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Why should hotels go green? Insights from guests experience in green hotels

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ABSTRACT

Over the last years, the lodging industry started to implement a wide spectrum of green practices to mitigate its pressure on the environment and to respond to the growing consumers' environmental concerns. Recently, scholar's attention to guest perception of hotels green practices has been grown. This paper through a PLS-SEM analysis, presents the results of a survey targeted to the guests of an ecolabel-awarded hotel, investigating how consumers perceive the actions implemented by hotels to reduce their environmental impacts. The study provides hotel managers with insights from guests staying in green hotels. The main objectives are to explore how guests perceive "green hotel" practices and to test the relationship between guest perceptions of hotel green practices and behavioral intentions. Additionally, the impact of green practices in determining a specific loyalty towards green hotels has been tested. Finally, the study investigates the role of guest satisfaction as a mediator for guest loyalty. Results of this study supported the research hypotheses showing that customers positively recognize the hotels' environmental commitment, with a significant influence on guest satisfaction and loyalty. Findings also suggest that guest who experienced the stay in a green hotel are more likely to develop a specific loyalty toward the hotels implementing green practices. Implications, limitations and future lines of research are also provided.

1. Introduction

The tourism sector is one of the world's largest industry, contributing to 10.4% of global gross domestic product (GDP) and a key enabler of economic development globally. Tourism is a trillion-dollar industry, driving the 7% of global exports and proving approximately 1 in 10 of all jobs (WTTC, 2018). On the other hand, tourism activities strongly impacts on the environment, contributing not only to environmental degradation but also to the raising of greenhouse gases (GHG) emissions associated with the sector (Pang et al., 2013). Tourism account for about 8% of global greenhouse gas emissions (Lenzen et al., 2018). The study of Lenzen et al. (2018) found that, between 2009 and 2013, tourism's annual global carbon footprint increased from 3.9 to 4.5 bn tons of CO_2 equivalent. Additionally, forecasts indicate that the tourism industry is becoming more energy, freshwater, land and food intense, and within 25–45 years tourism resources use will double (Gossling and Peeters, 2015). Climate change and tourism are closely interrelated. While the tourism sector massively contributes to greenhouse gas emissions, mostly related to transportation, it also faces profound impacts from global warming being one of the most vulnerable industries to environmental degradation and climate change (Gossling and Peeters, 2015; Smith, 1990). Considering this aspect, the success of the tourism industry in the long-term is strictly linked to its capacity to manage environmental sustainability issues (Bramwell and Lane, 2008). Therefore, addressing sustainability has become a major concern for the industry, policy makers and consumers (Lee et al., 2011).

Increased pressure on the environment also come from to the accommodation sector, responsible for roughly 20% of the tourism emissions. This sector has been the forerunner of corporate social responsibility (CSR) practices in the tourism sector. Since decades, has been applying green practices, starting to consider environmental related aspects of the service as a pillar in its operations (Han et al., 2018; Park and Kim, 2014; Wang et al., 2018). Hotels are the primary form of accommodation and one of the most important sectors of the travel and tourism industry, but they are also a major energy and water-intensive sector in their day to day operations (Han et al., 2018; Verma and Chandra, 2016). These aspects are posing serious environmental and reputational problems to hotels managers. Nowadays consumers are increasingly aware of these issues and are demanding "green consciousness" in hotels operation management (Yi et al., 2018). Hoteliers are adapting to these "green wave" providing ecofriendly attributes to their services and transforming their business in "green hotels" or "environmentally friendly hotels" (Verma and Chandra, 2016). Green

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hotels can be defined as: "*pro-environmental lodging properties which implement different green practices such as saving water and energy, reducing the solid waste, and recycling and reusing the durable service items (e.g., bins, towels, etc.) to protect the earth we live in*" (Green Hotel Association, 2012; Han et al., 2009; Kim and Han, 2010).

Consumers growing attention toward environmental issue and sustainability has fostered hoteliers to transform their business implementing green practices in hospitality management. This is a great opportunity for hotel managers to exploit this differentiation factor in the market (Cronin et al., 2011; Dodds and Holmes, 2016). Therefore green activities have a strategic value for companies, and not only represent the "right thing to do" but "the smart thing to do" to succeed in the marketplace (Luo and Bhattacharya, 2006). Considering the developments in the hospitality industry, going green is becoming an effective strategy to boost hotels competitiveness and gaining market share acquiring sustainability-sensitive guest segments (Merli et al., 2018; Verma and Chandra, 2018; Yi et al., 2018). This means gaining and keeping guest that have a positive attitude toward hotels implementing a wide spectrum of green practices, such as waste recycling, energy and water savings, and certification standards (Berezan et al., 2013a; Hsiao et al., 2014; Xu and Gursoy, 2015). As a consequence, several definitions of green practices in the hospitality context have been proposed. Kim et al. (2017a,b) define them as "*a value-added business strategy that benefits a hospitality operation that engages in environmental protection initiatives*" (p. 236), embracing the evidence that are commercially-driven actions that provide both financial and commercial added value while reducing environmental impact (Kim et al., 2017a). Therefore, in order to be economically valuable, green initiatives have to reduce operational cost and create perceived value for costumers (Robinot and Giannelloni, 2010). Scholars have dedicated numerous studies to explore the role of hotel green practices in determining guest behavioral intentions (Gao et al., 2016). Showing that hotel commitment towards sustainability is a significant determinant of guest satisfaction (Gao and Mattila, 2014; Martínez García de Leaniz et al., 2017; Robinot and Giannelloni, 2010; Xu and Gursoy, 2015; Yusof et al., 2015). Additionally, guest awareness of hotel CSR practices, if properly implemented, can also determine guest increased loyalty and willingness to pay a premium price for their stay at the "Green hotel" (Kang et al., 2012; Lee et al., 2010; Teng et al., 2012). However, the relationship between stated intentions and actual behavior is not straightforward (Kim et al., 2017a) and is strictly influenced by what consumers can observe of the firm's CSR efforts (Wang et al., 2017).

One way for the hotels to demonstrate to guest their commitment to go green is adopting environmental certifications, such as ecolabels (Gössling and Buckley, 2016; Martínez García de Leaniz et al., 2017). However, even certified hotels adopt different approaches towards the environment, regarding its effective integration in the hotel general management, leading to different levels of environmental performance improvement (Bonilla Priego et al., 2011). Among a large spectrum of voluntary environmental management tools, third party certified ecolabels stand out due to their capacity to inform guest and to the trustworthiness ensured by third-party certification process (Geerts, 2014). Nevertheless, the success of ecolabels depends on guest perception and behavior intention, and on the willingness to collaborate with the hotel in the improvement of environmental performance (Ayuso, 2007; Penz et al., 2017).

Eco-labels, together with Environmental Management Systems (EMS), have been proven to be the most effective in reducing companies' negative impact on the environment and to communicate hotel's efforts toward sustainability (Ayuso, 2007; Tepelus and Córdoba, 2005). Therefore, the starting point for the identification of green hotel practices of this study is the "Legambiente Turismo" eco-label, which is the most diffused Italian green lodging program (Legambiente, 2017). The main goal of the study is to evaluate how hotel guests perceive green hotel practices; and to verify if green practices are determinants in influencing hotel guest overall satisfaction, loyalty, and loyalty toward green hotels. The model proposed introduces two distinct conceptualization of guest loyalty. The first refer to the loyalty to the hotel that guest have experienced, while the second aims to identify guest revisit intentions and word of mouth towards the general category of "green hotel". Therefore, the investigation also intends to evaluate if a positive experience in a green hotel will also contribute to generate a specific green loyalty for this peculiar hotel category (Martínez García de Leaniz, 2015; Martínez García de Leaniz et al., 2017; Wang et al., 2018). Moreover, it investigates the role of guest satisfaction as a significant mediator for guest loyalty. Results of the study offer interesting findings both to hospitality research, industry practitioners and hoteliers. The research contributes to understanding the role of guest perceived performance of environmentally friendly practices in determining guests' positive behavioral intentions. Next, it offers insight from guest experiences in green hotels helping to figure out if, by experiencing a green hotel, consumers develop positive word of mouth and revisit intention toward the eco-label certified hotels. The output of the study also assists hotel managers engaged with these types of initiatives to understand if efforts made toward sustainability have positive returns with respect to guest behavioral intentions.

After this introduction, in Section 2 the paper analyzes the theoretical background of the study and presents the research hypotheses. In Section 3 are outlined the survey design and the measurement scales, data collection and methods of data analysis. Section 4 illustrates the findings of the study. Next, Section 5 provides discussion, implications, limitations and outlook of the study.

2. Literature and hypotheses development

2.1. The influence of green practices on customer satisfaction

The relationship between service attributes and customer satisfaction in lodging industries have been widely debated by scholars (Albayrak and Caber, 2015; Anderson and Mittal, 2000). However, more efforts should be done to deeper explore the relation between eco-friendly hotels attributes and guests' satisfaction (Han et al., 2011; Le et al., 2018; Yusof et al., 2017). Customer satisfaction is considered a crucial element to sustain competitive business (Nash et al., 2006). It is also a critical indicator in evaluating firms' performances (Kassinis and Soteriou, 2003; Oliver, 1993) and financial success (Anderson et al., 1994). It may be defined as a cognitive process that compares customer experience and its initial reference base (Xu and Gursoy, 2015), resulting a feeling of pleasure or disappointment from comparing a product's perceived performance in relation to expectation (Cronin et al., 2000; Oliver, 1981, 1993, 1977). This consideration is crucial in evaluating the role of green practices on guest satisfaction. As said before, guest are more than ever expecting the implementation of sustainable action in hotel management (Berezan et al., 2013b; Robinot and Giannelloni, 2010). In fact, Robinot and Giannelloni (2010) find that hotel environmental attributes are evaluated by guests as "basic factors" constituting an integral part of the service. However, other authors suggest that this attribute may represent "facilitating attributes" that can contribute to guest excitement (Slevitch et al., 2013). Brunssmith et al. (2015) showed that even though the connection between green practices and guest satisfaction is lower when considering core attributes, they do not reduce satisfaction if not implemented. Considering this aspect, to contribute to customer satisfaction green attributes should be provided together with core attributes delivered without failure (Kassinis and Soteriou, 2015; Manaktola and Jauhari, 2007). The significance of the relationship between green practices and satisfaction has been tested and confirmed by scholars in the context of hotel industry (Ham and Han, 2013; Merli et al., 2018; Prud'homme and Raymond, 2013; Xu and Gursoy, 2015; Yusof et al., 2017). Others, instead, find out that eco-friendly attributes moderates the relationship between service quality and customer satisfaction (Lee et al., 2018).

Some authors, also tested the relevance of different green practices on satisfaction (Berezan et al., 2013a; Gao and Mattila, 2014; Han et al., 2018). Thus, this paper tests the impact of hotel eco-friendly practices on customer satisfaction in hotels. The subsequent hypothesis is tested:

H1. *Hotel environmental practices positively influence guest satisfaction with the hotel.*

2.2. The influence of environmental practices on customer loyalty

There is a great debate over the meaning of customer loyalty. According to Oliver (1997) this construct is defined as "a deeply held commitment to rebuy or re-patronize a preferred product or service consistently in the future, despite situational influences and marketing efforts having the potential to cause switching behavior" (Oliver, 1997, p. 392). Loyalty may be split into behavioral loyalty and attitudinal loyalty. The first refer to repeated transaction over the time. The latter refer to an emotional link, that also generate a positive word of mouth (Martínez and Rodríguez del Bosque, 2013; Saleem and Raja, 2014). Even though there is no common agreement on what generates loyalty (Mason et al., 2006), these two aspects of loyalty should be considered in hospitality research (Han et al., 2011). In sustainability management of hotels to improve guest loyalty is pivotal in assuring hotel long-term success (Han et al., 2018).

In literature green practices in hospitality industries has been found as mean to improve customer loyalty (Chen and Tung, 2014; Gao et al., 2016; Kim and Han, 2010; Yusof et al., 2015). In particular, scholars studied both the relation of sustainable practices on word-of-mouth (Han et al., 2009; Lita et al., 2014; Wang et al., 2018; Xu and Li, 2016) and revisit intention (Hashim et al., 2013; Kim et al., 2017b; Njite and Schaffer, 2017). Additionally, guest perception of green practices are significant contributors to the hotel green image that enhances guest loyalty for green hotels (Martínez García de Leaniz, 2015; Martínez García de Leaniz et al., 2017; Wang et al., 2018).Thus, the paper tests the following hypothesis:

H2. *Hotel environmental practices positively influence guest loyalty toward the hotel.*

Scholars' investigations identify a positive relationship between environmental practices and guest loyalty, as greater customer willingness to return and positive word of mouth. These results lead to the emergence of a more specific consideration: do environmental practices contribute to generate a specific loyalty toward green hotels? According to Han and Kim (2010) green practices have a positive influence on guests' revisit intention, suggesting that hoteliers should find efficient strategies to communicate their environmental friendly initiatives (Han and Kim, 2010). Others scholars, investigating consumer eco-friendly attitudes, have found that firms' level of responsibility toward the environment significantly boosts hotel guests' intentions to visit a green hotel and to engage word of mouth in favor of green hotels (Han et al., 2011). Considering the previous discussion, this paper test weather a hotel with a higher rate of commitment toward green practices will lead guests to experience greater loyalty toward green hotels. Thus, the following hypothesis is formulated:

H3. *Hotel environmental practices positively influence guest loyalty toward green hotels.*

2.3. The influence of customer satisfaction on loyalty

Customer satisfaction is a pivotal concept for firms to survive and compete in the market but also to understand consumer behavior (Fen and Lian, 2007; Han and Kim, 2010). There is general consensus that customer satisfaction is an antecedent of customer loyalty (Boulding et al., 1993; Lee, 2009; Martínez and Rodríguez del Bosque, 2013). Fen and Lian (2007) study shows that satisfaction is important to the marketer because it is generally assumed to be a significant determinant of repeat sales, positive word of mouth, and customer loyalty.

In hospitality research this positive link is often remarked (Kandampully and Suhartanto, 2003; Kassinis and Soteriou, 2015; Kim et al., 2013). In relation to the implementation of sustainable practices in green hotels, recent studies shows a connection between guest satisfaction for green hotel and guest loyalty (Gallarza and Saura, 2006; Gao et al., 2016; Merli et al., 2018; Prud'homme and Raymond, 2013; Xu and Gursoy, 2015). In particular, Wang et al. (2018) found that guest satisfaction is positively related to their intention to recommend green hotels, the so called Word-of-Mouth (WOM). Also Martínez García de Leaniz (2015) study confirms that guests tend to develop greater levels of loyalty toward a the green hotel when they are satisfied with the green hotel performance. Additionally, guest satisfaction has been proved also as a significant antecedents for both WOM and revisiting intentions (Ramseook-Munhurrun et al., 2015). This evidence, provided by previous literature, is thus tested with the following hypothesis:

H4. *Guest satisfaction is a significant antecedent of guest loyalty toward the hotel.*

As in the above discussed hypothesis (H3), this paper aims at examining also the effect of customer satisfaction on loyalty toward the general category of green hotels. The concept of "green loyalty" has been introduced by Martínez García de Leaniz (2015) that defined it as the "*consumer commitment to repurchase or otherwise continue using a green brand*". In this study guest satisfaction has been found as pivotal constructs for understanding consumer behavioral intentions. Particularly, Martínez García de Leaniz (2015) founds that guest satisfaction positively influence guest green loyalty. Consistent with these findings, Han and Kim (2010) suggested that the efforts made by hotel managers to increase customer satisfaction will influence their post-purchase decision-making process. In fact, they found guest satisfaction positively associated to guest predisposition in revisiting a green hotel (Han and Kim, 2010). Considering this previous literature, the model proposed tests if customer satisfaction influence guests to develop loyalty toward a green hotel:

H5. *Guest satisfaction is a significant antecedent of guest loyalty toward green hotels.*

2.4. The mediation effect of customer satisfaction on loyalty

Previous investigations have shown that the perceived quality of service influence customer loyalty by means of satisfaction, that has a mediator role for behavioral intentions (Cronin et al., 2000; Ekinci, 2003). In the field of tourism, customer satisfaction is often identified as a mediator between service quality and loyalty (Bradley and Sparks, 2012; Ekinci, 2003; He and Song, 2008; Mohamad et al., 2014; Ramseook-Munhurrun et al., 2015; Lee et al., 2007). The mediation role is also highlighted in studies dealing specifically with hospitality (Al-Rousan and Abuamoud, 2013; Olorunniwo et al., 2006; Osman and Sentosa, 2013; Wilkins et al., 2009). Considering the context of green hotels, the paper also aims at testing if customer satisfaction acts as a mediator between environmental practices and loyalty toward green hotels. This hypothesis have been successfully tested in investigations dealing with sustainability practices in the hotel industry (Han and Kim, 2010; Xu and Gursoy, 2015). Given the relevance of the mediation role of customer satisfaction the following hypotheses are presented:

H6. *Guest satisfaction mediates the relationship between hotel environmental practices and guest loyalty toward the hotel.*

H7. *Guest satisfaction mediates the relationship between hotel environmental practices and guest loyalty toward green hotels.*

Fig. 1 shows the theoretical model tested in the analysis.

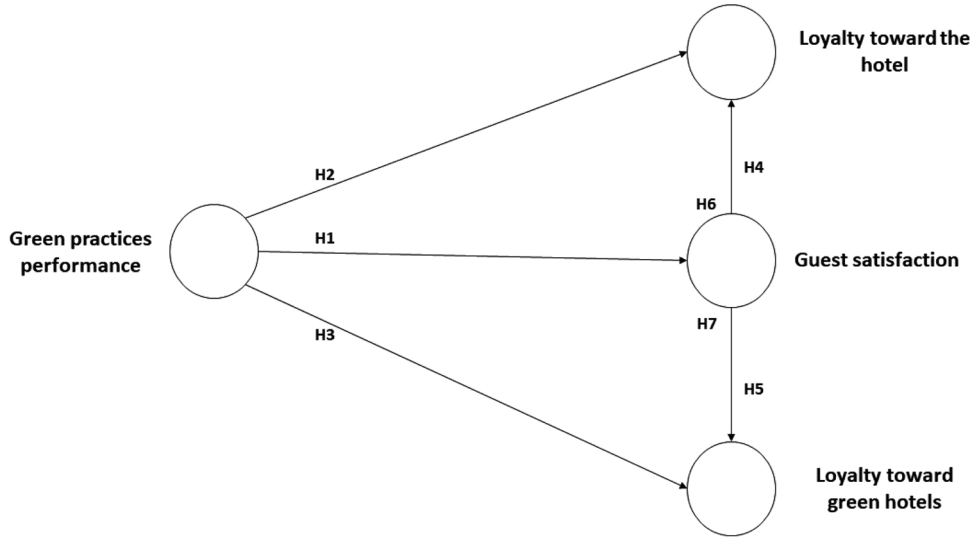

Fig. 1. Theoretical Model.

3. Research methods

3.1. Survey design

The research was carried out through a survey, by the means of a questionnaire. The questionnaire was built with a three-step approach. First, the measurement scales were identified through a literature review. Next, the list of items obtained was skimmed with semi-structured interviews conducted with a panel of 10 managers of hotels awarded with the Legambiente Turismo eco-label. Results of this step allowed to drop redundant items, reduce the number of items and improve the semantic comprehensibility and clarity. Then, 30 hotel guests were chosen as random sample for the pretest to assess the suitability of the questionnaire as an instrument of measurement (Castellanos-Verdugo et al., 2015). Results of this phase are minor changes on wording of sentences to improve readability and clarity of the questions. Finally, the questionnaire was reviewed and finalized by authors. In its final version, the questionnaire consisted of three sections. The first section aimed at measuring guests' perceptions about hotel environmental practices, and was composed of 10 items adopted from previous studies (Bastič and Gojčič, 2012; Berezan et al., 2013a; Kassinis and Soteriou, 2015; Levy and Park, 2011; Prud'homme and Raymond, 2013; To et al., 2015; Wu et al., 2013; Yusof et al., 2014). The environmental attributes were also integrated with specific requirements that the hotel must satisfy to obtain the Legambiente Turismo eco-label, if such items were not identified in previous studies. Guests' evaluation of hotel environmental attributes was measured with a Likert-type scale ranging from 1 (poor performance) to 7 (excellent performance). The second section consisted of six items to measure guest' overall satisfaction, loyalty toward the hotel, and loyalty toward green hotels. The two items measuring the overall satisfaction were retrieved from the study of Lai and Hitchcock (2016, 2015). Measures of loyalty, expressed as revisit intention and word of mouth were shaped on Chi (2011) and Xu and Gursoy (2015). Finally, to investigate loyalty toward green hotels, the scale was adapted from the studies conducted by Han et al. (2011) and Han and Kim (2010). Both satisfaction and loyalty were measured on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). In the final section, guests' demographic information (age, gender, duration of the stay, type of trip), awareness of the hotel eco-label and previous experience with a green hotel were included (Han et al., 2011). Table 2 presents the measurement scales, with items mean values and standard deviation (scale 1–7).

3.2. Data collection

After receiving the approval of the managers, 500 questionnaires were sent to the hotel. The hotel staff, once trained and informed about the research, were invited to distribute the questionnaire to all hotel guests during check-out process. The survey was conducted during summer, this season is the most appropriate as it is the period of greatest influx of guests, as the hotel is in a seaside location in Italy. A total of 366 filled questionnaires were collected. 31 cases were excluded because incomplete or otherwise unusable (Bastič and Gojčič, 2012; Han et al., 2011). Eventually, 325 questionnaires were usable and employed for the subsequent analysis. The minimum sample size in PLS-SEM should be ten times the largest number of structural paths directed at a specific latent construct. As shown in Table 2, the largest number of indicators in the measurement model for one construct is ten. Therefore, the sample satisfies the required threshold (Hair et al., 2011).

3.3. Data analysis

To estimate the structural equation models and to test hypothesis PLS-SEM modeling was chosen (Wold, 1982). PLS-SEM is a "regression-based" approach that minimizes the residual variances of the endogenous constructs (Hair et al., 2011). Variance-based SEM was preferred over covariance-based SEM (Jöreskog, 1978), as it well-suits the characteristics of the investigation and the nature of the collected data (Hair et al., 2014a,b). This choice was made firstly because of the explorative nature of the study. Second, as measures were developed with a Likert scale, data have a non-normal data distribution. PLS does not require any normality assumptions and handles non-normal distributions relatively well (Ali et al., 2018; Hair et al., 2011). Finally, PLS works well with the mediation analysis that is presented in this paper (Ali et al., 2018; Chin, 1998). SmartPLS (V.3.2.6) software was employed to build models and assess their validity (Ringle et al., 2015).

4. Results

This section presents the results of the analysis. First, information on the main characteristics of respondents, type of traveler and purpose of stay, guest information on the eco-label are provided (Section 4.1). Next, validity and reliability analysis of the measurement model are tested (Section 4.2). Finally, the hypotheses developed in Section 2 are tested through the structural models (Section 4.3).

4.1. Hotel characteristics and profile of respondents

The hotel under investigation is certified with the Legambiente Turismo Ecolabel, and in 2014 has won the Legambiente Turismo prize as best tourist structure for the activities dedicated to the natural environment and for the workshops offered to the young guests. The three-star hotel is located in the natural park of the “Delta del Po”, recently declared a UNESCO World Heritage Site, and just a few minutes from the beaches. The hotel implements a variety of green practices such as:

- houses designed with the idea of bio-architecture, limited height, with green roofs for a low environmental impact;
- most of the water in the village is heated and powered by solar panels;
- low energy consumption lamps used in all areas of the village;
- separate waste collection with ecological areas available to customers at strategic points of the structure;
- information and suggestions in the room to increase guests awareness for a lower energy consumption, paper material services and information leaflets made of recycled paper, eco-friendly courtesy service;
- cleaning products with certified quality;
- use of km0 food and an important partner of projects at European level such as Ecorutour and the "menu that leaves no imprint";
- use of electric vehicles for the maintenance inside the village and for the safari in the owned farm;
- environmental workshops on eco-sustainable tourism
- Orienteering and Cyclo-tourism activities available to guests.

Table 1 summarizes the demographic profiles of the respondents. Roughly 70% of respondents were male, while females were 30.7%. Most respondents were in the age range 18–29 (34.8%) and 30–39 (35.7%), whilst only 6.2% aged over 60. Almost a half of respondents were travelling with family (46.5%), 23% with friends, 18% as single, and 11% in couple. The majority was staying at the hotel for leisure (72.7%), while 23.3% for business purposes. Considering the nights of stay, the majority stayed at the hotel 1–2 nights (35.1%), 34.2% 6–10 nights, 17.2% 3–5 nights and 13.5% over 10 nights.

Table 1 provides an overview on guest information on the Legambiente Turismo eco-label. Only one third (30.7%) of guests were aware that the hotel is awarded with the eco-label. Of them, 55.9% acquired this information during the staying, while 44.1% knew it before the visit. Eventually, guests were asked about previous experiences in tourism accommodations with eco-label or other environmental certification. Over 80% of the guests were not aware if they have stayed in an accommodation of this type.

4.2. The measurement model evaluation

The first step of the analysis consisted in the analysis of the relationship between constructs and indicators to empirically assess the measurement model type and to evaluate constructs’ reflective or formative nature (Diamantopoulos and Siguaw, 2006; Gudergan et al., 2008; Hair et al., 2014a,b; Klarner et al., 2013). Following the guidelines of Hair et al. (2014a,b) as well as Jarvis et al. (2003) reflective constructs was chosen (Hair et al., 2013). This decision was mainly due to the following considerations: indicators have been conceived as manifestations of the construct; indicators shared a common theme; dropping an indicator does not alter the conceptual domain of the construct. To validate this choice, an empirical testing of the theoretical assumptions by means of confirmatory tetrad analysis (CTA-PLS) was also performed (see Appendix A1). This analysis, which allows to empirically distinguishing a formative measurement model specification from a reflective one, confirmed the reflective nature of the constructs (Gudergan et al., 2008).

Subsequently, a two-step analytical procedure was followed, with the assessment of the measurement model followed by the structural model assessment. The measurement model evaluates that all the considered constructs are correctly measured through the indicators (Klarner et al., 2013), and it must be assessed for its reliability and validity. Table 2 shows indicators outer loadings for each construct. For three of them (Satisfaction; Guest loyalty towards the hotel; Guest loyalty towards green hotels) indicators’ outer loadings are well above the 0.7 threshold, commonly considered as highly satisfactory for the measurement of indicator reliability (Ali et al, 2018). Considering the Green practices construct, five indicators have outer loadings below this threshold. Nevertheless, these indicators have been retained for three reasons. First, they strongly contribute to the content validity of the model, as they belong to the specific set of environmental practices required to be awarded with the eco-label (Hair et al., 2011; Hair et al., 2014a,b). Second, the AVE values for the constructs were higher than 0.5. Finally, indicators’ composite reliability is well above the 0.7 threshold and the elimination of these indicators do not lead to a substantial decrease of composite reliability (Cornwell, 2001; Hair et al., 2011; Memon and Rahman, 2014).

For all constructs, converged validity was tested thought the average variance extracted (AVE), ranging from 0.52 to 0.92 passing the threshold value of 0.5 (Hair et al., 2014a,b). Results shows that internal consistency reliability for all constructs is adequate. Particularly, Table 2 shows that in the model the Cronbach's α values range from 0.89 to 0.92 and the Composite reliability (CR) values range from 0.90 to 0.96, exceeding the threshold value (0.7).

Next, the discriminant validity was assessed. Table 3 shows that the square root of each AVE (shown on the diagonal) is greater than the related inter-construct correlations in the construct correlation matrix, indicating adequate discriminant validity for all of the reflective

Table 1
Demographics.

Variable	Range	Percentage	Variable	Range	Percentage
Gender	Female	30.7%	**Purpose of stay**	Leisure	72.7%
	Male	69.3%		Business	27.3%
Age	18–29	34.8%	**Nights of stay**	1-2	35.1%
	30–39	35.7%		3–5	17.2%
	40–49	22.4%		6–10	34.2%
	50–59	5.9%		over 10	13.5%
	over 60	1.2%	**Hotel Eco-label awareness**	Yes	30.7%
Type of traveler	Single	18.9%		No	69.3%
	Couple	11.6%	**Hotel Eco-label awareness before visit**	Yes	44.1%
	Family	46.5%		No	55.9%
	Friends	23.0%	**Other experience in eco-label hotel**	Yes	17.4%
				No	82.6%

Table 2
Measurement model evaluation results.

Constructs/Indicators	Mean	St. dev.	Loading
Green practices (Env_perf) α = 0.895; CR = 0.905; AVE = 0.526; rho_A = 0.905			
Organic or seasonal food are available for breakfast	6.01	0.99	0.672
The hotel implements water and energy saving practices (e.g. new linen only when necessary)	6.02	0.88	0.578
The hotel tries to avoid disposable or single-dose products	5.87	0.95	0.662
In the hotel separated waste collection is available	6.10	0.93	0.487
The hotel informs the guests about the good environmental practices implemented	5.86	1.08	0.843
The hotel provides its guests with information on how they can contribute to reduce the hotel's environmental impact	5.79	1.19	0.819
The hotel provides its guests with information on the environmental and cultural activities available in the area	5.96	1.17	0.863
The hotel provides information on public transportation	5.87	1.18	0.807
The hotel provides its guests bicycles for free or for rent	6.34	1.02	0.644
The hotel uses environmental certified or green labeled products (e.g. toiletry products, paper)	5.90	0.96	0.779
Guest satisfaction (Sat) α = 0.921; CR = 0.962; AVE = 0.926; rho_A = 0.922			
I am satisfied with my experience in this hotel	6.06	0.80	0.959
My expectations have been satisfied	6.03	0.79	0.966
Guest loyalty towards the hotel (Loy) α = 0.893; CR = 0.949; AVE = 0.903; rho_A = 0.893			
I would come back again in this hotel	5.90	1.04	0.948
I would recommend this hotel in the future	5.91	0.95	0.953
Guest loyalty toward green hotels (Loy_env) α = 0.903; CR = 0.954; AVE = 0.911; rho_A = 0.904			
I would come back in a hotel that implements good environmental practices	5.86	0.93	0.955
I would recommend a hotel that implements good environmental practices	5.90	0.88	0.954

α = Cronbach's Alpha; CR = Composite reliability; AVE = Average Variance Extracted: Rho_A = reliability coefficient.

Table 3
Fornell-Larcker discriminant validity criteria.

	1	2	3	4
Green practices	**0.725**			
Guest loyalty towards the hotel	0.506	**0.950**		
Guest loyalty towards green hotels	0.441	0.593	**0.955**	
Guest satisfaction	0.524	0.733	0.583	**0.963**

Table 4
HTMT discriminant validity criteria.

	1	2	3	4
Green practices				
Guest loyalty towards the hotel	0.563			
Guest loyalty towards green hotels	0.490	0.660		
Guest satisfaction	0.578	0.808	0.639	

constructs. Discriminant validly was also assessed with the Heterotrait–Monotrait ratio (HTMT) that has a high power in detecting validity issues in variance-based SEM. All values of the HTMT are below the suggested 0.9 threshold (Table 4), suggesting a relevant relationship between indicators and constructs (Henseler et al., 2015).

The measurement model assessment showed the reliability and validity of constructs measures. Thus, next section aims to test the hypotheses developed in Section 2 through the structural models' evaluation.

4.3. Assessment of the structural model

For path analysis and to test the structural model and research hypotheses SmartPLS version 3.0 was used. Applying the bootstrapping procedure with 5.000 iterations the statistical significance of the path coefficients was examined. Additionally, following the recent guidelines of Henseler et al. (2015) that suggest applying the standardized root mean square residual (SRMR) as the only approximate model fit criterion, a SRMR value of 0,060 was calculated for our model, indicating a more than adequate model fit. A value of 0 for SRMR would indicate a perfect fit, and generally, an SRMR value less than 0.08 is recommended to be adequate for PLS path models. The structural

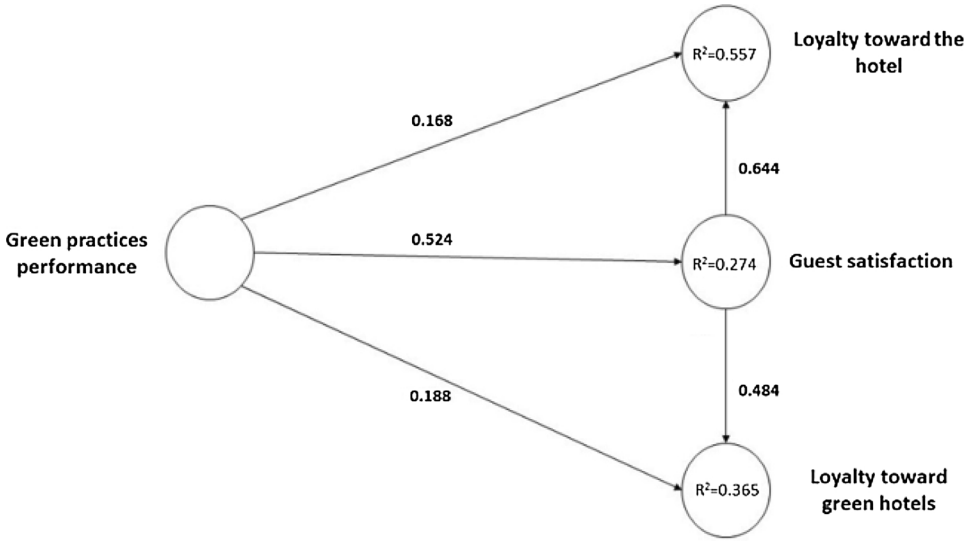

Fig. 2. Structural Model.

model examines the relationships in terms of weights and magnitudes between the endogenous and exogenous latent variables in the model (Hair et al., 2011). Fig. 2 provides a graphical description of the tested model. The core criteria to evaluate the structural model are the path coefficient significance level (β), the coefficient of determination (R^2), and cross-validated redundancy (Q^2) (Hair et al., 2014a,b). A t-statistic was obtained through a bootstrapping procedure with 5000 resamples, to evaluate the significance of path coefficients and estimate the standard error in the proposed models. The p-values generated by the bootstrapping allow to accept or reject the hypotheses, testing the significance of the relationship among constructs. R^2 represent the effect of the exogenous constructs on endogenous construct and measures the predictive accuracy of the model. PLS-SEM objective is to maximize the R^2 value that ranges between 0 and 1. Values below 0.25 indicate a weak accuracy, below 0.50 a moderate accuracy, and below 0.75 a substantial predictive accuracy. The Stone-Geisser's Q^2 values are obtained through a blindfolding procedure to evaluate the predictive relevance of the exogenous constructs on endogenous constructs. Values below 0 ensure the model predictive relevance. The bootstrapping procedure indicates that all path coefficients are significant with a confidence interval of 95%, thus all the hypotheses H1, H2, H3, H4, and H5 are accepted. The predictive accuracy of the model is confirmed by the Q^2 and R^2 values. The model explains 55.7% of Guest loyalty towards the hotel variance, 36.5% of Guest loyalty towards green hotels and 27.4% of Guest satisfaction (Table 5).

Next, effect sizes were assessed. To evaluate the magnitude of the relationship between the latent variables, showing how much an exogenous latent variable contributes to an endogenous latent variable's R^2 value (Wong, 2013). Following Cohen (1988) guidelines (0.02 for small effect, 0.15 for medium effect, and 0.35 for large effect) the effect size was measured and reported in Table 5 (Hair et al., 2014a, b).

4.4. Testing the mediation effect

To estimate the role of Satisfaction as mediator of Loyalty (towards hotel and towards green hotel), we used Preacher and Hayes (2008) bootstrapping method. The path coefficients of Model 1 (without mediator) and path coefficients of Model 4 (with mediator) are compared according to Eq. (2). The results show that Env_prat direct effect on Loy decreases considerably (Δ = 0.337), from a significant relationship of 0.506 to a low but still significant level of 0.168. Concurrently a similar relation is found for Env_prat direct effect on Loy_env, which decreases considerably (Δ = 0.254), from a significant relationship of 0.441 to a low but still significant level of 0.188 (Table X). Therefore, it is possible to assume that Sat partially mediates the relation between Env_prat and Loy, and between Env_prat anf Loy_env. Moreover, according to Zhao et al. (2010), as the direct effect (c') and indirect effect (a × b) point the same positive direction, the model defines a complementary partial mediation (Nitzl and Roldán, 2016). The significance of total, direct and indirect effects are tested using a bootstrap procedure with 5000 resample and a 95% confidence interval. Eventually, the Variance Accounted For (VAF) evaluates the strength of the mediation (Helm et al., 2010). VAF varies between 0 and 100%, with values above 80% indicating full mediation, between 20 and 80% partial mediation, and below 20% no mediation effect. The VAF (see Eq.(2)) determines the size of the indirect effect in relation to the total effect (Hair et al., 2014a,b).

$$VAF = \frac{a\,x\,b}{a\,x\,b + c'} \quad (2)$$

Table 6 shows that direct and indirect effect between Env_perf and Loy, and Env_perf and Loy_env are significant. Therefore, hypothesis H4a and H4b are accepted, as Sat is a mediator for the two relationships. The VAF indicates that Sat is a partial mediator of both Loy (VAF 0.668) and Loy_env (0.575).

Table 6
Summary of mediating effect test.

	Total effect	Direct effect	Indirect effect	VAF	Mediation
Env_perf → Loy	0.506***	0.168***	0.337***	0.668	66.80%
Env_perf → Loy_env	0.441***	0.188***	0.254***	0.575	57.50%

*** Significance level at 99.9% (*p-value* < 0.01).

5. Discussion, implications, limitations and future outlook

The study investigates the impact of hotel green attributes on guest's perceptions. First, it studies the existence of a direct significant relationship between hotel green attributes and customer satisfaction, loyalty and loyalty toward green hotels. Specifically the research reveals (1) a significant relation between hotel environmental practices and guest satisfaction (H1), confirming previous studies findings that environmental friendly actions enhance visitor satisfaction (Berezan et al., 2013a; Gao and Mattila, 2014; Kassinis and Soteriou, 2003; Lee and Heo, 2009; Xu and Gursoy, 2015); (2) that hotel environmental practices have a significant influence on guests revisit intention and positive word of mouth (H2a). This result is consistent with previous scholars' findings (Berezan et al., 2013a; Choi et al., 2009; Gao et al., 2016; Gao and Mattila, 2014; Han and Kim, 2010; Kassinis and Soteriou, 2003; Lee et al., 2010; Xu and Gursoy, 2015); furthermore, results show that (3) guests staying in a green hotel develop a favorable loyalty toward this type of hotels (H2b), confirming previous research results (Han et al., 2011; Martínez García de Leaniz et al., 2017; Wang et al., 2018).

Table 5
Model 4 hypotheses statistics (bootstrapping) and endogenous constructs assessment (R^2 and Q^2).

Path coefficients and bootstrapping

Hypothesis		Original Sample	T Statistics	P Values	f^2
H1	Green practices → Guest satisfaction	0.524	9.003	0.000	0.378
H2	Green practices → Guest loyalty towards the hotel	0.168	2.239	0.025	0.046
H3	Green practices → Guest loyalty towards green hotels	0.188	2.137	0.033	0.040
H4	Guest satisfaction → Guest loyalty towards the hotel	0.644	10.958	0.000	0.681
H5	Guest satisfaction → Guest loyalty towards green hotels	0.484	6,174	0.000	0.268

Endogenous constructs assessment

	R^2	R^2 Adjusted	Q^2
Guest loyalty towards the hotel	0.557	0.555	0.479
Guest loyalty towards green hotels	0.365	0.361	0.304
Guest satisfaction	0.274	0.272	0.238

Secondly, the study investigates the role of customer satisfaction as an antecedent of loyalty (e.g. see (Boulding et al., 1993; Lee, 2009; Martínez and Rodríguez del Bosque, 2013)). In line with other studies in the field of green hotels (Gallarza and Saura, 2006; Gao et al., 2016; Prud'homme and Raymond, 2013; Xu and Gursoy, 2015), findings show that (4) guest satisfaction is a determinant factor for guest loyalty towards the hotel (H3a); moreover, results suggest that (5) guest loyalty toward green hotels is significantly influenced by the level of guest satisfaction (H3b), confirming Han and Kim (2010) conclusions.

Finally, the paper investigated the role of overall satisfaction as a mediator between hotel green practices and loyalty, as well as between hotel green practices and loyalty toward green hotels. Mediation was analyzed following the approach provided by Preacher and Hayes (2008). Results indicate that (6) satisfaction acts as a mediator in the structural model, confirming hypothesis H4a and H4b and previous studies findings (Al-Rousan and Abuamoud, 2013; Han and Kim, 2010; Olorunniwo et al., 2006; Osman and Sentosa, 2013; Wilkins et al., 2009; Xu and Gursoy, 2015).

Furthermore, satisfaction mediating for the 66.80% the relationship between hotel environmental practices and loyalty, and for 57.50% between hotel environmental practices and loyalty toward green hotels (Table 6). The meaningful mediation effect played by satisfaction is confirmed by the coefficients of determination for loyalty and loyalty toward green hotels. In fact, Model 4, assuming the mediation role of satisfaction, has a greater predictive power with respect to Model 1 without mediation (Figs. 1 and 2).

The major findings of this research thus offers interesting insight for scholars, tourism practitioners and "green hotels" managers. First, it enriches the literature dealing with sustainability practices in the hospitality industry, guest perceptions and the role of these practices in stimulating consumers to develop positive behavioral intentions and a positive attitude toward green hotels. Findings may also assist hospitality practitioners. Managers when choosing among available strategies to enhance service quality might invest in sustainability practices, since these enhance guest satisfaction and behavioral intentions. Therefore, investing in eco-friendly practices may also bring competitive advantages with respect to competitors, as long as the hotels are able to effectively communicate eco-friendly attributes to customers. Results also show that environmental practices can only partially explain guest overall satisfaction, which is a construct build on several variables of service quality and consumers attitudes (Um et al., 2006). Thus, satisfaction is a multi-attribute construct and it is a crucial mediator for loyalty. In case of a failure in service delivery of non-environmental attributes, satisfaction, and consequently loyalty, may decrease. Therefore, green practices may have a positive effect on satisfaction only as long as there is no service failure (Gao and Mattila, 2014).

The starting point of this study was to analyze the effectiveness of the most widespread eco-label in the Italian hospitality industry (Legambiente Turismo). The research results demonstrate that consumers positively recognize the environmental practices implemented by the hotel, but in most cases, they are not aware of the eco-label program. This highlights a failure in communicating the eco-label certification. In this context, Legambiente should further encourage companies to communicate their environmental commitment. Hotels should inform guests that the eco-label is certified by an independent third party that perform credible audits (Gössling and Buckley, 2016), and this would lead to enhance the credibility of the hotel sustainability actions, also increasing brand recognition and awareness from the public (Berezan et al., 2013a; Han et al., 2011).

Despite the positive contribution to the field of sustainability in hospitality industry, this study is not free of limitation that reveal opportunities for further investigations. The study does not address the way through which environmental practices influence customer satisfaction and loyalty. In this way, further investigation on guests' eco-friendly attitudes and demographic characteristics seems to be necessary in order to fully understand this link. Secondly, to produce generalizable results, the scope of the survey may be extended to other hotels with the same certification and to non-certified hotels. A new line of research may also test the model on hotel awarded with other eco-labels, such as the official Eu-Ecolabel, that represent a reference point at European Union level. It would contribute to evaluate if to a different label correspond a different effect on guest behavior.

Additionally, the analysis may be extended to other hospitality segments, such as restaurants and resorts. Finally, as service quality in hotels is conceived as a multi-criteria construct, it would be compelling to evaluate the simultaneous effect of environmental attributes together with the other service attributes that in literature have been identified as crucial in the hotel industry.

6. Conclusions

This study investigates how consumers perceive actions implemented by hotels towards environmental sustainability. Presenting results of a survey carried out through a questionnaire targeted to guests of an Italian hotel awarded with the Legambiente Turismo eco-label, it hypothesizes that hotel environmental practices positively influence guest overall satisfaction and loyalty. The PLS-SEM analysis leads to accept all the hypothesis tested, showing that the hotels environmental commitment is positively recognized by customers, influencing both satisfaction and loyalty. Moreover, findings suggest that the staying at green hotel lead guests to develop a specific loyalty toward the whole range of eco-friendly hotels. Therefore, guests are more willing to return to a green hotel and to recommend it through positive word of mouth. The study also confirms previous scholars' findings indicating customer satisfaction as having a (partial) mediator role between hotel service attributes and customer loyalty. Finally, the results suggest that hotel practitioners should make further efforts to communicate to guests their commitment toward sustainability, especially when the hotel is awarded with a third party certified eco-label.

Appendix A1 Confirmatory tetrad analysis in PLS-SEM results

ENVPRAT	Original Sample	Bootstrap T Statistics	CI Low adj.	CI Up adj.[1]
envprat,1,10,2,3	0,066	1,694	−0,059	0,191
envprat 1,10,3,2	0,073	2,111	−0,038	0,181
envprat 1,10,2,4	0,130	2,734	−0,023	0,280
envprat 1,2,4,10	−0,012	0,526	−0,085	0,061
envprat 1,10,2,5	0,056	1,604	−0,056	0,167
envprat 1,10,2,6	0,046	1,305	−0,066	0,157
envprat 1,10,2,7	0,070	1,816	−0,053	0,192
envprat 1,10,8,2	−0,070	2,011	−0,180	0,041
envprat 1,10,9,2	0,011	0,245	−0,133	0,153
envprat 1,10,6,3	−0,030	0,710	−0,167	0,107
envprat 1,10,3,7	0,069	1,776	−0,056	0,191
envprat 1,10,8,3	−0,061	1,816	−0,167	0,046

τ**envprat** 1,10,5,4	0,045	1,297	−0,066	0,154
τ**envprat** 1,10,4,6	0,080	2,021	−0,048	0,206
τ**envprat** 1,10,7,4	0,039	0,909	−0,097	0,174
τ**envprat** 1,10,8,4	−0,025	0,811	−0,120	0,072
τ**envprat** 1,5,7,10	−0,018	0,652	−0,107	0,072
τ**envprat** 1,10,5,9	−0,011	0,351	−0,113	0,090
τ**envprat** 1,5,9,10	0,014	0,389	−0,102	0,131
τ**envprat** 1,10,8,6	0,064	1,282	−0,095	0,223
τ**envprat** 1,10,9,7	0,099	2,000	−0,060	0,256
τ**envprat** 1,2,3,6	0,007	0,251	−0,079	0,091
τ**envprat** 1,5,6,2	−0,024	0,898	−0,107	0,061
τ**envprat** 1,3,5,8	−0,007	0,146	−0,160	0,147
τ**envprat** 1,3,9,6	−0,035	0,852	−0,168	0,097
τ**envprat** 1,4,6,7	−0,045	0,927	−0,200	0,111
τ**envprat** 1,5,8,7	0,022	0,435	−0,136	0,180
τ**envprat** 1,5,9,7	0,013	0,243	−0,161	0,186
τ**envprat** 1,6,9,8	0,045	0,813	−0,133	0,221
τ**envprat** 10,2,8,4	−0,155	2,694	−0,337	0,030
τ**envprat** 10,4,7,3	−0,118	1,923	−0,314	0,078
τ**envprat** 10,3,8,9	0,058	1,121	−0,108	0,224
τ**envprat** 10,5,8,6	−0,069	1,154	−0,259	0,123
τ**envprat** 2,3,9,4	−0,032	0,999	−0,133	0,070
τ**envprat** 3,4,5,6	0,132	1,743	−0,110	0,373

[1]Adjustment of the 5% bias corrected bootstrap (two-tailed) confidence interval (CI) limits uses the Bonferroni method to account for multiple testing issues.

CTA-PLS analyzes the specification of indicators in a measurement model by calculating the difference between the product of a pair of covariances and the product of another pair of covariances (tetrad), which is successively done for every possible combination of two pairs of indicators in a measurement model. A vanishing tetrad equals zero. In reflective measurement models, all the model-implied nonredundant tetrads are expected to vanish (Gudergan et al., 2008). Table x presents the residual values of the model-implied nonredundant vanishing tetrads per construct. As indicated by the bootstrap t-value, some of these values are significantly different from zero. However, the CTA-PLS measurement model assessment requires testing if tetrads are significantly different from zero when all the hypotheses (tetrads) are simultaneously analyzed. For these multiple hypotheses testing purpose, we draw on the Bonferroni adjusted confidence intervals. If a reported confidence interval includes zero, the tetrad is not significantly different from zero and, thus, vanishes. Because all the tetrads of the constructs vanish (i.e., they are not significantly different from zero), we cannot reject the reflective direction of relationships in these measurement models.

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