

Inside the Rating Scores: A Multilevel Analysis of the Factors Influencing Customer Satisfaction in the Hotel Industry

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Abstract

In this study, we conducted a multilevel analysis of factors affecting customer satisfaction in the global hotel industry. The survey data collected from TripAdvisor.com included customer reviews relating to 13,410 hotels located in 80 major global urban tourism destinations. We examined multiple relevant factors at each of the following five levels of analysis: (a) service encounter, (b) visitor, (c) visitor's nationality, (d) hotel, and (e) destination. The results show that hotel attributes and the personal characteristics of visitors most powerfully influence customer satisfaction. However, the purpose of the trip, the characteristics of the destination, and the visitor's nationality are also found to play an important role in hotel evaluation. By integrating multiple levels of analysis into a single statistical model, multilevel modeling framework enables researchers and professionals to see the “big picture” of factors affecting customer satisfaction in the contemporary hotel industry.

Keywords

customer satisfaction; hospitality industry; multilevel analysis; online ratings; hotel attributes; urban tourism

Introduction

Customer satisfaction is a top priority in the modern hospitality industry. Its link with customer loyalty and improved financial performance has been demonstrated many times over in the literature (Anderson, 2012; Assaf, Josiassen, Knežević Cvelbar, & Woo, 2015; Sparks & Browning, 2011). Given its importance, much research over the past decades has been devoted to examining factors affecting customer satisfaction. Using data collected through questionnaires and interviews, researchers have diligently accumulated the existing body of knowledge. Yet, the scarcity of empirical data has forced researchers to focus on a handful of relevant factors (or observational units) at a time, with the scope of analysis restricted to factors operating at a single “level.” This circumstance has led travelers' expectations and preferences (Banerjee & Chua, 2016; Besser, Zeigler-Hill, Weinberg, & Pincus, 2016; Mauri & Minazzi, 2013), hotel attributes (Akbaba, 2006; Albayrak & Caber, 2015; Dolnicar & Otter, 2003; Gundersen, Heide, & Olsson, 1996; Zhou, Ye, Pearce, & Wu, 2014), and cross-destination (Bulchand-Gidumal, Melián-González, & Lopez-Valcarcel, 2013), cross-country, and cross-regional (Banerjee & Chua, 2016) differences in hotel guest satisfaction to emerge as important, but, somewhat detached research topics devoted to each particular level of analysis. These level-specific research topics were, naturally, dominated by the traditional analytical tools intended for single-level analysis, such as

ordinary least squares (OLS) regression (including ANOVA) and structural equation modeling (SEM).

The recent emergence of online review services has opened up a new frontier in research on customer satisfaction in the hospitality industry. Customer reviews posted using these services include specific and detailed information on service encounters in various tourist destinations worldwide. Empirical data are no longer scarce, and researchers are increasingly employing online reviews to gain valuable insights into what makes a great customer experience. This abundance of data is gradually changing research methods in the field of hospitality, as it already has in many other fields of research, leading to new analytical tools being adopted. These data, therefore, constitute a valuable tool for determining the future direction of research methodology and which particular research methods are likely to be most promising going forward. One part of the answer to this question might lie in the characteristics of the data themselves. Namely, large data samples collected through online surveys have different statistical properties from those collected through

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traditional surveys: They are much more likely to involve multiple reviews provided by the same persons and to encompass reviews that are geographically dispersed. This gives the data a characteristic hierarchical structure—reviews are nested within reviewers, hotels are nested within destinations, and destinations are nested within countries. The problem with traditional analytical tools is that they either ignore the hierarchical structures existing in data, which may produce biased estimates, or account for the structures by including dummy variables, which is statistically inefficient. Therefore, prospective analytical tools need to be capable of dealing with the hierarchical structures that commonly underlie online data, and must do so in a statistically appropriate and efficient way. Another part of the answer might lie in the type of research questions that remain to be addressed in the future. As noted before, numerous level-specific questions relating to customer satisfaction in the hospitality industry have already been amply addressed in the literature. What remain largely hidden are the simultaneous and synergistic effects that factors operating at different levels of analysis may have on customer satisfaction. Some of the intriguing questions that need to be addressed in greater detail are as follows: Do the effects of certain individual, hotel, and destination characteristics reported in the literature remain significant when all relevant factors operating at the other levels are controlled for? How much of the variation in customer satisfaction can be attributed to each level of analysis? How do factors operating at different levels interplay to create, enhance, or reduce customer satisfaction? The simultaneous examination of large numbers of relevant factors operating at different levels may be the key to understanding the multi-layered nature of customer experience. The increasing abundance of online data has finally endowed researchers with sufficient statistical power to conduct this type of multilevel examination and the prospective tools need to be capable of performing it.

Multilevel modeling is an analytical framework that is well suited to both the tasks described above. For this reason, it may be expected that this approach will rapidly gain in popularity and eventually become the analytical tool of choice for the analysis of online reviews. Although it has already been applied successfully in several published studies (Bulchand-Gidumal et al., 2013; Ling, Lin, & Wu, 2016; Radojevic, Stanicic, & Stanic, 2015a), the full potential of the multilevel framework as a research tool in the field of hospitality is still largely untapped.

To that end, this article aims to present a multilevel analysis of factors affecting customer satisfaction with hotel services. For this purpose, we used a global sample collected from TripAdvisor—a major online booking and review service. Based on the existing evidence from the literature and theoretical deduction, we first identified five levels relevant to the analysis: (a) service encounter, (b) visitor, (c) visitor's

nationality, (d) hotel, and (e) destination. We then estimated how much of the total variation in the reported satisfaction with hotel services can be attributed to the entirety of relevant factors (both tangible and intangible) that operate at each level, offering useful insights into the general decomposition of satisfaction into subjective and objective realms, and their relative importance. Finally, we examined how much of the variation at each level can be explained by the quantifiable level-specific factors. By including a comprehensive list of relevant factors in a single model and analyzing their differential and combined effects, we hope to enable researchers and professionals to see how multilevel modeling framework can help them better comprehend the “big picture” of the causal mechanism that lies behind customer satisfaction in the contemporary hotel industry.

Literature Review

According to expectation disconfirmation theory, customer satisfaction is achieved when the perceived performance of the service exceeds the customer's pre-purchase expectations (Oliver, 1977, 1980). As suggested by the literature, both expectation and performance facets of customer satisfaction are influenced by a variety of factors operating at different levels.

The expectation side is, generally, somewhat less examined in the literature (Wang, Qu, & Hsu, 2016), especially at the individual traveler level. However, personal standards are expected to play an important role in the formation of expectations (Liljander & Strandvik, 1997; Oliver, 2010). A recent study by Besser et al. (2016) shows that individuals with high levels of pathological grandiosity tend to expect a vacation to be more pleasurable than it is ever likely to be, even when they are objectively informed beforehand about what to expect. Consequently, when events do not turn out as well as anticipated, these individuals may have intensified negative emotions (Besser et al., 2016). Similarly, other personal characteristics such as travel experience, preference for hotel and destination attributes, and psychological profile (Jani & Han, 2013, 2014) may also contribute to the systematic differences observed (Lee, Law, & Murphy, 2011) between individual travelers regarding their expectations and other personal standards relevant in the hotel service context. In addition to travelers' personal characteristics, their national identities may exert unique effects on service evaluation. A study by Kozak (2001) found that visitors from different countries reported different average satisfaction levels after visiting the very same destination, the differences presumably owing to different expectations of service quality (Armstrong, Mok, Go, & Chan, 1997) and different requirements of hotel staff (Prayag & Ryan, 2012). More generally, the cultural, socioeconomic, and political-economic contexts from which customers come are shown to explain the cross-national differences observed in

customer satisfaction reasonably well (Morgeson, Mithas, Keiningham, & Aksoy, 2011).

The performance side of customer satisfaction, however, has been thoroughly examined in the literature, with hotel attributes established as an important research topic. Convenient location, service quality, reputation, and friendliness of staff are found to be among the most important characteristics of hotels in terms of customer satisfaction (Dolnicar & Otter, 2003). As regards the directly observable attributes, star classification is consistently shown to be a reliable predictor of customer satisfaction (Ryan, 2007), but air conditioning, a lobby bar, free wireless Internet connection, and membership of a branded hotel chain (Radojevic, Stanisic, & Stanic, 2015a) have also recently been identified as relevant. Another set of factors capable of affecting hotel performance is that related to the tourist destinations in which hotels are located. Destinations establish economic and cultural contexts within which hotel service is delivered and, therefore, have their unique, albeit less pronounced, effects on a guest's satisfaction. Significant cross-destination differences in average reported levels of customer satisfaction with hotel services are documented in the literature (Bulchand-Gidumal et al., 2013; Radojevic, Stanisic, & Stanic, 2015a). These differences should primarily be attributed to the shared characteristics of the hotel service offer in each destination such as local level of development of the hospitality industry, quality of staff training, and food and beverages offered. Nevertheless, it is conceivable that the general level of traveler satisfaction with a tourist destination may also play a subtle role; even if destination-specific factors, such as the level of economic development, attractiveness, and even climate are exogenous to hotels and may not directly affect hotel service performance, their influence on hotel service evaluation cannot entirely be ruled out.

Finally, there is one additional set of factors that may affect customer satisfaction: encounter-specific factors. Generally, these include all factors that do not fall into the four sets previously defined, but are capable of affecting customers' expectations and experience, and hence their evaluation of hotel service. Two examples are travel purpose (Ariffin & Maghzi, 2012; Li, Law, Vu, & Rong, 2013; Masiero, Yoonjoung Heo, & Pan, 2015) and season (Maharjan, 2012).

The intuitive idea that visitor- and visitor's nation-level factors rule the expectation side, whereas hotel- and destination-level factors predominantly rule the performance side of customer satisfaction, is no more than a good starting point for analysis. According to the evidence found in the literature, factors operating at all levels simultaneously affect both expectation and performance sides. Information on hotel and destination attributes that is available in the pre-visit stage is shown to affect customer expectations (Ariffin & Maghzi, 2012; Banerjee & Chua, 2016; Wang et al., 2016), whereas certain characteristics of guests such

as their tipping habits or even their physical appearance (Knežević, Tomka, Bizjak, Fabjan, & Kukulj, 2015) may affect the quality of the hotel service provided. What adds even further complexity is that factors operating at different levels may interact. For instance, it is to be expected that the cultural and economic conventions that visitors carry within themselves interact with the cultural and economic context of the destination they visit, as both guest and host bring their own culturally defined expectations, behaviors, and prejudices to the encounter (Sharpley, 2014).

Based on the above analysis of the relevant literature, we identified five distinct levels at which factors affecting customer satisfaction are expected to operate: (a) service encounter, (b) visitor, (c) visitor's nationality, (d) hotel, and (e) destination. Owing to the complexity of the relevant factors and their described interplay, they are best analyzed in a single research model. Accordingly, we propose a multi-level analytical framework that integrates these five levels and allows a holistic examination of factors affecting customer satisfaction with hotel services. The framework is summarized in Figure 1.

Material and Method

In this section, we describe the structure of the data set, discuss in more detail the rationale for using the multilevel (random effects) modeling framework, and define the dependent and explanatory variables. We also discuss some important aspects of the modeling process that support our interpretation of the results, such as the centering of the explanatory variables and the choice of the reference categories.

Data

We collected the survey data for this study from TripAdvisor.com. The data set comprised customer reviews relating to 13,410 hotels located in 80 capital cities (urban tourism destinations) around the globe. We choose only those cities whose corresponding countries have data available on all six of Hofstede's (2010) cultural dimensions, which are important explanatory variables in this study. These 80 countries, along with their respective cultural dimension scores, are listed in Appendix A, and the geographical coverage of the study is illustrated in Figure 2.

Having identified the destination cities, we collected all available data relating to them from TripAdvisor.com, including the complete information available on the attributes of all the hotels listed on TripAdvisor at the time of collection, all reviews posted associated with those hotels, as well as publicly available information on the authors of the reviews. A total of 3,488,473 distinct customer reviews met the defined criteria. The reviews were provided by 2,233,671 unique registered TripAdvisor users (some users provided ratings on multiple hotels; these were differentiated based on their

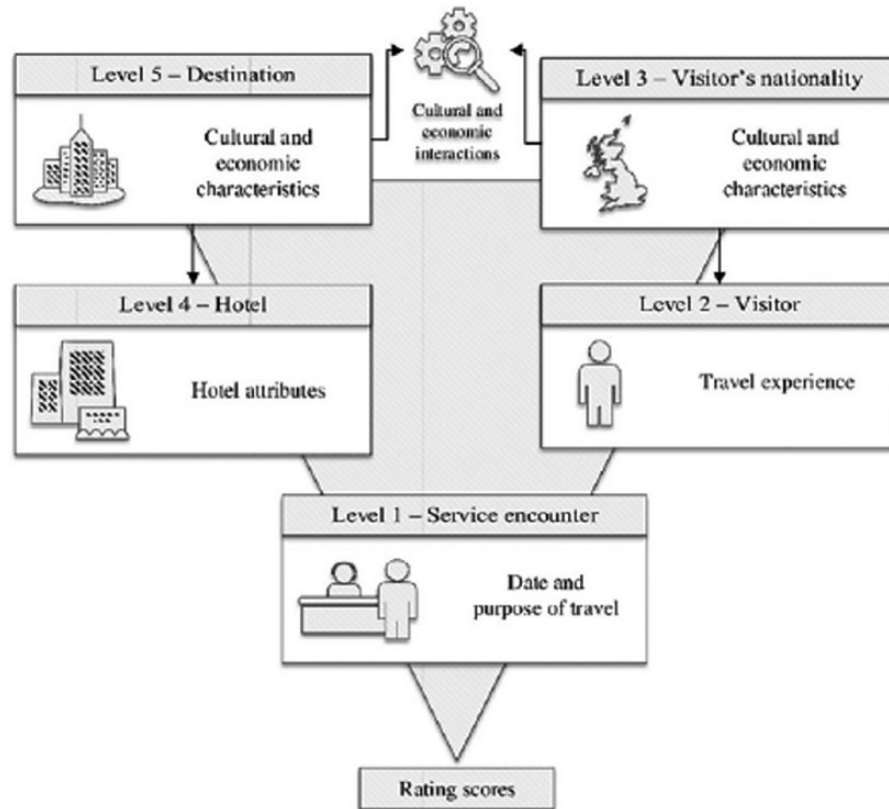


Figure 1.
Graphical Summary of the Analytical Framework of the Study.



Figure 2.
Countries Included in the Study, Shown in the Darker Color.

unique user IDs) of 210 different nationalities (as declared on the users' profiles). All the reviews collected were completed between August 31, 2002, and May 15, 2015.

The sample described above is used in the analysis of the dependent variable presented in section "Rating Scores (Dependent Variables)." In the later sections, on specifying

and fitting the regression models, the size of the sample generally decreased (to around 1.5 million), and varied across the models owing to missing observations within dependent or explanatory variables—predominantly the Hofstede's scores for visitors' countries.

Rating Scores (Dependent Variables)

When reviewing a property on TripAdvisor.com, users are required to provide an "overall rating" that denotes their general encounter-specific satisfaction with the services of the property under review. The rating score is on a 1 to 5 scale with the following descriptive labels, respectively: *terrible*, *poor*, *average*, *very good*, and *excellent*. The smoothed historical trend of the mean overall rating scores, and their total yearly counts, as observed in the study sample, are presented in Figure 3.

Besides the exponential growth in the annual number of reviews posted, there is an apparent trend showing an increase in the mean value of overall rating scores for the hotels.

In addition to the overall score, users may, at their own discretion, assign additional criteria-specific ratings: location, cleanliness, rooms, service, sleep quality, and value. The

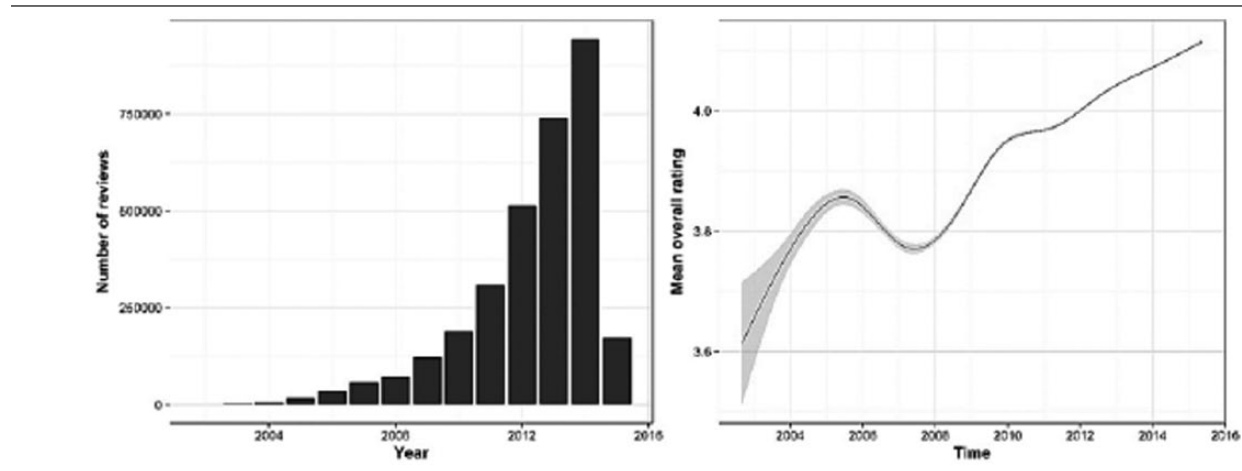


Figure 3.

Total Number of Ratings by Year and Smoothed Historical Trend of the Mean Overall Rating Scores (With 95% Confidence Interval) as Observed in the Data Sample From TripAdvisor.com.

Table 1.

Correlations Between the Rating Scores.

	Overall	Location	Cleanliness	Rooms	Service	Sleep Quality	Value
Overall	1.000	.626	.820	.867	.852	.817	.816
Location	.626	1.000	.517	.547	.607	.600	.586
Cleanliness	.820	.517	1.000	.844	.789	.781	.753
Rooms	.867	.547	.844	1.000	.764	.784	.774
Service	.852	.607	.789	.764	1.000	.742	.770
Sleep quality	.817	.600	.781	.784	.742	1.000	.729
Value	.816	.586	.753	.774	.770	.729	1.000

fact that the overall rating scores are not merely simple averages of the other six rating scores allows us to explore the bilateral associations between different criteria-specific scores. Given the elective nature of the criteria-specific ratings, the analysis is best conducted at the level of individual hotels. The total number of properties with at least one rating score assigned for each of the mentioned criteria was 349.

The correlations between the average rating scores are presented in Table 1.

The level of accordance between the rating scores is high, as expected. However, the values of certain coefficients are surprisingly high. For instance, the scores for the location criterion exhibit strong correlation with the scores for sleep quality (.600) and rooms (.547). We can offer at least two different explanations for this phenomenon. The first is that hotels occupying premium locations tend to be managed more professionally—the large investments in acquiring premium locations may go hand in hand with large investments in equipment and staff training. This interpretation considers hotel location to be an integral part of the overall service

quality construct and proposes an intuitive, location-to-overall-rating direction of causal effect. The second relates to the presence of a “spill-over effect,” which means that customers who are satisfied with the general level of hotel services tend to rather impulsively and immethodically assign similarly high ratings to the location criterion. These two explanations are not mutually exclusive, and it is likely that both are true to some extent, as will be shown later in the analysis.

Multilevel Modeling Framework

For the purpose of this study, we used a multilevel analytical¹ framework. Multilevel analysis (a) accounts for the non-independence of observations within groups, (b) decomposes the total variance into variance within and variance between groups, and (c) allows the simultaneous examination of the effects of group-level and individual-level variables on individual-level outcomes (Diez Roux, 2002). We now briefly explain these three characteristics and clarify their relevance for this and future research.

The first important advantage of multilevel regression is that it “can be parameterized to account for the non-independence of the data” (Feaster, Brincks, Robbins, & Szapocznik, 2011, p. 2). Correlated groups within data often arise as a result of nesting, with data structured (or nested) within a grouping variable (Atkins, 2005), as well as in studies involving repeated measurements collected from multiple individuals (Ryu, 2014). The data sample we collected from TripAdvisor does involve repeated measures and nesting structures. It includes repeated measures in the sense that some reviewers posted multiple reviews, and most hotels had multiple reviews associated with them. Consequently, the values of individual ratings observed in the sample are not entirely independent of each other, but tend to cluster in relation to the reviewers as well as the hotels. Moreover, individual hotels are often nested within locations, and reviewers are nested within their nations, which again makes the individual ratings within those grouping factors more similar to each other than to other ratings in the sample. Consequently, reviewers, hotels, destinations, nations, and similar grouping factors, can all be seen as distinct sources (and layers) of dependencies within the rating scores. Although the resultant dependencies directly violate an important assumption of the standard OLS model, making it unsuitable for analysis, they are dealt with efficiently² in the multilevel modeling framework. As the units in each layer represent a random sample from their respective universes,³ the layers can be regarded as “levels” and modeled as random effects in the multilevel framework. The hierarchical (nesting) structure of the effects is also appropriately integrated in the model specification. Technically speaking, hotels are nested within destination cities (each particular hotel is located in only one city) and reviewers are nested within their nations (each reviewer has only one country of origin declared on TripAdvisor). By accounting for the dependencies in such a way, multilevel models produce unbiased standard errors and allow valid statistical inferences.

The second advantage of the multilevel approach for this study is that it allows estimation of the amount of variance in the rating scores that lies at each level, both before and after inclusion of the explanatory variables. This procedure is called variance components analysis. It is informative in terms of assessing the relative importance of the distinct levels and their respective explanatory variables. For example, by decomposing the variance in the ratings scores into within- and between-hotel components, we are able to understand how different the hotels are with regard to the reported levels of customer satisfaction and how much of the difference can be explained by hotel attributes. So, the hierarchical structure of online data, which would be considered problematic from the perspective of traditional analytical tools, is, within the multilevel framework, regarded as a useful source of information to be used for additional analysis.

Finally, the multilevel modeling framework allows examination of the relationships between variables at different levels in the hierarchical structure (contextual analysis). The relationships between the variables are not necessarily identical across the levels—for example, wealth and customer satisfaction might have a negative correlation between nations and a positive correlation within nations. Assuming that these relationships are identical (using an OLS model), when they are not, results in “ecological fallacy” (Brewer & Venaik, 2014) and biased results. Also, some of the explanatory variables used in this study are defined and observed only at the aggregate level of analysis, with no analogues at the individual or hotel level. The dimensions of national culture are, as indicated by Minkov and Hofstede (2011), “meaningless as descriptors of individuals or as predictors of individual differences because the variables that define them do not correlate meaningfully across individuals” (p. 3). By including Hofstede’s culture scores at the proper national level, we acknowledge the fact that culture is a collective, not an individual phenomenon. The values of national GDPs are also included at the national level, rather than being projected onto individuals (using an OLS model), which would ignore the considerable individual variations in income that exist within the nations. As a general rule, each factor affecting customer satisfaction should be included in the statistical model at the level at which it is observed and measured, and this is possible in the multilevel framework.

Explanatory Variables

We include explanatory variables at all five levels: date and type of travel at the encounter level, travel experience at the visitor level, hotel attributes at the hotel level, and indicators of economic development and cultural characteristics at the destination and visitor’s country levels. We also include seven cross-level interaction terms, one for the economic development indicator and one for each of the six cultural dimensions, to examine the potential interplay between the variables.

Definitions of the explanatory variables are presented in Table 2.

Centering of Explanatory Variables and Choice of Reference Categories

Centering the explanatory variables is vital to the interpretation of intercept and slope parameters in multilevel models (Enders & Tofghi, 2007). Given the aim of this study, the values of the hotel-, destination-, and visitor’s country-level explanatory variables are centered at their grand means. As a reference category for the star classification variable, we selected the 3.5-star classification, as it is a medium category according to the sample. We set all

Table 2.
Study Variables.

Level I variables—Encounter

1. Trip purpose: transaction-specific type of trip (solo, business, couples, families, friends)
2. Date: date of the review

Level II variables—Reviewer

1. Reviewer's travel experience: reviewer's TripAdvisor badge at the time of data collection (reviewer, senior reviewer, contributor, senior contributor, top contributor)^a

Level III variables—Visitor's country

1. GDP 2014 vis.: visitor-country 2014 nominal GDP per capita in US\$ (log-transformed)
2. Cult pdi vis.: visitor-country score for power distance
3. Cult idv vis.: visitor-country score for individualism
4. Cult mas vis.: visitor-country score for masculinity
5. Cult uai vis.: visitor-country score for uncertainty avoidance
6. Cult lto vis.: visitor-country score for long-term orientation
7. Cult ivr vis.: visitor-country score for indulgence

Level IV variables—Hotel (descriptive statistics are provided in Appendix B)

Star classification

1. Hotel stars: star classification^b

General characteristics

2. Hotel price: price per room per night in euros—(double occupancy; check in: September 30, 2015, check out: October 01, 2015; log-transformed)
3. Hotel distance: distance from the city center in km (log-transformed)
4. Hotel size: number of rooms in the hotel (log-transformed)

Room types

5. Suites: 1 if present, 0 if not
6. Family rooms: 1 if present, 0 if not

Room equipment

7. Air conditioning: 1 if present, 0 if not
8. Microwave: 1 if present, 0 if not
9. Minibar: 1 if present, 0 if not
10. Refrigerator in room: 1 if present, 0 if not

Facilities

11. Free parking: 1 if present, 0 if not
12. Kitchenette: 1 if present, 0 if not
13. Bar/lounge: 1 if present, 0 if not
14. Self-serve laundry: 1 if present, 0 if not
15. Business center with Internet access: 1 if present, 0 if not
16. Conference facilities: 1 if present, 0 if not
17. Meeting rooms: 1 if present, 0 if not
18. Banquet room: 1 if present, 0 if not
19. Casino and gambling: 1 if present, 0 if not

Services

20. Babysitting: 1 if present, 0 if not
21. Dry cleaning: 1 if present, 0 if not
22. Multilingual staff: 1 if present, 0 if not
23. Airport transportation: 1 if present, 0 if not
24. Laundry service: 1 if present, 0 if not
25. Children's activities (kid/family friendly): 1 if present, 0 if not
26. Free breakfast: 1 if present, 0 if not
27. Concierge: 1 if present, 0 if not
28. Room service: 1 if present, 0 if not
29. Restaurant: 1 if present, 0 if not
30. Shuttle bus service: 1 if present, 0 if not

(continued)

Table 2. (continued)

Internet connection
31. Free Internet: 1 if present, 0 if not
32. Free high-speed Internet (Wi-Fi): 1 if present, 0 if not
33. Paid Wi-Fi: 1 if present, 0 if not
34. Paid Internet: 1 if present, 0 if not
35. Public Wi-Fi: 1 if present, 0 if not
Recreation and relaxation
36. Ski-in / ski-out: 1 if present, 0 if not
37. Fitness center with gym/workout room: 1 if present, 0 if not
38. Spa: 1 if present, 0 if not
39. Tennis court: 1 if present, 0 if not
40. Golf course: 1 if present, 0 if not
41. Hot tub: 1 if present, 0 if not
42. Pool: 1 if present, 0 if not
43. Beach: 1 if present, 0 if not
Support for people with disabilities
44. Wheelchair access: 1 if present, 0 if not
45. Reduced mobility rooms: 1 if present, 0 if not
Smoking policy
46. Non-smoking hotel: 1 if present, 0 if not
47. Non-smoking rooms: 1 if present, 0 if not
48. Smoking rooms available: 1 if present, 0 if not
Pet policy
49. Pets allowed (dog/pet friendly): 1 if present, 0 if not
Level V variables—Destination city
1. GDP 2014 dest.: destination-country 2014 nominal GDP per capita in US\$ (log-transformed)
2. Cult pdi dest.: destination-country score for power distance
3. Cult idv dest.: destination-country score for individualism
4. Cult mas dest.: destination-country score for masculinity
5. Cult uai dest.: destination-country score for uncertainty avoidance
6. Cult lto dest.: destination-country score for long-term orientation
7. Cult ivr dest.: destination-country score for indulgence
Cross-level interactions
1. GDP inter.: interaction between the GDP values
2. Cult pdi inter.: interaction between scores for power distance
3. Cult idv inter.: interaction between scores for individualism
4. Cult mas inter.: interaction between scores for masculinity
5. Cult uai inter.: interaction between scores for uncertainty avoidance
6. Cult lto inter.: interaction between scores for long-term orientation
7. Cult ivr inter.: interaction between scores for indulgence

Note. Pdi = power distance; idv = Individualism; mas = masculinity; uai = uncertainty avoidance; lto = long-term orientation; ivr = Indulgence.

a. The reviewer's rank is derived from their total number of reviews posted on TripAdvisor.com in the following way: 3-5, reviewer; 6-10, senior reviewer; 11-20, contributor; 21-49, senior contributor; 50+, top contributor (<https://www.tripadvisor.com/hc/en-gb/articles/200613997-What-are-review-badges->).

b. The star classification available on TripAdvisor.com is provided by third parties such as Expedia; for criteria, see <http://www.expedia.com/Hotel-Star-Rating-Information>

services and amenities to their grand/global mean values. As a result, the intercepts (constants in the regression models) are interpreted as the expected values of ratings that a visitor coming from a country with moderate economic development and moderate cultural characteristics would assign to a typical hotel located in a country with similar characteristics. In other words, they represent expected

rating scores in a service encounter that is average with respect to all hotel and national characteristics. We selected less experienced travelers (those who had written between three and five reviews on TripAdvisor) as the reference category for travel experience, and leisure trip (including solo, couples, families, and friends) is selected as a reference category for trip purpose. In view of the trend of an increase in

average rating scores, we centered the date variable at the date of the latest review in the sample, that is, May 15, 2015, so that the intercepts reflect the most recent levels of reported satisfaction.

The slopes (partial regression coefficients) are estimates of the marginal (partial) effects of the corresponding factors on reported levels of encounter-specific customer satisfaction with hotel services. They indicate the expected absolute change in the assigned rating score associated with the corresponding categorical factor being present/available versus it not being present/available in the course of the service encounter (for a unit increase in the case of numerical factors), holding all the remaining included factors constant at their reference categories (mean values in the case of numerical factors).

Model Specification and Fitting

Using the flexible “classification notation” introduced by Browne, Goldstein, and Rasbash (2001), we specified the model as follows:

$$y_i = x_i\beta + u_{\text{visitor}(i)}^{(2)} + u_{\text{vis national}(i)}^{(3)} + u_{\text{hotel}(i)}^{(4)} + u_{\text{destination}(i)}^{(5)} + e_i,$$

$$u_{\text{visitor}(i)}^{(2)} \sim \mathcal{N}(0, \sigma_{u(2)}^2),$$

$$u_{\text{vis national}(i)}^{(3)} \sim \mathcal{N}(0, \sigma_{u(3)}^2),$$

$$u_{\text{hotel}(i)}^{(4)} \sim \mathcal{N}(0, \sigma_{u(4)}^2),$$

$$u_{\text{destination}(i)}^{(5)} \sim \mathcal{N}(0, \sigma_{u(5)}^2),$$

$$e_i \sim \mathcal{N}(0, \sigma_e^2)$$

where $x\beta$ refers to the fixed part of the model inclusive of the intercept (this part is omitted from the null models); random effects are denoted by u , with superscripts indicating the corresponding classifications (the superscript for level 1 is omitted according to the convention); i indexes the lowest level (individual reviews); $\text{visitor}(i)$, $\text{vis national}(i)$, $\text{hotel}(i)$, and $\text{destination}(i)$ are functions that return the unit numbers of the visitor, the visitor’s nationality, the hotel, and the destination, respectively, that the i th review is associated with; and e refers to the lowest level residuals. The random effects are assumed to be normally distributed, independent across classifications, and independent of any predictor variables that are included in the model (Rasbash, Leckie, Pillinger, & Jenkins, 2010).

Because classification notation does not specify the hierarchical relationships in the data, classification diagrams are typically presented in addition to the model equation (Browne et al., 2001; Rasbash & Browne, 2008; Rasbash et al., 2010). The classification diagram for the model proposed herein is

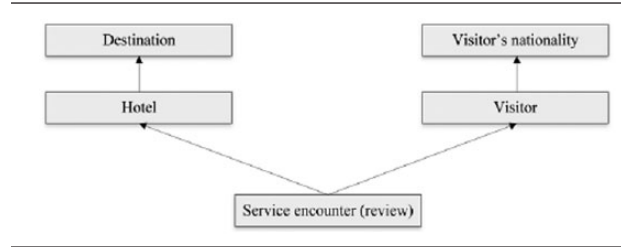


Figure 4.
Classification Diagram.

presented in Figure 4. Two nodes connected by an arrow indicate a nested relationship, whereas two unconnected nodes indicate a crossed relationship (Rasbash et al., 2010).

We conducted all the calculations for this study using the R software environment for statistical computing (R Core Team, 2015) and its associated software package lme4 (Bates, Maechler, & Bolker, 2012). All the results presented in the following section are completely reproducible; the data and the R code can be accessed through the following web address: <http://dx.doi.org/10.17632/kwsrxshf9x.1>.

Results

The results are organized into two subsections. In the first subsection, we report and discuss estimates of variance in the rating scores attributable to each level. In the second subsection, we report the amount of explained variance for each level and discuss the estimates of effects of their corresponding explanatory variables.

Null Models—Models With No Explanatory Variables Included

First, we fitted a model with only levels specified and no explanatory variables included to decompose the total variance in ratings scores into level (variance) components. Here, we discuss the normalized values (summing to 1) of variance visually presented in Figure 5. The complete output is presented in Appendix C.

On average, around 40% of the variation in the rating scores is explained by all relevant factors (both observed and unobserved) operating at the four grouping factor levels. However, residual variation (the encounter level) is beyond their control—it is a result of idiosyncrasies in individual service encounters. Location and cleanliness are the criteria the values of which are easiest to predict based on the grouping factors, with almost half of the variation being explained by them. Arguably, location is the most “objective” of all criteria, being a stable characteristic of each hotel (hence the high between-hotel variability), the same for all customers independent of the selected room format, and invariant through time. The relatively high consensus

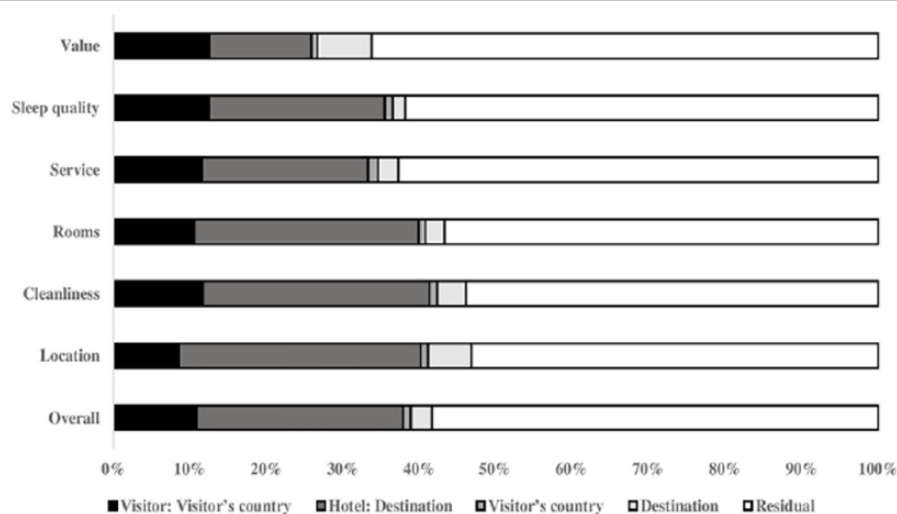


Figure 5.
Variance Components Analysis.

Table 3.
General Characteristics of the Models.

Variables	Overall Rating Score	Location Rating	Cleanliness Rating	Rooms Rating	Service Rating	Sleep Quality Rating	Value Rating
Constant	3.871*** (0.038)	4.218*** (0.042)	4.065*** (0.039)	3.863*** (0.040)	3.961*** (0.040)	3.998*** (0.033)	3.883*** (0.041)
Observations	1,658,174	1,416,813	1,462,529	1,358,301	1,643,756	1,313,588	1,464,853
Pseudo R ²	.46	.47	.50	.48	.44	.46	.42

* $p < .1$. ** $p < .05$. *** $p < .01$.

among the reviewers (low between-individual variation) on this criterion is, therefore, not surprising. Location scores are also influenced by the destination factor, possibly owing to the destination's size and its specific spatial distribution of the hotels. Ratings for cleanliness are mainly influenced by the hotel and the reviewer's characteristics, reflecting the fact that both hotels and individuals have their specific standards on this aspect. Certain evidence exists that ratings on cleanliness also vary across destinations. Rooms are predominantly an objective criterion, but slightly less so than location, as, in addition to the material features, there is an aesthetic aspect to them that is perceived and evaluated by customers. The rating scores for the remaining three criteria—service, sleep quality, and value—are somewhat more difficult to predict given the grouping factors. They are more subjective, with relatively pronounced differences among reviewers. Service is the only criterion for which visitor's national identity seems to play a role, which makes it promising for the analysis of influence of cultural characteristics on hotel evaluation. Quality of sleep appears to be affected by hotel-level factors more than anticipated. Value

is the criterion that is most difficult to explain by the four grouping factors, and, what is particularly surprising is the low importance of the hotel and the high importance of the destination.

The variance component analysis presented above revealed that the most “subjective” evaluation criteria are value, sleep quality, and service. However, predominantly “objective” (hotel-specific) criteria are location and rooms. Cleanliness is both subjective and objective.

Next, we proceed to examine how much of the variation attributed to each level can be explained by quantifiable factors that operate at that particular level.

Saturated Models—Models With All Available Explanatory Variables Included

General characteristics of the saturated regression models, in terms of intercept values, number of observations, and model fit are presented in Table 3.

As already stated, the intercepts (the constants in the regression models) are interpreted as the expected values of

Table 4.
Estimates for Encounter-Specific Variables.

Variables	Overall Rating Score	Location Rating	Cleanliness Rating	Rooms Rating	Service Rating	Sleep Quality Rating	Value Rating
Date of review	0.0001*** (0.00000)	0.0001*** (0.00000)	0.00002*** (0.00000)	0.0001*** (0.00000)	0.0001*** (0.00000)	0.0001*** (0.00000)	0.0001*** (0.00000)
Business trip	-0.180*** (0.002)	-0.079*** (0.002)	-0.122*** (0.002)	-0.175*** (0.002)	-0.128*** (0.002)	-0.161*** (0.002)	-0.216*** (0.002)

* $p < .1$. ** $p < .05$. *** $p < .01$.

ratings in an encounter in which most factors take their moderate or average values. Their values show that, in a typical encounter, the customer is expected to be most satisfied with the hotel's location and cleanliness, and least satisfied with quality of room. This may be owing to the fact that location is commonly a key hotel selection factor, qualities of which are transparent, and easily obtainable. The opposite may be true for rooms: Besides being given a lower priority among selection criteria, the quality of room may not be well known in advance. As regards model fit, scores for cleanliness, rooms, and location criteria are best explained. The reason for this is that they are the most "objective" ratings and those mainly influenced by hotels, the level at which we have included most explanatory variables. The complete output from the regression models is provided in Appendix D. In the following text, the results are presented in a more convenient, level-focused manner that maintains interpretation.

Encounter-specific variables. Bearing in mind the observed trend for an increase in the average rating score (see Figure 3), we accounted for the declared time of encounter. Another obtainable variable defined at the level of encounter was type of traveler, which included the following categories: solo travelers, couples, families, friends, and business. Although some subtle differences in the reported levels of satisfaction between the first four categories of travelers were observed during the preliminary analysis, they were dwarfed by the uniqueness demonstrated by business travelers. As the purpose of the trip was recognized as a much more relevant criterion, we reclassified the categories accordingly. The resulting two categories were (a) leisure trips (including solo travelers, couples, families, and friends, 80.29%) and (b) business trips (including only business travelers, 19.71%). The results are presented in Table 4.

Potential reasons for the persistent increase in reported levels of customer satisfaction include the following:

1. More informed decisions on the part of customers driven by the rise in online review and booking services—travelers (especially those writing reviews

on TripAdvisor.com and other online services) are progressively more inclined to select hotels based on their online reputation, which increases the odds of high quality hotels being selected. Online services also provide a considerable amount of detailed information on hotels, helping customers to select those that best suit their specific needs, and to avoid those reported as being poor on aspects that matter to them most. The increasing abundance of online reviews and easily available detailed information on hotels has led to improved transparency, more informed decisions relating to hotel selection and, finally, improved overall customer satisfaction.

2. Improved feedback from customers—hotels are increasingly able to collect and analyze many customer reviews, which allows them to identify and improve their weak spots.
3. Increasing coverage of properties combined with differential characteristics—more properties are being covered and reviewed on TripAdvisor.com and ever-more users are joining the service. If the characteristics of previously covered properties and earlier users are different from more recently covered properties and users who have joined more recently, this may have caused the increase in valence of the rating scores.

Although this question remains open for future research, a tentative analysis shows that the first two hypotheses are somewhat more supported by the data.

Travel purpose exerts a significant effect on customer satisfaction with hotel services. Business travelers report significantly lower levels of satisfaction across all aspects of hotel service, which is consistent with the findings of previous studies (Banerjee & Chua, 2016; Radojevic, Stanicic, & Stanic, 2015b).⁴ As regards the relatively low ratings for rooms, it is important to note that business travelers have different preferences for hotel attributes (Dolnicar, 2002), which may influence their hotel selection and consequently their satisfaction. Specifically, business travelers are more interested in convenience than luxury, generally "picking [a hotel] based on how close it is to the

Table 5.
Estimates for Reviewer-Specific Variables.

Variables	Overall Rating Score	Location Rating	Cleanliness Rating	Rooms Rating	Service Rating	Sleep Quality Rating	Value Rating
Senior reviewer	-0.016*** (0.002)	-0.012*** (0.002)	-0.004 (0.003)	-0.018*** (0.003)	-0.009*** (0.003)	-0.007** (0.003)	-0.004 (0.003)
Contributor	-0.033*** (0.002)	-0.025*** (0.002)	-0.010*** (0.002)	-0.038*** (0.003)	-0.019*** (0.003)	-0.021*** (0.003)	-0.017*** (0.003)
Senior contributor	-0.059*** (0.002)	-0.038*** (0.002)	-0.020*** (0.002)	-0.064*** (0.003)	-0.036*** (0.002)	-0.039*** (0.003)	-0.037*** (0.003)
Top contributor	-0.087*** (0.002)	-0.061*** (0.002)	-0.040*** (0.002)	-0.096*** (0.003)	-0.061*** (0.003)	-0.064*** (0.003)	-0.058*** (0.003)

* $p < .1$. ** $p < .05$. *** $p < .01$.

airport or to the meeting place” (Jones, 2015), which may be at cost of service and room quality. Concerning the reported level of satisfaction with the quality of service, a sensible explanation is offered by travel industry professionals (Jones, 2015), who suggest that business travelers “come from a corporate cultural perspective that requires accountability,” and are, therefore, less tolerant with regard to quality of service. Business traveler complaints reported by Banerjee and Chua (2016) seem to confirm this point: “[W]hat I cannot afford is the poor and unprofessional service,” “. . . asking 2 times to the guest service to have a hotel car for airport transfer . . . the car came 20 min late” and “the Wi-Fi was too slow to work.” The fact that business travelers are more critical with regard to service quality is documented in other travel-related industries, such as airlines (Boehmer, 2012). Dissatisfaction with quality of sleep can also be linked directly with trip purpose. Business travelers report increased levels of stress and sleep deprivation (Burkholder, Joines, Cunningham-Hill, & Xu, 2010), which is not surprising given that 39% of all business travelers report that they work more hours when they travel than they do at the office (Expedia Viewfinder Travel Blog, 2013). Finally, it seems that dissatisfaction with all the described factors culminates in the value criterion, which is affected to the greatest extent, reflecting the fact that even though they pay the same price, business travelers cannot fully appreciate their stay in the way that leisure travelers do.

Visitor-(reviewer)-specific variables. We included only one visitor-specific variable, namely, reviewer rank (badge) on TripAdvisor. We should note that the reviewer rank is actually that held at the moment of data collection, and hence, its effects on customer satisfaction should primarily be interpreted in terms of between-person (as opposed to within-person) variation. The estimated effects of the ranks are presented in Table 5.

The results indicate that highly ranked reviewers are the most rigorous. Given that this category of travelers is likely

to have extensive travel experience, we can infer that the personal criteria for evaluation of hotel service increase with travel experience. This interpretation is supported by a study by Lee et al. (2011). Another interesting question is why the highly ranked reviewers are particularly stringent concerning the room quality criterion. As reported by Ip, Lee, and Law (2012), travel website users are, in comparison with the overall population, relatively young, highly educated, and have a high level of personal income. Thus, if the highly ranked reviewers have higher incomes, they may also live in more upscale apartments and, as a result, have higher personal standards when assessing the quality of interiors.

Hotel-specific variables. The estimated effects of the hotel-specific variables are presented in Table 6.

Star classification is undoubtedly the most reliable predictor of customer satisfaction with hotel services. The estimated difference in average rating scores between 5-star and 1-star hotels is around 0.53 (3.59 vs. 4.12), which is an effect unrivaled by any other measurable factor included in this research. The observed effect⁵ is quite as expected, as the classification criteria are defined with the aim of capturing the overall level of hotel quality; in spite of ongoing criticism, their relevance for customer satisfaction has been confirmed many times in the literature (Núñez-Serrano, Turrión, & Velázquez, 2014; Ryan, 2007). Better star classification is mainly perceived by customers through superior rooms, but cleanliness, quality of sleep, and quality of service also seem to be enhanced. However, the effect is less pronounced for the value criterion as better star classification typically implies a higher price.

Higher price of stay is associated with increased customer satisfaction. With all other factors held constant, a twofold increase in the price of a stay leads to a significant .27 increase in customer satisfaction. This means that prices, on average, correctly and efficiently reflect the relative qualities of hotels that remain uncaptured by the other

Table 6.
Estimates for Hotel-Specific Variables.

Variables		Overall Rating Score	Location Rating	Cleanliness Rating	Rooms Rating	Service Rating	Sleep Quality Rating	Value Rating
Star classification	5 star	0.248*** (0.026)	0.052* (0.027)	0.208*** (0.027)	0.297*** (0.028)	0.215*** (0.025)	0.238*** (0.024)	0.098*** (0.024)
	4.5 star	0.179*** (0.030)	0.061* (0.032)	0.165*** (0.032)	0.207*** (0.033)	0.168*** (0.029)	0.178*** (0.028)	0.078*** (0.028)
	4 star	0.083*** (0.018)	−0.002 (0.018)	0.070*** (0.019)	0.096*** (0.020)	0.075*** (0.017)	0.078*** (0.017)	0.035*** (0.016)
	3 star	−0.089*** (0.017)	−0.022 (0.018)	−0.113*** (0.018)	−0.160*** (0.019)	−0.060*** (0.017)	−0.101*** (0.016)	−0.050*** (0.016)
	2.5 star	−0.146*** (0.029)	0.053* (0.030)	−0.243*** (0.030)	−0.281*** (0.031)	−0.111*** (0.028)	−0.212*** (0.027)	−0.093*** (0.027)
	2 star	−0.275*** (0.025)	0.026 (0.026)	−0.359*** (0.026)	−0.392*** (0.027)	−0.239*** (0.024)	−0.301*** (0.024)	−0.170*** (0.023)
	1.5 star	−0.472*** (0.126)	−0.032 (0.128)	−0.561*** (0.131)	−0.527*** (0.142)	−0.491*** (0.122)	−0.530*** (0.120)	−0.361*** (0.118)
	1 star	−0.281*** (0.047)	0.140*** (0.049)	−0.389*** (0.049)	−0.416*** (0.051)	−0.260*** (0.046)	−0.336*** (0.045)	−0.161*** (0.044)
		0.391*** (0.013)	0.460*** (0.013)	0.377*** (0.014)	0.373*** (0.014)	0.338*** (0.013)	0.340*** (0.012)	0.161*** (0.012)
General characteristics	Price of stay	0.391*** (0.013)	0.460*** (0.013)	0.377*** (0.014)	0.373*** (0.014)	0.338*** (0.013)	0.340*** (0.012)	0.161*** (0.012)
	Distance from the city center	−0.017*** (0.005)	−0.162*** (0.005)	−0.001 (0.005)	0.003 (0.005)	−0.018*** (0.005)	0.008* (0.005)	−0.011** (0.005)
	Number of rooms	−0.081*** (0.007)	−0.053*** (0.007)	−0.058*** (0.007)	−0.086*** (0.007)	−0.095*** (0.007)	−0.053*** (0.006)	−0.051*** (0.006)
Room types	Suites	0.128*** (0.012)	0.112*** (0.012)	0.099*** (0.012)	0.134*** (0.012)	0.113*** (0.011)	0.104*** (0.011)	0.074*** (0.011)
	Family rooms	−0.028*** (0.010)	−0.0001 (0.011)	−0.033*** (0.011)	−0.037*** (0.011)	−0.018* (0.010)	−0.027*** (0.010)	−0.023** (0.010)
Room equipment	Air conditioning	0.081*** (0.014)	0.012 (0.015)	0.093*** (0.015)	0.103*** (0.015)	0.053*** (0.014)	0.085*** (0.013)	0.069*** (0.013)
	Microwave	0.056 (0.036)	0.018 (0.037)	0.046 (0.037)	0.106*** (0.040)	0.051 (0.034)	0.060* (0.034)	0.069** (0.033)
	Minibar	−0.030** (0.015)	0.001 (0.015)	−0.048*** (0.016)	−0.039* (0.016)	−0.012 (0.014)	−0.047*** (0.014)	−0.033** (0.014)
	Refrigerator in room	−0.047*** (0.018)	−0.005 (0.019)	−0.057*** (0.019)	−0.059*** (0.020)	−0.055*** (0.017)	−0.063*** (0.017)	−0.043** (0.017)
Facilities	Free parking	0.049*** (0.013)	−0.146*** (0.013)	0.072*** (0.014)	0.066*** (0.014)	0.063*** (0.013)	0.075*** (0.012)	0.063*** (0.012)
	Kitchenette	0.029* (0.015)	−0.010 (0.016)	−0.003 (0.016)	0.087*** (0.017)	−0.006 (0.015)	0.029** (0.014)	0.052*** (0.014)
	Bar/lounge	0.020* (0.011)	−0.034*** (0.012)	0.024** (0.012)	0.011 (0.012)	0.037*** (0.011)	0.012 (0.011)	0.018* (0.010)
	Self-serve laundry	0.006 (0.012)	0.010 (0.012)	0.016 (0.012)	0.005 (0.013)	0.006 (0.011)	−0.001 (0.011)	0.013 (0.011)
	Business center with Internet access	−0.003 (0.013)	−0.015 (0.013)	−0.017 (0.013)	−0.008 (0.014)	0.002 (0.012)	0.004 (0.012)	−0.007 (0.012)
	Conference facilities	−0.010 (0.015)	−0.035** (0.016)	−0.004 (0.016)	−0.012 (0.017)	−0.010 (0.015)	−0.006 (0.014)	−0.008 (0.014)
	Meeting rooms	−0.036*** (0.014)	−0.028** (0.014)	−0.028* (0.014)	−0.025* (0.015)	−0.022* (0.013)	−0.025* (0.013)	−0.039*** (0.013)
	Banquet room	−0.046*** (0.014)	−0.022 (0.014)	−0.047*** (0.015)	−0.040*** (0.015)	−0.049*** (0.013)	−0.028** (0.013)	−0.038*** (0.013)
	Casino and gambling	−0.140*** (0.051)	0.059 (0.052)	−0.147*** (0.053)	−0.202*** (0.054)	−0.116** (0.048)	−0.122*** (0.047)	−0.144*** (0.046)

(continued)

Table 6. (continued)

	Variables	Overall Rating Score	Location Rating	Cleanliness Rating	Rooms Rating	Service Rating	Sleep Quality Rating	Value Rating
Services	Babysitting	0.060*** (0.012)	0.055*** (0.013)	0.042*** (0.013)	0.046*** (0.013)	0.060*** (0.012)	0.044*** (0.011)	0.038*** (0.011)
	Dry cleaning	0.032*** (0.011)	0.034*** (0.011)	0.025** (0.011)	0.027** (0.012)	0.031*** (0.010)	0.034*** (0.010)	0.023** (0.010)
	Multilingual staff	0.018 (0.012)	0.008 (0.013)	0.014 (0.013)	0.019 (0.013)	0.025** (0.012)	0.009 (0.012)	0.013 (0.011)
	Airport transportation	0.003 (0.012)	0.021* (0.012)	0.012 (0.013)	0.004 (0.013)	0.008 (0.012)	0.003 (0.011)	0.001 (0.011)
	Laundry service	-0.008 (0.012)	-0.017 (0.013)	-0.004 (0.013)	-0.007 (0.013)	-0.002 (0.012)	-0.006 (0.011)	-0.012 (0.011)
	Children activities (kid/family friendly)	-0.011 (0.016)	-0.009 (0.016)	-0.013 (0.016)	-0.005 (0.017)	-0.012 (0.015)	-0.0003 (0.015)	0.002 (0.014)
	Free breakfast	-0.013 (0.011)	0.041*** (0.011)	-0.014 (0.012)	-0.036*** (0.012)	-0.004 (0.011)	-0.033*** (0.010)	0.003 (0.010)
	Concierge	-0.019* (0.011)	0.030*** (0.011)	-0.020* (0.011)	-0.035*** (0.012)	-0.007 (0.010)	-0.024** (0.010)	-0.019* (0.010)
	Room service	-0.021* (0.013)	-0.017 (0.013)	-0.039*** (0.013)	-0.024* (0.014)	-0.004 (0.012)	-0.014 (0.012)	-0.043*** (0.012)
	Restaurant	-0.024* (0.013)	-0.024* (0.013)	-0.032** (0.013)	-0.016 (0.014)	-0.026** (0.012)	-0.025** (0.012)	-0.033*** (0.012)
	Shuttle bus service	-0.037*** (0.011)	-0.021* (0.012)	-0.037*** (0.012)	-0.040*** (0.012)	-0.028** (0.011)	-0.037*** (0.011)	-0.030*** (0.010)
Internet connection	Free Internet	0.191*** (0.022)	0.125*** (0.023)	0.178*** (0.023)	0.199*** (0.024)	0.174*** (0.022)	0.157*** (0.021)	0.154*** (0.021)
	Free high-speed Internet (Wi-Fi)	0.088*** (0.018)	0.060*** (0.019)	0.095*** (0.019)	0.080*** (0.020)	0.092*** (0.017)	0.073*** (0.017)	0.084*** (0.017)
	Paid Wi-Fi	0.041 (0.034)	0.084** (0.035)	0.034 (0.035)	0.057 (0.036)	0.032 (0.032)	0.066** (0.031)	0.034 (0.031)
	Paid Internet	-0.009 (0.032)	-0.043 (0.033)	0.013 (0.033)	-0.014 (0.034)	0.0001 (0.030)	-0.022 (0.030)	-0.017 (0.029)
	Public Wi-Fi	-0.023* (0.013)	0.005 (0.013)	-0.012 (0.014)	-0.034** (0.014)	-0.013 (0.013)	-0.013 (0.012)	-0.011 (0.012)
Recreation and relaxation	Ski-in/ski-out	0.220 (0.210)	-0.102 (0.219)	0.215 (0.221)	0.154 (0.229)	0.235 (0.202)	0.118 (0.202)	0.260 (0.200)
	Fitness center with gym/workout room	0.055*** (0.014)	-0.078*** (0.014)	0.053*** (0.014)	0.094*** (0.015)	0.039*** (0.013)	0.084*** (0.013)	0.047*** (0.013)
	Spa	0.011 (0.014)	-0.009 (0.014)	0.017 (0.015)	0.016 (0.015)	0.016 (0.013)	0.016 (0.013)	0.001 (0.013)
	Tennis court	-0.016 (0.015)	-0.024 (0.015)	-0.019 (0.016)	-0.030* (0.016)	0.004 (0.014)	-0.011 (0.014)	-0.024* (0.014)
	Golf course	-0.021 (0.048)	-0.074 (0.050)	-0.030 (0.050)	-0.022 (0.053)	-0.005 (0.046)	0.023 (0.044)	-0.011 (0.044)
	Hot tub	-0.021 (0.015)	0.004 (0.016)	-0.029* (0.016)	-0.020 (0.016)	-0.025* (0.015)	-0.021 (0.014)	-0.036*** (0.014)
	Pool	-0.048*** (0.015)	-0.120*** (0.015)	-0.052*** (0.016)	-0.040*** (0.016)	-0.042*** (0.014)	-0.027* (0.014)	-0.062*** (0.014)
	Beach	-0.088 (0.054)	-0.071 (0.056)	-0.067 (0.056)	-0.124** (0.058)	-0.053 (0.052)	-0.079 (0.051)	-0.111** (0.050)
Support for people with disabilities	Wheelchair access	0.089*** (0.011)	-0.034*** (0.012)	0.108*** (0.012)	0.114*** (0.012)	0.073*** (0.011)	0.097*** (0.011)	0.066*** (0.010)
	Reduced mobility rooms	-0.018 (0.019)	0.021 (0.019)	0.034* (0.020)	0.017 (0.018)	0.030* (0.017)	0.005 (0.017)	-0.018 (0.019)

(continued)

Table 6. (continued)

	Variables	Overall Rating Score	Location Rating	Cleanliness Rating	Rooms Rating	Service Rating	Sleep Quality Rating	Value Rating
Smoking policy	Non-smoking hotel	0.071*** (0.012)	0.0003 (0.012)	0.075*** (0.012)	0.069*** (0.013)	0.055*** (0.011)	0.065*** (0.011)	0.061*** (0.011)
	Non-smoking rooms	-0.012 (0.014)	-0.013 (0.014)	0.013 (0.014)	-0.015 (0.015)	0.007 (0.013)	-0.005 (0.013)	-0.011 (0.013)
	Smoking rooms available	-0.032* (0.019)	0.027 (0.020)	-0.045** (0.020)	-0.055*** (0.021)	-0.034* (0.019)	-0.044** (0.018)	-0.028 (0.018)
Pet policy	Pets allowed (dog/pet friendly)	-0.009 (0.013)	-0.003 (0.013)	-0.013 (0.013)	-0.018 (0.014)	0.001 (0.012)	-0.012 (0.012)	-0.018 (0.012)

* $p < .1$. ** $p < .05$. *** $p < .01$.

quantitative variables included in this research, especially (based on estimates of regression coefficients) the qualities of location that are not captured by the variable defined as proximity to the city center.

Increased distance from the city center is mainly reflected in poor ratings for the location criterion. Doubling the distance decreases a hotel's rating for location by approximately .11.⁶ However, the corresponding influence on overall satisfaction of approximately .01 is rather small.

With regard to hotel size, it appears that a disproportionately large number of rooms makes hotels congested and causes quality of service to deteriorate.

Of the other observable hotel attributes, those with the most significant positive effects on customer satisfaction are as follows: free Internet (.191), suites (.128), wheelchair access (.089), free high-speed Wi-Fi Internet (.088), air conditioning (.081), non-smoking hotel (.071), babysitting (.060), fitness center with gym (.055), free parking (.049), and dry cleaning (.032). Attributes with the most significant negative effects on customer satisfaction are casino and gambling (-.140), pool (-.048), refrigerator in room (-.047), banquet room (-.046), shuttle bus service (-.037), meeting rooms (-.036), and minibar (-.030).

In addition to a factor-oriented interpretation, our research design allows us to undertake a criterion-oriented analysis, which is particularly effective for hotel-level analysis. However, when interpreting the results in criterion-oriented fashion, it is vital to allow for the potential effects of the aforementioned "spill-over effect." Spillover may cause certain hotel features, that are undesirable from a certain aspect to appear as having a less-than-actual negative or even marginally positive effect on that aspect, if they are desirable from some other aspects. Therefore, it is important to differentiate between aspects for which the observed effect is genuine and aspects that are subject to spillover and interpret the regression coefficients comparatively and relatively across the criteria rather than in absolute terms.

Country (destination and visitor's country)-level variables. The effects of destination- and visitor's country-level variables are presented in Table 7.

Naturally, the effects of country-level variables on customer satisfaction are relatively subtle when compared with those of hotel- and visitor-level variables. Nevertheless, the results show that they are meaningful and not of a trivial magnitude.

The results show that guests from highly developed countries are relatively more demanding as hotel customers. Specifically, a 100% increase in the economic development of the guest's country of origin (more precisely, in the GDP of the guest's country) is associated with a 0.03 decrease in average overall ratings. Regression estimates suggest that the location criterion is affected the most, which indicates that certain qualities of a destination, such as its local transportation choices and tourist attraction offerings that are actually situated outside of the hotels being evaluated, are eventually reflected in the evaluations, specifically through scores for location. A decrease in satisfaction among individuals from developed countries is also evident for the room and cleanliness criteria, which is likely due to the higher standards and expectations that they have developed living in such countries.

The fact that the impact of the effect is mostly captured through the guest country, rather than the destination, is likely to result from the fact that we projected the economic development of country onto the destination, resulting in a loss of precision; also, the economic development of a destination is, at least partially, implied in the price of stay variable.

With regard to cultural profiles, we identified five dimensions that are relevant in hotel service encounters: power distance, individualism, uncertainty avoidance, long-term orientation, and indulgence.

Power distance is defined as "the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally"

Table 7.
Estimates for Destination- and Visitor's Country-Level Variables.

Variables	Overall Rating Score	Location Rating	Cleanliness Rating	Rooms Rating	Service Rating	Sleep Quality Rating	Value Rating
GDP destination country	0.001 (0.033)	0.004 (0.037)	0.020 (0.034)	-0.014 (0.034)	0.003 (0.034)	-0.003 (0.027)	0.036 (0.037)
GDP visitor's country	-0.046*** (0.013)	-0.046*** (0.012)	-0.040*** (0.013)	-0.043*** (0.013)	-0.022 (0.016)	-0.039*** (0.013)	-0.031** (0.014)
GDP interaction	0.005*** (0.001)	0.007*** (0.001)	0.003*** (0.001)	0.007*** (0.001)	0.004*** (0.001)	0.003*** (0.001)	0.007*** (0.001)
Power distance destination country	-0.003* (0.002)	-0.003 (0.002)	-0.003 (0.002)	-0.002 (0.002)	-0.005** (0.002)	-0.002 (0.002)	-0.004* (0.002)
Power distance visitor's country	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.0004 (0.001)
Power distance interaction	-0.00001*** (0.00000)	0.00002*** (0.00000)	-0.00000 (0.00000)	-0.00001* (0.00000)	-0.00001** (0.00000)	-0.00000 (0.00000)	-0.00001** (0.00000)
Individualism destination country	-0.004** (0.002)	-0.005** (0.002)	-0.004** (0.002)	-0.004** (0.002)	-0.004** (0.002)	-0.003** (0.001)	-0.003 (0.002)
Individualism visitor's country	0.002*** (0.001)	0.002** (0.001)	0.003*** (0.001)	0.002*** (0.001)	0.003*** (0.001)	0.002*** (0.001)	0.002*** (0.001)
Individualism interaction	0.00000** (0.00000)	0.00000* (0.00000)	0.00001*** (0.00000)	0.00001*** (0.00000)	0.00000** (0.00000)	-0.00001*** (0.00000)	0.00001*** (0.00000)
Masculinity destination country	0.002 (0.001)	0.001 (0.001)	0.002 (0.001)	0.003* (0.001)	0.002* (0.001)	0.001 (0.001)	0.003* (0.001)
Masculinity visitor's country	-0.0001 (0.001)	-0.0001 (0.0005)	-0.0004 (0.001)	-0.0003 (0.001)	-0.001 (0.001)	-0.0002 (0.001)	-0.0001 (0.001)
Masculinity interaction	-0.00000 (0.00000)	0.00002*** (0.00000)	-0.00001*** (0.00000)	0.00001*** (0.00000)	-0.00000** (0.00000)	0.00000** (0.00000)	-0.00001** (0.00000)
Uncertainty avoidance destination country	0.002 (0.001)	0.001 (0.001)	0.002* (0.001)	0.002 (0.001)	0.001 (0.001)	0.001 (0.001)	0.003* (0.001)
Uncertainty avoidance visitor's country	0.002*** (0.0005)	0.001*** (0.0004)	0.001*** (0.0005)	0.002*** (0.0005)	0.002*** (0.001)	0.003*** (0.0005)	0.001*** (0.0005)
Uncertainty avoidance interaction	-0.00001*** (0.00000)	0.00002*** (0.00000)	-0.00001*** (0.00000)	0.00001*** (0.00000)	-0.00001*** (0.00000)	-0.00000 (0.00000)	-0.00001*** (0.00000)
Long-term orientation destination country	0.003* (0.001)	0.001 (0.002)	0.003** (0.001)	0.002 (0.002)	0.002 (0.002)	0.003** (0.001)	0.002 (0.002)
Long-term orientation visitor's country	-0.0004 (0.001)	-0.0003 (0.001)	-0.001 (0.001)	-0.0003 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Long-term orientation interaction	-0.00000* (0.00000)	0.00002*** (0.00000)	-0.00000 (0.00000)	0.00000 (0.00000)	-0.00000 (0.00000)	-0.00000 (0.00000)	-0.00001*** (0.00000)
Indulgence destination country	-0.004*** (0.001)	-0.002 (0.002)	-0.003** (0.001)	-0.004** (0.002)	-0.004*** (0.002)	-0.003** (0.001)	-0.006*** (0.002)
Indulgence visitor's country	0.001 (0.001)	0.0003 (0.001)	0.001 (0.001)	0.001* (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Indulgence interaction	-0.00000 (0.00000)	0.00002*** (0.00000)	0.00000 (0.00000)	0.00000 (0.00000)	0.00002*** (0.00000)	-0.00000 (0.00000)	0.00000 (0.00000)

* $p < .1$. ** $p < .05$. *** $p < .01$.

(Hofstede, Hofstede, & Minkov, 2010, p. 521). Individuals in cultures demonstrating a high power distance are very deferential to figures of authority, and generally accept an unequal distribution of power (Grimsley, 2015). According to the results, hotel service encounters taking place in destinations characterized by high power distance are rated relatively lower. A recent study by Banerjee and Chua (2016) might be especially insightful in this regard, as it provides a qualitative analysis of

customer complaints from regions in the Middle East and Africa, which are characterized by high scores for power distance. Many complaints are specifically devoted to customer service. Some examples include "rude staff," "service level was abominable," "long queues for reception, with reception staff pretending that you are invisible," "the worst customer service I have ever had," "staff had unpleasant attitude," and "staff seem inexperienced and not service-oriented" (Banerjee

& Chua, 2016, p. 129). The relevance of power distance in relation to the service quality aspect is confirmed by the regression estimates, according to which the service ratings criterion is most affected by this cultural dimension. Based on the definition of this cultural dimension and empirical results, it is likely that in settings with a high power distance culture, staff members are culturally predisposed to overtly assume either a role of authority or a subordinate role. However, the effects of these two roles on customer satisfaction are asymmetric. As found by Román and Martín (2016), a reduction in the *friendliness of staff* results in dissatisfaction with service quality that is significantly greater than the satisfaction achieved by an equivalent improvement in friendliness. However, when using hotel services, those from high power distance cultures tend to assign somewhat higher scores. An interesting explanation is offered by Huang, Huang, and Wu (1996), who note that these people are likely to perceive unsatisfactory service as a fact of life and are therefore, less prone to making complaints. Based on the sign of the interaction term, when both the guest and the host are from cultures characterized by high power distance, the satisfaction decreases, perhaps owing to the possibility that both sides assume the role of authority. According to the results, the best cross-cultural combination for this dimension is definitely achieved when visitors from high power distance origins stay in destinations characterized by low power distance.

Individualism stands for “a society in which the ties between individuals are loose: everyone is expected to look after him—or herself and his or her immediate family only” (Hofstede et al., 2010, p. 519). As hosts, individualist societies receive lower ratings; genuine effects seem to exist for location, rooms, and service criteria. In the eyes of those from collectivist cultures, individualist societies may appear cold, starting literally from their typically cold climatic conditions, to city layouts that are more stretched out, interior design that may be perceived as *overly minimalist and “bitter”* and more reserved personal interactions. Hospitality workers in collectivist countries are more apt to manifest organizational citizenship behavior (Magnini, Hyun, Kim, & Uysal, 2013). However, when in the role of customers, those from highly individualist cultures are found to report higher levels of satisfaction (Johnson, Herrmann, & Gustafsson, 2002), especially for services (Frank, Enkawa, & Schvaneveldt, 2015), and our results confirm this finding.

Uncertainty avoidance is defined as “the extent to which the members of a culture feel threatened by uncertain or unknown situations” (Hofstede et al., 2010, p. 522). Being part of culture that scores high on uncertainty avoidance is advantageous for either party (although at a decreasing pace—see the coefficient with the interaction term). These people avoid conflict in communication and seek consensus in conversation and security through written rules, regulations, and “face saving” (Reisinger, 2009), which might be especially important for hotel service encounters.

Long-term orientation denotes “the fostering of pragmatic virtues oriented toward future rewards, in particular perseverance, thrift, and adapting to changing circumstances” (Hofstede et al., 2010, p. 519). China and other East Asian countries score high on this cultural dimension. Characteristics such as accountability, willingness to subordinate oneself for a purpose and serve to others, self-discipline, personal adaptiveness, and long-term business orientation (Hofstede et al., 2010) are all advantageous in the hospitality industry, and make these nations good hosts, as confirmed by the results.

Finally, individuals coming from countries that score high on indulgence, which stands for “a tendency to allow relatively free gratification of basic and natural human desires related to enjoying life and having fun” (Hofstede et al., 2010, p. 519), are, as evidenced by the results, slightly more predisposed to being good hotel customers than they are to being good hotel employees.

Generally, the effect of culture on hotel service evaluation is moderate—in about 95% of all possible cross-cultural combinations, culture is expected to have an impact of less than ± 0.2 on ratings scores. Nonetheless, in the 5% of the most extreme cases, culture might influence ratings by as much as ± 0.35 . According to the model estimates, the best cross-cultural combinations for overall customer satisfaction in hospitality should be Polish people as guests and South Koreans as hosts. The cultural characteristics of South Korean, Japanese, and Taiwanese people appear to be well predisposed toward hospitality, as the expected average culture-attributable effects across all possible combinations (including them as hosts) are positive and equal around 0.24, 0.20, and 0.19, respectively. However, the least promising combinations are those for people from Singapore or China staying in the United States, Cape Verde, or Australia. Reisinger and Turner (2002a, 2002b) offer a thorough description of the differences between Asian and Australian cultures that are relevant for tourism.

Conclusion

Supported by the increasing abundance of empirical data, the prevalently level-specific analysis of customer satisfaction in the hospitality industry has the opportunity to evolve into a more holistic, multilevel type of analysis. By providing theoretical motivation for the use of multilevel models in the field of satisfaction with hotel service, offering a realistic model specification, examining the functionality of the model specification using a large sample of empirical data, and providing a detailed analysis of the specification-related results, we hope to encourage use of the framework and provide a good reference for its future use. In doing so, we reached important conclusions about the relevance and relative importance of the individual levels and their corresponding factors with respect to customer satisfaction, which could prove useful for upcoming multilevel studies using online customer reviews.

Implications of the Findings

Of the four grouping factor levels, hotels exert the most influence on customer satisfaction—about 27% of total variance in the overall rating scores is found to occur among hotels. This means that each individual hotel exerts a strong unique effect on customer satisfaction; this effect is found to be particularly robust for predominantly “objective” aspects, which are hotel location, cleanliness, and quality of rooms. By including a comprehensive list of hotel attributes, we explained about one half of the variance at this level, and found that, the highest positive associations with customer satisfaction are exhibited by star classification, free Internet connection, and suites, whereas the presence of a casino and gambling has a strong negative association. Visitors (reviewers) are also found to exert significant unique effects when evaluating hotel services, producing about 11% of total variance. Individual differences among reviewers are found to play a particularly important role in more “subjective” aspects of service, such as value, quality of sleep, and service. Still, only about 7% of the variance occurring at this level has been explained by visitors’ travel experience, as indicated by their TripAdvisor reviewer rank. For this reason, the influence of the reviewers’ (visitors’) personal characteristics on their evaluation of hotel services may be regarded as the most prospective area of study. The third effect that needs to be accounted for in research is that of destination—it makes about 3% of the total variance. Characteristics of destination seem to affect reported levels of satisfaction with value, location, and cleanliness for hotels located in them. The visitor’s national identity, as indicated by the results, does not make a strong influence on overall customer satisfaction with hotel services. Only about 1% of total variance in overall customer satisfaction with hotel services is found to occur among visitors’ countries. Cultural and economic characteristics explain about 40% of variance at this level. Our findings have important implications for future multilevel research in the field. In view of their significance observed in this study, hotel-, visitor-, and destination-specific effects must be accounted for when analyzing customer satisfaction using online data. However, the visitor’s nationality can be omitted without significant loss in terms of model fit and reliability of results, if the main focus of research is on overall satisfaction with hotel services. However, research focusing mainly on the quality of service aspect of satisfaction, should consider controlling for this level.

The findings of this study have also certain implications for hotel managers. As contemporary lifestyle causes constant shifts in customer preferences, managers should regularly update their beliefs on the relative importance of hotel attributes. Based on our findings, customers recently attach considerable importance to modern communication and entertainment technologies (Wi-Fi); appreciate spacious (suites), air-conditioned, and clean (non-smoking) rooms; maintain a busy lifestyle (prefer to have babysitting and dry cleaning services available), but are also increasingly aware of

the health benefits of physical fitness (fitness center and gym). However, some facilities, such as casinos and gambling venues, seem to be falling out of favor with customers. Perhaps an even more important take away from this study is that cultural characteristics of customers and hotel destinations, along with their interplay, are one of the core influences in evaluation of hotel services. The managers should, in the light of this, foster the acquisition of intercultural competence among hotel employees, which is expected to help in relieving much of the normal anxieties experienced by travelers when trying to integrate into a new cultural setting (Reimann, Lunemann, & Chase, 2008; Ye, Zhang, & Yuen, 2013).

Limitations and Recommendations for Future Research

We must acknowledge a few limitations to this study. First, the study focuses on hotels located in urban tourism destinations. Owing to the recognized idiosyncrasies of urban tourism (Ashworth & Page, 2011), the importance of certain factors (e.g., hotel attributes) observed in this study may not be readily generalized to other types of tourist destinations, such as sun or winter sport resorts. Also, the empirical data set used in this study is limited to quantitative variables that are publicly available, which poses certain risks in terms of data reliability. So, for instance, TripAdvisor’s lists of hotel features may not be fully comprehensive, completely accurate, or up to date. Still, the risks related to data reliability are particularly unlikely to materialize in the case of most popular hotels that are, owing to the characteristics of the data sampling process used in this research, most represented in our sample. Another potential limitation is in using the hotel distance from the city center as a proxy for the attractiveness of its location. In using this proxy, we assume that the destination cities examined are mono-centric, which is not entirely accurate in certain cases. Also, owing to the availability of the data, we made an assumption that the cultural and economic characteristics of each touristic destination are identical to cultural and economic characteristics of the countries in which those destinations are situated. Even though the capital cities should be reasonably representative of their respective countries, projecting country-level values on to cities, undoubtedly, produces some disaggregation error. Finally, reviewers’ countries of origin have been estimated based on the information publicly available on their user accounts. This information is declared by the traveler through an open-ended text box, and, as such, it lacks structure (e.g., “sunshine coast” or “Seaside, California”). Using the Google Geocoding application program interface (API), we identified countries for those observations for which entries were reasonably well defined and precise. We disregarded observations with ambiguous entries. That said, owing to the large sample size and the broad scope of the study, we do not expect the reliability of the reported results to be greatly affected by any of the listed limitations.

We recommend that future research consider analyzing business and leisure travelers separately. They are shown to have different preferences for hotel attributes, and, thus, it is very likely that the effects of certain factors significantly differ between the two groups. Next, the trend of the consistent increase in the average rating score on TripAdvisor, which is illustrated in Figure 3, is not previously documented in the literature. Due to its magnitude (an increase from approximately 3.6 in 2003 to approximately 4.1 in 2015), the effect should be included in the research design of future studies and surely deserves further examination. Future research should also consider including additional visitor- and destination-specific factors, to provide further explanation for the variance occurring at these levels. The possibility of obtaining additional visitor-specific factors through online services is, currently, rather limited, but the fact that more than 90% of variance at this level remains unexplained calls for further research efforts in this direction. However, including

additional destination-specific factors such as quality of touristic attractions, quality of transport, or infrastructure should not pose a great challenge for researchers, and might be quite informative. Furthermore, certain personal characteristics of visitors may interact with the characteristics of hotels and/or destinations; this sort of cross-level interactions is straightforwardly modeled within the multilevel framework. Finally, future research should also investigate the possibility that the effects of certain factors meaningfully vary across destinations. For instance, the effect of hotel distance from the city center is likely to vary from destination to destination owing to the varying size of destinations; and the importance of air conditioning may vary across destinations owing to the varying climates. Varying effects can also be properly modeled within the multilevel framework using random slopes (coefficients are allowed to vary by group), which is another important reason why researchers should consider using this framework.

Appendix A

Countries Included in the Analysis and Their Hofstede's Cultural Dimension Scores.

No.	Country	pdi	idv	mas	uai	lto	ivr
1	Albania	90	20	80	70	61	15
2	Angola	83	18	20	60	15	83
3	Argentina	49	46	56	86	20	62
4	Australia	36	90	61	51	21	71
5	Austria	11	55	79	70	60	63
6	Bangladesh	80	20	55	60	47	20
7	Belgium	65	75	54	94	82	57
8	Brazil	69	38	49	76	44	59
9	Bulgaria	70	30	40	85	69	16
10	Burkina Faso	70	15	50	55	27	18
11	Canada	39	80	52	48	36	68
12	Cape Verde	75	20	15	40	12	83
13	Chile	63	23	28	86	31	68
14	China	80	20	66	30	87	24
15	Colombia	67	13	64	80	13	83
16	Croatia	73	33	40	80	58	33
17	Czech Republic	57	58	57	74	70	29
18	Denmark	18	74	16	23	35	70
19	Dominican Republic	65	30	65	45	13	54
20	Egypt	70	25	45	80	7	4
21	El Salvador	66	19	40	94	20	89
22	Estonia	40	60	30	60	82	16
23	Finland	33	63	26	59	38	57
24	France	68	71	43	86	63	48
25	Germany	35	67	66	65	83	40
26	Ghana	80	15	40	65	4	72
27	Greece	60	35	57	100	45	50
28	Hong Kong	68	25	57	29	61	17
29	Hungary	46	80	88	82	58	31
30	Iceland	30	60	10	50	28	67

(continued)

Appendix A (continued)

No.	Country	pdi	idv	mas	uai	lto	ivr
31	India	77	48	56	40	51	26
32	Indonesia	78	14	46	48	62	38
33	Iran	58	41	43	59	14	40
34	Iraq	95	30	70	85	25	17
35	Ireland	28	70	68	35	24	65
36	Italy	50	76	70	75	61	30
37	Japan	54	46	95	92	88	42
38	Jordan	70	30	45	65	16	43
39	Latvia	44	70	9	63	69	13
40	Lebanon	75	40	65	50	14	25
41	Libya	80	38	52	68	23	34
42	Lithuania	42	60	19	65	82	16
43	Luxembourg	40	60	50	70	64	56
44	Malaysia	100	26	50	36	41	57
45	Malta	56	59	47	96	47	66
46	Mexico	81	30	69	82	24	97
47	Morocco	70	46	53	68	14	25
48	Mozambique	85	15	38	44	11	80
49	Netherlands	38	80	14	53	67	68
50	New Zealand	22	79	58	49	33	75
51	Nigeria	80	30	60	55	13	84
52	Norway	31	69	8	50	35	55
53	Pakistan	55	14	50	70	50	0
54	Peru	64	16	42	87	25	46
55	Philippines	94	32	64	44	27	42
56	Poland	68	60	64	93	38	29
57	Portugal	63	27	31	99	28	33
58	Romania	90	30	42	90	52	20
59	Russia	93	39	36	95	81	20
60	Saudi Arabia	95	25	60	80	36	52
61	Serbia	86	25	43	92	52	28
62	Singapore	74	20	48	8	72	46
63	Slovakia	100	52	100	51	77	28
64	Slovenia	71	27	19	88	49	48
65	South Africa	49	65	63	49	34	63
66	South Korea	60	18	39	85	100	29
67	Spain	57	51	42	86	48	44
68	Sweden	31	71	5	29	53	78
69	Switzerland	34	68	70	58	74	66
70	Taiwan	58	17	45	69	93	49
71	Tanzania	70	25	40	50	34	38
72	Thailand	64	20	34	64	32	45
73	Trinidad and Tobago	47	16	58	55	13	80
74	Turkey	66	37	45	85	46	49
75	United Kingdom	35	89	66	35	51	69
76	United States	40	91	62	46	26	68
77	Uruguay	61	36	38	99	26	53
78	Venezuela	81	12	73	76	16	100
79	Vietnam	70	20	40	30	57	35
80	Zambia	60	35	40	50	30	42

Note. Pdi = power distance; idv = Individualism; mas = masculinity; uai = uncertainty avoidance; lto = long-term orientation; ivr = Indulgence.

Appendix B

Descriptive Statistics for the Hotel-Level Study Variables.

	Star Classification											Total
	1	1.5	2	2.5	3	3.5	4	4.5	5	Not available		
	Mean values											
General characteristics	Count	157	20	987	513	4,079	1,145	2,954	311	804	2,440	13,410
	Hotel price double room per night in euros	81.83	65.62	88.22	66.17	98.90	104.31	153.50	178.53	279.99	72.76	125.76
	Distance from the city center in km	3.28	4.16	3.90	4.57	4.07	5.19	4.29	5.31	3.91	5.81	4.54
Room types	Number of rooms	48.81	66.47	56.71	71.51	84.32	134.98	153.56	278.90	238.68	68.80	115.18
	Suites	0.03	0.10	0.06	0.14	0.23	0.48	0.58	0.89	0.88	0.10	0.34
	Family rooms	0.40	0.40	0.45	0.31	0.46	0.43	0.63	0.72	0.76	0.15	0.45
Room equipment	Air conditioning	0.42	0.30	0.41	0.44	0.40	0.35	0.31	0.24	0.28	0.28	0.35
	Microwave	0.01	0.00	0.01	0.01	0.01	0.05	0.02	0.05	0.01	0.01	0.02
	Minibar	0.10	0.20	0.09	0.12	0.17	0.20	0.23	0.21	0.23	0.10	0.17
Facilities	Refrigerator in room	0.10	0.05	0.11	0.16	0.13	0.15	0.08	0.10	0.05	0.11	0.11
	Free parking	0.07	0.15	0.14	0.22	0.22	0.37	0.26	0.45	0.30	0.09	0.22
	Kitchenette	0.08	0.00	0.06	0.08	0.10	0.18	0.14	0.24	0.13	0.09	0.11
	Bar/lounge	0.17	0.30	0.28	0.17	0.45	0.56	0.75	0.83	0.88	0.17	0.48
	Self-serve laundry	0.01	0.15	0.09	0.18	0.20	0.32	0.42	0.48	0.55	0.01	0.24
	Business center with Internet access	0.01	0.15	0.13	0.29	0.35	0.58	0.70	0.86	0.88	0.06	0.42
	Conference facilities	0.00	0.00	0.01	0.03	0.05	0.14	0.19	0.33	0.32	0.01	0.10
Services	Meeting rooms	0.05	0.20	0.11	0.19	0.33	0.51	0.72	0.89	0.91	0.04	0.40
	Banquet room	0.00	0.00	0.03	0.06	0.11	0.26	0.41	0.63	0.69	0.01	0.21
	Casino and gambling	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.00	0.01
	Babysitting	0.10	0.05	0.10	0.09	0.13	0.19	0.31	0.52	0.62	0.05	0.19
	Dry cleaning	0.08	0.25	0.23	0.27	0.39	0.49	0.65	0.77	0.81	0.11	0.42
	Multilingual staff	0.10	0.00	0.16	0.23	0.30	0.39	0.57	0.67	0.73	0.02	0.33
	Airport transportation	0.15	0.05	0.18	0.21	0.20	0.24	0.23	0.24	0.29	0.13	0.20
	Laundry service	0.23	0.50	0.36	0.54	0.55	0.65	0.74	0.82	0.83	0.22	0.55
	Children activities (kid/family friendly)	0.04	0.10	0.08	0.08	0.08	0.11	0.11	0.22	0.22	0.06	0.10

(continued)

Appendix B (continued)

	Star Classification										Total	
	1	1.5	2	2.5	3	3.5	4	4.5	5	Not available		
Internet connection	Free breakfast	0.13	0.25	0.22	0.23	0.34	0.43	0.36	0.23	0.17	0.10	0.28
	Concierge	0.29	0.15	0.31	0.33	0.39	0.47	0.59	0.77	0.83	0.13	0.42
	Room service	0.22	0.20	0.29	0.42	0.52	0.69	0.84	0.95	0.97	0.25	0.57
	Restaurant	0.15	0.25	0.28	0.42	0.55	0.78	0.79	0.95	0.95	0.27	0.57
	Shuttle bus service	0.09	0.00	0.13	0.15	0.19	0.22	0.29	0.30	0.30	0.07	0.19
Recreation and relaxation	Free high-speed Internet (Wi-Fi)	0.61	0.60	0.67	0.66	0.73	0.75	0.80	0.82	0.84	0.28	0.67
	Paid Wi-Fi	0.04	0.00	0.09	0.08	0.08	0.11	0.12	0.31	0.28	0.01	0.10
	Paid Internet	0.04	0.00	0.10	0.10	0.09	0.12	0.15	0.32	0.31	0.01	0.11
	Public Wi-Fi	0.58	0.50	0.56	0.39	0.42	0.33	0.29	0.23	0.25	0.25	0.35
	Ski-in/ski-out	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Support for people with disabilities	Fitness center with gym/workout room	0.01	0.00	0.03	0.10	0.15	0.48	0.55	0.91	0.88	0.08	0.30
	Spa	0.08	0.00	0.09	0.04	0.10	0.15	0.22	0.43	0.59	0.06	0.16
	Tennis court	0.01	0.00	0.03	0.03	0.06	0.07	0.16	0.25	0.30	0.00	0.09
	Golf course	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.02	0.00	0.01
	Hot tub	0.01	0.15	0.02	0.02	0.05	0.11	0.14	0.37	0.37	0.02	0.09
Smoking policy	Pool	0.00	0.15	0.03	0.05	0.10	0.28	0.29	0.72	0.65	0.07	0.19
	Beach	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.02	0.01	0.01
	Wheelchair access	0.11	0.30	0.17	0.23	0.35	0.49	0.65	0.81	0.84	0.10	0.40
	Reduced mobility rooms	0.04	0.00	0.04	0.03	0.07	0.07	0.10	0.07	0.10	0.03	0.07
	Non-smoking hotel	0.10	0.05	0.16	0.19	0.22	0.30	0.32	0.29	0.29	0.02	0.21
Pet policy	Non-smoking rooms	0.55	0.55	0.68	0.58	0.71	0.72	0.84	0.86	0.89	0.23	0.66
	Smoking rooms available	0.03	0.05	0.05	0.04	0.06	0.08	0.07	0.13	0.10	0.03	0.06
	Pets allowed (dog/pet friendly)	0.06	0.05	0.12	0.07	0.17	0.13	0.27	0.16	0.28	0.04	0.16

Appendix C

Complete Output From Variance Components Analysis.

	Overall	Location	Cleanliness	Rooms	Service	Sleep Quality	Value
Null model							
Visitor: Visitor's country	0.11	0.07	0.11	0.12	0.13	0.14	0.14
Hotel: Destination	0.28	0.27	0.29	0.34	0.24	0.25	0.15
Visitor's country	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Destination	0.03	0.05	0.04	0.03	0.03	0.02	0.08
Residual	0.61	0.45	0.53	0.65	0.71	0.67	0.76
Total variance	1.05	0.84	0.98	1.15	1.13	1.09	1.15
Visitor: Visitor's country	10.90%	8.64%	11.70%	10.57%	11.58%	12.55%	12.60%
Hotel: Destination	26.99%	31.52%	29.63%	29.37%	21.73%	22.93%	13.28%
Visitor's country	0.98%	1.02%	0.97%	0.87%	1.28%	1.07%	0.81%
Destination	2.76%	5.75%	3.94%	2.49%	2.66%	1.63%	7.12%
Residual	58.36%	53.07%	53.75%	56.71%	62.75%	61.81%	66.19%
Tal variance	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Saturated model							
Visitor: Visitor's country	0.11	0.07	0.11	0.11	0.12	0.13	0.14
Hotel: Destination	0.14	0.15	0.16	0.16	0.13	0.12	0.11
Visitor's country	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Destination	0.04	0.05	0.04	0.04	0.04	0.03	0.05
Residual	0.61	0.45	0.53	0.65	0.71	0.67	0.76
Total variance	0.91	0.73	0.84	0.97	1.01	0.95	1.07
Visitor: Visitor's country	11.64%	9.30%	13.26%	11.59%	12.05%	13.72%	12.74%
Hotel: Destination	15.76%	21.14%	18.49%	16.50%	12.77%	12.43%	10.65%
Visitor's country	0.68%	0.83%	0.81%	0.63%	0.97%	0.68%	0.64%
Destination	4.59%	7.30%	4.93%	4.27%	4.37%	2.77%	4.95%
Residual	67.33%	61.43%	62.51%	67.00%	69.83%	70.41%	71.02%
Total variance	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
% of variance explained							
Visitor: Visitor's country	7.31%	7.08%	2.54%	6.96%	6.50%	4.02%	5.86%
Hotel: Destination	49.31%	42.09%	46.33%	52.34%	47.20%	52.43%	25.34%
Visitor's country	40.24%	29.94%	27.96%	38.82%	31.99%	44.56%	25.70%
Destination	-44.52%	-9.63%	-7.78%	-45.79%	-47.67%	-49.01%	35.29%

Appendix D

Complete Output From the Regression Models.

Variables		Overall Rating Score	Location Rating	Cleanliness Rating	Rooms Rating	Service Rating	Sleep Quality Rating	Value Rating
Date and purpose of the trip	Date of review	0.0001*** (0.00000)	0.0001*** (0.00000)	0.00002*** (0.00000)	0.0001*** (0.00000)	0.0001*** (0.00000)	0.0001*** (0.00000)	0.0001*** (0.00000)
	Business trip	-0.180*** (0.002)	-0.079*** (0.002)	-0.122*** (0.002)	-0.175*** (0.002)	-0.128*** (0.002)	-0.161*** (0.002)	-0.216*** (0.002)
	Senior reviewer	-0.016*** (0.002)	-0.012*** (0.002)	-0.004 (0.003)	-0.018*** (0.003)	-0.009*** (0.003)	-0.007*** (0.003)	-0.004 (0.003)
	Contributor	-0.033*** (0.002)	-0.025*** (0.002)	-0.010*** (0.002)	-0.038*** (0.003)	-0.019*** (0.003)	-0.021*** (0.003)	-0.017*** (0.003)
	Senior contributor	-0.059*** (0.002)	-0.038*** (0.002)	-0.020*** (0.002)	-0.064*** (0.003)	-0.036*** (0.002)	-0.039*** (0.003)	-0.037*** (0.003)
Reviewer's TripAdvisor rank	Top contributor	-0.087*** (0.002)	-0.061*** (0.002)	-0.040*** (0.002)	-0.096*** (0.003)	-0.061*** (0.003)	-0.064*** (0.003)	-0.058*** (0.003)
	5 star	0.248*** (0.026)	0.052* (0.027)	0.208*** (0.027)	0.297*** (0.028)	0.215*** (0.025)	0.238*** (0.024)	0.098*** (0.024)
	4.5 star	0.179*** (0.030)	0.061* (0.032)	0.165*** (0.032)	0.207*** (0.033)	0.168*** (0.029)	0.178*** (0.028)	0.078*** (0.028)
	4 star	0.083*** (0.018)	-0.002 (0.018)	0.070*** (0.019)	0.096*** (0.020)	0.075*** (0.017)	0.078*** (0.017)	0.035*** (0.016)
	3 star	-0.089*** (0.017)	-0.022 (0.018)	-0.113*** (0.018)	-0.160*** (0.019)	-0.060*** (0.017)	-0.101*** (0.016)	-0.050*** (0.016)
Star classification	2.5 star	-0.146*** (0.029)	0.053* (0.030)	-0.243*** (0.030)	-0.281*** (0.031)	-0.111*** (0.028)	-0.212*** (0.027)	-0.093*** (0.027)
	2 star	-0.275*** (0.025)	0.026 (0.026)	-0.359*** (0.026)	-0.392*** (0.027)	-0.239*** (0.024)	-0.301*** (0.024)	-0.170*** (0.023)
	1.5 star	-0.472*** (0.126)	-0.032 (0.128)	-0.561*** (0.131)	-0.527*** (0.142)	-0.491*** (0.122)	-0.530*** (0.120)	-0.361*** (0.118)
	1 star	-0.281*** (0.047)	0.140*** (0.049)	-0.389*** (0.049)	-0.416*** (0.051)	-0.260*** (0.046)	-0.336*** (0.045)	-0.161*** (0.044)
	Price of stay	0.391*** (0.013)	0.460*** (0.013)	0.377*** (0.014)	0.373*** (0.014)	0.338*** (0.013)	0.340*** (0.012)	0.161*** (0.012)
General characteristics of the hotel	Distance from the city center	-0.017*** (0.005)	-0.162*** (0.005)	-0.001 (0.005)	0.003 (0.005)	-0.018*** (0.005)	0.008* (0.005)	-0.011** (0.005)
	Number of rooms	-0.081*** (0.007)	-0.053*** (0.007)	-0.058*** (0.007)	-0.086*** (0.007)	-0.095*** (0.007)	-0.053*** (0.006)	-0.051*** (0.006)

(continued)

Appendix D (continued)

Room types	Variables	Overall Rating		Cleanliness		Rooms Rating		Service Rating		Sleep Quality		Value	
		Score	Location Rating	Rating	Rating	Rating	Rating	Rating	Rating	Rating	Rating	Rating	Rating
Room equipment	Suites	0.128*** (0.012)	0.112*** (0.012)	0.099*** (0.012)	0.134*** (0.012)	0.113*** (0.011)	0.104*** (0.011)	0.074*** (0.011)					
	Family rooms	-0.028*** (0.010)	-0.0001 (0.011)	-0.033*** (0.011)	-0.037*** (0.011)	-0.018* (0.010)	-0.027*** (0.010)	-0.023** (0.010)					
	Air conditioning	0.081*** (0.014)	0.012 (0.015)	0.093*** (0.015)	0.103*** (0.015)	0.053*** (0.014)	0.085*** (0.013)	0.069*** (0.013)					
	Microwave	0.056 (0.036)	0.018 (0.037)	0.046 (0.037)	0.106*** (0.040)	0.051 (0.034)	0.060* (0.034)	0.069** (0.033)					
	Minibar	-0.030** (0.015)	0.001 (0.015)	-0.048*** (0.016)	-0.039** (0.016)	-0.012 (0.014)	-0.047*** (0.014)	-0.033** (0.014)					
	Refrigerator in room	-0.047*** (0.018)	-0.005 (0.019)	-0.057*** (0.019)	-0.059*** (0.020)	-0.055*** (0.017)	-0.063*** (0.017)	-0.043** (0.017)					
	Free parking	0.049*** (0.013)	-0.146*** (0.013)	0.072*** (0.014)	0.066*** (0.014)	0.063*** (0.013)	0.075*** (0.012)	0.063*** (0.012)					
	Kitchenette	0.029* (0.015)	-0.010 (0.016)	-0.003 (0.016)	0.087*** (0.017)	-0.006 (0.015)	0.029*** (0.014)	0.052*** (0.014)					
	Bar/lounge	0.020* (0.011)	-0.034*** (0.012)	0.024** (0.012)	0.011 (0.012)	0.037*** (0.011)	0.012 (0.011)	0.018* (0.010)					
	Self-serve laundry	0.006 (0.012)	0.010 (0.012)	0.016 (0.012)	0.005 (0.013)	0.006 (0.011)	-0.001 (0.011)	0.013 (0.011)					
Services	Business center with Internet access	-0.003 (0.013)	-0.015 (0.013)	-0.017 (0.013)	-0.008 (0.014)	0.002 (0.012)	0.004 (0.012)	-0.007 (0.012)					
	Conference facilities	-0.010 (0.015)	-0.035** (0.016)	-0.004 (0.016)	-0.012 (0.017)	-0.010 (0.015)	-0.006 (0.014)	-0.008 (0.014)					
	Meeting rooms	-0.036*** (0.014)	-0.028** (0.014)	-0.028* (0.014)	-0.025* (0.015)	-0.022* (0.013)	-0.025* (0.013)	-0.039*** (0.013)					
	Banquet room	-0.046*** (0.014)	-0.022 (0.014)	-0.047*** (0.015)	-0.040*** (0.015)	-0.049*** (0.013)	-0.028** (0.013)	-0.038*** (0.013)					
	Casino and gambling	-0.140*** (0.051)	0.059 (0.052)	-0.147*** (0.053)	-0.202*** (0.054)	-0.116** (0.048)	-0.122*** (0.047)	-0.144*** (0.046)					
	Babysitting	0.060*** (0.012)	0.055*** (0.013)	0.042*** (0.013)	0.046*** (0.013)	0.060*** (0.012)	0.044*** (0.011)	0.038*** (0.011)					
	Dry cleaning	0.032*** (0.011)	0.034*** (0.011)	0.025** (0.011)	0.027** (0.012)	0.031*** (0.010)	0.034*** (0.010)	0.023** (0.010)					
	Multilingual staff	0.018 (0.012)	0.008 (0.013)	0.014 (0.013)	0.019 (0.013)	0.025** (0.012)	0.009 (0.012)	0.013 (0.011)					
	Airport transportation	0.003 (0.012)	0.021* (0.012)	0.012 (0.013)	0.004 (0.013)	0.008 (0.012)	0.003 (0.011)	0.001 (0.011)					

(continued)

Appendix D (continued)

Variables	Overall Rating Score	Location Rating	Cleanliness Rating	Rooms Rating	Service Rating	Sleep Quality Rating	Value Rating
Laundry service	-0.008 (0.012)	-0.017 (0.013)	-0.004 (0.013)	-0.007 (0.013)	-0.002 (0.012)	-0.006 (0.011)	-0.012 (0.011)
Children activities (kid/ family friendly)	-0.011 (0.016)	-0.009 (0.016)	-0.013 (0.016)	-0.005 (0.017)	-0.012 (0.015)	-0.0003 (0.015)	0.002 (0.014)
Free breakfast	-0.013 (0.011)	0.041*** (0.011)	-0.014 (0.012)	-0.036*** (0.012)	-0.004 (0.011)	-0.033*** (0.010)	0.003 (0.010)
Concierge	-0.019* (0.011)	0.030*** (0.011)	-0.020* (0.011)	-0.035*** (0.012)	-0.007 (0.010)	-0.024** (0.010)	-0.019* (0.010)
Room service	-0.021* (0.013)	-0.017 (0.013)	-0.039*** (0.013)	-0.024* (0.014)	-0.004 (0.012)	-0.014 (0.012)	-0.043*** (0.012)
Restaurant	-0.024* (0.013)	-0.024* (0.013)	-0.032** (0.013)	-0.016 (0.014)	-0.026** (0.012)	-0.025** (0.012)	-0.033*** (0.012)
Shuttle bus service	-0.037*** (0.011)	-0.021* (0.012)	-0.037*** (0.012)	-0.040*** (0.012)	-0.028** (0.011)	-0.037*** (0.011)	-0.030*** (0.010)
Internet connection							
Free Internet	0.191*** (0.022)	0.125*** (0.023)	0.178*** (0.023)	0.199*** (0.024)	0.174*** (0.022)	0.157*** (0.021)	0.154*** (0.021)
Free high-speed Internet (Wi-Fi)	0.088*** (0.018)	0.060*** (0.019)	0.095*** (0.019)	0.080*** (0.020)	0.092*** (0.017)	0.073*** (0.017)	0.084*** (0.017)
Paid Wi-Fi	0.041 (0.034)	0.084** (0.035)	0.034 (0.035)	0.057 (0.036)	0.032 (0.032)	0.066** (0.031)	0.034 (0.031)
Paid Internet	-0.009 (0.032)	-0.043 (0.033)	0.013 (0.033)	-0.014 (0.034)	0.0001 (0.030)	-0.022 (0.030)	-0.017 (0.029)
Public Wi-Fi	-0.023* (0.013)	0.005 (0.013)	-0.012 (0.014)	-0.034** (0.014)	-0.013 (0.013)	-0.013 (0.012)	-0.011 (0.012)
Recreation and relaxation							
Ski-in/ski-out	0.220 (0.210)	-0.102 (0.219)	0.215 (0.221)	0.154 (0.229)	0.235 (0.202)	0.118 (0.202)	0.260 (0.200)
Fitness center with gym/workout room	0.055*** (0.014)	-0.078*** (0.014)	0.053*** (0.014)	0.094*** (0.015)	0.039*** (0.013)	0.084*** (0.013)	0.047*** (0.013)
Spa	0.011 (0.014)	-0.009 (0.014)	0.017 (0.015)	0.016 (0.015)	0.016 (0.013)	0.016 (0.013)	0.001 (0.013)
Tennis court	-0.016 (0.015)	-0.024 (0.015)	-0.019 (0.016)	-0.030* (0.016)	0.004 (0.014)	-0.011 (0.014)	-0.024* (0.014)
Golf course	-0.021 (0.048)	-0.074 (0.050)	-0.030 (0.050)	-0.022 (0.053)	-0.005 (0.046)	0.023 (0.044)	-0.011 (0.044)
Hot tub	-0.021 (0.015)	0.004 (0.016)	-0.029* (0.016)	-0.020 (0.016)	-0.025* (0.015)	-0.021 (0.014)	-0.036*** (0.014)

(continued)

Appendix D (continued)

	Variables	Overall Rating Score	Location Rating	Cleanliness Rating	Rooms Rating	Service Rating	Sleep Quality Rating	Value Rating
Support for people with disabilities	Pool	-0.048*** (0.015)	-0.120*** (0.015)	-0.052*** (0.016)	-0.040** (0.016)	-0.042*** (0.014)	-0.027* (0.014)	-0.062*** (0.014)
	Beach	-0.088 (0.054)	-0.071 (0.056)	-0.067 (0.056)	-0.124** (0.058)	-0.053 (0.052)	-0.079 (0.051)	-0.111** (0.050)
Smoking policy	Wheelchair access	0.089*** (0.011)	-0.034*** (0.012)	0.108*** (0.012)	0.114*** (0.012)	0.073*** (0.011)	0.097*** (0.011)	0.066*** (0.010)
	Reduced mobility rooms	-0.018 (0.019)	0.021 (0.019)	0.034* (0.020)	0.017 (0.018)	0.030* (0.017)	0.005 (0.017)	-0.018 (0.019)
Pet policy	Non-smoking hotel	0.071*** (0.012)	0.0003 (0.012)	0.075*** (0.012)	0.069*** (0.013)	0.055*** (0.011)	0.065*** (0.011)	0.061*** (0.011)
	Non-smoking rooms	-0.012 (0.014)	-0.013 (0.014)	0.013 (0.014)	-0.015 (0.015)	0.007 (0.013)	-0.005 (0.013)	-0.011 (0.013)
Economic development	Smoking rooms available	-0.032* (0.019)	0.027 (0.020)	-0.045** (0.020)	-0.055*** (0.021)	-0.034* (0.019)	-0.044** (0.018)	-0.028 (0.018)
	Pets allowed (dog/pet friendly)	-0.009 (0.013)	-0.003 (0.013)	-0.013 (0.013)	-0.018 (0.014)	0.001 (0.012)	-0.012 (0.012)	-0.018 (0.012)
Culture	GDP destination country	0.001 (0.033)	0.004 (0.037)	0.020 (0.034)	-0.014 (0.034)	0.003 (0.034)	-0.003 (0.027)	0.036 (0.037)
	GDP visitor's country	-0.046*** (0.013)	-0.046*** (0.012)	-0.040*** (0.013)	-0.043*** (0.013)	-0.022 (0.016)	-0.039*** (0.013)	-0.031** (0.014)
	GDP interaction	0.005*** (0.001)	0.007*** (0.001)	0.003*** (0.001)	0.007*** (0.001)	0.004*** (0.001)	0.003*** (0.001)	0.007*** (0.001)
	Power distance destination country	-0.003* (0.002)	-0.003 (0.002)	-0.003 (0.002)	-0.002 (0.002)	-0.005** (0.002)	-0.002 (0.002)	-0.004* (0.002)
	Power distance visitor's country	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.0004 (0.001)
	Power distance interaction	-0.00001*** (0.00000)	0.00002*** (0.00000)	-0.00000 (0.00000)	-0.00001* (0.00000)	-0.00001** (0.00000)	-0.00000 (0.00000)	-0.00001** (0.00000)
	Individualism destination country	-0.004** (0.002)	-0.005** (0.002)	-0.004** (0.002)	-0.004** (0.002)	-0.004** (0.002)	-0.003** (0.001)	-0.003 (0.002)
	Individualism visitor's country	0.002*** (0.001)	0.002** (0.001)	0.003*** (0.001)	0.002*** (0.001)	0.003*** (0.001)	0.002*** (0.001)	0.002*** (0.001)
	Individualism interaction	0.00000** (0.00000)	0.00000* (0.00000)	0.00001*** (0.00000)	0.00001*** (0.00000)	0.00000** (0.00000)	-0.00001*** (0.00000)	0.00001*** (0.00000)
	Masculinity destination country	0.002 (0.001)	0.001 (0.001)	0.002 (0.001)	0.003* (0.001)	0.002* (0.001)	0.001 (0.001)	0.003* (0.001)

(continued)

Appendix D (continued)

Variables	Overall Rating Score	Location Rating	Cleanliness Rating	Rooms Rating	Service Rating	Sleep Quality Rating	Value Rating
Masculinity visitor's country	-0.0001 (0.001)	-0.0001 (0.0005)	-0.0004 (0.001)	-0.0003 (0.001)	-0.001 (0.001)	-0.0002 (0.001)	-0.0001 (0.001)
Masculinity interaction	-0.0000 (0.00000)	0.00002*** (0.00000)	-0.0000*** (0.00000)	0.00001*** (0.00000)	-0.00000*** (0.00000)	0.00000*** (0.00000)	-0.00001** (0.00000)
Uncertainty avoidance destination country	0.002 (0.001)	0.001 (0.001)	0.002* (0.001)	0.002 (0.001)	0.001 (0.001)	0.001 (0.001)	0.003* (0.001)
Uncertainty avoidance visitor's country	0.002*** (0.0005)	0.001*** (0.0004)	0.001*** (0.0005)	0.002*** (0.0005)	0.002*** (0.001)	0.003*** (0.0005)	0.001*** (0.0005)
Uncertainty avoidance interaction	-0.00001*** (0.00000)	0.00002*** (0.00000)	-0.00001*** (0.00000)	0.00001*** (0.00000)	-0.00001*** (0.00000)	-0.00000 (0.00000)	-0.00001*** (0.00000)
Long-term orientation destination country	0.003* (0.001)	0.001 (0.002)	0.003*** (0.001)	0.002 (0.002)	0.002 (0.002)	0.003*** (0.001)	0.002 (0.002)
Long-term orientation visitor's country	-0.0004 (0.001)	-0.0003 (0.001)	-0.001 (0.001)	-0.0003 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Long-term orientation interaction	-0.00000* (0.00000)	0.00002*** (0.00000)	-0.00000 (0.00000)	0.00000 (0.00000)	-0.00000 (0.00000)	-0.00000 (0.00000)	-0.00001*** (0.00000)
Indulgence destination country	-0.004*** (0.001)	-0.002 (0.002)	-0.003*** (0.001)	-0.004*** (0.002)	-0.004*** (0.002)	-0.003*** (0.001)	-0.006*** (0.002)
Indulgence visitor's country	0.001 (0.001)	0.0003 (0.001)	0.001 (0.001)	0.001* (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Indulgence interaction	-0.00000 (0.00000)	0.00002*** (0.00000)	0.00000 (0.00000)	0.00000 (0.00000)	0.00002*** (0.00000)	-0.00000 (0.00000)	0.00000 (0.00000)
Model information	3.871*** (0.038)	4.218*** (0.042)	4.065*** (0.039)	3.863*** (0.040)	3.961*** (0.040)	3.998*** (0.033)	3.883*** (0.041)
Observations	1,658,174	1,416,813	1,462,529	1,358,301	1,643,756	1,313,588	1,464,853
Log likelihood	-2,078,233.000	-1,544,735.000	-1,744,197.000	-1,745,744.000	-2,175,873.000	-1,718,759.000	-1,994,508.000
AIC	4,156,644.000	3,089,648.000	3,488,571.000	3,491,666.000	4,351,924.000	3,437,696.000	3,989,193.000
BIC	4,157,741.000	3,090,730.000	3,489,657.000	3,492,744.000	4,353,020.000	3,438,772.000	3,990,279.000
Pseudo R²	.46	.47	.50	.48	.44	.46	.42

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion.

*p < .1. **p < .05. ***p < .01.

Authors' Note

The authors have made their data available on the research site Mendeley. See Radojevic, Tijana; Stanisic, Nemanja; Stanic, Nenad (2016), "Inside the Rating Scores: A Multilevel Analysis of the Factors Influencing Customer Satisfaction in the Hotel Industry," Mendeley Data, <https://data.mendeley.com/datasets/kwsrxshf9x/1>

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Notes

1. This type of modeling is known by different names across disciplines, including multilevel models, random effects or mixed models, and hierarchical linear models (Feaster, Brincks, Robbins, & Szapocznik, 2011).
2. Another option in accounting for these effects would be to include them as fixed effects (dummy variables). Given the number of participants included in this study (especially of individual reviewers) a fixed-effect specification of the research model would statistically be very inefficient. Including the four factors in the model as levels (random rather than fixed effects) also improves the generalizability of the results, so that the resulting models can be applied to predict values for units that were not included in the sample.
3. The key aspect that defines a variable as being a level is that its units can be regarded as a random sample from a wider population of units (Multilevel Structures and Classifications, 2015). The hotels included in this research do indeed represent a random sample from the entire population of (TripAdvisor reviewed) hotels located in the cities examined. Similarly, the destinations examined represent a random sample of all possible (urban tourism) destinations in the world. The same logic holds for the individual reviewers within their nations, and the nations themselves.
4. It is now apparent that most business travelers declared themselves as "anonymous" on Booking.com at the moment when the data for this study were collected. Business travelers were in the meantime established as a separate category.
5. The otherwise consistently positive association between star classification and customer satisfaction is seemingly reversed in the case of 1.5-star hotels, which, on average, received lower ratings than 1-star hotels. However, this difference in ratings is not statistically significant (see the standard error associated with the respective coefficient) and is most likely the result of sampling error, given that an unusually small share of hotels in the sample (20 hotels or about 0.15% of the total sample size) received 1.5-star classification.
6. In the case of log-transformed variables, a 100% increase in the independent variable is associated with an $\ln(2) \times \beta$ increase in dependent variable.

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