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National culture as a factor in visitors' evaluations of hotel services

Elżbieta Wąsowicz-Zaborek [1]

SGH Warsaw School of Economics, Department of International Business, Al. Niepodległości 162, Warsaw 02-554, Poland

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ABSTRACT

This study investigates cross-cultural variations in perceptions of hotel services by analyzing online reviews of 3-, 4-, and 5-star hotels in Warsaw, drawing from a dataset of 11,089 reviews posted on Hotels.com. It adopts a mixed-methods approach, encompassing 32 nations characterized by diverse Hofstede's cultural dimensions. The study identifies key factors influencing guest satisfaction, including room quality, breakfast, location, cleanliness, and staff performance. These factors exert varying impacts on customer attitudes depending on power distance, individualism, masculinity, and independence in each culture. This research addresses a gap in the literature due to limited publications on cultural disparities in online hotel reviews. Moreover, this study is unique in its geographical focus on Warsaw, with no comparable research identified. Practical implications include aiding hotel management in tailoring quality policies and enhancing customer experience for specific national cultures based on critical satisfaction drivers.

1. Introduction

The ongoing globalization and technological advancements make international travel faster and easier, enabling tourism businesses to target tourists from various countries. In this context, it is critical to understand how customers from different markets vary in terms of economic, technological, environmental, legal, demographic, and sociocultural requirements. Among these, sociocultural factors pose unique challenges due to their complex and often subtle nature. Although some cultural attributes are observable, their interpretation can be difficult. Therefore, it is essential to understand how culture influences the attitudes and behaviors in target markets to enhance marketing efforts effectively.

Culture viewed as a collective phenomenon, is defined by shared values, moral principles, customs, and a common language among a group of individuals (Hsu et al., 2015). This construct, often tied to specific national context, includes individuals' behavior and preferences. Hofstede and Hofstede (2007), defined national culture as "the collective programming of the mind that distinguishes members of one group or category from members of another".

Although researchers have described cultures and their dimensions in different ways (Hofstede and Hofstede, 2007), Hofstede's concept which includes six dimensions - power distance (high/low), collectivism vs. individualism, masculinity vs. femininity, uncertainty avoidance (strong/weak), orientation (long-term/short-term), and restraint vs. indulgence (Hofstede, 1983; Hofstede and Bond, 1988; Hofstede Insights.com; 2021) - is frequently used to describe cultural differences. This study employs also these dimensions to evaluate how foreign tourists from different countries rate hotel services.

People from various cultural backgrounds communicate in distinct ways due to the complexity und uniqueness of their cultures (Shachaf and Snyder, 2007). The offline cultural characteristics of customers are closely mirrored in online communication (Ess and Sudweeks, 2006).

Customers frequently seek opinions from others, especially those with similar lifestyles, purchasing power, and preferences, referred to as "word of mouth" (WOM) opinions (Helm, 2000). Many academics believe that WOM in electronic environments has given consumers more power and access to accurate and up-to-date product information (Umit Kucuk and Krishnamurthy, 2007).

Online reviews have become a vital source of customer feedback in the hospitality industry (Xie et al., 2014). They offer valuable insights into client satisfaction and serve as a crucial tool for hotel managers to understand and improve their services (Mauri and Minazzi, 2013; Zhou et al., 2014). Managers can monitor and understand customer perceptions by examining reviews of their goods and services, which has largely replaced push marketing (O'Connor, 2010). User-generated content (UGC), particularly reviews created by consumers, has gained recognition as a reliable and unbiased information source, playing a crucial role in the decision-making process (Sweeney et al., 2008). Compared to traditional qualitative methods such as surveys,

E-mail address: ewasowi@sgh.waw.pl.
[1] ORCID 0000–0001-8422–4383

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user-generated content analysis enables the identification of spontaneous opinions not captured by standard measurement scales (Sangpikul, 2022).

UGC has significantly influenced the information-seeking and travel planning behaviors of travelers, particularly in the tourism and hospitality industries (Fotis et al., 2012). Consequently, many firms have adopted social media and OTAs as data sources for analyzing customer opinions. OTAs, such as Booking.com and Hotels.com, provide platforms for the exchange of travel services, where viewing other users' reviews is crucial for both customers and service providers (García-Pablos et al., 2016). For small operators and budget hotel brands, online reviews from OTAs are especially important for enhancing customers' hedonic or emotional experiences with the brand (Wąsowicz-Zaborek, 2020), which can significantly impact online sales and marketing strategies.

By analyzing UGC, businesses can improve service quality and customize communications to different customer groups from various countries. Internet users generate massive amounts of complex, unstructured data, requiring mixed qualitative and quantitative approaches for accurate interpretation of customer opinions and emotions in the global market.

Despite the growing body of research on UGC and customer satisfaction, there is limited literature addressing cultural differences in online hotel reviews. This study aims to fill this gap by focusing on the cultural dimensions outlined by Hofstede and examining their influence on hotel service evaluations. The study will identify key factors influencing guest satisfaction based on online reviews on the Hotels.com platform and analyze how these factors vary across different national cultures. Additionally, the research will demonstrate and validate the use of UGC as a valuable data source for investigating international customers' attitudes, employing a mixed methods approach to explore textual datasets.

The next section presents a review of the literature highlighting the significance of this research topic. Subsequently, the methodology used to address the research questions will be explained, followed by the presentation of results, key conclusions, limitations of the study, and propositions for further research.

2. Literature review and hypotheses development

The study aims to investigate hotel guests' satisfaction levels through the lens of the national cultures of their countries of origin. Specifically, the research addresses the following research questions:

1. Which aspects of hotel service offerings receive the most feedback from visitors?
2. Do guests from different countries and cultural backgrounds bring up different discussion points in their feedback, and if so, how does this vary across countries and national cultures?
3. Does a guest's country of origin and cultural background influence their evaluation of hotel services and amenities?

2.1. Factors affecting customer satisfaction according to online reviews by hotel guests

User-generated content (UGC) encompasses information published by end-users on digital platforms, including social media, forums, and reviews sites (e.g. TripAdvisor). This information can manifest as textual, visual or video posts (Ayeh et al., 2013a, 2013b). Online reviews, a form of UGC, have become increasingly influential in shaping customer attitudes and decisions, particularly in the hospitality industry. Consequently, they have garnered significant interest of both academics and practitioners in recent years. An analysis of papers published between 2012 and 2022 in scientific journals indexed in the Scopus database revealed a significant increase in the use of UGC as an information source. Approximately 840 results were found containing keywords such as "user-generated content", 'UGC", "online reviews", and "online opinions", with nearly 40 % of these articles exploring opinions about lodging facilities (Wąsowicz-Zaborek, 2023).

Previous research on travel services utilized various online datasets, primarily from platforms like TripAdvisor (Kaveski Peres and Pacheco Paladini, 2021, 2021; Khorsand et al., 2020; Rita et al., 2022; Riva and Agostino, 2022; Sahin et al., 2017; Xie et al., 2017), and Yelp (Alamoudi and Alghamdi, 2021; AlSurayyi et al., 2019; Banerjee et al., 2017; Deng et al., 2022). There were also analyses that used comments from online travel agency (OTA) platforms like Booking.com (Aakash et al., 2021; Abirami and Askarunisa, 2017; Abrudan et al., 2020; Anagnostopoulou et al., 2020; Nilashi et al., 2022; Rita et al., 2022) and Ctrip.com (Agarwal et al., 2021; Filieri et al., 2022; Liu et al., 2020; Liu and Chen, 2022), as well as Airbnb (Cavique et al., 2022; Ding et al., 2020; Gao et al., 2022; Huang, Coghlan, and Jin, 2020).

Many studies in the fields related to digital technologies prioritized evaluating data acquisition or sentiment analysis tools over the results obtained (e.g. Ray et al., 2021; Zvarevashe and Olugbara, 2018; Sodanil, 2016). Akhtar et al. (2017) and Kiatkawsin et al. (2020) compiled lists of the most frequently discussed topics without conducting in-depth analyses of customer experiences. In contrast, studies by management scholars, particularly in marketing, provide more detailed insights into the determinants of customer satisfaction. Li et al. (2013) identified six determinants: logistics and location, facilities, receptionist services, food and drink, room cleanliness and maintenance, and monetary value. Similarly, Buschken and Allenby, (2016) explored latent topics in online reviews, finding common factors such as check-in, nearby attractions, food recommendations, room noise, room features, location, transportation, amenities, staff friendliness, and New York experiences.

Xu and Li (2016) examined variables influencing satisfaction and dissatisfaction in online comments. Customer satisfaction with different types of hotels had mostly the same drivers: location, perceived employee competence and room quality. However, the relative importance of each driver varied across different types of analyzed hotels. There were more characteristics that contributed to dissatisfaction than to satisfaction (Wi-Fi, facilities, parking, bathroom, noise, pool, and room cleanliness) and these also varied by hotel type.

Cavique et al. (2022) employed a text mining approach to analyze reviews posted on Airbnb. The major topics associated with quality perceptions were host service, physical aspects, and location.

Based on this overview of publications in tourism that utilize UGC, we propose the following hypothesis regarding the determinants of satisfaction and dissatisfaction of hotel customers:

Hypothesis 1. The most important factors determining hotel customer satisfaction are: location, employees, room facilities, cleanliness, and food and beverage offerings.

2.2. Cross-cultural differences in hotel guests' online reviews

While few studies directly address cultural differences in UGC, existing research suggests that cultural factors significantly influence online behaviors. Gao et al. (2018) found an inverse relationship between reviewers' power distance and their hotel ratings. In particular, customers who have a high power distance are more likely to report dissatisfaction, as opposed to those who have a low power distance. They view service providers as beneath them and demand special treatment. When service staff is unable to respond flexibly to their requirements, they feel dissatisfied. Mariani and Matarazzo's (2021) showed that customer satisfaction is higher when service providers and customers speak the same language, which is an important element of national culture. This suggests that hotel staff's ability to adjust to the expectations of members of different cultures enhances customer satisfaction.

Cultural background affects not only overall ratings but also the content of guests' reviews. Westerns are more likely to rely on analytical

narratives and positive emotional responses (Kim et al., 2018). Their online opinions, for example, often focus on service and atmosphere rather than meal quality and price (Nakayama and Wan, 2018).

Sann et al. (2020) compared the online complaining behavior of Asian and non-Asian hotel guests who posted negative hotel reviews on TripAdvisor. They found that non-Asian reviewers were more active and detailed in their complaints about service experience, value for money and security. The non-Asian guests also wrote more frequently about hotel cleanliness and the property itself.

Incorporating Hofstede's dimensions of national culture, Leon (2019) examined how national culture influences the likelihood and nature of customer comments, revealing effects on review length and content.

Guan et al. (2022) used machine learning techniques to analyze UGC, and identified three main dimensions of hotel service quality: adaptability, reliable delivery and tangibles. The impact of these dimensions on customer perceptions varied depending on the guest's national culture. Cultures prioritizing individualism and uncertainty avoidance emphasized reliable service and tangibles, while those with higher levels of power distance, masculinity, long-term orientation, and indulgence valued adaptability more.

Tsiotsou (2022) analyzed online reviews about luxury services from TripAdvisor posted by customers from the East, North, South and West of Europe. Eastern and Northern Europeans were more generous in their evaluations. Eastern Europeans focused on the hotel's "physical evidence/environment," Western Europeans on the "core product" (room and food), and Southern and Northern Europeans on "staff".

These studies collectively suggest that national culture shapes both the propensity to write reviews and the factors emphasized within them. However, comprehensive cultural comparisons remain limited, highlighting the need for further investigation. The aforementioned research provides a basis for the following hypotheses:

Hypothesis 2. The national culture of hotel guests' countries differentiates satisfaction scores in online reviews.

Hypothesis 3. The national culture of hotel guests' countries differentiates the importance of satisfaction factors in evaluating hotel services.

3. Research method

To obtain reliable data reflecting actual customer attitudes (as opposed to declared attitudes in surveys), this study used spontaneous opinions posted by hotel guests on the Hotels.com website. Booking.com and Hotels.com are the two leading platforms offering a wide range of accommodation options in Warsaw. Hotels.com was selected for this study due to its comparable popularity and extensive offerings at the time of data collection. While much of the existing research has focused on Booking.com (leading in Europe), using data from Hotels.com introduces new insights and diversifies the academic literature. The choice provides a fresh perspective on hotel guest satisfaction by analyzing data from a significant yet underexplored platform. A Python-based web scraper collected 11,700 reviews of 3-, 4-, and 5-star hotels in the Warsaw area between January 1, 2017, and September 9, 2020. After initial screening, reviews with incomplete data and from countries with fewer than 20 comments were excluded. This resulted in a final sample of 11,089 observations, encompassing opinions from 32 different nations.

To analyze cultural influences, the study employed the latest iteration of Hofstede's cultural dimension indices, specifically the data updated at the end of 2023 and sourced from the Hofstede Insights website (https://www.hofstede-insights.com). This updated dataset integrates findings from research by Minkov and colleagues (Minkov, Bond, et al. 2018; Minkov, Dutt, et al. 2018; Minkov et al., 2017, 2019), encompassing a period largely concurrent with the Hotels.com data collection timeframe. The use of these updated indices enhances analytical precision by capturing recent shifts in cultural dimensions that may have influenced guest attitudes during the period under review, ensuring that the cultural variables are relevant to the dataset under analysis. This approach is consistent with established practices in consumer behavior research, where Hofstede's dimensions are widely employed to provide a standardized framework for interpreting cultural influences, offering a reliable foundation for investigating the impact of national culture on consumer behavior across various contexts.

The data show disparities in sample sizes across countries, with some countries contributing a significantly larger number of reviews (e.g., USA: 2216) compared to others (e.g. Czech Republic 22) (see Table 1). Despite these imbalances, the identified trends and relationships still offer valuable insights into the influence of cultural dimensions on hotel satisfaction.

To examine the relationships between average satisfaction ratings, Hofstede's cultural dimensions, commenters' nationalities and hotel categories, descriptive statistics, correlations, regression analyses, and cluster analyses were performed using SPSS 27.

The downloaded review texts were machine-translated into English to ensure consistency and comparability. The process of qualitative data analysis involved a sequence of steps. First, text preprocessing was performed to remove semantically redundant elements such as conjunctions, prepositions, and punctations marks. Next, a dictionary of synonyms, related words, and different word forms was compiled. Qualitative text analysis with MaxQDA 2020/2022 was then conducted to identify key hotel attributes mentioned in reviews, both within the entire sample and within each analyzed country. The subsequent steps in data acquisition and analysis are shown in Fig. 1.

Source: own elaboration

4. Findings

Table 1 presents the distribution of the study sample by country, including average satisfaction ratings and Hofstede's cultural dimension indices. The means of rating scores were calculated using the Hotels.com's own scale (1−10).

Table 2 displays the cross-tabulation of accommodation categories (hotel star ratings) by country. Notably, consumers from China (9.28), Singapore (9.27), and Greece (9.02) gave the highest average scores. Although Chinese and Singaporean guests often chose lower-category hotels (3 and 3,5 stars), over 20 % stayed in 5-star hotels, a factor that could influence the average scores. The lowest average ratings were given by Spaniards (7.73) and Danes (7.82), who also less frequently used top-category facilities (only a few percent).

The majority of Israeli and Mexican guests utilized the highest-category facilities, while Czechs and Lithuanians mostly opted for lower-category accommodations.

To address the research questions and test Hypothesis 2 (which posits that national culture influences satisfaction scores in online reviews), a linear regression model was employed to explore the relationship between cultural dimensions (based on reviewers' stated countries) and overall ratings.

The regression model was estimated at the country level, with each of the 32 data points representing the mean hotel rating provided by guests from a specific country. Hofstede's national culture dimensions, with country-level scores sourced from the Hofstede Insights website, served as the predictors.

While the accompanying table reports t-statistics and p-values for the regression coefficients, inferential statistics are not applicable in this context. The sample encompasses the entire population of interest (i.e., the 32 countries), precluding generalization to a larger population. However, effect size measures, such as R-squared and standardized regression coefficients, remain meaningful for describing the associative patterns among these countries.

The model's R-squared value of 0.242 indicates that national cultural dimensions account for approximately 24.2 % of the variance in average

Table 1
Distribution of the study sample by country, with average satisfaction ratings and culsutral dimension indicators from Hofstede Insight.

	Frequency	Average rating	Dimensions of national culture according to Hofstede Insight					
			Power distance	Individualism	Masculinity	Uncertainty avoidance	Long-term orientation	Indulgence
USA (us)	2216	8.92	40	60	62	46	50	68
Taiwan (tw)	65	8.83	58	40	45	69	87	49
Turkey (tr)	36	8.44	66	46	45	85	35	49
Singapore (sg)	49	9.27	74	43	48	8	67	46
Sweden (se)	725	8.76	31	87	5	29	52	78
Russia (ru)	104	8.90	93	46	36	95	58	20
Poland (pl)	1145	8.66	68	47	64	93	49	29
Norway (no)	423	8.84	31	81	8	50	55	55
Netherlands (nl)	179	8.46	38	100	14	53	67	68
Mexico (mx)	66	8.94	81	34	69	82	23	97
Lithuania (lt)	25	8.72	42	55	19	65	49	16
Republic of South Korea (kr)	252	8.38	60	58	39	85	86	29
Japan (jp)	414	8.57	54	62	95	92	100	42
Italy (it)	530	8.69	50	53	70	75	39	30
Israel (il)	255	8.96	13	56	47	81	47	-
Hong Kong (hk)	83	8.63	68	50	57	29	93	17
Ireland (ie)	278	8.50	28	58	68	35	51	65
Greece (gr)	45	9.02	60	59	57	100	51	50
United Kingdom (gb)	1450	8.85	35	78	68	35	60	69
France (fr)	483	8.65	68	74	43	86	60	48
Finland (fi)	268	8.54	33	75	26	59	63	57
Spain (es)	118	7.73	57	67	42	86	47	44
Denmark (dk)	159	7.82	18	89	16	23	59	70
Germany (de)	713	8.73	35	79	66	65	57	40
Czech Republic (cz)	22	8.82	57	70	57	74	51	29
China (cn)	47	9.28	80	43	66	30	77	24
Switzerland (ch)	132	8.76	34	79	70	58	42	66
Canada (ca)	427	8.92	39	72	52	48	54	68
Brazil (br)	79	8.61	69	36	49	76	28	59
Belgium (be)	90	8.69	65	81	54	94	61	57
Australia (au)	187	8.83	38	73	61	51	56	71
Austria (at)	24	8.08	11	77	79	70	47	63
Total	11089	8.74						

Source: Own elaboration based on data obtained from Hotels.com and Hofstede Insights - https://www.hofstede-insights.com/product/compare-countries/ accessed: 12.10.2024

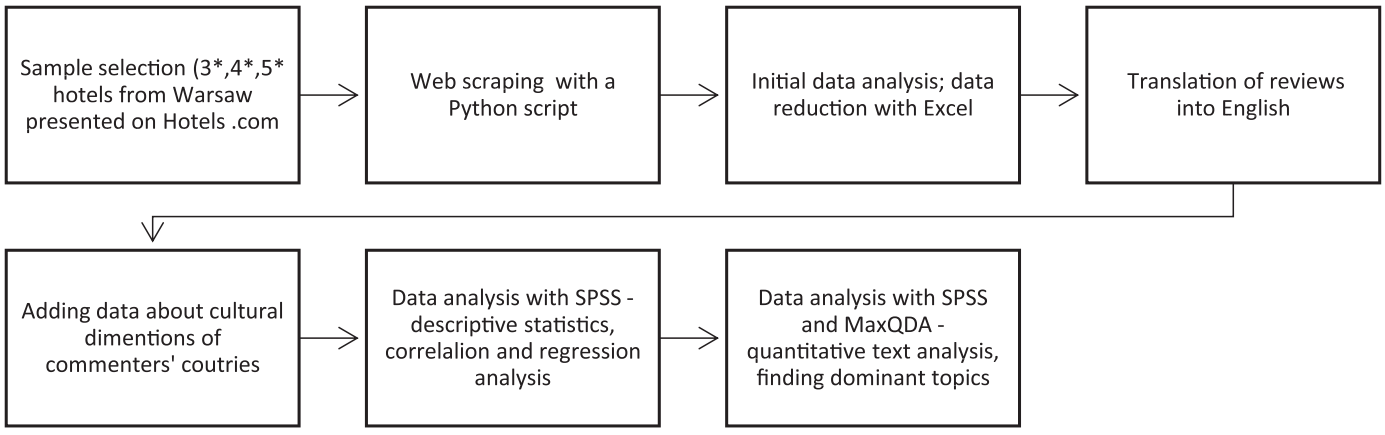


Fig. 1. Data acquisition and analysis workflow in the study.

satisfaction ratings across the 32 countries. Based on the standardized regression coefficients (betas), power distance (β = 0.324), uncertainty avoidance (β = −0.366), and masculinity (β = 0.330) emerged as the most influential cultural dimensions. As anticipated, power distance, masculinity, and indulgence were positively associated with satisfaction ratings, while individualism, uncertainty avoidance, and long-term orientation exhibited negative associations. The weakest associations were observed for indulgence (β = 0.023) and individualism (β = −0.032).

Importantly, the analysis revealed minimal multicollinearity among the predictor variables, with all variance inflation factor (VIF) values below 3. This indicates that the estimated regression coefficients are unbiased.

These findings suggest that national cultural dimensions are associated with differences in reported hotel satisfaction. The strongest predictors – power distance, uncertainty avoidance, and masculinity – warrant further investigation to understand how cultural norms related to authority, risk aversion, and gender roles influence perceptions of hotel service quality. Table 3. provide a detailed overview of the regression model's summary.

a. *R=0.492; R-square=0.242*

Table 2
Cross-tabulations of accommodation categories by countries (N=11089).

Country	category										Total
	3.0*		3,5*		4*		4,5*		5*		
	Frequency	% of country	Frequency	% of country	Frequency	% of country	Frequency	% of country	Frequency	% of country	Frequency
USA	647	29.2 %	80	3.6 %	778	35.1 %	12	0.5 %	699	31.5 %	2216
Taiwan	26	40.0 %	2	3.1 %	23	35.4 %	1	1.5 %	13	20.0 %	65
Turkey	12	33.3 %	2	5.6 %	15	41.7 %	3	8.3 %	4	11.1 %	36
Singapore	17	34.7 %	2	4.1 %	19	38.8 %	0	0.0 %	11	22.4 %	49
Sweden	179	24.7 %	17	2.3 %	286	39.4 %	12	1.7 %	231	31.9 %	725
Russia	44	42.3 %	5	4.8 %	41	39.4 %	2	1.9 %	12	11.5 %	104
Poland	566	49.4 %	140	12.2 %	269	23.5 %	22	1.9 %	148	12.9 %	1145
Norway	113	26.7 %	15	3.5 %	173	40.9 %	3	0.7 %	119	28.1 %	423
Netherlands	56	31.3 %	5	2.8 %	81	45.3 %	3	1.7 %	34	19.0 %	179
Mexico	19	28.8 %	3	4.5 %	20	30.3 %	1	1.5 %	23	34.8 %	66
Lithuania	15	60.0 %	1	4.0 %	8	32.0 %	1	4.0 %	0	0.0 %	25
Korea	71	28.2 %	11	4.4 %	101	40.1 %	2	0.8 %	67	26.6 %	252
Japan	129	31.2 %	6	1.4 %	198	47.8 %	0	0.0 %	81	19.6 %	414
Italy	212	40.0 %	17	3.2 %	210	39.6 %	3	0.6 %	88	16.6 %	530
Israel	66	25.9 %	4	1.6 %	90	35.3 %	2	0.8 %	93	36.5 %	255
Hong Kong	28	33.7 %	2	2.4 %	35	42.2 %	1	1.2 %	17	20.5 %	83
Ireland	95	34.2 %	22	7.9 %	101	36.3 %	0	0.0 %	60	21.6 %	278
Greece	18	40.0 %	0	0.0 %	23	51.1 %	0	0.0 %	4	8.9 %	45
United Kingdom	526	36.3 %	60	4.1 %	487	33.6 %	7	0.5 %	370	25.5 %	1,45
France	154	31.9 %	29	6.0 %	184	38.1 %	13	2.7 %	103	21.3 %	483
Finland	79	29.5 %	11	4.1 %	110	41.0 %	4	1.5 %	64	23.9 %	268
Spain	56	47.5 %	5	4.2 %	41	34.7 %	1	0.8 %	15	12.7 %	118
Denmark	63	39.6 %	9	5.7 %	62	39.0 %	1	0.6 %	24	15.1 %	159
Germany	232	32.5 %	49	6.9 %	289	40.5 %	7	1.0 %	136	19.1 %	713
Czechia	15	68.2 %	0	0.0 %	4	18.2 %	2	9.1 %	1	4.5 %	22
China	16	34.0 %	4	8.5 %	16	34.0 %	1	2.1 %	10	21.3 %	47
Switzerland	33	25.0 %	2	1.5 %	52	39.4 %	0	0.0 %	45	34.1 %	132
Canada	153	35.8 %	19	4.4 %	149	34.9 %	2	0.5 %	104	24.4 %	427
Brazil	33	41.8 %	3	3.8 %	25	31.6 %	0	0.0 %	18	22.8 %	79
Belgium	29	32.2 %	2	2.2 %	40	44.4 %	5	5.6 %	14	15.6 %	90
Australia	63	33.7 %	9	4.8 %	61	32.6 %	1	0.5 %	53	28.3 %	187
Austria	7	29.2 %	1	4.2 %	11	45.8 %	0	0.0 %	5	20.8 %	24

Source: Own elaboration

Table 3
Regression coefficients in the model for average hotel rating as the dependent variable.

Model		Non-standardized coefficients	Standardized coefficients	t	Significance	Collinearity diagnostics: VIF
		B	Beta			
1	(Constant)	8.588		13.812	<.001	
	Power distance	0.005	0.324	1.108	0.279	2.706
	Individualism	−0.001	−0.032	−0.108	0.915	2.724
	Masculinity	0.005	0.330	1.648	0.112	1.270
	Uncertainty avoidance	−0.005	−0.366	−1.702	0.102	1.462
	Long-term orientation	−0.002	−0.081	−0.375	0.711	1.477
	Indulgence	0.000	0.023	0.099	0.922	1.632

Source: Own study.

b. *Dependent variable: Average hotel satisfaction score*

To examine more closely how individual countries' reviews correlate with satisfaction ratings and hotel categories, country variables were transformed into binary dummies. This approach facilitates statistical analysis and allows for a clearer interpretation of how specific cultural traits influence satisfaction. Subsequently, Spearman correlation coefficients were calculated for the country dummies, hotel satisfaction ratings, and hotel categories. Statistically significant relationships between ratings and countries were found for the following: USA, Singapore, Netherlands, Japan, Israel, United Kingdom, Finland, Spain, Denmark, China and Canada. Similarly, significant correlations were observed between some country dummies and the categories of hotels chosen by visitors, including the USA, Sweden, Russia, Poland, Norway, Lithuania, Italy, Israel, Spain, Denmark, Czechia, and Switzerland. Table 4 provides a summary of the correlation analysis.

In some countries, one or both relationships (between reviews and satisfaction ratings, and between reviews and hotel categories) were significant but negative. This suggests that tourists from Netherlands, Japan, Finland, Spain and Denmark tended to give poorer ratings to hotels, while visitors from Russia, Poland, Lithuania, Italy, Denmark, Spain, and Czechia were more likely to choose more affordable accommodations.

To identify patterns in the relationships between cultural factors and average rating service quality ratings, a cluster analysis was conducted to establish similarities between the countries represented by the reviewers. By grouping countries with similar cultural characteristics, we can uncover patterns and insights that might not be apparent from a simple linear regression model.

A k-means cluster analysis was performed on the cultural dimensions

Table 4
Correlations between commenters' countries, their satisfaction ratings and hotel categories (N=11089).

Country	Rating	Category
United States	0.082**	0.081**
Taiwan	0.004	−0.009
Turkey	0.002	−0.005
Singapore	0.020*	−0.002
Sweden	−0.007	0.066**
Russia	0.008	−0.025**
Poland	−0.021	−0.136**
Norway	0.005	0.032**
Netherlands	−0.034**	0.000
Mexico	0.008	0.016
Lithuania	0.005	−0.030*
Republic of South Korea	−0.018	0.018
Japan	−0.029*	0.002
Italy	−0.016	−0.036**
Israel	0.032**	0.043**
Hong Kong	−0.010	−0.001
Ireland	−0.012	−0.010
Greece	0.010	−0.015
United Kingdom	0.030**	−0.006
France	−0.015	0.001
Finland	−0.038**	0.012
Spain	−0.070**	−0.033**
Denmark	−0.079**	−0.023*
Germany	−0.017	−0.013
Czechia	0.004	−0.028*
China	0.021*	−0.005
Switzerland	0.003	0.029**
Canada	0.021*	−0.005
Brazil	−0.003	−0.011
Belgium	−0.008	−0.002
Australia	0.003	0.007
Austria	−0.018	0.002

**. Significant correlation at the level of 0.01.
*. Significant correlation at the level of 0.05.
Source: own elaboration

of each country. The optimal number of clusters was determined to be three using both the Elbow method and Silhouette Score. The identified clusters showed moderate but meaningful differences in hotel satisfaction ratings.

The first cluster, which can be named "balanced satisfaction", comprises the USA, Sweden, Norway, Ireland, Netherlands, Italy, Israel, United Kingdom, France, Finland, Denmark, Germany, Switzerland, Canada, Belgium, Australia, and Austria. These countries exhibit an average satisfaction rating of 8.72. This cluster is characterized by a mix of high to moderately high individualism and varying levels of indulgence. The cultural profiles of these countries are generally balanced, resulting in moderate satisfaction levels. The predominance of Western nations within this cluster suggests that guest expectations are shaped by individualistic values, which emphasize personal space, privacy, and autonomy in hotel experiences. The moderately high satisfaction rating indicates that hotels generally meet these expectations.

Countries in the second cluster, which can be named "high satisfaction" are Taiwan, Singapore, South Korea, Japan, China, and Hong Kong. The average rating for this cluster is 8,79, which is the highest among the clusters. Countries in this group share rather high scores in collectivism and long-term orientation. Guests from these regions place a high value on relationships, community, and future-oriented thinking. The high satisfaction ratings can be attributed to the emphasis on hospitality and service quality in these cultures. Hotels that cater to these guests often excel in providing attentive, personalized service and maintaining high standards of cleanliness and order, which align with the cultural expectations of these travelers.

The last cluster, "lower satisfaction", contains Turkey, Russia, Poland, Mexico, Lithuania, Greece, Spain, Czech Republic, Brazil. The average rating for this cluster is 8,59, which is the lowest one. This cluster includes countries with higher uncertainty avoidance and power distance. These cultural traits can lead to higher expectations for structured and predictable services. The slightly lower satisfaction rating suggests that there may be gaps between the guests' expectations and the services provided by the hotels. For instance, guests from these courtiers might prefer more guidance and clearer communication from hotel staff, along with a higher degree of professionalism and authority in service indications.

Although the sample size in this study did not provide sufficient statistical power to identify statistically significant relationships in the regression analysis, the model nonetheless explained 24 % of the variance in hotel ratings. Furthermore, cluster analysis revealed distinct differences in hotel satisfaction ratings across consumer groups from countries characterized by varying levels of cultural dimension indices. These findings support Hypothesis 2, which posits that the national culture of hotel guests' countries influences satisfaction scores in online reviews.

The next phase of the research involved text analysis to determine what aspects of their hotel stays were most important to guests. This analysis served as the basis for verifying the third hypothesis. Initially, the data were reduced using an exclusion list and an analytical dictionary. The quantitative text analysis identified the most frequently mentioned topics in customer reviews, and these were visualized in word clouds. The word clouds highlight the key themes and attributes discussed by guests, providing a visual presentation of the importance and frequency of different topics.

The topics most frequently commented on were visualized as a cloud in Fig. 2.

The frequency with which specific subjects were mentioned in reviews is reflected in the size of the font used in the word cloud (Fig. 2). As can be seen, the most prominent theme was the "room" that the guest used, encompassing aspects like size, bed, view from the window, and bathroom. Reviewers also frequently mentioned the "cleanliness" of both the facilities and the room. "Breakfast" and the "general quality of food" were two additional significant concerns raised in the comments.

The facility's "location" emerged as a crucial factor, evidenced by the word "location" itself and related terms like "central station," "airport," "palace" (referring to proximity to Warsaw's Palace of Culture and Science), "a minute's walk," and "center". The facility's accessibility by public transport was also frequently mentioned, with key phrases like "tram," "bus stop," "walking distance," and "train station". The importance of hotel location was notably emphasized by guests from non-European countries, particularly Australia, Brazil, Canada, China, Hong Kong and Korea. It was also frequently referenced by those located on the geographical fringes of Europe - Ireland and Finland. This suggests that geographical factors might be more influential than national culture when it comes to prioritizing location. However, the cultural dimensions analysis reveals that the aforementioned countries predominantly represent cultures with relatively high levels of indulgence. According to Zhang et al. (2020), indulgent cultures prioritize leisure and pleasure-seeking experiences. This translates to a greater emphasis on recreational activities during vacations. Travelers from such cultures may therefore be more likely to prioritize convenient access to local attractions and amenities. By choosing hotels situated near these attractions, they can minimize travel time and maximize their opportunities for relaxation and enjoyable experiences. This aligns with the observation that guests from indulgent cultures placed a higher importance on location in their hotel reviews.

The hotel staff also emerged as an important theme, indicated by keywords like "staff," "helpful," and "friendly."

This list of prevalent topics aligns with the attributes of hotel offerings proposed in Hypothesis 1 as the most critical criteria for perceived service quality. Therefore, Hypothesis 1 is validated. To test Hypothesis 3, opinions from each country were examined separately. The findings were again visualized in word clouds representing the most prevalent topics for each country.

Table 5
Word clouds for the most important topics in Hotels.com reviews by visitors' countries.

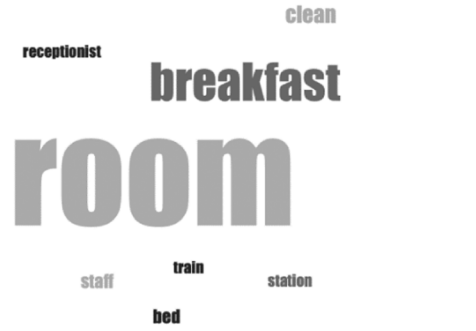
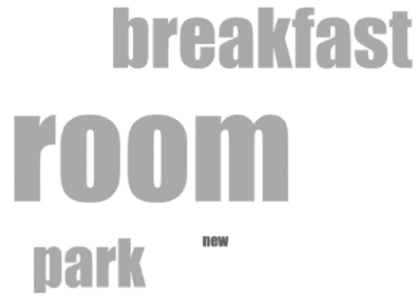
Australia		Japan	
Austria		Lithuania	
Belgium		Mexico	
Brazil		Netherlands	

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Table 5 (*continued*)

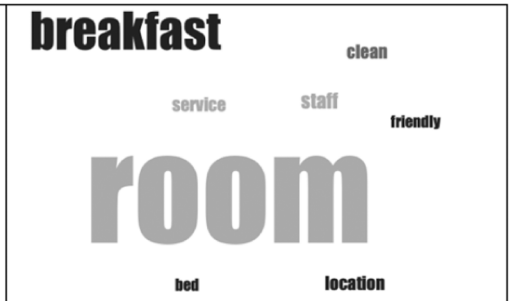
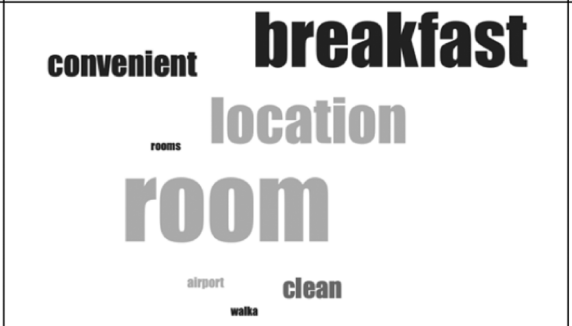
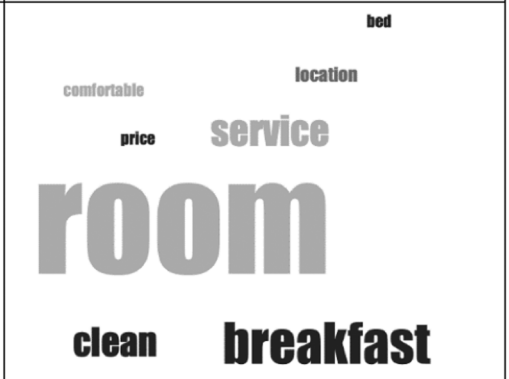
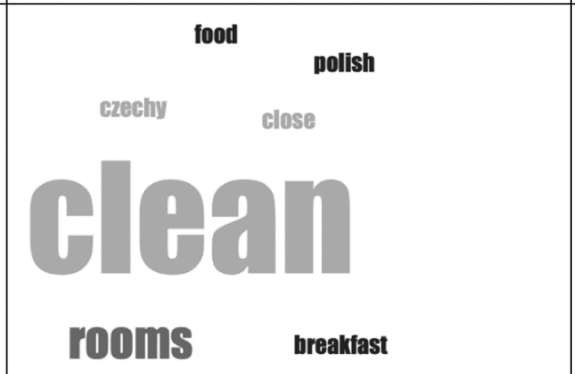
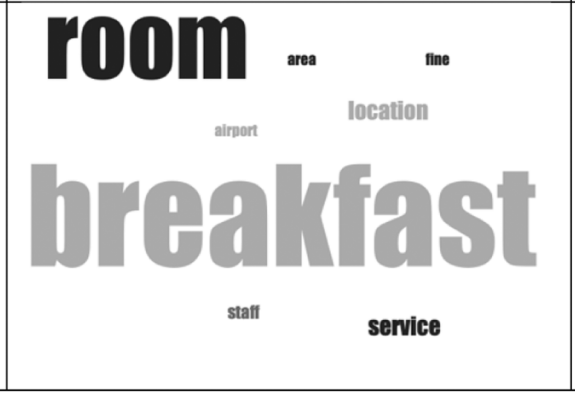
Canada		Norway	
China		Poland	
Czechia		Republic of South Korea	
Denmark		Russia	

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Table 5 (*continued*)

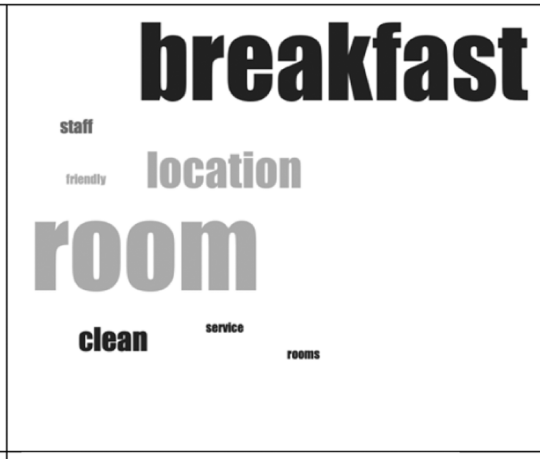
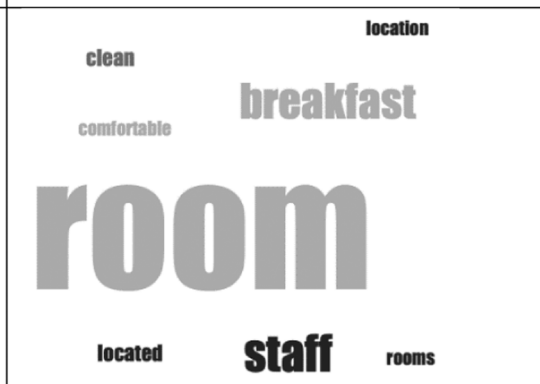
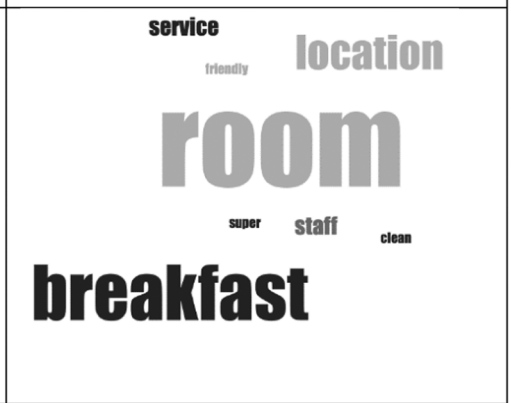
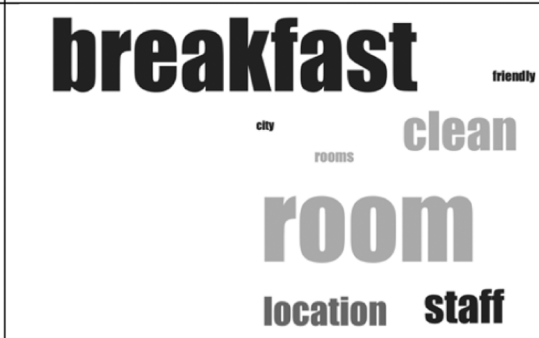
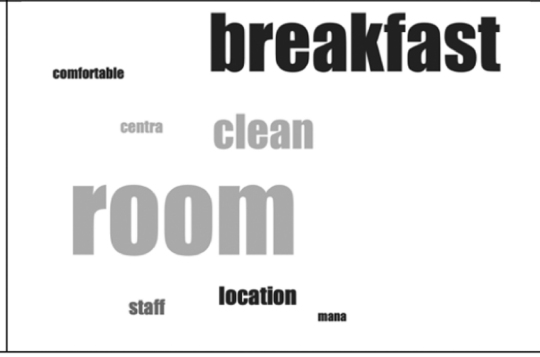
Finland		Singapore	
France		Spain	
Germany		Sweden	
Greece		Switzerland	

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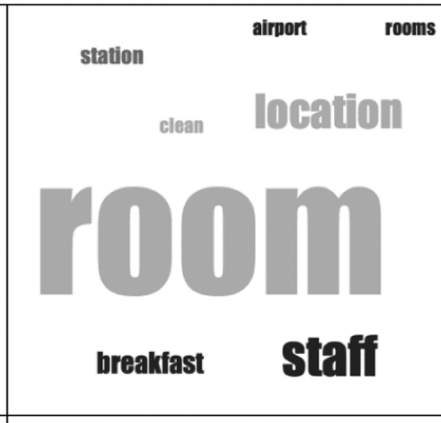
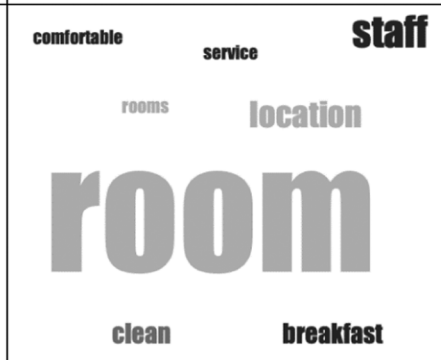
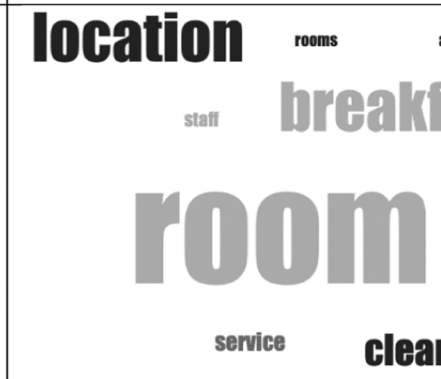
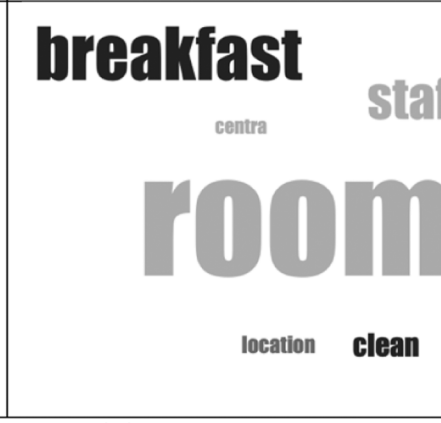
Table 5 (*continued*)

Hong Kong		Taiwan	
Ireland		Turkey	
Israel		United Kingdom	
Italy		USA	

Source: Own elaboration

Fig. 2. The most frequently mentioned topics in consumer reviews.
Source: own elaboration

The analysis for 32 countries focused on the frequency of key terms presented in word clouds, and their correlations with cultural dimensions which allowed for the identification of patterns, leading to meaningful insights. Due to limited space, the visualizations focus on the most salient topics. However, the complete qualitative analysis conducted for this study was more comprehensive, also considering the context of the most important topics covered in the reviews.

Power distance, which measures the extent to which less powerful members of society accept unequal power distribution, is a key cultural dimension. In countries with high power distance indices, such as Russia, China and Mexico, reviews frequently mentioned “staff” and “service”, reflecting a preference for structured, hierarchical interactions where service quality is critically evaluated. Conversely, in countries with low power distance like Denmark, Norway, and Sweden, an emphasis on “friendly” service can be observed, indicating an expectation for egalitarian interactions.

Individualism, measured by the degree of interdependence within a society, also plays a role. In highly and moderately individualistic countries like the USA, Australia and Netherlands, reviews frequently highlighted “room” and “comfort”, reflecting a strong preference for personal space and individualized service. These cultures value privacy and the quality of personal accommodations. In contrast, countries with low individualism, such as Taiwan, China, and South Korea, often focus on family-friendly services and communal experiences.

Hofstede and Hofstede (2007) posit that individuals from individualistic societies, characterized by a focus on personal achievement and autonomy, tend to prioritize self-care and the well-being of their immediate families over broader societal concerns This individualistic orientation often manifests in a preference for maintaining distance from service providers, as these individuals value self-reliance and personal responsibility. This preference for autonomy and self-determination aligns with the findings of Furrer, Liu, and Sudharshan (2000), who observed that physical elements within a service environment, such as self-service kiosks or online check-in options, can be perceived as a means to minimize interpersonal interactions and enhance feelings of control The emphasis on individuality in these cultures also extends to the realm of food consumption. Research by Kivela and Crotts (2006) and Sheldon and Fox (1988) has shown that tourists’ cultural backgrounds significantly influence their culinary preferences and choices during their travels. This may explain the observation in the current study that reviewers from individualistic cultures frequently mentioned "breakfast" in their hotel evaluations. While the act of dining is often a social activity, for individualistic tourists, the experience of savoring regional cuisine can contribute to a sense of personal fulfillment and create unique memories that reinforce their individual identity. This emphasis on personal experiences and self-discovery aligns with the broader individualistic ethos.

Uncertainty avoidance measures a society’s tolerance for ambiguity and unstructured situations. In the context of hotel evaluations, this dimension manifests in distinct patterns across cultures. High uncertainty avoidance countries, such as Greece, Russia, Mexico, and Czech Republic, frequently mentioned “clean” and “service” in their online reviews, reflecting a strong preference for predictability, cleanliness, and reliable service. Cleanliness, a tangible and easily verifiable aspect of a hotel’s environment, serves as a reliable indicator of adherence to established standards and protocols. Similar conclusions were also reached by Zhang et al. (2020), who note that cleanliness not only contributes to a sense of physical comfort but also fosters a feeling of psychological security and well-being, which is particularly important for individuals who are averse to uncertainty. Low uncertainty avoidance countries, such as Singapore, the USA, and Denmark, show a broader range of topics in their reviews, which may indicate a higher tolerance for ambiguity and a flexible approach to service standards. These cultures are generally more adaptable and open to new experiences, which may translate to a less rigid adherence to specific expectations in the hotel context. Guests from these cultures might be more forgiving of minor inconsistencies in service delivery or more open to novel approaches to hospitality.

Long-term orientation describes a society’s willingness to consider future rewards over immediate benefits. In countries with high long-term orientation, such as China, Japan, and Taiwan, there was a stronger emphasis on quality and value, indicating a focus on long-term benefits and sustained satisfaction. In the hospitality context, this translates to a heightened concern for the overall value proposition of the hotel experience, including the quality of amenities, the durability of facilities, and the long-term benefits derived from the stay. Guests from these cultures may be more willing to invest in higher-priced accommodations if they perceive them as offering superior quality and lasting value. Countries with low long-term orientation, such as the USA, Australia, and Norway, end to prioritize "comfort" and "convenience" in their reviews. reflecting a desire for instant gratification and short-term rewards. In the hospitality context, this translates to a greater emphasis on the immediate sensory and experiential aspects of the stay, such as the comfort of the bed, the convenience of amenities, and the overall ease and enjoyment of the experience.

When analyzing indulgence, one should concentrate on the extent to which a society allows for the relatively free gratification of basic human desires related to enjoying life and having fun. According to Zhang et al. (2020), the significance of location is more pronounced for guests originating from indulgent cultures, a finding echoed in the current study where reviewers from high-indulgence countries. like Mexico, Sweden, and Australia frequently mentioned hotel location as one of the most important aspects. Zhang et al. (2020) further explain that indulgent societies permit the relatively unrestrained fulfillment of human impulses pertaining to the pursuit of pleasure and leisure. Therefore, it is possible that these guests may place greater importance to recreational activities. The preference for more leisurely holidays may lead individuals to opt for hotels that offer convenient proximity to local attractions, as they seek to minimize restrictions while maximizing their relaxation and comfort. This aligns with the frequent mention of "breakfast" and "leisure" in reviews from high-indulgence countries like Mexico, Sweden, and the USA, confirming their emphasis on enjoyment and indulgence in their hotel experiences. Conversely, low indulgence countries like Russia, China, and Japan focus on “service” and “order”,

reflecting a more restrained approach to leisure and preference for structured experiences.

The analysis of word clouds and cultural dimensions reveals that national culture significantly influences the content of online reviews. Each cultural dimension shapes guests' expectations and experiences in distinct ways, impacting their satisfaction with hotel services. Individualism aligns with a focus on personal comfort and space, while low power distance and high uncertainty avoidance emphasize the need for accessible, highs-quality, and clean accommodations. High indulgence cultures value leisure and relaxation, reflected in their demand for high-quality rooms, diverse breakfast options, and convenient locations.

The qualitative analysis presented here demonstrates that opinions expressed by representatives of different cultures vary. While the qualitative nature of this work does not allow for direct statistical testing, the findings seem strong enough to confirm Hypothesis 3, which posits that national culture influences the importance of satisfaction factors in evaluating hotel services.

5. Conclusion and discussion

The study examined the impact of national culture on hotel satisfaction using online reviews from Hotels.com for 3-, 4-, and 5-star hotels in Warsaw. The findings contribute to the growing body of research on customer satisfaction by highlighting the influence of cultural dimensions on guest evaluations of hotel services. These findings align with Hofstede's cultural dimensions theory and extend its application to the hospitality industry, emphasizing the nuanced ways in which cultural traits shape service expectations and satisfaction (see Hofstede and Hofstede, 2007; Hofstede et al., 2010).

The study aimed to test three hypotheses regarding the influence of national culture on hotel guests' reviews. The first hypothesis proposed that location, employees, room facilities, cleanliness, and food and beverage offerings are the most important factors determining hotel customer satisfaction. This hypothesis was confirmed as the analysis of online reviews identified room quality, breakfast, location, cleanliness, and stuff performance as critical determinants of guest satisfaction. These results are largely consistent with those of Li et al. (2013), who suggested that the most crucial drivers of satisfaction are logistics and location, facilities, receptionist services, food and beverage, room cleanliness and maintenance, and monetary value. The current study's findings are also partly in line with the proposal of Buschken and Allenby (2016) who pointed out the importance of check-in, nearby attractions, food recommendations, room noise, positive room features, location, transportation, amenities, staff friendliness, and the overall experience. Zhang et al. (2020), who examined how different cultural dimensions affect the weight given to various aspects of a guest's experience after they had checked out of a hotel, also provided a similar picture regarding room, cleanliness, and location evaluations by representatives of different nations.

The second hypothesis, which proposed that the national culture of hotel guests' countries influences satisfaction scores expressed in online reviews, was examined through statistical methods, including regression and cluster analysis. This analysis revealed variations in satisfaction scores across different cultural contexts. Notably, the regression model indicated that national cultural dimensions accounted for 24.2 % of the variance in mean country-level satisfaction scores.

Cluster analysis further confirmed that cultural dimensions significantly differentiate satisfaction scores, grouping countries with similar cultural profiles and showing distinct patterns in satisfaction ratings. Representatives of countries with relatively higher collectivism and long-term orientation indices provided the highest ratings. In contrast, guests from countries with higher uncertainty avoidance and power distance indices gave the lowest ratings. The influence of power distance on opinions published online was also addressed by Gao et al. (2018), who showed a negative relationship between this cultural dimension and hotel ratings. But their research design did not include other cultural dimensions in their research design, limiting direct comparison with the current analysis.

The third cluster grouped representatives of countries with high individualism and varying degrees of indulgence, exhibiting a mid-level average score. However, the differences in average scores among the identified clusters were not large, as all scores in the analyzed data set were relatively high (above 7,73).

The third hypothesis, proposing that national culture differentiates the importance of satisfaction factors in hotel service evaluation, was also confirmed. The analysis showed that different cultures prioritize different aspects of hotel services. High individualism cultures focus on room quality and personal comfort, while high power distance cultures emphasize staff performance and service quality. High uncertainty avoidance cultures value cleanliness and predictability, and high indulgence cultures place a premium on location and leisure activities.

Methodologically, this study investigated the validity of the online guest reviews as a data source for research on hotel service quality and customer satisfaction. Hotels.com reviews, with their open-ended format, provide guests with considerable expressive freedom. This results in a dataset that is both heterogeneous and challenging to analyze. However, this very characteristic can also enhance the reliability of the data, as it captures guests' unfiltered opinions and experiences in their own words. This is in contrast to structured surveys, which may introduce bias through pre-defined question formats and answer choices. To leverage this rich data source effectively, the study adopted a mixed-methods approach, combining qualitative and quantitative analysis techniques. This methodological approach is well-suited to future research endeavors that seek to capture the complex interplay between guest cultural backgrounds and hotel service quality.

In addition to its theoretical and methodological contributions, the current study offers important practical implications, especially for facilities operating in heterogeneous international markets. By understanding the cultural preferences of their guests, hotel managers can tailor services to meet culturally specific expectations, enhancing guest satisfaction and fostering positive word-of-mouth promotion. Understanding that guests from individualistic cultures value privacy and room quality, hotels can focus on enhancing these aspects to improve satisfaction. Similarly, recognizing the importance of staff performance for guests from high power distance cultures can help to shape staff training programs to emphasize attentiveness, respect, and clear communication. Hotels catering to guests from high uncertainty avoidance cultures may be more appreciative of cleanliness and orderliness to meet these guests' expectations. Finally, for guests from high indulgence cultures, promoting the hotel's location and nearby attractions can enhance their overall experience. These insights can inform marketing strategies and service improvements, enabling hotels to better cater to the diverse needs of their international clientele.

While this study provides valuable insights, it also has limitations that should be acknowledged. The reliance on reviews from a single platform – Hotels.com – may not capture the full spectrum of customer opinions available across different online travel agencies. Future research could benefit from a more comprehensive dataset, including reviews from multiple platforms to enhance the robustness and generalizability of the findings. Another limitation is that the cultural dimension scores used in the analysis reflect national averages rather than individual guest values. While Hofstede's framework provides a valuable tool for understanding cultural differences across countries, it is important to recognize that individuals within a particular nation may exhibit varying degrees of adherence to these cultural norms (compare Minkov et al., 2023). Future research that explores methods to capture individual guests' cultural orientations on a more granular level could provide more nuanced insights.

Moreover, it is important to emphasize that national cultures evolve under the influence of changing demographic, economic, social, political, and even environmental conditions (Varnum and Grossmann, 2021). For example, one of the important trend discussed in literature, is

the increase of collectivism in many previously found individualistic cultures caused mainly by the Covid-19 pandemic (Han et al., 2021). Therefore, the results presented should be interpreted within the context of individual cultural dimensions, as well as their combinations and interrelationships. These factors are the primary influences of the behaviour of reviewers, and in this respect, the findings remain universal, making a significant theoretical and practical contribution. The analysis presented in this article is temporally consistent, as both the reviews from Hotels.com and the cultural dimension indicators from Hofstede Insights were based on the data from the same period. Given the continuous evolution of culture, future analyses of the attitudes of residents from different countries should account for the variability while maintaining the foundational assumptions about the influence of individual cultural dimensions.

In the process of the study, the author encountered several technical challenges that could potentially impact the research results. One significant issue was the need to standardize the textual data by translating it into a common language. Due to the large volume of data, machine translation into English was necessary, as it offers the most advanced algorithms and comprehensive dictionaries for identifying synonyms and conducting sentiment analysis. Although current machine translation methods are generally accurate enough to capture the essence of reviews, they may lose some nuances, particularly in conveying emotions, which are often deeply intertwined with the author's national culture. Consequently, translation may result in the loss of culturally sensitive content, weakening the observed effects of national culture in subsequent analysis. However, it is important to note that sentiment analysis was not the primary focus of this study. To analyze international customers' emotions effectively, it is advisable to avoid translation and limit the dataset to opinions expressed only in a single language, preferably English due to its widespread international use. However, a substantial portion of the reviews on Hotels.com are written in various national languages. Introducing this limitation in this study would have significantly reduced the sample size and diminished the cultural diversity of the dataset. As such, having a culturally uniform sample would have precluded from achieving the stated goals of this research. Therefore, to carry out sentiment analysis on an international scale, it would be necessary to either accept a reduced sample size or source data from multiple OTA platforms and other recommendation sites, such as TripAdvisor or Zoover.

In conclusion, this study underscores the significant role of national culture in shaping hotel guests' evaluations of service quality. By integrating Hofstede's cultural dimensions with the analysis of online reviews, the research highlights how cultural traits influence key satisfaction drivers, offering both theoretical and practical contributions to the field of international hospitality management. The findings emphasize the need for culturally aware service strategies to enhance guest satisfaction.

CRediT authorship contribution statement

Elżbieta Wąsowicz-Zaborek: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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