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Assessing Differences in Word Use in Online User Generated Travel Reviews across Hotel Segments

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ASSESSING DIFFERENCES IN WORD USE IN ONLINE USER GENERATED TRAVEL REVIEWS ACROSS HOTEL SEGMENTS

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ABSTRACT

User generated travel reviews are becoming a prominent information source for travelers making hotel purchase decisions. This study examines 60,648 user generated travel reviews for 4,853 hotels, across hotel segments determining word use patterns and frequencies. The intent of this study was to determine if actionable words: those that would suggest areas where a hotel could take action and thereby improve their customer satisfaction varied by segment. The study found that travelers' use of words and word patterns in comments accompanying online ratings had some differences across different hotel segments.

Key Words: hotel, online, rating, comments, segment, travel

INTRODUCTION

Hotels throughout the world offer many different products, amenities and price points. Travelers can stay at large hotels or small hotels, hotels with limited amenities and hotels with seemingly endless facilities and services. To facilitate comparison and analysis, the hotel industry has classified hotels into segments according to room rates and hotel amenities (Shoemaker, Lewis and Yesawich, 2006; and Vallen and Vallen, 2009).

Hotel quality is commonly communicated through rating systems (Ingram, 1996; Sturken, 2004; Vallen and Vallen, 2009). The traditional rating systems based on well established standards have largely been replaced by traveler comment systems found on travel related Internet sites. Many online travel sites allow travelers to post a rating of a hotel based on their satisfaction with their hotel stay, including a free-text review of the hotel. Research has found that 70% of hotel shoppers preferred traveler reviews to professional reviews, and up to 88% of those reading them said online guest reviews impact their decisions (Web 2.0, 2008). User generated travel reviews have been shown to affect the purchase decisions and public perception of hotels (Barksy and Nash, 2009; Gretzel and Yoo, 2008). Travelers now consider the feedback of other travelers more important to their purchase decisions than the recommendations of travel experts, formal rating systems, and even family and friends (Yesawich, 2007).

Research examining online user generated ratings and comments is new. Several researchers have examined comments in specific markets, and across the industry as a whole (Fernández-Barcala, González-Díaz, and Prieto-Rodriguez, 2009; O'Connor, 2008; Stringam and Gerdes, 2010; Ye, Law and Gu, 2009). These studies while insightful did not report differences in guest comments according to segmentation. It is reasonable to anticipate that travelers would have different expectations of a hotel according to the type of hotel and room rate (Oh, 2003). The primary contribution of this study is the investigation to what extent differing expectations are revealed in guest comments and assigned ratings, and determine how they vary across market segments.

LITERATURE REVIEW
Service Quality Expectations

Researchers have long examined service quality expectations for hotels. Research has shown a "low extent of agreement" over what travelers consider to be the most relevant hotel attribute (Dolnicar and Otter, 2003). Several studies indicated hotel cleanliness was a significant factor influencing guest satisfaction and purchase decisions (Atkinson, 1988; Knutson, 1988; Lewis, 1987; Lockyear, 2002; Weaver and Oh, 1993). Price, location, and facilities have been shown to be important factors in hotel accommodation purchase decisions (Dolnicar and Otter, 2003; Lockyear, 2005). Several studies found the quality of service to be the most important factor influencing repeat purchase decisions for hotel guests (Dube and Renaghan, 2000; Lewis, 1985).

Hotel Segmentation

Some research has focused on specific hotel segments. Lockyear (2002) determined that business guests considered the bathroom and shower quality, standard of bedroom maintenance, and the comfort of the mattress and pillow to be of high importance. Moskowitz and Krieger (2003) examined the needs of consumers in mid-priced business hotels, finding that Internet access was the most important hotel factor. Bowen and Shoemaker (1998) explored factors affecting loyalty in luxury hotels, finding service features to be more important than physical appearance or equipment. Saleh and Ryan (1991) found the availability of a restaurant, convenient parking, interior décor, and exterior aesthetics were factors that led to hotel selection by four star hotel guests.

There is however little research examining the differences in guest expectations between hotel segments. Griffin, Shea and Weaver (1997) examined the differences in business travelers' preferences for hotel characteristics between mid-priced and luxury hotels. They found low price, convenient access to a family restaurant, and the ability to pre-arrange check-in to be more common preferences in mid-priced properties than luxury properties. They also determined that bellman service, concierge service, a gourmet restaurant, bathrobe, and hair dryer were more common preferences of business travelers for luxury hotel properties than for mid-priced properties.

Researchers have analyzed guest comments to determine customer satisfaction. Based on interviews with hotel managers, Cadotte and Turgeon (1988) find the quality of service to be the most frequent focus of both complaints and compliments. Crotts, Mason and Davis (2009) suggested that travel blogs can also be a source to aid in identifying elements of traveler satisfaction.

Ratings, Pricing and Satisfaction

Information about a product or service can affect consumer expectations (Clow and Vorhies, 1993; and Gould-Williams, 1999). Previous research has demonstrated that when consumers have high expectations they are more likely to express disappointment or dissatisfaction with service quality than when their expectations are lower (Parasuraman, Berry and Zeithaml, 1991; Parasuraman, Zeithaml, and Berry, 1988). Specific to the hotel industry, the star rating of a hotel has been shown to influence traveler expectations (Callan, 1998; Danziger, Israeli and Bekerman, 2006).

Hotel guest expectations are often influenced by room rate and the quality rating of the hotel (Danziger, et al., 2006; Gallarza and Gil-Saura, 2006; Israeli, 2002). Research has shown an association of the price of hotel reservations to quality (Dodds and Monroe, 1985; Dodds, Monroe, and Grewal, 1991; Oh, 2000; Rao and Monroe, 1989; Zeithaml, 1988).

There is limited research examining the relationship of price to hotel ratings. Henley, Cotter and Herrington, (2004) examined the influence of hotel ratings on hotel room pricing, finding that hotels anticipating

improved ratings raised room rates, and hotels predicting lower ratings lowered their room rates. Because on-line user generated ratings for hotels are relatively new, there is no research examining the inverse: the impact of hotel pricing or segmentation on ratings.

Online User Generated Reviews

Researchers have recently begun to examine online user generated reviews for hotels. Pekar and Ou (2008) discuss the challenges in analyzing online user generated feedback. Gretzel and Yoo (2008) studied the characteristics of travelers who write online user generated reviews on TripAdvisor. They found travelers who use travel review sites have high incomes and travel frequently. They also found review sites to be more influential in selecting destination accommodations than for accommodations selected en-route. An additional finding of their study revealed differences in gender and generation, namely that travel review sites had less of an impact on both male travelers and older travelers.

Researchers have analyzed feedback in limited, regional markets. O'Connor (2008) studied online user generated reviews of hotels in London and found that price, size of the hotel room, cleanliness and location were the most frequent concerns in user generated ratings. Fernández-Barcala et al., (2009) studied user generated feedback for hotels in Spain finding that price, age of hotel, and star category negatively affected hotel ratings. Ye, Law and Gu (2009) analyzed user generated ratings for hotels in three large cities in China and found a significant relationship between online user generated reviews and hotel financial performance. Stringam and Gerdes (2010) determined that travelers rating U.S. hotels frequently use words related to cleanliness when assigning hotels low ratings, but use words related to service and elements of service when assigning hotels a high rating.

METHODOLOGY

Data used in this study were obtained from publicly available hotel reviews posted on the Expedia Website. Expedia, Inc. maintains one of the world's leading online travel companies Expedia.com, with "60 million consumers worldwide visit our sites every month, booking more than 57 million room nights at our hotel partners' properties last year," (Rokou, 2009). To ensure that reviews are based on first-hand experience, Expedia only accepts reviews of a hotel from travelers who have booked and paid for a reservation for that hotel through their Website. Travelers rate overall satisfaction, with each score based on a 1 (poor) to 5 (excellent) rating system. Travelers can also enter a 'free response' comment, often describing their experiences at the hotel, in part justifying the ratings assigned.

An automated web spider (Gerdes and Bender, 2008) visited Expedia.com and collected traveler reviews for all hotels listed by Expedia for the 100 largest U.S. cities. The spider gathered all available traveler comments and associated ratings for each hotel, adhering to the site's Robot Exclusion Standard restrictions (Koster, 2007). During this time the spider collected data on 10,537 hotels and 60,648 customer comments from the Expedia site.

After the collection of the hotel critiques, the extraction process identified all unique words combining common variations (i.e. plurals, tense differences, misspellings) contained in the text comments. Word extraction was done asynchronously from the data collection. This process identified 6,642 unique words, ignoring capitalization.

The hotels were divided into ten segments: Economy, Midscale without Food and Beverage (F&B), Midscale with Food and Beverage (F&B), Extended Stay, Upscale, Upper-Upscale, Luxury, Casino, Upscale Casino, and Vacation Ownership (see Table 1). The segments and the assignment of the hotels to segments were completed in accordance with information obtained from Smith Travel Research (Shoemaker, Lewis, and Yesawich, 2006), and the Matrix Hospitality Index (MMHI) (Market Matrix, 2010). Hotels not classified by either the MMHI

or Smith Travel Research were dropped from the analysis. Comments pertaining to those hotels were also dropped from the analysis, resulting in 4,853 hotels, and 60,648 customer comments used for the analysis.

The intent of this study was to determine if actionable words: those that would suggest areas where a hotel could take action and thereby improve their customer satisfaction varied by segment. Determining the words for analysis was a two step process. In the first step we identified actionable words used differently by travelers when they write critiques of a hotel stay. To determine these words, we followed the approach of Gerdes, Stringam and Brookshire (2008).

The second step in the word selection process was to determine if the words were actionable. That is, would the word help direct hoteliers to actions that could improve online user generated ratings? Four independent coders reviewed the candidate words found in the first step and coded them as either actionable or not. Words coded as actionable by all four coders were retained, resulting in a list of 134 words used in the word frequency analysis. Of the 60,648 comments, 36,021 contained one or more of the words. We used this reduced set of comments as the basis of analysis for our study.

For this study we partitioned the comments into five categories corresponding to the traveler's overall satisfaction rating for each hotel segment. Word Ranking was calculated for each word within each category. The word most frequently used was ranked 1, the second most frequent word ranked 2, etc. This method is based on the premise that words which are used more frequently address issues of higher importance (Ryan and Bernard, 2003).

Some hotel segments had smaller samples than others. Furthermore, when the data was stratified by the traveler overall ratings of the hotel, some comment counts were too small to be significant. The division between some hotel segments was very distinct and collapsing those data categories would distort the findings. For example: Extended Stay hotels, Casino hotels, and Vacation Ownership resorts are unique products, with markets different than each other as well as the industry as a whole. As such, data from these segments was not combined with other categories, and the lack of significance due to sample size for some columns is noted. Further examination of these segments is recommended for future studies.

FINDINGS OF THE STUDY

Travelers rated hotels favorably across the segments. On average travelers assigned 73.3% of hotels a level 4 or 5 rating, with only 5.2% of hotels receiving a level one rating (see Table 1). The data reveals some patterns as traveler's ratings are examined across hotel segments. Results for Midscale hotels without F&B were closest to the overall average ratings (see Table 1). All the other segments saw some variation.

Table 1
Distribution of traveler assigned ratings across the hotel segments

Hotel Segment	Traveler Assigned Rating Level				
	1	**2**	**3**	**4**	**5**
Economy	13.0%	15.3%	21.9%	32.2%	17.6%
Midscale w/out F&B	4.8%	7.8%	12.8%	35.1%	39.4%
Midscale with F&B	8.4%	12.8%	18.7%	33.6%	26.5%
Extended Stay	3.6%	4.9%	9.7%	27.6%	54.2%
Upscale Hotels	2.8%	5.9%	10.3%	32.9%	48.1%
Upper Upscale Hotels	2.1%	4.5%	9.4%	30.4%	53.6%
Luxury	2.2%	2.8%	7.1%	24.6%	63.4%
Casino	4.0%	7.7%	18.3%	49.0%	21.0%
Upscale Casino	2.8%	8.3%	9.9%	27.4%	51.6%

Vacation Ownership	2.5%	3.6%	8.7%	29.8%	55.4%
Overall	5.5%	8.4%	13.7%	32.4%	40.0%

A few of the differences can be attributed to the historical ratings process which rewarded hotels that had a higher number of and level of amenities. In traveler assigned ratings the traveler may assign a hotel a rating based on a satisfaction scoring process or the historical rating process. Both the Economy and Luxury hotel segments reflected the historical rating process with more traveler assigned ratings closer to the historical rating results than for other hotel segments. This historical rating viewpoint may also attribute to the slightly higher than average level 5 ratings for the three segments marketed to high end travelers (i.e., Upper Upscale hotels, Upscale hotels, and Upscale Casinos).

Looking beyond the affect of historical rating processes, some segments performed better than others (see Table 1). Extended Stay properties, and Vacation Ownership Resorts, received higher ratings than average. They received more level five and less level one and level two ratings than the average of the segments. Casino hotels received more level three and level four ratings than the average of the segments. Midscale hotels with F&B received less favorable ratings than the average of the segments. Midscale hotels with F&B did however receive more level four ratings than the average of the segments.

We see from the word rankings that travelers were most frequently concerned with cleanliness, and service or staff (see Table 2). Comments accompanying level one and level two ratings frequently included words related to the lack of cleanliness, while comments accompanying level four and level five ratings often mentioned the service, staff, or a similarly related word.

Table 2
Ten most frequently used words by segment

R	Economy (5,310)	Midscale without F&B (6,880)	Midscale with F&B (5,805)	Extended Stay (1,215)	Upscale (6,347)	Upper Upscale (8,572)	Luxury (1,366)	Casino (142)	Upscale Casino (118)	Vacation Ownership (266)
1	clean	clean	clean	clean	clean	staff	staff	clean	clean	clean
2	staff	breakfast	staff	breakfast	staff	clean	clean	price	staff	pool
3	price	staff	breakfast	staff	bed	bed	bed	staff	bed	staff
4	bed	bed	bed	bed	breakfast	restaurant	restaurant	smoke	price	bed
5	breakfast	price	price	price	restaurant	breakfast	pool	employee	restaurant	price
6	airport	airport	pool	pool	price	pool	view	bed	bathroom	Disney
7	bathroom	pool	airport	buffet	pool	price	price	coffee	shower	view
8	pool	restaurant	restaurant	restaurant	airport	view	bathroom	restaurant	view	breakfast
9	dirt	bathroom	bathroom	downtown	downtown	airport	shopping	bathroom	buffet	restaurant
10	shower	downtown	downtown	bathroom	bathroom	downtown	valet	affordable	coffee	bathroom

R – Word Frequency Rank of words used in traveler comments of hotels within segment
Number in parentheses indicate the sample size of comments used to compile word rankings

When the data was examined by hotel segment some of the findings were found to be similar to the results averaged across all segments, but some of the categories showed unique preferences of market segments (See Tables 3 and 4). Travelers staying in Casino, Economy, Extended Stay, Midscale, Upscale Hotel, Upscale Casino and Vacation Ownership properties mentioned the word "clean" more often than any other word. Clean was ranked second for the remaining segments. The words "smell", "dirt", and "noise" are used more often in guest comments about hotels in the lower priced segment. When words about a lack of cleanliness appeared frequently in the higher priced segments, travelers were more likely to assign low level ratings, than they were in lower priced segments.

This was poignantly true for Luxury hotels: when words related to a lack of cleanliness were used, only the very lowest rating was assigned.

Table 3
Word frequency ranking when travelers assigned a level one rating across segments

R	Economy (614)	Midscale without F&B (316)	Midscale with F&B (445)	Extended Stay (39)	Upscale (175)	Upper Upscale (175)	Luxury (25)
1	dirt	clean	dirt	bed	bed	staff	dirt
2	clean	bed	clean	clean	staff	bed	clean
3	bed	dirt	bed	smell	dirt	dirt	stain
4	smell	staff	smell	towel	bathroom	clean	bed
5	bathroom	bathroom	staff	dirt	clean	bathroom	linen
6	smoke	breakfast	bathroom	smoke	shower	price	pool
7	shower	smell	breakfast	staff	breakfast	pool	valet
8	staff	shower	smoke	bathroom	mold	smoke	blinds
9	towel	smoke	shower	mold	smell	stain	broken
10	sheet	towel	broken	sheet	towel	sheet towel	expensive

WR – Word frequency Rank of words used in traveler comments of hotels within segment. Numbers in parentheses indicate the sample size of comments used to compile word rankings. Resort, Casino, Upscale Casino, and Vacation Ownership segments are not included because sample size for these segments was too small to be significant.

Table 4
Word frequency ranking when travelers assigned a level five rating across segments

R	Economy (978)	Midscale without F&B (2,736)	Midscale with F&B (1,544)	Extended Stay (662)	Upscale (3,117)	Upper Upscale (4,662)	Luxury (866)	Casino (37)	Upscale Casino (66)	Vacation Ownership (155)
1	clean	clean	clean	breakfast	staff	staff	staff	clean	clean	clean
2	staff	breakfast	staff	clean	clean	clean	clean	staff	staff	pool
3	price	staff	breakfast	staff	breakfast	bed	bed	price	bed	staff
4	breakfast	bed	price	price	bed	restaurant	restaurant	employee	price	view
5	bed	price	bed	bed	restaurant	breakfast	view	affordable	restaurant	restaurant
6	airport	airport	restaurant	buffet	price	pool	pool	coffee	bathroom	bed
7	pool	pool	pool	downtown	pool	view	price	accom.[1]	view	Disney
8	restaurant	restaurant	airport	pool	airport	price	bathroom	downtown	coffee	price
9	downtown	downtown	view	restaurant	downtown	downtown	downtown	pool	buffet	store
10	coffee	shopping	downtown	dinner shopping	buffet	airport	shopping	atmos.[2]	employee pillow	attractions

R – Word Frequency Rank of words used in traveler comments of hotels within segment
Number in parentheses indicate the sample size of comments used to compile word rankings
(Words appreciated – [1] – accommodating; [2] – atmosphere)
* Multiple words in the tenth row indicate the words had the same usage frequency.

Travelers staying in Luxury, and Upper Upscale hotels mentioned the word "staff" more often than any other word. For traveler comments about Extended Stay, and Midscale without F&B hotels, "breakfast" was the

most frequently mentioned word in guest comments. Travelers rating Vacation Ownership properties were more concerned with the pool than other travelers, using the word second most often in guest comments, behind clean.

The word "bed" is mentioned frequently by travelers across all segments, ranking 3rd or 4th most frequent word for nine out of ten categories (excepting Casino). The mention of the word bed was most frequent in comments about Upscale hotels, where it was the most frequently used word when travelers assigned a level one rating, yet was prevalent across the other rating levels as well.

The word "bathroom" and its components ("shower", "towel", etc.) are used frequently by travelers in comments accompanying ratings. For all of the hotel segments except for Luxury, the word "bathroom" was used more frequently when travelers assigned a lower rating. For Luxury hotels, the use of the word "bathroom" is more common when travelers assigned the highest rating. Linens to include "towels", "sheets", "pillows", etc… are mentioned more often in comments about lower priced hotel segments than for higher priced hotel segments, and when travelers assigned lower ratings than higher ratings. The word "shower", likewise, was one of the 15 most frequently used words across many of the categories, excepting Luxury and Upper Upscale hotels.

Food and Beverage related words were also mentioned more often when travelers assigned higher ratings. The word "restaurant" appears frequently in guest comments. The use of the word restaurant increased in frequency as the price point of the hotel increased. Conversely the word "coffee" appears more frequently in lower priced hotel segments than higher priced hotel segments, while the word "breakfast" appears frequently across all hotel segments except Luxury.

As regards service related words, the use of the word "courteous" is prevalent across many price points of segmentation. However, the words "attentive" and "accommodating" are used more frequently in comments about higher priced hotels, than for the lower priced segments.

Some word usage patterns between segments are simply due to the existence of the amenity in some hotels and not in others. Words such as "kitchenette", "buffet", "concierge" and "valet" appear frequently in guest comments for only those segments which offer the amenity. While this may negate the importance of the frequency of these words when compared to other segments, it does not negate the importance of the ranking within those segments.

When location related terms such as: "shopping", "downtown", "airport", etc. were used in the guest comments the traveler tended to assign a higher level rating. Although location related words had no discerning pattern between hotel segments.

The word "pool" was used more often in comments when travelers assigned a level three rating or higher with the exception of the Luxury segment, where the use of the word was prevalent across all 5 rating categories. Guest comments about the Luxury segment also saw an increased use of words related to décor relative to other hotel segments.

Words relating to pricing or room rates were frequent only in comments at the lowest and highest priced segments. For Economy hotels in particular, the frequency of the words related to room rates increased as the traveler rating increased, possibly indicating a satisfaction with the pricing.

SUMMARY, LIMITATIONS AND FUTURE RESEARCH

In this paper we explored over 60,000 comments and ratings made by travelers on an online travel distribution site in an attempt to identify which factors influence consumer ratings of hotels. This is one of the first studies that integrate the consumer rating with the comment narrative. We found that the word usage of travelers

when rating hotels exhibited several patterns that are consistent across the segments. Travelers were concerned with cleanliness. At all levels of rating and across all segments words regarding cleanliness or a lack of cleanliness were prevalent. For some segments cleanliness related words were used frequently across all ratings, while for other segments words relating to cleanliness were inversely related to travelers' ratings. In particular, travelers staying in Luxury hotels had no tolerance for lack of cleanliness. For Economy hotels the combination of words related to lack of cleanliness and frequency of words related to the bathroom leads to the impression that travelers are often concerned about the cleanliness of the bathroom for this segment. Hoteliers need to pay attention to cleanliness to avoid receiving a level one or level two rating. But to attain a level four or level five rating, hotels must be more than clean: the staff and service are important to travelers. Words related to "staff" and service elements were more frequent in comments for higher priced hotel segments, and when travelers assigned higher ratings.

For Extended Stay hotels the word "breakfast" was used more frequently as ratings increased, and most frequently at the level five rating. Both "restaurant" and "waffles" are mentioned more often when travelers assign a higher rating. Additional attention to the breakfast offerings of Extended Stay hotels may help attain higher traveler assigned ratings.

The convenience or location of a property relative to community amenities such as "shopping", "airport", and "downtown" was important to travelers regardless of the hotel segment. Travelers who mentioned location related words tended to rate the hotel higher, indicating that the convenience of the property, or the traveler's awareness of the convenience of the property can help drive higher ratings.

The word price appears most frequently in guest comments accompanying ratings for both the highest priced and lowest priced hotel segments. Further study analyzing phrases and sentences may further clarify the polar distribution of the data.

Other patterns and trends can be found when examining the data for each segment; however the formatting limitations of this paper prohibit the discussion, and presentation of additional results. While this study provides insight, the value to a hotelier may be more in the understanding of the comments and rating patterns for their particular hotel segment in addition to the comparison against other segments. It is recommended that the data for each segment be presented and analyzed separately, as well as comparatively.

Limitations and Recommendations for Further Study

This study has some limitations. The study was explorative in nature, focusing on a single distributor at a single point in time. The study only utilized cities in the United States. Further analysis using other Websites, and other countries would help to validate the findings.

This study was limited in its analysis as it did not examine the context of the comments or how each word was used. Thus while frequencies of word use were analyzed, the intention of the words was not determined. For instance a traveler could comment that a room was "not dirty", and the analysis would count the words "not" and "dirty" separately. Due to the sample size, the detailed analysis of each comment was not feasible. Future studies could utilize smaller samples and analyze the context of the words used. Likewise future studies could examine in detail the word use of a specific word found to be significant in the study, such as bathrooms. Future research could revisit those comments and assess the usage context.

While the size of the overall population was robust, there were concerns with sample size of some segments when stratified by rating level and by word. These are so noted. Further research would be warranted to verify the findings in these segments.

While traveler rating sites try to limit their ratings to only those guests making reservations through their Websites, it is known that stuffing of the ballots and intentional property slander exists (O'Connor, 2008). Despite Expedia's reservation requirement for reviewing hotels, it is possible that some comments from travelers could be biased comments from the hotel personnel itself, or from competing hotels. No attempt was made to filter out these comments. Further work is needed to identify the impact of these biased comments on the on-line guest feedback systems.

While an analysis of traveler comments can provide insight to factors that travelers consider frequently when rating a hotel, traveler satisfaction is complex with many contributing elements and cannot be surmised or predicted based on the findings of this study. Further analysis of traveler satisfaction and its relation to online rating systems for hotels is recommended.

This study examined traveler comments for hotels throughout the U.S. It is probable that factors which may be mentioned frequently in one market may not be a frequent concern for another city or region. For instance, O'Connor (2008) found that travelers in London were concerned with the small room size of the hotel rooms. Yet the size of the room was not mentioned frequently with travelers in this study. Further research focusing on certain markets, regions or hotel segments is recommended.

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