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The Role of Traveler Type and Hotel Star Rating in the Effect of Hotel Service Attributes on Customer Satisfaction

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ARTICLE INFO	ABSTRACT
	This study analyzes 136.413 reviews, sourced from booking.com, regarding 3, 4, and 5-star hotels in Athens, Greece. Using an R dedicated routine (LDA), to extract the most frequently used words from online reviews related to nine service attributes, and three-factor theory, a multi-attribute model is formulated to study the asymmetric effects of different hotel service attributes on customer satisfaction (CS) according to type of traveler (solo, group, couple, family) and hotel star rating. Results show that asymmetric effects are higher for the attributes of location, staff, and facilities. Location is a hybrid factor for 3*and 4* hotels but can delight couples and groups in 5* hotels and become a dissatisfier for families (3*& 5*) and groups (3*). Staff is a satisfier for 3* and a hybrid for 4* but a dissatisfier for 5* and for families and groups in 4*. Comfort is a dissatisfier for most customers but a hybrid for families and groups in 3* hotels and for solo travelers and families in 5 * hotels. Facilities is a satisfier for 3* and 5* and a hybrid for 4* but can delight solo and groups in 5*. Food is a hybrid for 3* but becomes a dissatisfier in 4* and 5*. Cleanliness, room, prices and processes are dissatisfiers/frustrators for all. Findings can help hotels customize their service mix for different customer segments and maximize satisfaction.

Keywords: Customer satisfaction, Customer type, Hotels, Online reviews, Service attributes, Star rating. |

INTRODUCTION

In today's world where the internet and social media affect all parts of our life, the emergence and the increasing importance of electronic word-of-mouth on consumer purchasing decisions is seen in all business sectors. The proliferation of online platforms has enabled consumers to share their experiences and opinions about products and services, creating a vast repository of information that potential buyers can access. One of the most important types of electronic word-of-mouth is online reviews. Research shows that consumers rely increasingly on reviews to make their purchasing decisions in many industries including hotels, restaurants and other service providers, and trust these reviews more than any other promotional content shared by businesses [1]; [2]. Also, researchers agree that the content of online reviews affects customer satisfaction from a service [3]; [4]; [5] and try to determine which service attributes lead to satisfaction or dissatisfaction [6]; [7].

However, the effect of the different hotel service attributes on customer satisfaction can be nonlinear or asymmetric [8]; [9]; [10]; [11]. In fact, researchers argue that the asymmetric effects differ for different types of customers (i.e. business, leisure, couple, family, friends and solo) [3]; [12] and according to hotel star rating [13]; [14]. However, there is still a need for further research on the impact of different service attributes on CS and on how this impact differs for different customer segments [15]; [16]; [11]. The purpose of this study is to investigate the effect of hotel service attributes on customer satisfaction for different types of travelers and hotel star ratings by analyzing online hotel reviews.

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LITERATURE REVIEW

Customers increasingly share their experiences and preferences online through online reviews. The power of electronic word-of-mouth is increasing and affects many consumer purchase decisions. Especially in the hotel industry, online reviews have become critical for consumer decision-making [17]; [18]. Research indicates that potential guests base their evaluations of hotels and their ultimate decisions on reviews and tend to believe reviews more than other traditional marketing messages or even personal suggestions from friends and family [1] [2]; [19]. Furthermore, researchers emphasize that online reviews affect customer satisfaction [3]; [4]; [5] and ultimately hotel performance [20]; [15]; [21]; [22]. Customer satisfaction is a critical issue of research in the hospitality field in recent years since it is considered as the key to success for hospitality businesses [11]; [23].

During the last ten years, several studies have used online reviews to assess customer satisfaction from services [24]; [25]; [26]; [27]). Researchers analyze online comments to determine which service attributes lead to customer satisfaction [6]; [7] and dissatisfaction [28]. However, recent research also shows that the different hotel service attributes can have asymmetric effects on customer satisfaction with a service [8]; [9]; [10]; [11]. Specifically, the impact of different service attributes on CS differs substantially for various traveler compositions (i.e., leisure, business, couple, family, friends, and solo), [29]; [30]; [31]; [3]; [12] and according to hotel star rating [32]; [30]; [13]; [14]. [29] find that although "value" and "rooms" are the most important attributes contributing to a high overall rating for the hotel, couples find location more important whereas cleanliness is the least important for friends. [31] show that customers report significantly lower levels of overall satisfaction with hotel services after business stays than after leisure stays and this effect is moderated by the traveler's country of origin. [33] argue that travelers in different group compositions perceive the quality of service differently because their needs and expectations are not the same whereas [34] find that the expectations and satisfaction of travelers change when they travel in different travel groups (solo, friends, couples, family). Therefore, it is important to study how different types of travelers are affected by hotel service attributes. In fact, there is a continuous call for research to investigate how the various hotel service characteristics affect CS and how this effect differs for various customer groups or for different types of hotels [29] [32]; [15]; [35]; [11]; [16].

The purpose of this study is to investigate the effect of hotel service attributes on customer satisfaction for different types of travelers and hotel star ratings by analyzing hotel online reviews. This will help hotel managers to design more effective business strategies and adjust the services provided with an aim to increase marketing and economic performance.

METHODOLOGY

This study analyzes 136.413 reviews, sourced from booking.com, regarding 120 3-, 4-, and 5-star hotels in Athens, Greece posted between June 2022 and August 2024. To better evaluate the effects of service attributes on customer satisfaction, this study considers only the reviews of customers that stayed in these hotels for more than three nights.

In order to investigate the asymmetric effect of hotel service attributes on customer satisfaction the text contained in each review on Booking.com is analyzed by separating the positive and negative comments. The analysis includes two stages. The first stage involves extracting information from the text regarding the evaluation of hotel service attributes and overall hotel evaluation. Then, a content analysis is done to develop a multi-attribute model that shows the relationship between positively and negatively assessed service attributes and customer satisfaction [36]. More specifically, 150 words that are mentioned more frequently in the review texts are extracted using an R dedicated routine (LDA) and then a group of three coders is used to classify the words into nine different service attributes: cleanliness, location, staff, facilities, room, food, comfort, processes, and price. In case of conflict amongst coders, a fourth experienced coder was used to resolve the issue. Each review text contains both positive and negative evaluations of the hotel service. Therefore, each review text is considered to contain up to (18) attributes (9 positive and 9 negative). These 18 attributes are independent variables and reflect multi-attributes of the hotel service mix. Also, they are constructed based on the binary representation [36] in which positive (negative) service attribute number variables refer to the number of words related to each attribute in pros (cons) of each review. Then, if the number of words in pros (cons) is greater than 0, then the variable becomes 1, otherwise 0.

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In the second step, after the creation of the nine independent dummy variables, we use the penalty-reward contrast analysis (PRCA) (e.g., [37]; [38]; [39]) and 3-factor theory ([40]) to investigate the asymmetric impact of different hotel service attributes on customer satisfaction according to type of traveler (solo, group, couple, family) and hotel star rating. The three-factor theory assumes that the effect of a service attribute on CS varies according to its performance and proposes three types of attributes: basic/dissatisfiers (minimum requirements of service that do not create high satisfaction, if they are offered but increase dissatisfaction if they are missing), performance/hybrids that have a linear and symmetric effect on CS, and excitement/satisfiers that may produce high customer satisfaction if they increase, but their absence does not create dissatisfaction.

Furthermore, the baseline model specification used is given by the following expression:

$$CS_i = a + \sum_{k=1}^{9} p_k \cdot X_{ki} + \sum_{k=1}^{9} r_k \cdot Y_{ki} + e_i$$

where CS = the overall customer satisfaction for each review, X_k = the kth negative dummy variable (negative comment), Y_k = the kth positive dummy variable (positive comment), p_k = the penalty index for the kth negative dummy variable, r_k = the reward index for the kth positive dummy variable.

In order to find the impact asymmetry index (IA), which is used for categorizing service attributes according to the 3-factor theory, the following mathematical expressions need to be calculated:

$$RIOCS_k = r_k + p_k \qquad SGP_k = \frac{r_k}{RIOCS_k} \qquad DGP_k = \frac{p_k}{RIOCS_k} \qquad SGP_k + DGP_k = 1 \qquad IA_k = SGP_k - DGP_k$$

The IA values for each service attribute vary between +1 and -1. These two extreme values represent attributes characterized as perfect satisfiers and perfect dissatisfiers respectively. While, when for a service attribute IA = 0, this represents a perfect hybrid. In between of the above values and using the taxonomy proposed by [8] and presented in Table 1, the IA index is interpreted as follows:

Table 1: Attribute categorization rules

IA	Attribute Category
(0.4, 1]	Delighter
(0.1, 0.4]	Satisfier
(-0.1, 0.1]	Hybrid
(-0.1, -0.4]	Dissatisfier
(0.4, -1]	Frustrator

Moreover, the level of impact of each attribute is determined by splitting the *RIOCS* values into three equal intervals, in which the lower interval values refer to the low impact attributes, the middle interval values refer to medium impact attributes and the higher interval values refer to high impact attributes.

RESULTS

Sample Profile

Firstly, descriptive statistics are used to thoroughly understand the characteristics of our data set before the main analysis. Table 2 presents the distribution of online reviews by type of hotel, measured by number of stars. The majority of reviews concern 4-star hotels (55,1%), followed by those for 3-star hotels (29.7%) and 5-star hotels (15.2%).

Table 2: Distribution of online reviews by hotel star

Hotel stars	Frequency	Percent
3*	40,848	29.9
4*	73,359	53.8
5*	22,206	16.3
Total	136,413	100.0

Furthermore, Table 3 presents the distribution of online reviews by traveler type, in which couples and families are the most frequent traveler group compositions. Couples make up almost half of reviews (43.6%) and families are 27.9%. Groups and solo travelers have lower percentages (12.7% and 15.8% respectively)

Table 3: Distribution of online reviews by traveler type

Type of customer	Frequency	Percent
Couple	59,466	43.6
Family	38,050	27.9
Group	17,322	12.7
Solo traveller	21,575	15.8
Total	136,413	100.0

Also, Table 4 divides review ratings into four categories according to the level of the overall rating. The percentage of customer satisfaction ratings that were less than 6 out of 10 was 12.1%, 30.2% were between 6 and 8 and more than half (57.7%) were more than 8.

Table 4: Online reviews distribution by review rating category

Frequency	Percentage	Mean
0-6	16,572	12.1
6-8	41,172	30.2
8-10	78,669	57.7
Total	136,413	1.0

Asymmetric Effects

The asymmetric effects of the different hotel service attributes on customer satisfaction are analyzed using a PRCA analysis and the 3-factor theory of customer satisfaction. Table 5 describes the empirical results of the PRCA analysis that includes the binary attribute variables as independent variables and the overall customer satisfaction rating as the dependent variable. The proposed model explains 25.4 % of the variance in customer satisfaction.

The estimated coefficients show that all positive attributes cause positive effects, whereas all negative attributes lead to negative effects, as expected. However, the impact of negative attributes seems to be greater than those of positive attributes for eight out of nine attribute variables. The only exception is facilities that is classified as a satisfier.

Table 5: Impact of service attributes on overall customer satisfaction

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Service Attribute	RI	PI	RIOCS	SGP	DGP	IAI	Type	Impact
LOCATION	0.315	-0.367	0.682	0.462	-0.538	-0.076	Hybrid	Low Impact
STAFF	0.357	-0.375	0.732	0.488	-0.512	-0.025	Hybrid	Low Impact
FOOD	0.306	-0.452	0.759	0.404	-0.596	-0.192	Dissatisfier	Low Impact
CLEANLINESS	0.385	-0.892	1.277	0.301	-0.699	-0.397	Dissatisfier	High Impact
COMFORT	0.394	-0.557	0.951	0.414	-0.586	-0.172	Dissatisfier	Medium Impact
FACILITIES	0.422	-0.262	0.684	0.617	-0.383	0.234	Satisfier	Low Impact
ROOM	0.168	-0.584	0.752	0.223	-0.777	-0.554	Frustrator	Low Impact
PRICES	0.106	-0.504	0.610	0.174	-0.826	-0.651	Frustrator	Low Impact
PROCESSES	0.473	-0.833	1.306	0.362	-0.638	-0.275	Dissatisfier	High Impact

Results indicate that staff, food, cleanliness, room and prices are categorized as basic factors (dissatisfiers/frustrators) for all reviewers. Especially cleanliness and processes are dissatisfiers with a high impact showing that customers are particularly demanding of these two attributes and that the high-quality service in these two factors is critical for their satisfaction. Also, the absence or low quality of these two factors will increase dissatisfaction. Furthermore, location and staff are considered to be hybrid factors and only facilities is a satisfier factor. These results confirm the presence of asymmetric effects of hotel service attributes on customer satisfaction and reveal that reviewers are very demanding with respect to the factors that are categorized as basic attributes, but they do not seem to have high expectations from facilities, a factor categorized as a satisfier. Therefore, the quality of facilities can be used by hotels to increase customer satisfaction together with a good location and high-quality staff.

Furthermore, results show that the asymmetric effects vary between different types of travelers and hotel star ratings (see tables 6,7,8).

Table 6: Asymmetric effects for 3* hotels in different traveler compositions

3*					
Service Attribute	All	Solo	Couple	Family	Group
LOCATION	Hybrid	Hybrid	Hybrid	Dissatisfier	Dissatisfier
STAFF	Satisfier	Satisfier	Satisfier	Satisfier	Hybrid
FOOD	Hybrid	Hybrid	Hybrid	Dissatisfier	Hybrid
CLEANLINESS	Dissatisfier	Frustrator	Dissatisfier	Dissatisfier	Frustrator
COMFORT	Dissatisfier	Dissatisfier	Dissatisfier	Hybrid	Hybrid
FACILITIES	Satisfier	Hybrid	Satisfier	Satisfier	Satisfier
ROOM	Frustrator	Frustrator	Frustrator	Frustrator	Frustrator
PRICES	Frustrator	Dissatisfier	Dissatisfier	Frustrator	Frustrator
PROCESSES	Dissatisfier	Dissatisfier	Dissatisfier	Dissatisfier	Frustrator

Table 7: Asymmetric effects for 4* hotels in different traveler compositions

4*					
Service Attribute	All	Solo	Couple	Family	Group
LOCATION	Hybrid	Satisfier	Hybrid	Hybrid	Hybrid
STAFF	Hybrid	Hybrid	Hybrid	Dissatisfier	Dissatisfier
FOOD	Dissatisfier	Dissatisfier	Dissatisfier	Dissatisfier	Frustrator

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CLEANLINESS	Dissatisfier	Dissatisfier	Frustrator	Dissatisfier	Dissatisfier
COMFORT	Dissatisfier	Dissatisfier	Dissatisfier	Dissatisfier	Dissatisfier
FACILITIES	Hybrid	Dissatisfier	Hybrid	Hybrid	Satisfier
ROOM	Frustrator	Frustrator	Frustrator	Dissatisfier	Frustrator
PRICES	Frustrator	Frustrator	Frustrator	Frustrator	Frustrator
PROCESSES	Dissatisfier	Dissatisfier	Dissatisfier	Dissatisfier	Dissatisfier

Table 8: Asymmetric effects for 5* hotels in different traveler compositions

5*					
Service Attribute	**All**	**Solo**	**Couple**	**Family**	**Group**
LOCATION	Satisfier	Hybrid	Delighter	Dissatisfier	Delighter
STAFF	Dissatisfier	Dissatisfier	Dissatisfier	Dissatisfier	Dissatisfier
FOOD	Dissatisfier	Dissatisfier	Dissatisfier	Dissatisfier	Dissatisfier
CLEANLINESS	Frustrator	Frustrator	Frustrator	Frustrator	Dissatisfier
COMFORT	Dissatisfier	Hybrid	Dissatisfier	Hybrid	Dissatisfier
FACILITIES	Satisfier	Delighter	Satisfier	Satisfier	Delighter
ROOM	Frustrator	Frustrator	Frustrator	Frustrator	Frustrator
PRICES	Frustrator	Frustrator	Frustrator	Frustrator	Frustrator
PROCESSES	Dissatisfier	Dissatisfier	Dissatisfier	Dissatisfier	Dissatisfier

Evidently, different traveler types using different quality level accommodations evaluate differently the impact of different service attributes on customer satisfaction. Specifically, for the whole sample results show that asymmetric effects are higher for the attributes of location, staff, and facilities. However, location is a hybrid factor for 3*and 4* hotels but can delight couples and groups in 5* hotels and become a dissatisfier for families (3*& 5*) and groups (3*). Staff is a satisfier for 3* hotels and a hybrid for 4* hotels but a dissatisfier for 5* hotels and for families and groups in 4* hotels. Comfort is a dissatisfier for most customers but a hybrid for families and groups in 3* hotels and for solo travelers and families in 5 * hotels. Facilities is a satisfier for 3* and 5* hotels and a hybrid for 4* hotels but can delight solo travelers and groups in 5* hotels. Food is a hybrid for 3* hotels but becomes a dissatisfier in 4* and 5* hotels. Finally, cleanliness, room, prices and processes are all dissatisfiers or frustrators. Specifically, cleanliness is a dissatisfier for 3- and 4-star hotels, whereas it is a frustrator for 5-star hotels. This means that customers of 5 * hotels are more demanding from this service attribute and its improvement will decrease their dissatisfaction faster than in other types of hotels (3* or 4*). Furthermore, processes is a dissatisfier for almost all customers except groups in 3-star hotels whereas prices is a frustrator for most customers except solo travelers and couples in 3-star hotels.

MANAGERIAL IMPLICATIONS, LIMITATIONS, SUGGESTIONS FOR FURTHER RESEARCH

This study presents results regarding the effects of hotel service attributes on the satisfaction of different customer segments. The results confirm the moderating effects of traveler type and hotel star rating on the asymmetric relationship between the evaluation of service attributes in online reviews and customer satisfaction. These results can be used by hotels to customize their service mix according to different customer needs (e.g. different traveler types or hotel star ratings) and as a result maximize customer satisfaction that ultimately affects hotel performance. Hotels can provide a different service bundle to each customer according to which factors are more important for each person.

This study is limited to reviews for the hotels of one city for 2 years. Future research can extend the sample in terms of geographic area covered and number of reviews or investigate the role of other factors such as customer culture. Also, primary research studies are needed to validate the results of review analysis. Finally, researchers can focus on

creating a system that analyzes reviews continuously and provides feedback to hotels and other businesses such as airlines or cruise lines on how to manage effectively the satisfaction of each customer according to their specific needs.

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