# Asymmetric Effects of User Generated Multi-Attribute Evaluation on Hotel Online Ratings: Do They Vary Among Cultures?

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## Abstract
Online rating platforms enable the sharing of user generated content concerning customer evaluations of the services received by hospitality providers. However, research on the effects of customer culture on the relationship between positive and negative evaluation of service attributes and overall rating remains limited. This study aims to investigate how hotel service attributes, extracted from online reviews, explain customer's overall rating and are contingent on customers' culture. A total of 26,792 online reviews are analyzed to identify the top service features. Then, a multi-attribute model is formulated to examine how customers' culture affects the asymmetric impact of service attributes on the hotel's overall rating. Results indicate that customers from different cultures assess differently the impact of service attributes on their overall rating. The results of this study can be used to segment the tourism market and to identify which aspects of the service need to be adjusted depending on the cultural group they target.

**Keywords**: Online reviews, culture, service attributes, three factor theory, international marketing

## 1. Introduction
Online reviews are currently the most important and reliable source of information for consumers wishing to arrange their hotel accommodation. This electronic version of the traditional word of mouth (WOM) is known to have a significant effect on hotel performance (Kim et al., 2015), given than more than 9 out of 10 consumers consult the reviews' textual content in rating platforms, like TripAdvisor, Booking, Expedia etc., before they proceed with an online hotel booking (Min et al., 2018; Guan et al., 2022). Given the importance of online service evaluation in predicting consumer behavior (Mathwick and Mosteller, 2016; Patil and Rane, 2023; Glaveli et al., 2023), there are a lot of research efforts aiming to analyze the textual content of online reviews to detect the hotel service attributes that determine customer satisfaction and, in turn, a hotel's overall rating (Kim et al., 2023; Chatterjee and Mandal, 2020; Abdullah et al., 2023; Moreno Brito et al., 2024).

Many studies argue that different service attributes have asymmetric effects on customers' overall service evaluation (e.g. Mikulic & Prebežac, 2008; Kim et al., 2016; Kim et al., 2023; Athanasopoulou et al., 2023; Zhou et al., 2023). Therefore, service quality improvements depend on the magnitude of the effects of positive and negative evaluations of identified service attributes on customers' overall rating. Service attributes are classified in three groups, based on the three-factor theory of customer satisfaction (i.e. Satisfiers, Hybrids and Dissatisfiers) (Kim et al., 2023). Kim et al. (2022; 2023) analyse online reviews to detect, through text mining techniques, the most influential service attributes and find that the

negative service attributes have a bigger influence on deviations of hotel's overall ratings than the positive ones. On the other hand, online reviews are generated by reviewers with different cultural backgrounds. As such, online reviews reflect the prevailing values of the reviewer's culture (Guan et al., 2022). Few studies use online reviews to investigate the impact of culture on service evaluation and customer satisfaction (e.g., Mariani and Predvoditeleva, 2019; Zhang et al., 2020; Mariani et al., 2020; Guan et al., 2022). However, most of these studies investigate either a single cultural dimension (i.e. uncertainty avoidance) or how online service attributes' evaluation of customers from different cultural backgrounds affects hotel overall ratings. The purpose of this study is to investigate whether the asymmetric effects of different hotel service attributes, extracted from online reviews, vary for customers from different cultures.

## 2. Theoretical framework

*Online reviews and consumers' overall evaluation*
User-generated content (UGC) is published information that an unpaid contributor provides to a Peer to Peer (P2P) platform. The information might be a photo, video, blog or discussion forum post, poll response or comment made through a social media website (Ayeh et al., 2013; Guan et al., 2022). Online reviews have attracted the attention of both academics and practitioners as they serve as consumers' source of information, affect consumers' attitude and purchase intentions and predict companies' financial performance (Akamavi et al., 2015; Chatterjee and Mandal, 2020; Liu et al., 2023).

Online reviews are used by companies to gain insights on how consumers evaluate services and understand what predicts their satisfaction. Content analysis of online reviews in the hospitality sector shows that several service attributes affect hotels' overall ratings. For example, Li et al. (2013) identify six service factors extracted from online reviews, location/logistics, facilities, receptionist services, food and beverages, room cleanliness and maintenance, and monetary value. Kim et al. (2022) and Athanasopoulou et al. (2023) discern similar service attributes.

*Asymmetric impact of service attributes on consumers' overall evaluation*
Since each service attribute is related to either satisfaction or dissatisfaction at a different magnitude (e.g. Oliver, 1997; Kim et al., 2023), there might bet an asymmetric effect of each service attribute on the overall rating. The theoretical framework of the relationship between hotel service quality and customer satisfaction as reflected on reviews' overall evaluation is called three-factor theory (Mikulic & Prebežac, 2008; Kim et al., 2016; Kim et al., 2023; Athanasopoulou et al., 2023; Zhou et al., 2023). This theory classifies service attributes into three categories: 1) Basic factors, when the impact of the negative evaluation of an attribute on customer satisfaction is greater than the positive one, 2) excitement factors, when the impact of the negative evaluation of an attribute on customer satisfaction is lower than the positive one and 3) performance factors, when the impact of both the negative and the positive evaluation of an attribute on customer satisfaction are equal. Basic factors represent the qualifiers of a service, which induce dissatisfaction when they are not present, yet they do not produce satisfaction when they are delivered. Excitement factors produce satisfaction if they are delivered, but their absence does not lead to dissatisfaction. Finally, performance factors produce satisfaction when they perform high and dissatisfaction when they perform poorly (Mikulic and Prebežac, 2008).

*The role of culture in the effect of service quality attributes on consumers' overall evaluation*
Consumers' cultural origins are shown to affect both overall ratings, a proxy of customer satisfaction, and the content of online reviews (Banerjee & Chua, 2016; Min et al., 2018; Gao

et al. 2018; Tsiotsou, 2019; Zhang et al., 2020; Chatterjee and Mandal, 2020; Tsiotsou, 2022; Guan et al., 2022). Gao et al. (2018) find a negative relationship between reviewers' power distance and their online overall ratings. Guan et al. (2023), following Hofstede's cultural dimensions, find that service delivery reliability (mostly related with personnel and location) and tangibles are more important for reviewers with high levels of individualism and uncertainty avoidance, while service adaptability (mostly related with food and processes) aligns with cultures characterized by power distance, masculinity and long-term orientation. Furthermore, Zhang et al. (2020) show that the cultural dimensions of masculinity, individualism, uncertainty avoidance and long-term orientation significantly affect different aspects of hotels' online ratings. Finally, Tsiotsou (2019; 2022), conducts a European cross-supranational cultural study where Europe is split in 4 segments and she found significant differences between them in hotels' service attribute online ratings as well as in hotels' overall ratings.

*Cultural dimensions as moderators on the asymmetric effects of online service attributes on consumers' overall ratings*

The nature of the current study is exploratory, and its contribution is to investigate the moderating effects of Hofstede's cultural dimensions on the asymmetric relationships between service attributes, extracted from rewarding (positive) online reviews, and service attributes extracted from penalizing (negative) online reviews, on hotel consumers' overall ratings. The study considers the effects of Hofstede's five cultural dimensions: 1) The Power Distance Index (PDI), expressing the acceptance of power that is established in relationships by social institutions; 2) Individualism-Collectivism (IDV) reflecting the extent to which consumers view themselves as independent individuals or identify themselves with groups; 3) Masculinity-Femininity (MAS) referring to the extent to which a culture supports a traditional view of masculine, associated with assertiveness, or feminine traits, associated with nurturing; 4) The Uncertainty Avoidance Index (UAI) reflecting how societies are different in terms of risk perception; and 5) Long-Term Orientation (LTO) expressing the extent to which a society focuses on the future (i.e., perseverance, and delays in short-term gratification for future benefit) or the present and past benefits.

## 3. Research methodology

The study analyzes 26.792 online reviews extracted from Booking.com. These reviews concern consumers' evaluations for 98 4- and 5-star hotels located in Athens, Greece, and were posted between June 2022 and August 2024. The textual content of each review in Booking.com is divided into positive and negative aspects, which provide an easier way to examine the asymmetric effects of service attributes on consumers' overall ratings. The analysis includes three steps.

The first step is devoted to the extraction of hotel's service attribute-level evaluation from the text content, hotel overall evaluation and country of origin. A content analysis is performed in order to formulate a multi-attribute model relating positively and negatively assessed service attributes and customer's overall rating or satisfaction (Kim et al., 2023a; 2023b). More specifically, the most frequent mentioned 150 words from the textual content were extracted using an R dedicated routine (LDA) and then three independent coders classified the words into eight service attributes: cleanliness, location, staff, facilities, room, food, processes, and value for money (VfM). Any conflicts in the classification amongst coders were resolved by using a fourth coder with high experience in the field. As the textual content of each review consists of positive and negative evaluations of hotel services, the textual content of each review could contain up to sixteen (16) attributes (8 positive and 8 negative). The 16 independent variables, reflecting multi-attributes of the hotel service mix, were constructed

based on the binary representation (Kim et al., 2023), 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.

In the second step, Partial-Least Square Path Modelling is used to perform the penalty-reward contrast analysis (PRCA) (Mikulic and Prebežac, 2008), and the three-factor theory of customer satisfaction (Matzler and Sauerwein, 2002), to investigate the asymmetric impact of different service attributes on customer overall ratings for the hotels in the sample.

Finally, in the third step a five multigroup analysis is conducted, using a permutation test provided by XLSTAT package (Chin, 2009), to investigate the moderating relationships of each cultural dimension into the previously analyzed conceptual framework.

## 4. Results

The results of the online reviews' content analysis and word classification are presented in Table 1 in which part of the extracted most frequent words are classified into the eight service factors.

| Cleanliness | Location | Staff | Facilities | Room | Food | Processes | VfM |
|---|---|---|---|---|---|---|---|
| Clean room/ corridors/ facilities, bad smells, mold | Location, access, view, neighborhood | Service, polite, helpful, smile | Parking, airport shuttle, restaurant, gym, spa, pool, lobby | Air conditioning, tub, balcony, kettle, flat-screen TV, soundproofing, bed's comfort, lighting, fridge/minibar, | Menu, breakfast, lunch, dinner, juice, drinks, cocktails | Check-in, check-out, luggage handling, housekeeping, room service | Price, logical price, overpriced |

Table 1. Example of extracted word classification

The results of the penalty-reward contrast analysis (PRCA) for all extracted online reviews appear in Table 2. Results indicate that all coefficients are statistically significant ($p < 0,05$) and that penalty indices (PI), related to negative service evaluations, are greater than reward indices (RI), related to positive evaluations, for all service factors. These results confirm the presence of asymmetric effects of service attributes on consumers' overall rating and reveal that reviewers are very demanding because all service factors are categorized as basic attributes. The proposed model explains the 45,4% of the overall ratings variance.

| | RI | PI | RIOCS | SGP | DGP | IAI | TYPE |
|---|---|---|---|---|---|---|---|
| Cleanliness | 0.033 | -0.210 | 0.243 | 0.135 | -0.865 | -0.730 | F |
| Location | 0.094 | -0.137 | 0.230 | 0.407 | -0.593 | -0.185 | D |
| Staff | 0.157 | -0.207 | 0.364 | 0.431 | -0.569 | -0.138 | D |
| Facilities | 0.071 | -0.132 | 0.203 | 0.348 | -0.652 | -0.303 | D |
| Room | 0.131 | -0.298 | 0.429 | 0.305 | -0.695 | -0.390 | D |
| Food | 0.071 | -0.087 | 0.158 | 0.449 | -0.551 | -0.102 | D |
| Processes | 0.047 | -0.149 | 0.196 | 0.237 | -0.763 | -0.525 | F |
| Value for Money | 0.019 | -0.111 | 0.130 | 0.147 | -0.853 | -0.707 | F |
| F | 1,393.997 | | | | | | |
| Sig. | 0.000 | | | | | | |
| $R^2$ | 0.454 | | | | | | |

Table 2: Impact of service factors on overall rating

To perform the multigroup analysis each cultural dimension was split into two groups, where each group represents a high or a low score in a particular cultural dimension based on a midpoint split. The results of the multigroup analysis, shown in Table 3, reveal the following: The asymmetric relationships, presented in Table 2, are confirmed to a great extent for all cultural groups. The deviation from the general model is that Food is a hybrid attribute (instead of a dissatisfier) for reviewers with a low PDI, high individualism and low masculinity profile. Also, for all multi-group models the stronger positive effects on overall rating are related to staff, room and location evaluations, while the stronger negative effects on overall rating are generated by room, staff and cleanliness evaluations.

The negative evaluations of location and room from reviewers with a low PDI have a bigger effect on overall evaluation than those of reviewers with a high PDI, while the positive evaluations of cleanliness, room and VfM from reviewers with a high PDI have a stronger effect on overall evaluation than those of reviewers with low PDI. In addition, the negative evaluations of room from reviewers with a collectivistic profile have a bigger effect on overall evaluation than that of reviewers with an individualistic profile, the positive evaluations of cleanliness and VfM from reviewers with a collectivistic profile have stronger effects on overall rating that those of reviewers with an individualistic profile and the positive evaluations of room from reviewers with an individualistic profile have a stronger effect on overall rating that that of reviewers with a collectivistic profile.

| Cultural Dimension | Level | Cleanliness | Facility | Food | Location | Process | Room | Staff | VFM |
|---|---|---|---|---|---|---|---|---|---|
| PDI | L | | | | P | | P | | |
| | H | R | | | | | R | | R |
| INV | L | R | | | | | R | | R |
| | H | | | | | | P | | |
| MAS | L | | | | | | R | R | R |
| | H | | | | | R | | | |
| UAI | L | | | | | | P | | |
| | H | R | | | | | | | R |
| LTO | L | | | | | | | | |
| | H | | | | | | | | R |

Note: Penalty (P); Reward (R); Low (L); High (H)

Table 2: Asymmetric effects per cultural dimension

Furthermore, the positive evaluations of room, staff and VfM from reviewers with a feminine profile have a stronger effect on overall evaluation than those of reviewers with a masculine profile, while the positive evaluations for processes from reviewers with a masculine profile have a stronger effect on overall evaluation than that of reviewers with a feminine profile. Also, the negative evaluations of room from risk averse reviewers have a stronger effect on overall evaluation than that of risk seeking reviewers, while the positive evaluations of cleanliness and VfM from risk seeking reviewers have a stronger effect on overall evaluation than those of risk averse reviewers. Finally, the positive evaluations for VfM from reviewers with long-term orientation have a stronger effect on overall rating than that of reviewers with short-term orientation. The fitting quality of all multigroup models to the data is adequate ranging from 44,7% to 46% of the variance of the overall ratings.

## 5. Conclusions, implications, limitations, and suggestions for further research

The objective of this study is to investigate the asymmetric impact of service attributes' evaluation on hotel's overall rating, using online reviews, for customers from different cultures. The results confirm the moderating effects of reviewers' cultural background on the

asymmetric relationship between the evaluation of service attributes in online reviews and the overall rating of a hotel. More specifically, all service factors are classified as basic and their negative evaluation induces customer dissatisfaction, while their improvement is not expected to lead to much higher overall ratings. Therefore, we conclude that hotel customers expect the minimum requirements for all service attributes and become dissatisfied when these attributes do not meet their expectations while positive evaluations are expected to reduce the level of dissatisfaction from negative evaluations.

The results of this study can serve as a guide for customizing hotel services according to customer culture to prevent dissatisfaction and retain overall hotel performance. The value of this study is the identification of the different service attributes that are important for customer satisfaction so that hotels can differentiate their service mix to maximize the satisfaction of each customer and improve online ratings.

An improvement in online ratings can affect hotel performance significantly by improving their acquisition and retention rate through increased eWOM effects and better customization of certain service attributes based on customers' cultural background.

This study analyzes online reviews posted for hotels in Athens, Greece. Future research can extend the sample of reviews to hotels of other countries or investigate the role of other factors. For example, culture can have differential impacts on the overall rating contingent on customers' travel purposes (leisure vs. business), type of customer (solo vs. couple vs. group) and length of stay.

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