonomy which align with the hedonic tourism context.

In light of this, we demonstrate the impact of hedonic appeals in combination with established sustainable and financial appeals. Using our newly introduced profitability index, we pinpoint the combination of hedonic appeals and sustainable information as the most effective approach. This approach matches the effectiveness of financial incentives while offering the added advantage of eliminating the need to share cost savings. We also acknowledge the significance of guest satisfaction and sustainability assessment, which have unfortunately been largely overlooked in previous research (Demeter, Fechner, & Dolnicar, 2023; Kandampully & Suhartanto, 2000; Kang et al., 2012). Furthermore, we showcase a backfire-effect that occurs when hedonic appeals are not present. If hotels employ only sustainable appeals to promote their room cleaning policy, the initial positive effect on the reduction of room cleaning requests and the potential enhancement of sustainability ratings diminish. This observation emphasizes that the hotel's actions can potentially evoke green skepticism (Lasarov et al., 2021). This can lead not only to a lower sustainability rating by guests but also to less sustainable behaviors, such as no reduction in room cleaning requests. To overcome the gap between self-reported and actual behaviors, we investigate our variables of interest with a field experiment. Therefore, we can draw valid causal conclusions about the effectiveness of different interventions (Viglia & Dolnicar, 2020). In contrast to many other studies in sustainable tourism, our research methodology includes a control group, which greatly enhances the validity of our findings (Dolnicar, 2020; Viglia & Dolnicar, 2020). To replicate the effects in a controlled setting and to comprehensively

understand the underlying mechanisms, we conducted a laboratory experiment. The results indicate that hedonic guest value plays a pivotal role in mediating the positive impact of hedonic appeals on reducing room cleaning requests.

Theoretical contributions

Our work makes three clear theoretical contribution to the discipline. First, we advance sustainable tourism and hospitality research by introducing hedonic appeals as a lever to reduce room cleaning requests, an approach that is as effective as, or perhaps even more so than, the most established methods. Addressing the call by Demeter, Fechner, and Dolnicar (2023) to investigate the combination of multiple interventions, we integrate this approach with the most effective default option, which is the opt-in default (Knežević Cvelbar et al., 2021). Second, the literature has primarily focused on room cleaning requests as the outcome variable. We expand this standard variable by introducing side-effects, which are crucial for guest retention and the hotel's image (Rodríguez & Cruz, 2007) as additional relevant outcomes. Therefore, by creating a profitability index that considers multiple factors, including sustainability evaluation and guest satisfaction, alongside room cleaning requests, we offer a practical tool for researchers and practitioners to assess intervention effectiveness. This becomes particularly crucial in the context of customer experience, where image and long-term relationships with customers are essential (Lemon & Verhoef, 2016). Third, although some studies (e.g., Dolnicar et al., 2020) have explored hedonic interventions in the tourism context, none have elucidated their effects and underlying theories. We therefore contribute by providing a theoretical underpinning grounded in goal framing theory (Lindenberg, 2006) and the foundations of hedonic psychology (Kahneman, 1999) to explain the mechanisms behind the effects of hedonic appeals in sustainable tourism. Building upon a value creation framework (Smith & Colgate, 2007), we conceptualize and empirically validate the mechanisms that hedonic appeals induce.

8. Limitations and future research agenda

Our work suggests that hedonic appeals show particular potential and merit further investigation. Furthermore, our work primarily focuses on appeals related to comfort, freedom, and flexibility. Future research should consider other forms of hedonic appeals, such as gamification. By exploring the potential of gamification as a hedonic appeal, researchers can tap into the intrinsic motivation and enjoyment that games provide.

In addition to contextual and individual factors, the duration of the stay can shape the intervention effectiveness. We focus primarily on stays of at least 4 nights. However, previous research shows that the guests' willingness to participate in reuse programs tends to decline as the length of stay increases (Gössling et al., 2019). These findings align with studies suggesting that behavioral nudges, such as sustainable

messages, may have limited long-term effects, with guests potentially becoming less responsive after five days (Van Der Linden, 2015). We suggest to examine how interventions influence guest behavior over an extended period, considering the potential decline in responsiveness and the sustainability of the desired behaviors. Furthermore, research suggests that integrating financial incentives may be necessary to sustain guests' sustainable behaviors over time (Mai et al., 2021).

Our field experiment was conducted in a mid-sized hotel. Given that tourist behavior may vary across different types of hotels, it is crucial to conduct field experiments in various hotel settings to ensure the generalizability of our results (Rasoolimanesh et al., 2020).

Lastly, research indicates that changing room cleaning defaults from opt-out to opt-in does not affect guest satisfaction and is not perceived as inconvenient (Knezevic Cvelbar et al., 2021). However, some guests might be concerned about being perceived as untidy by hotel staff when making frequent requests. This could potentially lead to feelings of embarrassment during interactions. Additionally, having to consistently remember to request room cleaning might be bothersome. Future studies should investigate how guests feel when required to request room cleaning and how this will influence their satisfaction.

Further exploring these aspects will deepen our knowledge of how interventions influence sustainable behaviors in tourism. This can lead to the broader adoption of eco-friendly practices that benefit the environment, hotels, and guests alike.

9. Managerial implications

To improve the sustainability of their room cleaning policies without financial or other compromises we suggest the three below guidelines for hotels: First, we recommend that hotels adopt an opt-in room cleaning protocol as their standard practice. This approach, which is gaining popularity (CBS News, 2022; The New York Times, 2023) can cause a reduction of about 50% in room cleaning requests compared to opt-out defaults (Knezevic Cvelbar et al., 2021).

9.1. //1//adopt an opt-in room cleaning policy as the default//

Second, to compensate guests for minimizing room cleaning requests, many hotels offer financial incentives, such as vouchers for hotel services. While highly effective (Chan et al., 2020; Dolnicar et al., 2019), and increasingly popular among chains (The Washington Post, 2020), this approach has a downside. Hotels need to allocate part of their cost savings from reduced room cleaning to fund these incentives. Our results demonstrate that from a profit-oriented perspective, this strategy might be counterproductive as the greater effectiveness does not always offset the financial outlay.

9.2. //2//avoid overestimating the effectiveness of financial incentives//

Third, although many hotels employ sustainable appeals to persuade guests to forgo room cleaning, our findings suggest that such incentives are less effective than those offering personal benefits, such as financial or hedonic rewards (Knezevic Cvelbar et al., 2021). Considering the discussed downsides of financial incentives, we propose an innovative intervention strategy that offers guests non-financial incentives. This strategy can be easily implemented by hotels and lodging providers

worldwide, irrespective of their size, star rating or guest segments. It revolves around hedonic appeals, which involve communicating the personal benefits of reduced room cleaning, like enhanced freedom and privacy, to guests. Moreover, combining hedonic appeals with sustainable information could optimize profitability, as our profitability index suggests. For example, integrating hedonic appeals can improve the hotel's sustainability ratings, which aligns with the notion that sustainability measures are more credible when they also enhance the guest experience. Interestingly, hotel chains less commonly use hedonic appeals. While anecdotal evidence suggests their implementation, it appears to be informal or not prominently communicated in policy. This could be because hedonic appeals might be perceived as less compelling compared to sustainable appeals or financial incentives. Therefore, we suspect that the potential of hedonic appeals is largely underestimated. We recommend that hotels resist these trends and implement a combination of hedonic and sustainable appeals with opt-in room cleaning, as this approach can most effectively reduce room cleaning requests.

9.3. //3//incorporate hedonic appeals alongside sustainable appeals//

To underline the financial value of our implications, we conducted a cost analysis for a typical upper-midscale hotel with 100 rooms (Statista.com, 2023). By advocating this method, we align with practitioners (Avaneo Hotels, 2023) and research initiatives (The University of Queensland, 2023) that focus on harnessing the power of hedonism for sustainability.

In conclusion, our paper presents hotels with an effective strategy that not only leads to substantial cost savings but also creates guest value while maintaining high levels of sustainability and guest satisfaction.

Impact statement

This paper makes a clear actionable impact to the tourism and hospitality industry. First, it introduces a novel intervention approach that utilizes hedonic appeals to reduce room cleaning requests, surpassing established methods commonly used to promote sustainable behavior. Second, by introducing a profitability index, the article provides a comprehensive measure that takes into account room cleaning requests, costs of incentivization, and guest satisfaction, thereby enhancing our understanding of the effectiveness of different interventions. The profitability index reveals that a combination of hedonic appeals and pro-environmental appeals is the optimal approach, benefiting the environment, guests, and hotels simultaneously. Lastly, our work provides initial insights for hoteliers, suggesting that factors such as the hotel's location and guests' culture may influence the effectiveness of various interventions in fostering sustainable guest behavior.

CRedit authorship contribution statement

Melanie Trabandt: Writing – original draft, Data curation. **Wassili Lasarov:** Software, Methodology, Conceptualization. **Giampaolo Viglia:** Writing – review & editing, Visualization, Supervision.

Declaration of competing interest

none.

APPENDIX

Appendix 1. Treatments used in Study 1 (wording adopted from Knezevic Cvelbar et al., 2021)

Experimental Group 1: Hedonic + Sustainability Try our new room-cleaning concept to get more freedom and to protect the environment! We are testing a new room-cleaning concept and will be cleaning the rooms upon request. This means that we will not automatically clean your room every day (including changing towels). But if you would like us to clean your room, we would be happy to do so. All you need to do is to place the “Please clean my room today” sign on the outside handle of your door before 10 am. With this concept we will enhance your experience while staying in our hotel and provide you with more freedom and flexibility. As you have your room for yourself, you do not need to worry about being interrupted by housekeeping knocking on your door. You can customize your stay while we keep your privacy. At the same time, you maintain as much independence as possible by requesting room cleaning whenever you want. Please note that every time we clean a room we use 100 ml of chemicals, 35 l of water and 1.5 kWh of electricity, which is not good for the environment. You can make a difference and reduce the environmental burden of your stay by having your room cleaned upon request. Please help us make a difference to the environment. Enjoy your freedom and protect the environment during your stay! Message (handed over during the check-in and placed in the rooms) <i>Room cleaning</i> Every day, in a hotel all over the world, tons of towels are washed, liters of chemicals are used, which contaminates the water. Millions of kWh of electricity are consumed and our scare resource, water, is wasted. Is it really necessary to harm the environment to just have a clean room, new towels and new bed linen every day? Please decide...  ...TO PROTECT THE ENVIRONMENT. <i>. thank you .</i>	Experimental Group 2: Freedom: Hedonic + Financial Try our new room-cleaning concept to get more freedom and a restaurant voucher for free! We are testing a new room-cleaning concept and will be cleaning the rooms upon request. This means that we will not automatically clean your room every day (including changing towels). But if you would like us to clean your room, we would be happy to do so. All you need to do is to place the “Please clean my room today” sign on the outside handle of your door before 10 am. With this concept we will enhance your experience while staying in our hotel and provide you with more freedom and flexibility. As you have your room for yourself, you do not need to worry about being interrupted by housekeeping knocking on your door. You can customize your stay while we keep your privacy. At the same time, you maintain as much independence as possible by requesting room cleaning whenever you want. Saving water not only benefits the environment but also saves us money as room cleaning includes 30 minutes for room attendants plus the cost of cleaning supplies and laundering linens and towels. We want to share our savings benefits with you. For each skipped room cleaning, we will give you a 5 € voucher for a drink in our restaurant. Enjoy your freedom and get a free drink for 5 € during your stay! Message (handed over during the check-in and placed in the rooms) <i>Room cleaning</i> Every day, in a hotel all over the world, tons of towels are washed, liters of chemicals are used, which contaminates the water. Millions of kWh of electricity are consumed and our scare resource, water, is wasted. Is it really necessary to harm the environment to just have a clean room, new towels and new bed linen every day? Please decide...  ...TO GAIN A VOUCHER FOR OUR BAR. <i>. thank you .</i>
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Experimental Group 3: No Hedonic + Sustainability	Experimental Group 4: No Hedonic + Financial
Try our new room-cleaning concept to protect the environment! We are testing a new room-cleaning concept and will be cleaning the rooms upon request. This means that we will not automatically clean your room every day (including changing towels). But if you would like us to clean your room, we would be happy to do so. All you need to do is to place the “Please clean my room today” sign on the outside handle of your door before 10 am. Please note that every time we clean a room we use 100 ml of chemicals, 35 l of water and 1.5 kWh of electricity, which is not good for the environment. You can make a difference and reduce the environmental burden of your stay by having your room cleaned upon request. Please help us make a difference to the environment. Help us protect the environment during your stay! Message (handed over during the check-in and placed in the rooms) <i>Room cleaning</i> Every day, in a hotel all over the world, tons of towels are washed, liters of chemicals are used, which contaminates the water. Millions of kWh of electricity are consumed and our scare resource, water, is wasted. Is it really necessary to harm the environment to just have a clean room, new towels and new bed linen every day? Please decide...    ...TO PROTECT THE ENVIRONMENT. <i>. thank you .</i>	Try our new room-cleaning concept and get a restaurant voucher for free! We are testing a new room-cleaning concept and will be cleaning the rooms upon request. This means that we will not automatically clean your room every day (including changing towels). But if you would like us to clean your room, we would be happy to do so. All you need to do is to place the “Please clean my room today” sign on the outside handle of your door before 10 am. Saving water not only benefits the environment but also saves us money as room cleaning includes 30 minutes for room attendants plus the cost of cleaning supplies and laundering linens and towels. We want to share our savings benefits with you. For each skipped room cleaning, we will give you a 5 € voucher for a drink in our restaurant. Enjoy your free drinks during your stay! Message (handed over during the check-in and placed in the rooms) <i>Room cleaning</i> Every day, in a hotel all over the world, tons of towels are washed, liters of chemicals are used, which contaminates the water. Millions of kWh of electricity are consumed and our scare resource, water, is wasted. Is it really necessary to harm the environment to just have a clean room, new towels and new bed linen every day? Please decide...    ...TO GAIN A VOUCHER FOR OUR BAR. <i>. thank you .</i>

Appendix 2. OLS Regression results of Study 2

Dependent variable	Perceived Guest Value								
	Hedonic			Financial			Environmental		
	β	t	p	β	t	p	β	t	p
<i>Independent variables</i>									
Present vs. absent hedonic appeals	.17	2.07	.040	.15	2.03	.044	-.02	-.22	.828
Financial vs. sustainable appeals	.03	.35	.728	-.35	-4.80	.000	-.04	-.54	.592
Interaction effect	.11	1.39	.167	-.02	-0.23	.820	-.11	-1.44	.152
<i>Control variables</i>									
Age	.09	1.11	.269	-0.15	-1.96	.052	.18	2.13	.034
Gender ¹	.03	.37	.714	0.19	2.65	.009	-.12	-1.47	.143
R ²	.05			.23			.07		

Notes: Ordinary least squares regression. ¹dummy-coded: 0 = female; 1 = male.

Appendix 3. Estimated water consumption

	Water consumption*	Estimated water consumption per room cleaning	Total estimated daily water consumption**
Sink faucets	3.0 gallons (11.35 L) per minute.	Run for 5 s: 0.25 gallons (0.95 L).	25 gallons (95 L)
Showers	3.5 gallons (13.2 L) per minute.	Run for 8 s: 0.47 gallons (1.78 L).	47 gallons (178 L)
Toilets	3.5 gallons (13.2 L) per flush.	Are flushed twice: 7 gallons (27 L).	700 gallons (2650 L)
TOTAL		7.2 gallons (30 L)	772 gallons (3030 L)

Note. *Data sources: <https://www.seattle.gov/documents/Departments/SPU/Documents/HotelWaterConservation.pdf>; American Laundry News, Vol. 24, No 11, November 1998, EDC Ozone Laundry Systems package: (972) 257–0322; <https://www.statista.com/statistics/823786/average-number-of-rooms-per-hotel-by-chain-type/>; ** Estimations for a common upper-midscale hotel with 100 rooms (Statista.com, 2023).

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