The Influence of Sustainable Initiatives on Hotel Guest Experience

Megan J. Sharrock*

Faculty of International Hotel Management, Stenden South Africa, Port Alfred, Eastern Cape, South Africa, Email, megan.sharrock@nhlstenden.com

Miemie W. Struwig

Department of Business Management, Nelson Mandela University, Port Elizabeth, Eastern Cape, South Africa, Email, miemie.struwig@mandela.ac.za

Wouter Hensens

Faculty of International Hotel Management, Stenden South Africa, Port Alfred, Eastern Cape, South Africa, Email, wouter.hensens@nhlstenden.com

*Corresponding Author

Abstract

This study investigates the relationship between sustainable initiatives in hotels and their guest experiences by using big data from online guest reviews. Hotel review data of 1 018 938 hotel guest reviews from 23 international destinations were used. Word recognition software was utilised to filter reviews containing comments about sustainable initiatives resulting in a usable database of 903 reviews. Sentiment analysis was then performed to enable the transformation of the variables into 5-point Likert type scales. Using chi-squared tests and Cramer's *V* for statistical and practical significance respectively, sustainable initiatives were found to have a statistical significant relationship with each of the eight hotel experience dimensions as well as overall hotel experience. The eight hotel experience dimensions are value, service, location, rooms, food, ambience, facilities and cleanliness. The hypothesis was accepted as there was a statistically significant relationship between sustainable initiatives and the hotel experience dimensions. The results from the comments, provide hotel management and academics with new insight into the relationship between sustainable initiatives in hotels and the hotel guest experience. Sustainable initiatives should be considered as another important dimension of the hotel experience, and big data analysis is effective to analyse guest reviews.

Keywords: Sustainable initiatives, hotel experience dimensions, corporate social responsibility, sustainability, hotel online reviews

Introduction

It is important for hoteliers to understand all elements of the guest's hotel experience so that they can have a better understanding of what guests value in a hotel stay. In addition, hoteliers need to ensure that guest expectations are met to achieve guest satisfaction (Kotler, Bowen & Makens, 2006; Lovelock & Wirtz, 2004; Zeithaml & Bitner, 2000; Zeithaml, Bitner & Gremler, 2018). The hotel experience can be better understood by using guest feedback, which before social media, mostly relied on post-stay guest satisfaction and mystery guest surveys (Hensens, 2010; Wohl, 2012). Online guest reviews have added a new component to this system by providing hotels with a different user-friendly way of mining guest experience data from Internet sources such as TripAdviser and Yelp (Hensens, 2010; Wohl, 2012).

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Markovic and Raspor (2010) as well as Abbasi, Khalid, Azam and Riaz (2012) revealed that reliability is commonly seen as the most important quality indicator for guests, meaning that their satisfaction largely depends on staff sensitivity towards them, employee competence, prompt service and convenient operating hours. Khan (2017) as well as Limberger, Anjos, de Souza Meira and Anjos (2014) found that rooms and staff service were two of the most important dimensions of the hotel experience in relation to guest satisfaction ratings on online review platforms such as TripAdvisor and Expedia.

There is some research that implies a link between hotel environmental practices and their impact on the guest's hotel experience. For example, Berezan, Millar and Raab (2014) and Gao and Mattila (2014) found that hotel guests expressed high satisfaction levels when experiencing green initiatives such as hotel recycling policies and towel reuse systems. According to Garrick (2015) and Zipkin (2015), Corporate Social Responsibility (CSR) or sustainable efforts within hotels are on the rise. This involves the ethical and non-profit considerations that benefit society. Many hotels promote their sustainable efforts with larger groups competing for the 'most sustainable' recognition (Bruns-Smith, Choy, Chong & Verma, 2015). In 2009, Hilton Worldwide set a goal to reduce waste by 20% and water by 10%, and in their 2013 CSR report, they proved that this had been exceeded. While hotels have adopted CSR, the impact that this has had on guest experiences and guest satisfaction has not been adequately assessed or researched.

Bruns-Smith et al. (2015) refer to studies that have alluded to a positive relationship between hotel sustainable initiatives and guest experiences, but they remain unsure about the definite connection between sustainable initiatives and improved guest experiences. Liu, Wong, Shi, Chu and Brock (2014:187) and Martínez, Pérez and del Bosque (2014:276) conducted short studies that showed a link between brand loyalty and CSR initiatives in hotels, while Gao and Mattila (2014:27) as well as Liu and Mattila (2016:582) found that green initiatives or loyalty programmes positively enhanced guest experience. Berezan, Raab, Yoo and Love (2013:231) also found that sustainable efforts had a positive impact on some guests' experiences depending on their nationalities, while Peiró-Signes, Segarra-Oña, Verma, Mondéjar-Jiménez and Vargas-Vargas (2014:48) found that environmental certification had a positive impact on guest experience, but mainly in four-star hotels.

Porter and Kramer (2002) developed the theory of strategic corporate philanthropy, which aimed to improve both community and business goals so that both parties might benefit from the strategy. According to Porter and Kramer (2002), the original aim of this new paradigm was to address value creation that results from clustering of partners and tracking of project results. Porter and Kramer (2002) implied that strategic corporate philanthropy could create a competitive advantage for a business because of the shared benefits. Thus, the term was later developed into what is known as 'shared values' (Porter and Kramer, 2006). Although many hotels are implementing CSR or sustainable initiatives, the programmes are often more in line with the all-encompassing term, 'shared values' (Porter & Kramer, 2011). Shared value expresses sustainability from a different and more positive perspective in so far as it focuses on maintaining profits while also benefiting society (Porter & Kramer, 2011).

A preliminary theoretical review about the link between sustainable initiatives and the hotel experience showed that the number of publications as well as size of their data sets, was limited to specific, isolated case studies (Accor, 2015; Bender,2012; Berezan et al.,2013; Davies, 2013; Gao & Mattila, 2014; Liu & Mattila,2016; Liu et al., 2014; Martínez et al.,2014; Peiró-Signes et al., 2014; Zhao, 2014). Based on this overview, it was found that an increasing number of hotel guests were expecting to see sustainable practice initiatives in hotels. As a result, this expectation could have a positive, negative or neutral impact on the

experience according to Zeithaml et al.'s (2018) zone of tolerance theory. However, studies of this nature have been limited. The objective of this study was to evaluate the relationship between sustainable initiatives and hotel experiences. The key research question was: "Is there a relationship between sustainable initiatives and the hotel experience?" This research provided a theoretical framework to investigate the relationship of sustainable initiatives with the hotel experience by using online guest reviews. This would contribute to new knowledge in the theoretical field of sustainable initiatives and hotel experiences. Areas of sustainable initiatives that were commented on by hotel guests would be identified and discussed to further contribute to the theory on sustainable initiatives and hotel experiences. The methodology followed in this study could be an example for future studies using large data sets of online reviews. This paper includes an overview of the available literature, the research design, the results and final conclusions with recommendations.

Literature overview

The hotel experience, combined with expectations, leads to perceived service quality (Zeithaml & Bitner, 2000; Zeithaml et al., 2018). If a hotel guest's perception of quality is higher than expected or even surprisingly higher, then this will lead to a positive experience. If expectations are only slightly exceeded or merely met, then the guest is satisfied and has a neutral experience within the zone of tolerance. If the perceived level of service is lower than what was expected, then the guest will have a negative experience. Various elements of a guest's stay in a hotel are more frequently commented on in online reviews about hotel experiences. Hargreaves (2015:208), Khan (2017: 16-19), Ko (2018:5,9), Limberger et al. (2014:63) and Olery (2019) identified that the eight core hotel experience dimensions are value, service, location, rooms, food, ambience, facilities and cleanliness.

Sustainability for organizations is referred to as the ability of those organizations to adapt to the needs of current society, without negatively impacting the needs of future society (Giardina, 2020:314). Sustainable initiatives are defined as those that create best value for all stakeholders, while focusing on improving environmental and social areas relative to the environmental or social impact that an organization may have (Whelan & Fink, 2016). Larger hotel groups such as Accor and InterContinental Hotel Group are beginning to incorporate sustainable initiatives into their strategies to benefit themselves as well as society and other stakeholders such as employees (Bruns-Smith et al., 2015; Garrick, 2015; Liu et al., 2014; Martínez & del Bosque, 2013; Martínez et al., 2014). Susskind (2014:9) found that 30% of guests would chose to stay in hotels committed to sustainable initiatives, while 45% of the same respondent group expressed their willingness to pay higher room rates to stay in sustainable hotels. Barber (2014:379) and Molina-Azorín, Claver-Cortés, Pereira-Moliner and Tarí (2009) recommended green initiatives as being a competitive advantage for any hotel. Giardina (2020:322) and Martínez and del Bosque (2013:97) and Martínez et al. (2014:276) support the idea that customers are more likely to be loyal to a brand or property that is supporting CSR or sustainable initiatives. Sucheran and Moodley (2019:13) found that over 50% of hotel guests prefer hotels that have environmental accreditations. They noted that few travellers believe that sustainable initiatives in hotels compromise luxury or general comfort. However, those guests that were interviewed felt that restricted use of air-conditioners, low-flow showers and taps could reduce their satisfaction levels. They would however prefer to see the use of environmentally friendly products in hotels.

Chen (2015:264-265) further noted that simple sustainable initiatives such as recycling, locally-grown and organic products as well as energy-efficient lighting had an impact on guest decisions to stay in eco-friendly hotels. There are some theorists who believe that the hotel experience can improve as a result of CSR or sustainable initiatives in hotels

(Bruns-Smith et al., 2015). Berezan et al. (2014:13) and Kucukusta, Mak and Chan (2013:27) found that hotel recycling policies lead to an increase in positive hotel experiences based on higher satisfaction levels. Gao and Mattila (2014:26) found that CSR initiatives in hotels could enhance or improve the hotel experience, but only if there were already high levels of comfort, warmth and employee competence. One of Accor's (2015) key findings was that hotels with sustainable certification such as International Standards Organisation (ISO) 14001 yielded higher guest satisfaction rates. In a study conducted by Zhao (2014), more than 800 online surveys and social media questionnaires from tourists who stayed in Chinese hotels between 2012 and 2013, were analysed in terms of the importance that they placed on sustainable initiatives in hotels. In this study of Chinese hotels, Zhao (2014) found that the large majority of hotels with higher guest satisfaction ratings were also those with more advanced CSR strategies.

However, these studies are limited in their sample size and method of data collection as the majority of the studies relied on questionnaires, surveys and interviews, which encourage respondents to take time to think about answers to questions. However, if online guest reviews are used for further research about similar topics, it can be assumed that their answers are completely honest and unbiased. Another limitation of the existing body of knowledge relates to the geographical spread of hotels that were analysed. The areas covered in the relevant studies, which focused on aspects of sustainable initiatives in hotels, included Spain, Mexico, Germany, United States and China. In this literature overview, it was found that an increasing number of hotel guests were expecting to see sustainable practice initiatives in hotels. As a result, this expectation could have a positive, negative or neutral impact on the experience according to Zeithaml et al.'s (2018) zone of tolerance theory. The hotel experience can be measured by the eight experience dimensions identified in this literature overview as value, service, location, rooms, food, ambience, facilities and cleanliness. The findings from the literature overview have been combined to create a theoretical framework for this study, which is illustrated in Figure 1.
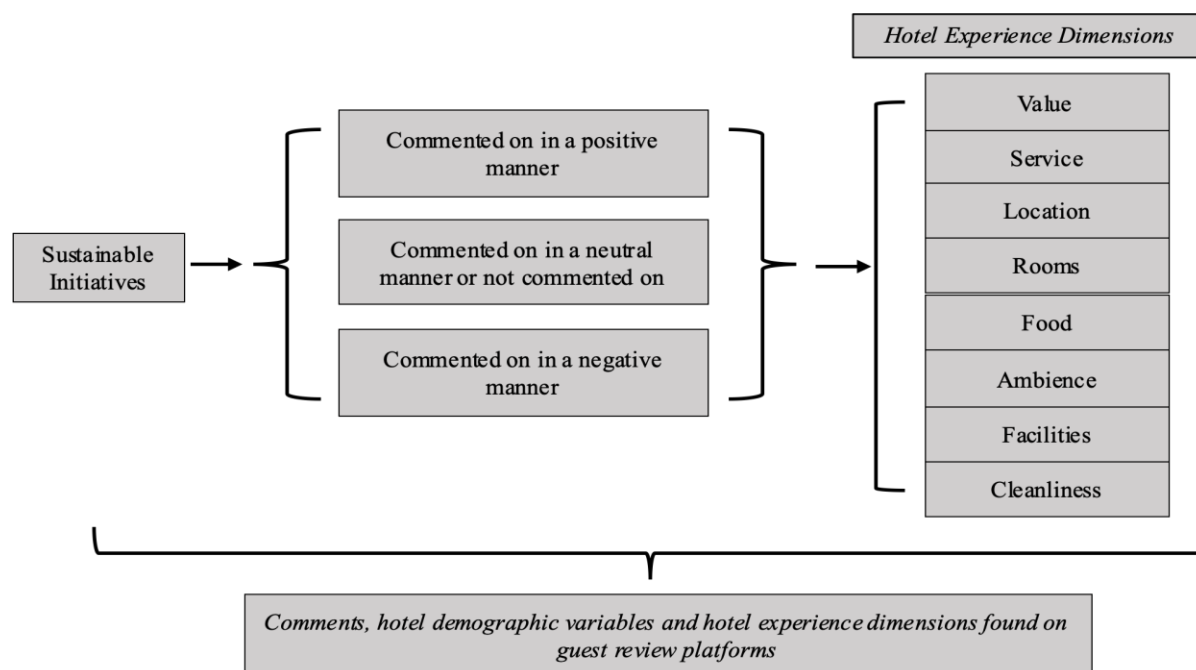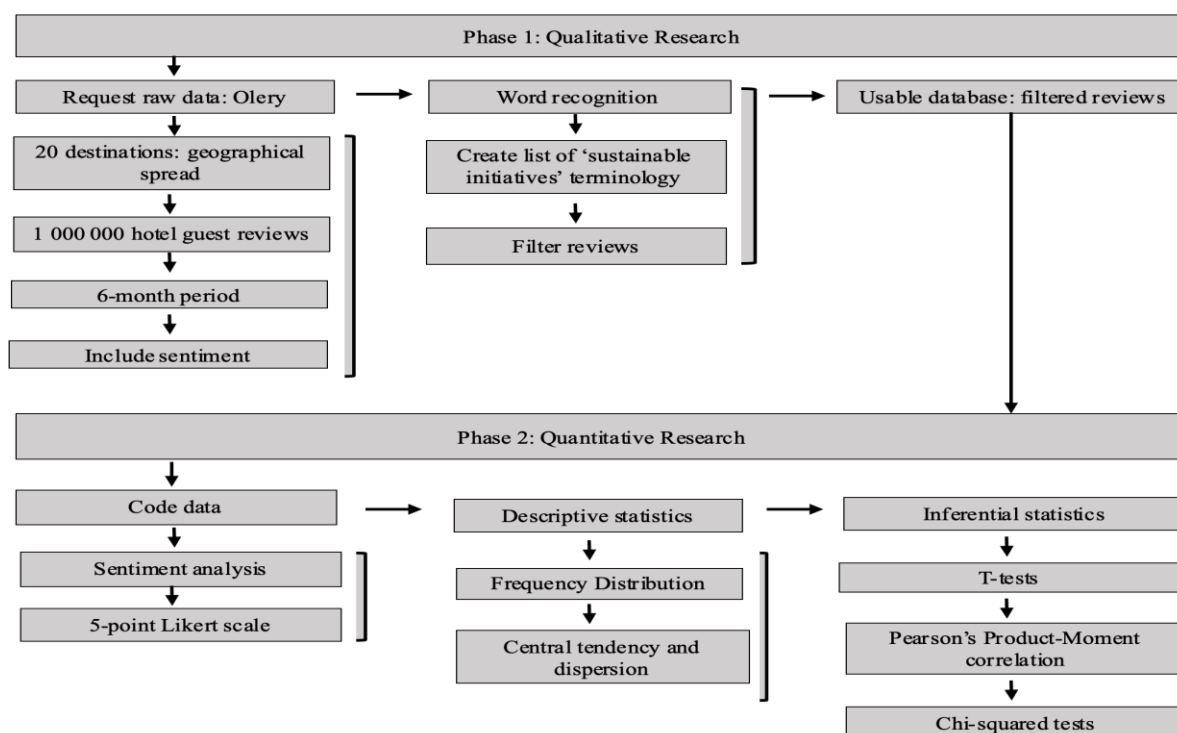

Source: Author's own model
Figure 1: Theoretical framework

The theoretical framework in Figure 1 shows that the overall hotel experience could potentially be affected by sustainable practice initiatives in hotels, leading to a more positive, neutral or even negative hotel experience. Online guest reviews revealed that the hotel experience was determined by eight dimensions, which include value, service, location, rooms, food, ambience, facilities and cleanliness. The theoretical framework shows that the primary objective of the research was to determine if there is a relationship between sustainable initiatives and the hotel experience dimensions. As a result, the following hypothesis is proposed:

> H_1 There is a direct relationship between sustainable practice initiatives in hotels and the eight identified hotel experience dimensions.

Research method

As big data in research is a relatively new phenomenon, research designs for the analysis of big data are still limited. Studies that involve big data analysis require creativity in their approaches because researchers need to filter data in a way that provides meaningful and usable information. Ideally, the data is filtered into 'light' and 'dark' areas. The 'light' areas are those that can be used for further analysis and the 'dark' areas are those that are irrelevant for the study in question (Lugmayr, Stockleben, Scheib & Mailaparampil, 2017:197). The research design that was adopted for this study filtered 'light' areas of data to be further analysed. The researchers chose to use mixed methods so that qualitative information could be filtered into a usable database, which could then be quantitatively coded to create information that could be statistically analysed. Thus, quantitative results produced the final outcomes that addressed the hypothesis presented in Figure 2. Figure 2 shows the two phases of the research design, which was made up of word recognition for the qualitative analysis and coding as well as descriptive and inferential statistics for the quantitative analysis.
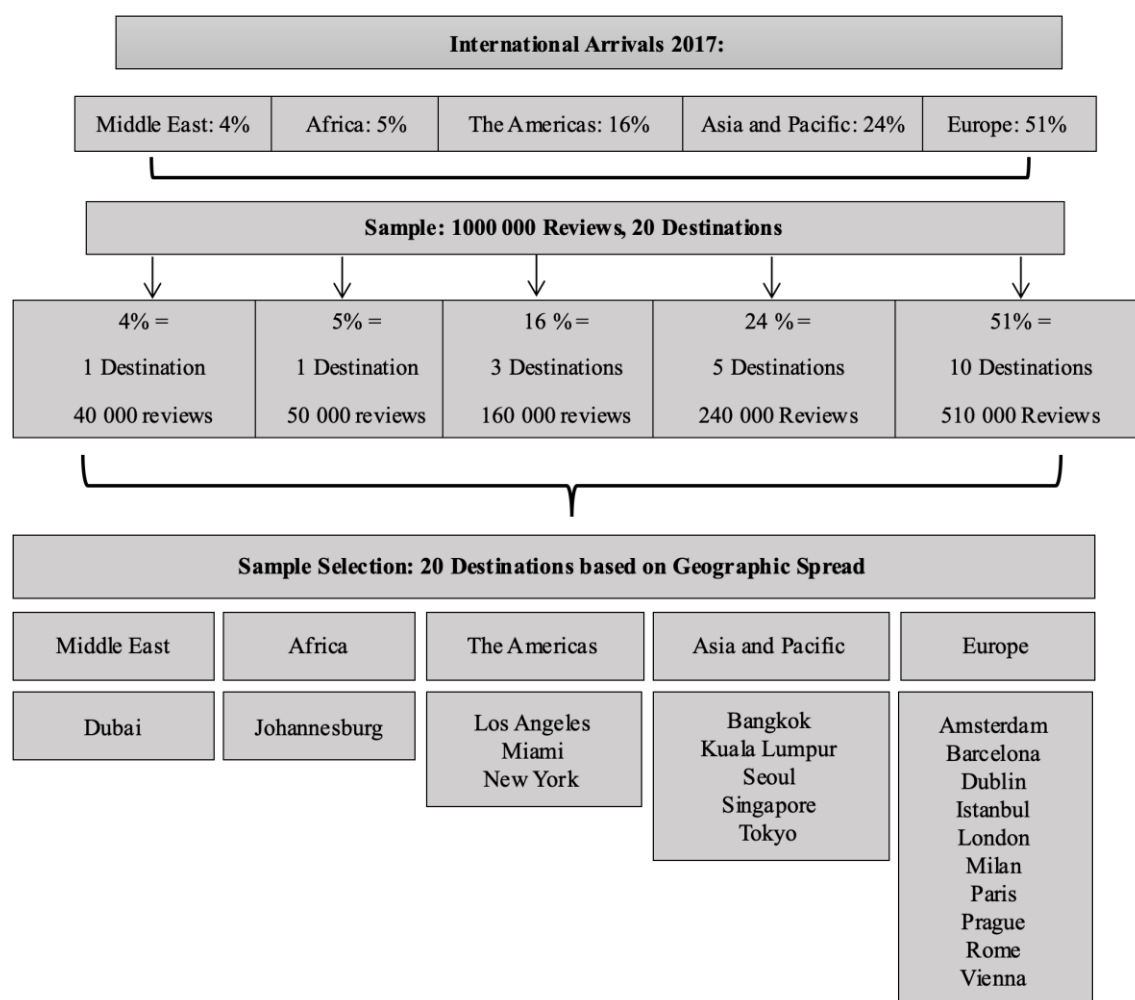

Source: Author's own model
Figure 2: Proposed research design

Figure 2 outlines the research design for the study. As the design involved qualitative analysis followed by quantitative analysis, it was divided into a two-phase approach. The first phase consisted of a qualitative approach using three steps to create a usable database for the second phase. This was done through word recognition in which reviews containing content about sustainable initiatives were filtered. The second phase of the research was quantitative in nature and consisted of coding of data and data analysis using descriptive and inferential statistics. The population represented in this study consisted of all travellers who had stayed in hotels. A sample of 1000 000 reviews was requested for this study, however, based on slight adjustments in the collation of data from Olery, a final sample of 1 018 938 reviews was drawn. The targeted population for this study did not have geographical boundaries, nor could it be entirely quantified owing to its vast nature. For this reason, a stratified random sampling method was adopted. The researcher used a sample frame that categorised the hotel guest reviews (reviewers) according to the destinations allocated for the sampling process. The sample frame was based on international arrivals. This selection can be seen in figure 3.

International Arrivals 2017:

| Middle East: 4% | Africa: 5% | The Americas: 16% | Asia and Pacific: 24% | Europe: 51% |

Sample: 1000 000 Reviews, 20 Destinations

4% =	5% =	16 % =	24 % =	51% =
1 Destination	1 Destination	3 Destinations	5 Destinations	10 Destinations
40 000 reviews	50 000 reviews	160 000 reviews	240 000 Reviews	510 000 Reviews

Sample Selection: 20 Destinations based on Geographic Spread

| Middle East | Africa | The Americas | Asia and Pacific | Europe |
| Dubai | Johannesburg | Los Angeles Miami New York | Bangkok Kuala Lumpur Seoul Singapore Tokyo | Amsterdam Barcelona Dublin Istanbul London Milan Paris Prague Rome Vienna |

Source: Author's own model
Figure 3: Stratified random sampling: Geographical spread

Figure 3 shows that the researcher used stratified random sampling to build a sample that would give a fair representation of global travellers who had stayed in hotels. The destination cities in figure 3 were initially selected for the study based on the list of most visited destinations in the world as presented by Millington (2017). Olery, the online data specialist,

was unable to provide the full sample for Johannesburg and therefore provided reviews from not only Johannesburg, but also Cape Town, Durban and Cairo to make up the requested 50 000 reviews for the selected time period.

Phase 1: Qualitative database creation

The researcher collected the data by means of online reviews of hotel guests. The initial data for this study was received in its 'raw' form, and included 1 018 938 online hotel guest reviews, in which the hotel guests were anonymous, and the eight hotel experience variables were presented in this data. 'Raw' data refers to information that has been collected, but not yet analysed in any way (Lavrakas, 2008). As the study also required reviews to show whether or not hotel guests were commenting on sustainable initiatives, the data needed to be filtered to identify reviews including words that related to sustainable initiatives. Therefore, a list of words relating to sustainable initiatives was compiled for the process of word recognition. The list of words was created using all relevant research conducted for the literature overview. To create a list that would lead to an accurate word recognition process, the researcher initially requested two sets of data files from Olery for a pilot, with approximately 7 000 reviews in each from Amsterdam and Dubai over the month of July 2017. The initial list of words that was created based on the relevant literature was tested on the pilot data files using the 'find' function in Excel. After this process, certain words had to be eliminated owing to their ambiguous nature. For example, to a hotel guest, the word 'green' not only represents environmental practices, but it also represents the colour of paint or the colour of a garden. Using trial and error with the original sets, allowed the researcher to refine the word recognition list, which includes words that relate to sustainable practice initiatives in hotels as commented on by hotel guests. These words were used to filter raw data into a database of reviews that included sustainable initiatives in their comments. This was done within each destination sub-set.

Online hotel guest reviews are qualitative in nature as they include uploaded sentences pertaining to guest experiences in hotels. Hence, the initial raw data file received by the researcher included qualitative information. Within this file, guest reviews were already divided according to their positive, neutral or negative sentiment as presented by Olery. Sentiment analysis processes guest reviews in a way that allows the researcher to determine whether a response to a product or service is positive, negative or neutral (Lamont, 2013:20). Sentiment analysis uses text analysis to gain results and this involves analytical methods that are statistical and linguistic in nature (Lamont, 2013:20). Negative, positive and neutral words or word groupings are identified and then grouped as such. For example, if an online review uses the words 'hate', 'disappointing' and 'frustrating' in a review, these would give the review a negative sentiment. After each destination had been filtered according to the word recognition, the researcher filtered the reviews according to sentiment. For example, if there were comments in the positive and negative review columns, then the researcher would delete those that did not relate to sustainable initiatives. The researcher chose to do so to eliminate any errors in the automated sentiment analysis. One error was picked up during the research trial with data from Amsterdam in which a 'sustainable initiatives' review was found in a neutral column, but it was, in fact, commented on in a negative way. After the word recognition for the full study had been completed and the sentiment refined, a usable database was created using the first phase of the research design, which included the receiving of raw data from Olery, and the division of that data according to positive, neutral and negative sentiments. Sustainable initiative word recognition was then used for data filtering. Once the database was finalised, the researcher was able to code the information for the second phase of the research using a 5-point Likert scale.

Phase 2: Quantitative analysis

A 5-point Likert scale was used to code the qualitative data from Phase 1 of the research. The independent variable was the 'sustainable practice' experience in a hotel as commented on by the guest and each comment was divided into positive, neutral or negative sentiments. Originally, a Likert scale was developed to rate respondent answers in relation to their degree of agreement or disagreement with a statement (Sullivan & Artino, 2013:541). For the purpose of this study, a 5-point Likert scale was used to further code the sentiment of a review. In the original data set, reviews were provided under three columns, namely, good, general or bad reviews, which translated to positive, neutral or negative reviews. However, to determine the degree to which the review was positive or negative, a 5-point Likert scale was used to code the sentiment of the hotel experience as commented on in a review. The interval for reviews that were very negative fell between 1.00 and 1.79, the interval for negative reviews was between 1.80 and 1.59, while the interval for neutral reviews fell between 2.60 and 3.40. The interval for reviews that were positive was between 3.41 and 4.20 and the interval for very positive reviews fell between 4.21 and 5.00. Three intervals for negative, neutral and positive sentiment, were categorised as 1.00 to 2.59, 2.60 to 3.40 and 3.41 to 5.00 respectively.

Not only was this coding completed for the sustainable practice comments, but it was also completed for each of the existing dimensions of hotel experience as indicated in the data set. These hotel experience dimensions, provided by Olery in the initial data file, included value, rooms, location, food, cleanliness, service, facilities and ambience. Central tendency and dispersion were used to show the mean and median of the set of values within a category as well as the standard deviation within that same set of values. To make inferences about how a group compared with regard to selected factors, t-tests were performed. These one-sample t-tests were used to determine p values for the Cohen's d level of significance as suggested by Gravetter and Wallnau (2009:264). The interpretation intervals for Cohen's d were used to determine level of significance for the study. The guidelines for the level of significance were based on the one-sample t-tests computed for this study. If the p value was less than 0.20, then the outcome was not significant, if the p value was between 0.20 and 0.49, then the level of significance was small and if the p value was between 0.50 and 0.79, then the level of significance was medium. P values above 0.80 represented a large level of significance.

Pearson's product-moment correlations are concerned with the association between variables. The correlation coefficient measures the strength and the direction of the linear relationship between the variables (Collis & Hussey, 2014:270; Gray, 2017:638). The correlation coefficient is measured within a range of +1 to -1, where + 1 represents a perfect positive correlation and -1 represents a perfect negative correlation. Additionally, the direction of the correlation is positive when both variables increase together, and it is negative when one increases and the other variable decreases (Collis & Hussey, 2014: 270). The Pearson's r value was also calculated. For the purpose of this study, an r value that was >=,300 showed statistically and practically significant correlations between some of the hotel experience dimensions and sustainable initiatives. Chi-square tests were used with each of the demographic items to determine whether there was a relationship between the variables. Cramér's *V* statistics were obtained for the items where significant p-values were indicated to test whether sample differences were big enough to have real meaning. Finally, Cronbach's Alpha was calculated to determine the reliability (internal consistency) of the hotel experience variables. An Alpha of 0.63 was observed, which, according to the acceptable level between 0.50 and 0.69, can be regarded as evidence of acceptable reliability (Pietersen

& Maree, 2016). The interpretation intervals for Cronbach's Alphas were used to evaluate the results.

Credibility, transferability and ethical concerns

The process of data collection was reviewed by two reviewers to ensure credibility of the data used for the study. Triangulation was used to support credibility for this study, which involves multiple methods of data collection to support the findings of a study (Saunders, Lewis & Thornhill, 2011:146; Verhoeven, 2011:154). In this study, outcomes from other theoretical studies as well as data from Olery were used to support the findings. The literature used various studies to support the idea that there were potential relationships between hotel demographic variables, sustainable initiatives and hotel experience dimensions, while the results drawn related to these relationships based on data provided by Olery. Data triangulation refers to the collection of data relating to the same phenomenon from different data sources (Korstjens & Moser, 2017:121-122). Data collected through Olery for this study came from more than ten different online review platforms. Furthermore, data triangulation refers to the use of different data sets throughout the analysis of the study, which could include raw material, codes and theoretical saturation (Korstjens & Moser, 2017:122). Although the same data was used for the qualitative and quantitative phases of this study, that data was used in its raw form for Phase 1 (qualitative) and in its coded form (quantitative). Transferability ensures that qualitative research results can be transferred to other or broader contexts. Transferability is usually ensured by involving a potential user to describe elements of behaviour or experiences within a context so that the behaviour or experiences may become relevant to those outside the study (Korstjens & Moser, 2017:121-122). Transferability for this study was achieved owing to the nature of online reviews and how they were posted.

Online review platforms allow reviewers the opportunity to post their comments about a hotel experience without being guided with specific questions that need to be answered. In this way, their opinions are completely honest and unbiased. According to Hensens (2015), Hu (2014) and UNWTO (2014) travellers who have access to the Internet are likely to use guest reviews and review star ratings to determine where they will stay. This shows that the information provided in online reviews is inherently transferable as all other potential travellers are using the information provided to make their own decisions about what they would like to experience and where.

Results

This section outlines the results of the demographic profile of the sample description and then the descriptive statistics are presented. Thereafter, reliability and credibility are discussed, followed by the results from the inferenial statistics.

Demographic profile of the sample

The initial raw sample of data that was requested from Olery in 2018, and included a total of 1 018 938 guest reviews from 23 destinations and 12 online review platforms. Three African cities were added by Olery to the original destination list owing to the lack of reviews available from Johannesburg. The added cities included Cape Town, Durban and Cairo. For the qualitative phase of this study, the sample size was, therefore, 1 018 938. Of these reviews, 903 usable reviews were identified as those including comments related to sustainable practice in the hotels. Therefore, of the original raw reviews, 0.09% were identified as those that included comments about sustainable initiatives based on the word recognition.

Once the quantitative sample of 903 reviews had been recognised, the sentiment of the reviews was coded using a 5-point Likert scale as illustrated in Table 1.

Descriptive Statistics – Measurement Variables

Table 1 provides the frequency distribution of sustainable initiatives and the hotel experience dimensions. These variables were measured according to the 5-point Likert scale that rated each hotel guest's review within the sample between the first interval of 1.00 to 1.79 (very negative) and the fifth interval of 4.20 to 5.00 (very positive). The overall experience (hotel experience), as reviewed by the hotel guests (reviewers) in the sample, is also included in Table 1.

Table 1: Frequency distribution: Measurement variables hotel experience dimensions and sustainable initiatives

Variable	Very Negative 1		Negative 2		Neutral 3		Positive 4		Very Positive 5		Total	
Sustainable Initiatives	107	12%	165	18%	148	16%	276	31%	207	23%	903	100%
Value	9	1%	17	2%	723	91%	24	3%	21	3%	794	100%
Rooms	49	6%	85	11%	355	45%	172	22%	133	17%	794	100%
Location	6	1%	8	1%	497	63%	126	16%	157	20%	794	100%
Food	22	3%	23	3%	535	67%	79	10%	135	17%	794	100%
Cleanliness	21	3%	26	3%	611	77%	98	12%	38	5%	794	100%
Service	35	4%	38	5%	371	47%	117	15%	233	29%	794	100%
Facilities	22	3%	24	3%	627	79%	53	7%	68	9%	794	100%
Ambience	3	0%	6	1%	727	92%	29	4%	29	4%	794	100%
Hotel Experience	0	0%	43	5%	458	58%	284	36%	9	1%	794	100%

(n=903: Sustainable initiatives; n=794: Hotel experience dimensions)

The descriptive statistics in Table 1 revealed that the highest frequencies of reviews for the eight hotel experience dimensions fell within the neutral sentiment interval of 2,60 to 3,40. The highest frequency for reviews that commented on sustainable initiatives, fell within the positive sentiment interval of 3,41 to 4,20. This initially suggested that reviewers were more likely to comment on sustainable initiatives in a positive manner. However, with a high standard deviation of 1,33, the mean score suggested slightly different outcomes. The mean scores for comments about service and location fell within the positive sentiment interval between 3,41 and 4,20, while sustainable initiatives and the remaining six hotel experience dimensions had mean scores that fell within the neutral sentiment interval of 2,60 to 3,40. This suggested that, on average, reviewers were more likely to comment on service and location in a positive manner.

In Table 2, central tendency and dispersion were measured for sustainable initiatives, the eight hotel experience dimensions and for overall hotel experience.

Table 2: Central tendency and dispersion: measurement variables

Variable	n	Mean	S.D.	Minimum	Quartile 1	Median	Quartile 3	Maximum
Sustainable Initiatives	903	3,34	1,33	1,00	2,00	4,00	4,00	5,00
Value	794	3,04	0,45	1,00	3,00	3,00	3,00	5,00
Rooms	794	3,32	1,07	1,00	3,00	3,00	4,00	5,00
Location	794	3,53	0,84	1,00	3,00	3,00	4,00	5,00
Food	794	3,36	0,89	1,00	3,00	3,00	4,00	5,00
Cleanliness	794	3,13	0,66	1,00	3,00	3,00	3,00	5,00
Service	794	3,60	1,09	1,00	3,00	3,00	5,00	5,00
Facilities	794	3,15	0,73	1,00	3,00	3,00	3,00	5,00
Ambience	794	3,09	0,44	1,00	3,00	3,00	3,00	5,00
Hotel Experience	794	3,28	0,43	2,00	3,00	3,25	3,63	4,38

(n=903: Sustainable initiatives; n=794: Hotel Experience Dimensions)

Using central tendency and dispersion (see Table 2), comments that included location or service experience dimensions produced mean scores that fell within the positive sentiment interval between 3,41 and 4,20. The remaining six hotel experience dimensions had mean scores that fell within the neutral sentiment interval of 2,60 to 3,40. When considered separately, sustainable practice comments also revealed mean scores that fell within the neutral sentiment interval. This suggested that, on average, reviewers were more likely to comment on sustainable initiatives in a neutral manner and service and location were more likely to be commented on in a positive manner.

Reliability and validity of the data

Before inferential statistics were used, reliability tests were conducted to ensure that measurement of variables included minimal or no errors. Cronbach's Alpha was used to test for reliability because of its ability to determine internal consistency for a test or scale. It is a tool that enables the researcher to establish that the elements of the test measure the same concept, which is necessary before the data can be used for further research to ensure credibility or validity (Tavakol, 2011: 53). For the purpose of this study, Cronbach's Alpha was used to determine reliability (internal consistency) because of the qualitative database that needed to be quantitatively analysed in the second phase of the research. Reliability was presented in the form of Cronbach's Alpha values. The Alpha score for dependent variables of this study was 0,63, hence the researcher was able to continue with inferential statistics analysis as per the level of acceptability being between 0.50 and 0.69 (Pietersen & Maree, 2016). Inferential ranking tables were drawn up using match-paired t-tests (statistical significance) together with Cohen's d (practical significance). To ensure validity of the data, two independent reviewers checked the data and concluded that it measured what it was supposed to measure.

Inferential ranking of the hotel experience

Match-paired t-tests (statistical significance) together with Cohen's d (practical significance) were combined to rank the hotel experience dimensions in terms of importance to the reviewers. The consolidated inferential ranking for hotel experience dimensions across all hotel demographic variables was presented. The results determined that service and location had the highest level of practical and statistical significance, with mean values above 3,5. This reveals that service and location were the most important hotel experience dimensions for hotel guests (reviewers) who mentioned sustainable initiatives in their comments.

Pearson's product-moment correlation

Pearson's product-moment correlations are concerned with the association between variables. The correlation coefficient measures the strength and the direction of the linear relationship between the variables (Collis & Hussey, 2014:270; Gray, 2017:638). The correlation coefficient is measured within a range of +1 to -1, where + 1 represents a perfect positive correlation and -1 represents a perfect negative correlation. Additionally, the direction of the correlation is positive when both variables increase together, and it is negative when one increases and the other variable decreases (Collis & Hussey, 2014: 270). The product-moment correlations for the hotel experience dimensions as per Pearson's model are shown in Table 3.

Table 3: Pearson's product-moment correlations for sustainable initiatives and hotel experience dimensions

Hotel Experience Dimension	Practical Significance (>=.300)
Value	.221
Rooms	*.371*

Hotel Experience Dimension	Practical Significance (>=.300)
Location	-.053
Food	*.352*
Cleanliness	.223
Service	*.444*
Facilities	.238
Ambience	-.071
Hotel Experience	*.456*

Table 3 shows that the correlation between sustainable initiatives and the hotel experience dimensions was investigated using Pearson's product-moment correlations. The results were presented in Table 3 and it was evident that, with Pearson's correlations coefficients above 0.300, there were medium positive correlations between sustainable initiatives and rooms, sustainable initiatives and food as well as sustainable initiatives and service. The highest correlation was between sustainable initiatives and the overall hotel experience (r = 0,456).

Testing the hypothesis by means of chi-square

To further test the relationship between sustainable initiatives and the hotel experience dimensions, chi-squared tests, combined with Cramer's *V* were calculated to test for statistical and practical significance. Table 4 represents the hotel experience dimensions relationships with sustainable initiatives.

Table 4: Chi-square results of hotel experience dimensions and sustainable initiatives

Hotel Experience Dimensions	Chi-Squared Result	Significant Relationship
Value	Chi²(d.f. = 4, n = 794) = 31.92; p < .0005; V = 0.14 Small	Yes
Rooms	Chi²(d.f. = 4, n = 794) = 230.30; p < .0005; V = 0.38 Large	Yes
Location	Chi²(d.f. = 4, n = 794) = 56.51; p < .0005; V = 0.19 Small	Yes
Food	Chi²(d.f. = 4, n = 794) = 104.47; p < .0005; V = 0.26 Medium	Yes
Cleanliness	Chi²(d.f. = 4, n = 794) = 57.50; p < .0005; V = 0.19 Small	Yes
Service	Chi²(d.f. = 4, n = 794) = 181.04; p < .0005; V = 0.34 Medium	Yes
Facilities	Chi²(d.f. = 4, n = 794) = 65.55; p < .0005; V = 0.20 Small	Yes
Ambience	Chi²(d.f. = 4, n = 794) = 26.84; p < .0005; V = 0.13 Small	Yes
Overall Hotel Experience	Chi²(d.f. = 4, n = 794) = 193.81; p < .0005; V = 0.35 Large	Yes

Based on the interpretation intervals , one large, two medium and five small differences were found, which were large enough to have meaning. The largest level of significance was for the relationship between sustainable initiatives and rooms. The moderate levels of significance referred to the relationships between food and sustainable initiatives as well as service and sustainable initiatives. Value, location, cleanliness, facilities and ambience were all found to have relationships with sustainable initiatives with a small level of significance. It was also noted that the relationship between overall hotel experience and sustainable initiatives had a large level of significance. Hypothesis 1 states that there is a direct relationship between sustainable initiatives and the hotel experience dimensions. The results showed a direct relationship between sustainable initiatives and all the hotel experience dimensions (p < .05). The overall experience and rooms revealed large 'V' values of 0.35 and 0.38 respectively, while food and service showed medium 'V' values of 0.26 and 0.34. Value, location, cleanliness, facilities and ambience had small 'V' values between 0.13 and 0.20. Using chi-squared tests and Cramer's *V* for statistical and practical significance respectively, sustainable initiatives were found to have a relationship with each of the eight hotel experience dimensions as well as overall hotel experience. Relationships between sustainable initiatives and rooms as well as sustainable initiatives and overall hotel experience were found to have the largest levels of significance as per Cramer's *V* interpretation intervals.

Therefore, sustainable initiatives had a direct relationship with hotel experience dimensions and H$_1$ was accepted.

Conclusion

A literature overview revealed that the eight dimensions of hotel experience include value, service, location, rooms, food, ambience, facilities and cleanliness. It was established that a hotel experience could either be positive, neutral or negative based on the relationship between hotel guests' expectations versus their actual experience in a property. Thus, the hotel experience is defined by the relationship between hotel guest expectations and their perceptions of their actual stay in a hotel measured against those initial expectations. Thereafter, sustainable initiatives was defined as the alignment of business objectives with societal goals in a way that benefitted all stakeholders. Lastly, the literature overview revealed a potential link between sustainable initiatives and the hotel experience. Based on the theoretical framework, a hypothesis was formulated. Based on the results from the empirical tests, the hypothesis was accepted, revealing a direct relationship between sustainable initiatives and the hotel experience dimensions. This outcome suggests that there is a link between sustainable initiatives in hotels and how guests experience their stay. This suggests that hotel managers should make guests more aware of their sustainable practice initiatives, which may generate more sustainable practice reviews in future. In the current study, only 0.09% of the reviews included sustainable initiatives. It is however, recommended that sustainable initiatives be treated as important for hotel businesses as they played a significant role in the hotel experience when observed by guests who chose comment. Lastly, this study showed how to use big data and the process used to convert the qualitative data into quantitative data. The transformation of qualitative data using word recognition and sentiment analysis could be a methodological example for future studies using online reviews.

Acknowledgements

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