

## Why do guests stay at Airbnb versus hotels? An empirical analysis of necessary and sufficient conditions



Manuel J. Sánchez-Franco<sup>a,\*</sup>, Maria Elena Aramendia-Muneta<sup>b</sup>

<sup>a</sup> Faculty of Economics and Business Administration, Universidad de Sevilla, Avda. Ramon y Cajal, n1, 41018 Sevilla, Spain

<sup>b</sup> Faculty of Economics and Business Administration, Universidad Pública de Navarra, Campus Arrosadia s/n, 31006 Pamplona, Spain

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### ABSTRACT

Our study explores the differences in necessary and sufficient conditions for producing (dis)satisfactory guest experiences between Airbnb and hotels, intending to develop competitive strategies for the hospitality industry. Using advanced Natural Language Processing techniques, we analysed user-generated content from both platforms in the Andalusian market, utilising Contextualised Topic Modelling and Necessary Condition Analysis to identify the main topics and relationships that impact guests' experiences. We also employed XGBoost to assess sufficient conditions for customer satisfaction, providing insights that can enhance the quality of lodging stays and improve marketing strategies. Overall, our findings show that both types of accommodation share similar necessary conditions for (dis)satisfaction, but differ in the order of importance. Proximity to tourist attractions and staff recommendations are important for Airbnb guest satisfaction, while hotel guests prioritise facilities and staff professionalism. Both types of accommodation share similar themes that contribute to guest dissatisfaction, including noise complaints, value for money, and staff professionalism. Airbnb offers unique and personalised experiences, while hotels prioritise efficient and appropriate interactions between staff and guests. Identifying and prioritising factors influencing guest satisfaction and dissatisfaction is essential for remaining competitive in the hospitality sector. To sum up, our research contributes significantly to the literature on hospitality services, with methodological implications for future studies.

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### Introduction

The sharing economy (or collaborative economy) is (a) rooted in the desire for sustainability, enjoyment and economic profits, and (b) grounded in co-creation through networks in online environments (Hamari et al., 2016; cf. also Allee, 2003; Prahalad and Ramaswamy, 2004; Reuschl et al., 2022). In particular, tourist areas have witnessed the explosive growth of the sharing economy, that here refers to creating value from underused assets -e.g., coordinating rent-outs for a short period (Huang & Yu, 2019). However, despite its growing interest amongst scholars and managers, travellers engage with peer-to-peer accommodation rental services (from now on, P2P accommodation) for motives (or conditions) that are not yet completely clear (Lalicic & Weismayer, 2018; Sainaghi & Baggio, 2020). Furthermore, attention paid to the critical differences between P2P accommodation and hotels has been even scarcer (e.g., Gao et al., 2022; Mao & Lyu, 2017; Sánchez-Franco & Alonso-Dos-Santos, 2021;

Tussyadiah & Zach, 2015; Tussyadiah, 2016; Varma et al., 2016, amongst others).<sup>1</sup>

Given its position as the world's largest P2P accommodation service provider, our study initially focuses on Airbnb (an accommodation rental business and a trusted third party) (Winkler et al., 2020). Airbnb has gained increasing attention for its efficient marketing strategies for multiple segments and for improving financial performance by reducing search and payment transaction costs (e.g., Dolnicar, 2021; Sánchez-Franco & Rey-Moreno, 2022; Strømmen-Bakhtiar & Vinogradov, 2019). In addition, Airbnb has a near zero-marginal cost structure, thus representing a considerable advantage over traditional hotel chains (Strømmen-Bakhtiar & Vinogradov, 2019).

As a result, Airbnb has become one of the most successful sharing economy models in the hospitality sector and the hottest trend for hospitality (Sainaghi & Baggio, 2020). Airbnb leads academics to analyse its potential threat to the traditional hotel sector or conclude that it creates new demand, providing opportunities for guests who

\* Corresponding author.

E-mail addresses: [majesus@us.es](mailto:majesus@us.es) (M.J. Sánchez-Franco), [elena.aramendia@unavarra.es](mailto:elena.aramendia@unavarra.es) (M.E. Aramendia-Muneta).

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otherwise would not have been able to travel. Nevertheless, previous research has provided controversial findings from a logic of sufficiency, frustrating hosts and hotel managers from forming a higher understanding of hospitality services to develop their competitive advantages and strategies. For instance, [Strømme-Bakhtiar and Vinogradov \(2019, p.1\)](#) -analysing a mixture of small and large regions- conclude that hotels face no pressure to reduce prices in areas with high Airbnb activity. On the other hand, [Heo et al. \(2019\)](#) note that Airbnb and the hotel industry “are not in direct competition and that their relationship might be more complex” (p. 87).

Furthermore, [Benítez-Aurioles \(2019, p.3\)](#) concluded that “the expansion of the peer-to-peer market for tourist accommodation has negatively affected hotel occupancy and economic returns in Barcelona, independently of the hotel category”. [Maté-Sánchez-Val \(2020, p.610\)](#) notes that “Airbnb’s private rooms and the concentration of the Airbnb market in fewer hosts are the main threats to traditional accommodation providers”. Travellers could regard Airbnb as an alternative (more or less perfect) to a hotel, e.g., mid (or low)-price hotels ([Guttentag & Smith, 2017](#)) or those not specialising in business guests ([Zervas et al., 2021](#)). Airbnb would also compete with the hotel domain regarding guest experience ([Mody et al., 2017](#)) and create “a more diversified experience than conventional hotel accommodation” ([Wang & Nicolau, 2017, p.120](#)). The human relationship is sometimes the primary shared asset ([Dolnicar, 2019; Zach et al., 2020](#)).

In sum, previous studies on Airbnb show no conclusive evidence of its effects on the hotel industry. Therefore, with the new challenges that Airbnb represents for hotels, it is still necessary to compare both types of accommodation to set side by side and test the differences between Airbnb and traditional hotels. “Understanding customer preferences is important for Airbnb accommodation hosts and hotel managers because they compete with and complement each other” ([Gao et al., 2022, p.119](#); see also [Cheng & Jin, 2019](#)). The higher the overlap (or similarity) of the preferences (or conditions) that promote satisfaction and the revisit intention of using Airbnb or hotels, the greater the potential threat of substitution.

In this study, we aim to contribute to the existing body of literature on the hospitality industry by addressing the gap in knowledge regarding the vital features of Airbnb experiences and hotels as perceived by guests and how to improve guest (dis)satisfaction. While previous research has explored the relationship between hospitality features and guest satisfaction, they have not thoroughly examined it in the context of necessity and sufficiency. Our study aims to fill the gap in the literature by providing a comprehensive assessment of the relationship between the vital features of Airbnb experiences and hotels as perceived by guests and guest (dis)satisfaction.

To achieve our research objectives, we employ advanced Natural Language Processing (NLP) techniques to analyse a large volume of natural and non-structured user-generated content (UGC) from Airbnb and hotels in the Andalusian market (Spain). By applying Contextualized Topic modelling (CTM), we can identify the main topics and semantic structures that affect guests’ experiences. Our findings are supported by the work of [Sánchez-Franco and Alonso-Dos-Santos \(2021\)](#) and [Sánchez-Franco and Rey-Moreno \(2022\)](#), who have also used CTM to analyse UGC and explore consumer preferences.

Our study employs Necessary Condition Analysis (NCA) to identify the essential prerequisites that must be met in order to achieve the desired outcome of guest satisfaction. This rigorous approach enables us to uncover the intricate interrelationships between key factors and the guest experience, effectively highlighting the conditions that must be fulfilled by managers to attain their desired objectives. Prior research conducted by [Dul \(2016\)](#) and [Dul et al. \(2010\)](#) also utilises NCA to analyse complex systems and isolate the necessary conditions for achieving the desired outcomes.

In addition, our study employs the XGBoost algorithm for classification tasks and regression analysis to reveal which topics are

sufficient conditions for customer (dis)satisfaction. This approach enables us to identify the topics most influential in shaping guest (dis)satisfaction, providing insights that can be used to improve marketing strategies and enhance the quality of lodging stays. Our findings align with previous research by [Birinci et al. \(2018\)](#), who have also used regression analysis to explore the relationship between hospitality features and customer satisfaction.

Overall, our study contributes to the ongoing debate regarding the competition between Airbnb and hotels in the same domain. By providing a comprehensive assessment of the necessary and sufficient conditions for achieving guest satisfaction, our findings enable managers to improve their marketing strategies and overcome issues related to lodging stays. In addition, our study validates the effectiveness of advanced NLP analysis and expands the literature on hospitality accommodation features, providing a reliable and accurate assessment of consumer preferences.

## Theoretical framework

Airbnb focuses on obtaining, giving, or sharing access to accommodations amongst individuals at competitive prices ([Sánchez-Franco & Alonso-Dos-Santos, 2021](#)). It is a business model where “customised content of a large variety of users is integrated into a network that creates value” ([Reuschl et al., 2022, p. 101](#)). Although Airbnb has become a low-cost option to earn additional income in a flexible manner ([Guttentag, 2015; Guttentag et al., 2018; Liang et al., 2018](#)), the growing sharing supply creates severe competition and forces (in conjunction with the reputational capital of the hosts; [Ikkala & Lampinen, 2014](#)) “to set the standards high and adjust the prices” ([Lalicic & Weismayer, 2018, p.88](#)). For instance, Airbnb provides a range of differentiated accommodations to experience well-being in (fashionable and warm) environments and satisfy guests’ curiosity and novelty seeking. As a result, Airbnb becomes a social option that allows exploring the destination authentically - allocating resources more efficiently.

On the one hand, assuming that the essential services could be comparable to a hotel’s ([Tussyadiah & Zach, 2015](#)), research on Airbnb -from the demand side- identifies “a multiplicity of relevant motives, including economic, sustainability-related, and social aspects” ([Dann et al., 2019, p.450](#)).

- Although [Cheng and Jin \(2019\)](#) propose that Airbnb users do not care more about value, competitive prices (*cf.* [Balck & Cracau, 2015](#)) and physical space in accommodation (*cf.* [Dolnicar, 2019](#)) are traditional motives for selecting P2P accommodation instead of hotels (see also [Quinby, 2014](#)). As [Strømme-Bakhtiar and Vinogradov \(2019, p.101\)](#) note, “Airbnb customers are different from traditional hotel guests, *i.e.*, they [an extended family of over five people] possibly would not have visited the place had the prices not been suitable”.
- Beyond economic benefits, social or physical distance from others (guests) could also be a relevant reason for selecting P2P accommodation, particularly entire apartments ([Bresciani et al., 2021](#)).
- [Mody et al. \(2017\)](#) conclude that Airbnb outperforms hotels in communities and localness, *e.g.*, staying in more residential neighbourhoods and offering real people and a home atmosphere (*cf.* [Ert et al., 2016; Guttentag, 2015; Tussyadiah, 2015](#)). [Quattrone et al. \(2016\)](#) also propose that P2P accommodation extends into residential areas and grows in areas with few or no hotels. Furthermore, Airbnb properties provide a more authentic interactive experience than hotels ([Birinci et al., 2018](#)) that could even lead to loyalty (*cf.* [Grayson & Martinec, 2004](#), for their authenticity conceptualisation). Airbnb users would thus value the authentic settings around the accommodation.
- In this regard, [Guttentag et al. \(2018\)](#) demonstrate that interaction and home benefits belong to the core of the Airbnb experience (*i.e.*,

authenticity based on enjoyment, escape and novelty seeking, *cf.* Lalicic & Weismayer, 2018) – above the perceived risk. Although Airbnb guests might not get what they expect from amateur hosts – unpleasant personal treatment, a lack of cleanliness, or the noise could create unsatisfactory assessments during the Airbnb stay (*cf.* Gao et al., 2022) – authenticity becomes an essential element of hospitality experiences and guest satisfaction.

- Gao et al. (2022) conclude that the host is the second most common topic and the most critical feature that separates Airbnb from hotels. In addition, previous research proposes cultural exchange and social interaction with their hosts (Balck & Cracau, 2015; Guttentag, 2015; Wang & Nicolau, 2017). “There is [indeed] a (...) higher trust between guests and hosts” (Bresciani et al., 2021, p. 2).
- The accommodation amenities in P2P are identified as one of the critical factors influencing Airbnb guests’ satisfaction (Tussyadiah, 2016; Tussyadiah & Zach, 2015) and enhance guests’ decision-making processes and service experience (Sánchez-Franco & Alonso-Dos-Santos, 2021). Amenities attract guests who (a) prefer the feeling of being at home rather than staying at a conventional hotel, and (b) enjoy multiple experiences, finding cost-savings to be their main driver in conjunction with location and household amenities (*cf.* Guttentag et al., 2018; Paulauskaite et al., 2017). For instance, “males are focused on the importance of hygiene, quality or room amenities serving as surrogates for more comprehensive processing” (p.2497). Therefore, the issues associated with a sense of being at home are essential amongst Airbnb guests (*cf.* Ju et al., 2019).
- Finally, Young et al. (2017) confirm that leisure travel, party size, and trip length could be moderating drivers in selecting P2P accommodation, evidencing the relevance of leisure customers. Airbnb is also preferred when travelling with friends (Poon & Huang, 2017). For instance, Airbnb facilitates everything from day trips to stays of several months, and in this sense, travellers tend to stay longer (Tussyadiah, 2016), except business travellers (Varma et al., 2016).

On the other hand, although research comparing the determinants in hotels that create customer satisfaction and dissatisfaction is scarce, its main conclusions can be summarised as follows. Hotels are preferred for shorter stays and family trips (Poon & Huang, 2017). Guests emphasise drivers such as location and accessibility (*e.g.*, walking distance from major attractions such as city centre, transportation hub, or beach), lower risks – through standardisation, regulations, and reputation- and property features such as open escapes, higher safety and security, car parking or gym services. Benítez-Aurioles (2019, p.3) proposes that “hotels that cannot compete on price or location may have to differentiate their services to travellers to ensure their survival”. Hotels, therefore, cultivate a traditional delivery-focused paradigm that emphasises service quality and facilities beyond guest characteristics (*e.g.*, age, nationality, gender, or trip purpose). For instance, amenities (such as Internet access, mini-bar, TV streaming services, hair dryers, and coffee makers) play an essential role in guests’ satisfaction (Radojevic et al., 2015). As Yu et al. (2020, p.3168) note, “research indicates that hotel amenities play a significant role in guests’ decision-making processes and service experience [...], including satisfaction”.

Chu and Choi (2000) highlight the room, reception, and security. Kandampully and Suhartanto (2000) demonstrate a positive correlation between cleanliness, reception, food & beverage characteristics and price and customer satisfaction. In addition, hotels offer house-keeping services, guest loyalty programmes (related to money-saving) and facilities to make them less vulnerable to competition (*cf.* Festila & Müller, 2017; Young et al., 2017; see also Dann et al., 2019). As a result, hotel guests have quality expectations according to their ratings.

Furthermore, hotels offer staff contact and facilitate indirect (and engaging) communication (*vs* social or physical distance) with other guests (Osman et al., 2019). Indeed, Parasuraman et al. (1988) highlight the quality of guests’ interaction with employees.

To sum up, previous research provides limited recommendations concerning the main relevant (necessary or sufficient) conditions in the context of the sharing economy *vs* the conventional hospitality industry. Despite this paradigm shift in the industry, as Mody et al. (2017, p.2379) concluded, “experience-related research remains underrepresented in the hospitality and tourism literature (Jiang et al., 2015; Ritchie et al., 2011)”. More recently, the gap remains. Sainaghi and Baggio (2020, p.2) note that scarce research explores the moderating effect of accommodation type on guests’ perception, *i.e.*, “the central question about the competitive threat generated by Airbnb toward hotels remains largely a black box”.

## Research questions

Our study analyses necessary features that allow an outcome to exist (Dul, 2016). Our first research question is: Are features related to hospitality services necessary (but not automatically sufficient) for the outcome (satisfaction or dissatisfaction) to exist? Second, based on the study of Tussyadiah and Zach (2015), our research addresses predicting a type of accommodation (classification approach). Our second research question is thus: What (identified) key accommodation characteristics provide the most accurate and best separation of the two classes of accommodation (*i.e.*, Airbnb and hotels)? Third, once the best classifying features have been identified, our third research question focuses on predicting a quantity (regression approach). It seeks to compare its impact on guest satisfaction or dissatisfaction. As Gao et al. (2022, p.119) note, “existing studies only extract the topic proportions and top words of each document from Airbnb or hotel reviews, but fail to identify and analyse the associated emotions”. For all kinds of accommodation, our study thus proposes the following question: Are the characteristics (detected and) related to hospitality services sufficient for the model outcome (*e.g.*, satisfaction or dissatisfaction) to be produced? See Fig. 1.

## Materials

### Data collection

This study analyses data from the Sevilla and Malaga destinations in southern Spain. Both cities could be conceptualised as strongly leisure-orientated destinations.

On the one hand, Airbnb data are obtained from the Inside Airbnb website <http://insideairbnb.com/> (available on 25 September 2021). InsideAirbnb is a third-party open-access site containing Airbnb listings’ count data and is not associated with or endorsed by Airbnb or its competitors.

Our study preserves the amateur character of the host and selects only hosts with a single listing. Moreover, Airbnb listings are restricted to entire apartments to compare offers easily. The entire apartments represent 84–88% of the Airbnb offer in Seville and Malaga, respectively (AirDNA, 2022). In addition, Airbnb listings are considered outliers if their price and the number of beds fall outside the interval formed by the 5th and 95th percentiles. Our research removes listings with a price lower than 22 US dollars (not including cleaning fees or additional guests) and higher than 216 US dollars. Our study filters out all lodgings with more than six beds.

On the other hand, for strictly academic purposes, our study extracts (from TripAdvisor.com) the anonymous reviews of hotels, with initially more than 1000 reviews per hotel available on 25 September 2021, similar to Airbnb apartments in price. TripAdvisor reviews widely serve as a data source for previous studies (Ding et al., 2022; Gao et al., 2022; Liu et al., 2020, amongst others). The number of full-service hotels analysed

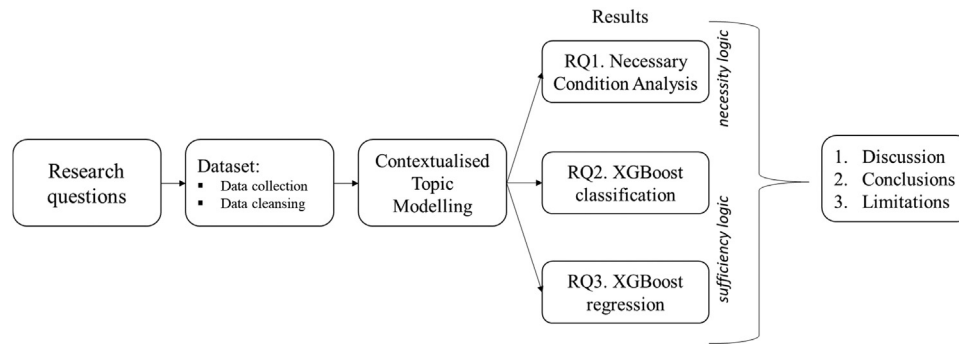


Fig. 1. Steps for transforming free-form text into a structured form and main research questions.

here is 38 (13 and 25 hotels in Seville and Malaga, respectively). The reviews are obtained using a Python crawler.

The final dataset contains 34,917 (English) reviews from 2017 until 25 September 2021, precisely 23,259 Airbnb reviews and 11,658 hotel reviews. As a result, the volume of sentences is slightly unbalanced between the two types of accommodation.

#### Data cleansing process

Our text mining approach is divided into the following steps: (a) retrieval of documents and conversion from markup languages into (unstructured) plain text; (b) text preprocessing, *i.e.*, segmentation into sentences and text normalisation; and (c) text analysis and extraction of knowledge from the corpus by identifying topics. Then:

- The text is split into logical constituents (here, sentences) through the period (“.”), question mark (“?”), and exclamation mark (“!”) -implemented here with a customised set of rules (in Python language) that capture particular issues.
- Our approach becomes sentences in ASCII. It removes non-alphabets and any other kind of characters which might not be a part of the language. In addition, it discards extra whitespaces.
- It checks the spelling of sentences and fixes contractions and compound terms.
- It eliminates a list of common stop words to filter out overly common terms (not contributing to information content). Stop words are terms that are used frequently. Filtering them enables a reduction of the search space without losing the semantic meaning.
- Our study lemmatises the words so they can be analysed as a single item to reduce the variability of the language and avoid redundancy in the document vocabulary.

#### Data mining

Our study proposes identifying guests' latent semantic structures (or topics) by analysing a bulk set of UGC through CTM-based data mining processing. In particular, our research applies a topic model with contextualised BERT embeddings to enhance the quality of topics; that is, overall coherence and interpretation (CombinedTM, CTM 2.2.0 in Python; *cf.* Bianchi et al., 2021a). Likewise, CTM fosters higher competitive topic diversity than classical topic modelling (e.g., Latent Dirichlet Allocation). As Bianchi et al. (2021a, p.760; *cf.* Bianchi et al., 2021b) conclude, “topic models [could] benefit from latent contextual information, which is missing in Bag-of-Word (BoW) representations”. CTM thus allows obtaining contextualised representations of documents. In this sense,

- The CTM here uses preprocessed sentences (derived from the cleansing process) for BoW. Our preprocessing reduces the

variability of the language and avoids redundancy in the narrative vocabulary.

- BoW represents the input in an inherently incoherent manner, however. Accordingly, CTM combines BoW with contextualised embeddings from the not-preprocessed (only lemmatised) corpus to significantly increase topic coherence and competitive topic diversity. Here, the sentence encoding model is the pre-trained ‘all-mpnet-base-v2’ that maps sentences to a 768-dimensional dense vector space.
- Assuming there is no single correct path to select an optimal number of topics, our study tries different paths (10, 20, 30, 40 and 50). Our analysis of the coherence metric and a handy number of topics finally sets 30 topics (100 epochs and 50 samples). In addition, it estimates the document-topic distribution matrix to which a logarithmic transformation is applied due to its significant right skewness.

In short, the CTM is trained with narrative input representations that consider word order and contextual information and *bypass* one of the main limitations of BOW models (Bianchi et al., 2020).

## Results

### Extracting topics

In Table 1, our study displays the most relevant terms per topic. The topics are numbered from 0 to 29. The extracted topics are easily interpretable and offer a coherent impression.

Our study initially outlines the topics related to a general assessment of the service received. Topics 22 and 25 relate to guest dissatisfaction triggered by a negative service encounter that brings about complaints. That is to say, the service experience offered would not correspond with, for example, those reflected in the published photographs, consequently damaging the trust between the two sides involved. Therefore, service failures (and negative experiences) are determinants of the brand-hate users express through UGC. On the contrary, topics 11, 14 and 19 are associated with a positive overall experience (guests' satisfaction). Finally, topic 27 relates to behavioural intentions indicating whether guests remain in or defect from a hospitality firm.

Second, our study describes the topics related to the stay's features (or conditions) that could determine the levels of satisfaction or dissatisfaction. Below, our analysis summarises the semantic content of each topic:

- Core services are associated with accommodation quality, *i.e.*, topics 2 (accommodation size and type), 16 (functional space and decoration and cleanliness regarding core services), 21 (noise complaints derived from out-accommodation activities) and 28 (amenities such as water machine, refrigerator, drying machine, and bathrooms). Topic 20 also relates to feeling “*at home*” or

**Table 1**

Topics represented by the top eight lemmatised terms from CTM - ordered from highest to lowest prevalence on the topic.

experiential value proposition to the different guest profiles	Topic 0	people	enough	one	cool	bite	long	little	use
closeness to the main attractions of the city;	Topic 1	major	site	real	alcazar	plaza	tourist	short	distance
accommodation size, and type	Topic 2	suite	large	huge	big	upgrade	live	double	superior
waiting times in crowded car parks	Topic 3	park	car	find	drive	difficult	rental	underground	garage
staying with friends/family and its duration	Topic 4	base	family	couple	kid	explore	ideal	perfect	place
value for money	Topic 5	appoint	maintain	money	value	equip	good	stock	furnish
customers' delight	Topic 6	top	lovely	roof	view	terrace	excellent	nice	great
comfortable, brand accommodation with lovely facilities	Topic 7	luxury	cosy	accommodation	lovely	heart	charm	nice	situate
location related to old town	Topic 8	historic	part	heart	far	explore	situate	old	city
staff recommendations, advice, and suggestions	Topic 9	give	tip	information	recommendation	suggestion	show	advice	useful
high-quality food, breakfast, or variety	Topic 10	choice	buffet	option	breakfast	selection	fresh	offer	delicious
guests' satisfaction (a)	Topic 11	awesome	brilliant	outstanding	accommodation	fault	incredible	fabulous	describe
public transportation hubs	Topic 12	stop	train	station	far	line	bus	ride	railway
swimming pool for sunbathing	Topic 13	top	terrace	relax	roof	sun	sit	swim	outdoor
guests' satisfaction (b)	Topic 14	accommodation	stay	much	need	just	location	staff	great
location associated with facilities in the neighbourhood	Topic 15	tapa	market	store	many	supermarkets	corner	shop	surround
functional space, decoration and cleanliness regarding core services	Topic 16	tidy	bright	sparkle	stylish	functional	cosy	new	necessary
reservations or waiting times or ease of placing a reservation	Topic 17	hour	last	go	wait	reservation	tell	time	flight
hospitable and communicative staff	Topic 18	hospitable	communicative	smile	personnel	attentive	polite	gracious	courteous
guests' satisfaction (c)	Topic 19	beat	great	central	excellent	value	ideal	money	location
perceived trustworthiness of the accommodation's photos	Topic 20	home	picture	feel	house	charm	photo	decor	detail
noise complaints	Topic 21	noise	noisy	hear	busy	light	side	traffic	sound
guests' dissatisfaction (a)	Topic 22	nothing	expect	comment	high	attitude	bad	negative	rate
staying with friends/family and its duration	Topic 23	week	three	wife	husband	weekend	wish	four	long
staff professionalism -associated with easy check-in/out	Topic 24	desk	pleasant	efficient	reception	professional	member	polite	attentive
guests' dissatisfaction (b)	Topic 25	wrong	advertise	complaint	post	believe	wow	club	avoid
efficient and appropriate interactions between staff and guests.	Topic 26	quick	fast	communication	communicate	hide	clear	check-out	question
behavioural intentions	Topic 27	hope	return	hesitate	future	love	forward	doubt	fall
in-accommodation amenities	Topic 28	water.	machine	facility	towel	tea	coffee	dry	fridge
pedestrian-orientated infrastructure	Topic 29	visit	hospitality	walkway	number	blvd	peace	aside,	tranquil

hedonic comfort while staying in a hospitality accommodation. Finally, topic 7 refers to comfortable, branded accommodation with nice facilities. In other words, core services refer to the essential benefits that guests seek (e.g., a cosy place to live).

- Relational drivers are inherent in hospitality services: responding to inquiries, keeping guests well informed, or simply making guests feel welcome. They are related to customer service performance (e.g., communication about directions, tips or advice, accommodation rules, Wi-Fi instructions, or check-in/out, amongst others), for instance, how staff deliver the service to make a hospitality experience satisfactory or dissatisfactory. Topics 9, 18, 24 and 26 focus on staff interactions (here, the term staff replaced the term host or the proper nouns used) and professionalism (e.g., friendliness and helpfulness, amongst others) associated with booking, checking guests in and out, or maintenance services. Topic 17 is related to additional services, e.g., seamless, effortless transaction and booking tasks.

Relational topics are thus associated with a feeling of welcome or personal interaction with the staff, e.g., its reliability (proper performance), responsiveness (knowledge and courtesy) and empathy (ability to care).

- Site-specific characteristics (convenience and access) are related to the location, i.e., easy accessibility to the hotel or other hotspots, attracting many visitors. Site-specific factors include distance to major attractions (topics 1 and 8) and pedestrian-orientated infrastructure encouraging people to walk quietly and peacefully from accommodation to hotspots (topic 29). Additionally, topic 12 focuses on public transportation hubs (trains or buses) and accessibility to tourist destinations by providing, for instance, shuttles. Finally, topic 15 concerns restaurants and groceries (neighbourhood amenities) that offer more high-quality experiences.
- Property characteristics are related to services such as a terrace overlooking the city that enhances customers' delight (topic 6), a swimming pool for sunbathing (topic 13), or incidences such as long waiting times in crowded car parks (topic 3) -also related to location.
- Topics 4 and 23 relate to staying with friends or family and its duration. Likewise, topic 0 is associated with an experiential value proposition for the different guest profiles- an evolving feeling of communion with family, friends, or other people- during hospitality experiences.

- Topic 5 relates to value for money, *i.e.*, allocating resources more efficiently. Value for money could be considered a relevant attribute for attracting guests (Nash et al., 2006), related to features such as comfort and stylish design.
- Our analysis extracts topic 10 related to high-quality food, breakfast, or variety. However, as Airbnb rental apartments do not usually provide breakfast, our study does not consider this topic in subsequent approaches.

**Findings**

*Analysing relationships in terms of necessity*

Our analysis employs the transformed sentence-topic distribution matrix (averaged by narrative) and focuses on necessary topics or critical conditions of (dis)satisfaction. Our study applies NCA (NCA 3.1.1 package in R, Dul, 2021) that identifies critical levels of these predictors (conditions) that must necessarily be present to achieve the desired result (Arenius et al., 2017; Dul, 2016). In other words, “performance will not improve by increasing the values of other determinants unless the bottleneck is taken away first (*e.g.*, by increasing the value of the critical determinant)” (Dul, 2016, p. 15).

First, our analysis applies CR-FDH less sensitive to outliers. CR-FDH is the default technique for parametric data. Second, our research analyses the potential presence of a significant empty zone in the upper left-hand corner that would illustrate the constraint of the necessary condition. See Fig. 2. This means the necessity of X (or high level of X) for the existence of Y (or high level), *i.e.*, there should be no narratives (or at least very few) with a low proportion of topic *i* and a high output value. Third, our study calculates the size of the

necessity effect (*d*) or the relative size of the empty zone, *i.e.*, to what extent the condition is necessary for the outcome. *d* ranges from 0 to 1. Our analysis considers only the conditions that are practically (here,  $d \geq 0.1$ ) and statistically significant ( $p\text{-value} \leq 0.01$ ) and, as a result, rejects the effect size being the result of random chance (*cf.* Dul, 2016 and Dul et al., 2010, amongst others). Fourth, our study sets  $c\text{-accuracy} \geq 0.99$ , *i.e.*, the percentage of observations on or below the ceiling. Finally, to be even tighter in determining the preconditions of necessity, the topics here need to be observed at no less than 30% (Bottleneck column in Table 2.) to reach an appropriate outcome level in practical settings (50%).

The top critical conditions of Airbnb dissatisfaction (in comparison to hotels) are the following:

- Topic 17 relates to additional services, such as reservations, waiting times, or the ease of making a reservation.
- Topic 9 is associated with staff recommendations, advice, and suggestions to enjoy life as a local or share local tips to give guests a unique experience.
- Topic 1 relates to proximity to the main heritage attractions.
- Topic 15 is composed of terms on facilities in the neighbourhood, for instance, restaurants and grocery markets that offer more high-quality experiences.
- Topic 24 is associated with staff interactions and professionalism, such as easy check-in/out.

In particular, to reach a 50% level of mention of dissatisfaction, topic 17 should occur at no less than 34.6%, topic 9 at no less than 30%, topic 1 at no less than 31.2%, topic 15 at no less than 35.6%, and topic 24 at no less than 31%. See the column ‘Bottlenecks-50%’ in Table 2.

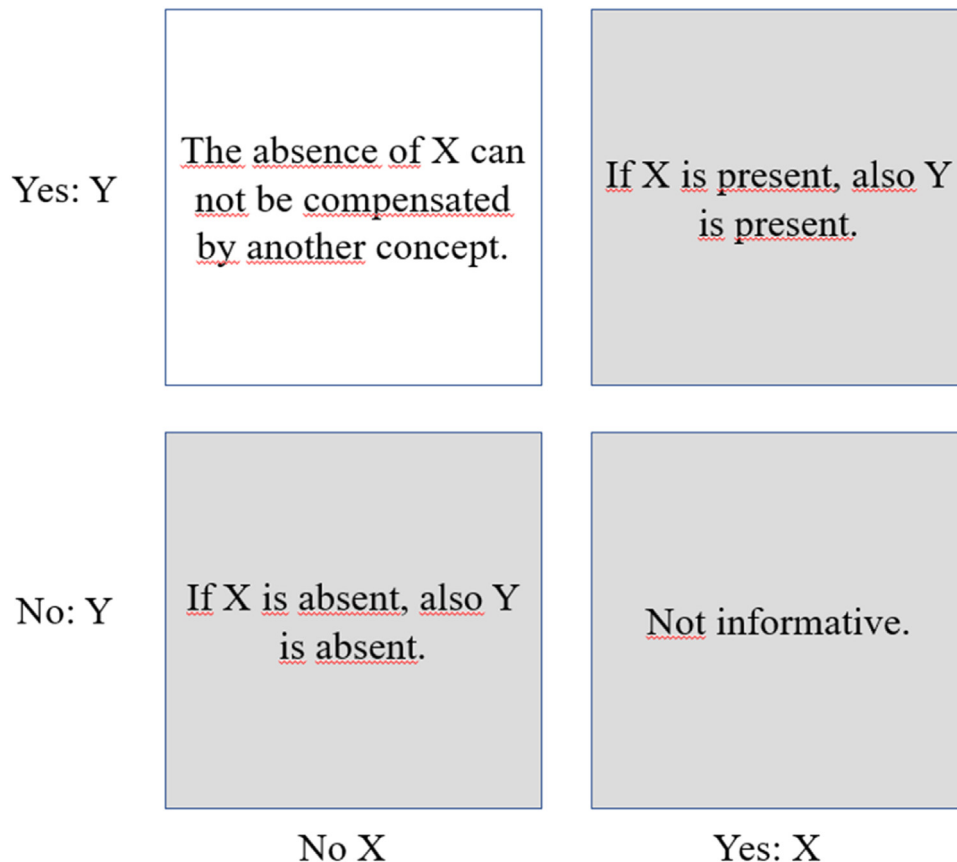


Fig. 2. Upper-left-corner. Source: Dul (2021).

**Table 2**  
Main NCA parameters (topics ordered by accommodation, outcome, and effect size).

Topics	Ceiling zone	Effect size	c-accuracy	p-accuracy	p-value	Slope	Outcome ineff.	Bottlenecks-50%
Dissatisfaction – Airbnb								
Topic 17	19.605	0.302	99.892	0.000	0.000	1.806	0.000	34.600
Topic 9	17.556	0.256	99.849	0.000	0.000	1.556	3.544	30.000
Topic 26	16.513	0.255	99.953	0.000	0.000	1.333	13.434	32.400
Topic 1	12.078	0.217	99.148	0.000	0.000	1.492	21.662	31.200
Topic 15	11.441	0.191	99.884	0.000	0.000	1.472	24.274	35.600
Topic 23	10.270	0.188	99.875	0.000	0.000	2.396	8.474	40.800
Topic 24	9.057	0.165	99.871	0.000	0.000	1.822	25.037	31.000
Dissatisfaction – Hotel								
Topic 23	25.858	0.347	99.151	0.000	0.000	1.267	0.000	34.700
Topic 20	23.214	0.323	99.494	0.000	0.000	1.371	0.000	32.300
Topic 26	21.750	0.310	99.605	0.000	0.000	1.207	6.273	30.800
Satisfaction – Airbnb								
Topic 17	9.773	0.198	99.901	0.000	0.000	0.711	36.047	34.600
Topic 9	10.148	0.195	99.974	0.000	0.000	0.717	34.551	30.000
Topic 24	7.562	0.181	99.966	0.000	0.000	1.194	27.078	31.000
Topic 1	7.306	0.172	99.961	0.000	0.000	1.542	18.565	31.200
Topic 26	7.375	0.150	99.983	0.001	0.001	0.739	43.347	32.400
Topic 15	6.312	0.138	99.983	0.000	0.000	0.893	42.378	35.600
Topic 23	4.239	0.102	99.970	0.001	0.005	0.715	57.769	40.800
Satisfaction – Hotel								
Topic 23	18.849	0.408	99.485	0.000	0.000	0.840	0.000	40.800
Topic 15	15.733	0.356	99.880	0.000	0.000	0.876	0.000	35.600
Topic 17	15.169	0.346	99.846	0.000	0.000	0.883	0.000	34.600
Topic 26	14.115	0.324	99.880	0.000	0.000	0.837	0.000	32.400
Topic 1	12.698	0.315	99.168	0.000	0.000	0.742	9.430	31.200
Topic 24	12.140	0.310	99.786	0.000	0.000	0.966	0.000	31.000
Topic 9	12.760	0.300	99.880	0.000	0.000	0.835	3.705	30.000

Main metrics: The ceiling zone is the empty space above the ceiling. The size of the ceiling zone represents the effect size compared to the size of the entire area that can have observations. c-accuracy is the percentage of observations that are on or below the ceiling. Finally, outcome inefficiency is the percentage of the range of the outcome where the condition is not necessary for the outcome. In other words, the outcome is not constrained by the condition.

On the other hand, only three preconditions are revealed (topics 23, 20 and 26) as necessary conditions for the dissatisfaction of hotel guests during their stays. Topics 23 and 26 relate to the overall (positive or negative) experience with the family and trip length (topic 23) for both types of accommodation and, in addition, replies and scheduled messages to keep in touch with guests while staying in a hospitality accommodation (topic 26). Moreover, topic 20 relates to the perceived trustworthiness of the accommodation's photos. Without the 32.3% level of topic 20, there is no possibility of reaching the 50% level of output value (Dul, 2016). Hotels should thus provide an accurate description to shape guests' expectations.

Moreover, the main necessary conditions for satisfaction coincide in both types of accommodation, although the order of importance differs. For Airbnb guests, the top 3 topics are 17, 9 and 24. Regarding hotel guests, the top 3 topics are 23, 15 and 17. See also Table 2.

#### Analysing relationships in terms of sufficiency

One essential contribution of this section is to answer the following research question: What key accommodation characteristics provide the most accurate and best separation of the two classes of data (i.e., Airbnb accommodations and hotels)? To answer this question, our analysis applies Extreme Gradient Boosting decision trees (from now on, XGBoost) on the transformed document-topic distribution matrix (averaged by narrative). XGBoost is an exciting version of the gradient-boost decision tree model for classification and regression issues (Chen & Guestrin, 2016). It includes a series of optimisations and regularisation techniques that help reduce overfitting. To improve the interpretability of the XGBoost model, our analysis also combines XGBoost with SHAP values (SHAPley Additive exPlanations) for plotting models' insights (cf. Lundberg & Lee, 2016). SHAP values are model-agnostic, present local accuracy, missingness, and consistency properties, and do not provide causality.

#### Classification model

The topics' probability distributions per narrative (obtained from CTM), except satisfaction- and dissatisfaction-based topics, and topics 27 and 10 are here used as input features of the classification model. Our research also splits the data set into two subsets to ensure the effectiveness of our approach (Climent et al., 2019):

- 80% of the data (train dataset) allows us to train the XGBoost model to find the best combination of parameters. Our research performs 10-fold cross-validation.
- The remaining 20% (validation dataset) validates the best-fitted model's performance and ensures that the model is generalisable.

The grid search of the scikit toolkit is used to select the parameters to achieve the best area under the curve (AUC) classification metric. The XGBoost classification model -or XGBClassifier- (after parameter tuning, i.e., `colsample_bytree: 0.5`, `eta: 0.5`, `gamma: 0.2`, `max_depth: 4`, `min_child_weight: 9`, `n_estimators: 600`, `subsample: 0.4`) obtains a prediction accuracy of 90% on the testing dataset. The ROC curves for the XGBClassifier are presented in Fig. 3. The ideal point is the upper left corner of the plot; that is, false positives are zero, and true positives are one. Our analysis also estimates the Matthews correlation coefficient ( $0.77 > 0.60$ ). This coefficient generates a high score only if models can predict a high percentage of true positives and negatives.

Once the tuned XGBoost model is fitted, the next step is to identify the importance of the features. In Fig. 4a the x-axis represents the average of the absolute SHAP value of each feature (i.e., magnitude) estimated from the testing data set. In Fig. 4b, our analysis plots the magnitude and directionality for Airbnb (class: 0) versus hotels (class: 1) to jointly visualise the features' importance and impact on the prediction. Fig. 4b shows how much each feature (or topic) contributes

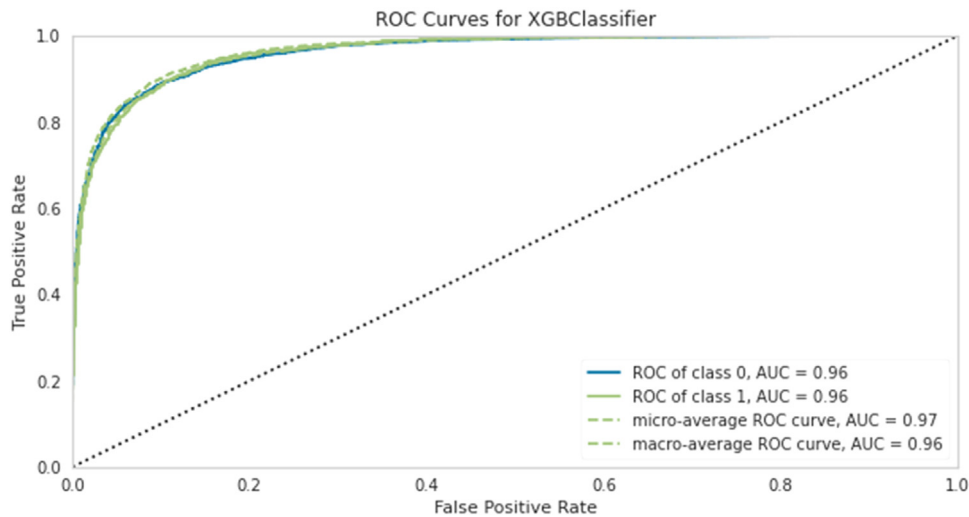


Fig. 3. ROC curves for XGBClassifier.

to the target variable (or accommodation type). Topics with high SHAP values (see x-axis) push thus towards class 1 (Hotels), while low SHAP values (see x-axis) push towards class 0 (Airbnb). In the following, our study presents the main results by accommodation type.

**Airbnb**

According to Airbnb stays the main features that predict the Airbnb narrative are the following.

- Topic 26 focuses on replies and scheduled messages to keep in touch with guests.
- Topic 4 is associated with staying with family, e.g., family as an essential component of relationships and interactions in hospitality staying.

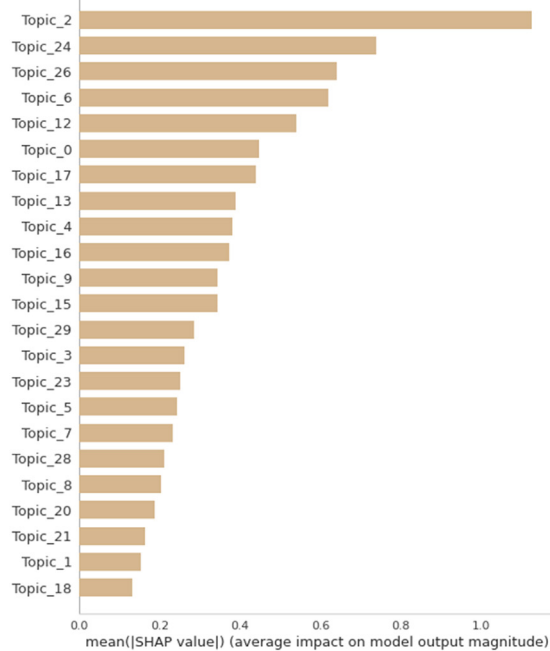
- Topic 16 relates to being tidy, bright, cosy, or functional. Airbnb travellers frequently mention the cleanliness of the accommodation or its excellent design.
- Topic 9 relates to staff help, sharing local treats, and giving a unique experience.

**Hotel**

The main features that show a positive impact (x-axis) on the model output -that are most likely to be mentioned in hotel narratives- are the following topics:

- Topic 2 refers to accommodation size. Its long-tail trend reaches to the right (and not to the left), thus being highly predictive for some dataset instances but not for others.

a. SHAP summary bar plot



b. SHAP summary plot

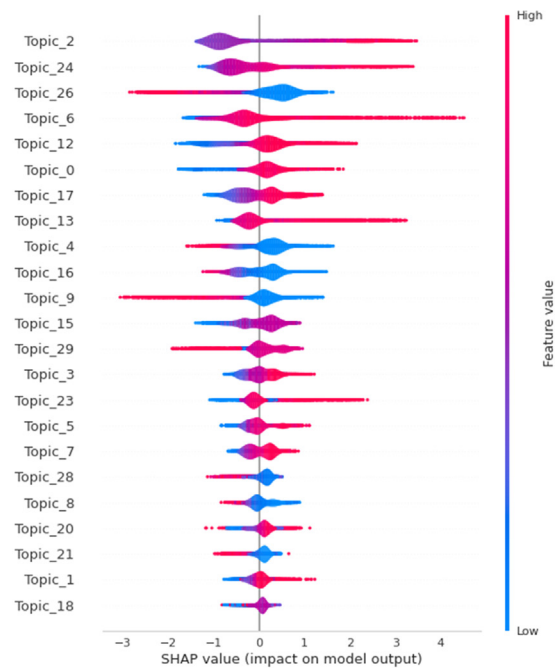


Fig. 4. The importance of topics.



- Topic 24 is associated with ease of checking in/out and professionalism.
- Topic 6 focuses on property characteristics related to services, such as a terrace overlooking the city that enhances customer delight.
- Topic 12 focuses on public transportation hubs (e.g., trains or buses) to facilitate accessibility to tourist destinations or attractions. Hotel travellers mostly comment on transportation hubs or systems compared to Airbnb guests.

Topic 6 affects some predictions by a significant amount, while topic 12 affects more predictions by a smaller amount.

- Topic 0 is associated with an experiential value proposition to the different guest profiles; that is, an evolving feeling of communion with family, friends, or other people (*strangers*), during a hotel stay experience.
- Topic 17 relates to additional services such as reservations or waiting times.
- Topic 13 is associated with memorable experiences and spectacular views of the surroundings. Comments such as '*experiences associated with relax, sun, swim, enjoy, or sunset*' are most likely to be mentioned in hotel narratives. The entire apartment could be in residential neighbourhoods without stunning views of the surroundings.

### Regression model

Our analysis identifies the (sufficient) antecedents of the overall guest stay evaluations. An additional contribution is thus to answer the following research question: Are the characteristics (detected and) related to hospitality services *sufficient* for the outcome to be produced in hospitality services?

To answer this question, four XGBoost regression models are generated for each hospitality class (Airbnb versus Hotels) and each of the two overall stay assessments (satisfaction versus dissatisfaction). Our analysis adopts 10-fold cross-validation in the training dataset (80% of the data) to select parameters. It chooses the model with minimum root-mean-square error through scikit-learn's parameter optimiser function (cf. scikit-learn 1.0.2 package in Python). The best (standard) hyperparameters for our four models and r-square values are displayed in Table 3. There is a slight gap between the train and testing results, most likely due to minimum overfitting. Although XGBoost does not assume normality, the residuals versus predicted values do not show significant dependency.

Our analysis employs SHAP values to gain a different view of each topic's importance in predicting the model's outcome. Annexes I-II show the importance of global features for our models. The global importance of each feature is taken to be the mean absolute value of that feature over all the given samples, and the blue bar indicates that the topic is positively correlated with the target variable.

**Table 3**  
XGBRegressor parameters tuning.

	DISSATISFACTION		SATISFACTION	
	Airbnb	Hotel	Airbnb	Hotel
n_estimators	900	1000	1000	1000
max_depth	3	3	3	4
min_child_weight	10	9	8	8
Eta	0.04	0.04	0.05	0.04
Subsample	0.30	0.5	0.40	0.40
colsample_bytree	0.50	0.4	0.50	0.50
Gamma	0.80	0.8	0.80	0.80
R <sup>2</sup> (training dataset)	0.740	0.721	0.518	0.389
R <sup>2</sup> (testing dataset)	0.724	0.705	0.502	0.382
RMSE (testing dataset)	0.190	0.245	0.194	0.191

Below, our analysis breaks down the results by dissatisfaction versus satisfaction and accommodation type.

### Dissatisfaction

Our models reach an r-squared of 0.724 (Airbnb model) and 0.705 (hotel model). The characteristics that determine dissatisfaction are similar between Airbnb and hotel guests, partly motivated by the choice of entire apartments compared to a hotel room (cf. Egresi et al., 2019). In this regard, the more significant the overlap of topics that promote dissatisfaction, the greater the potential threat of substitution between Airbnb and hotels.

According to the order of Airbnb guests, the most impactful attributes for both types of accommodation that are positively correlated with guest dissatisfaction are:

- Pedestrian-orientated infrastructure (topic 29).
- Hospitable and communicative staff (topic 18).
- An evolving feeling of community feeling with people (topic 0), i.e., family, friends, and strangers, during hospitality experiences.
- Property characteristics concerning location-based problems include long waiting times in crowded car parks (topic 3).
- Noise complaints from out-accommodation activities (topic 21), i.e., noise pollution or environmental noise.
- Value for money (convenient option), i.e., not paying more for a good or service than its quality or availability justify, and not necessarily regarding seeking the absolute cheapest accommodation (topic 5).
- In-accommodation amenities, e.g., microwave, refrigerator, air conditioner, and bath facilities (topic 28).
- Additional services such as reservations or waiting times (topic 17).
- Accommodation size and type in terms of room comfort (topic 2).

Although guests expect similarly, our topics suggest different features supporting the competitive advantage between the two types of accommodation. In the case of hotels, the most impactful features on dissatisfaction are as follows:

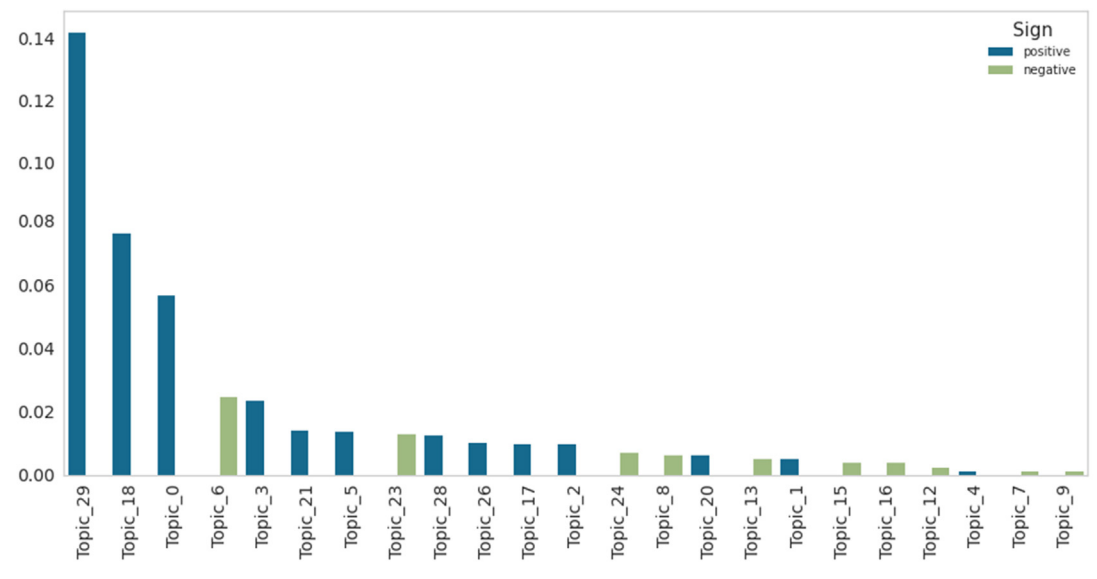
- Replies and schedules messages to keep in touch with guests (topic 26).
- Feeling "at home" or hedonic comfort while staying in a hospitality accommodation (topic 20).

### Satisfaction

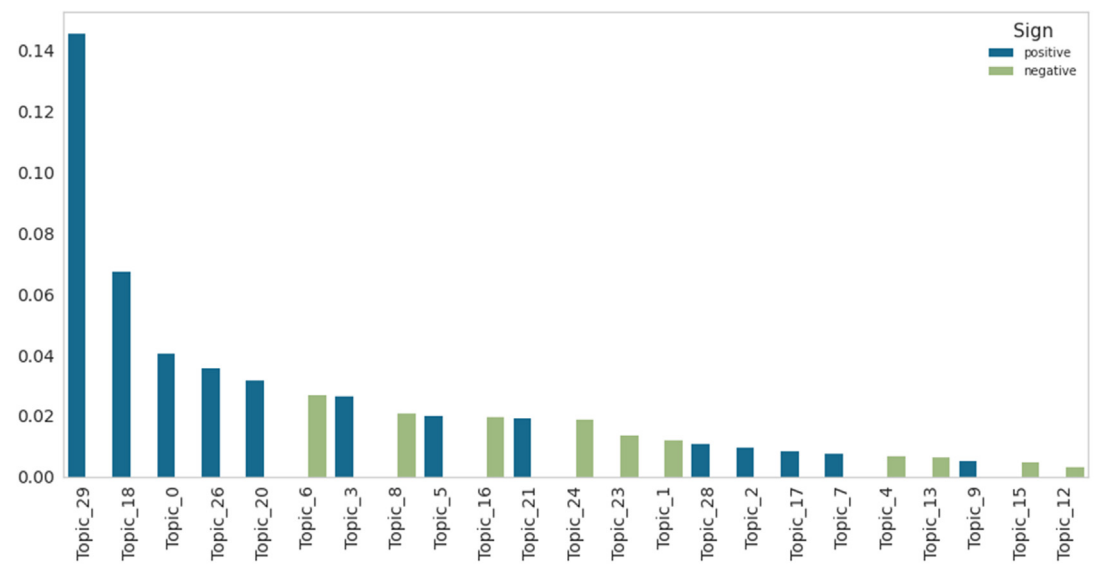
Our satisfaction-based models reach an r-squared of 0.502 (Airbnb model) and 0.382 (hotel model). According to the order of the Airbnb guest sample, the set of main characteristics that are positively correlated with guest satisfaction are as follows:

- Topic 6 amenities regarding guests' delight (roof, terrace, pool, etc.).
- Topic 29 related to pedestrian-orientated infrastructure about people walking quietly and peacefully from accommodation to hotspots.
- Topic 23 related to the length of stay with a wife or husband.
- Topic 1 associated with proximity to the main cultural monuments.
- Topic 8 on distance to major attractions.
- Topic 4 regarding staying with a family; that is, family as an essential component of relationships and interactions in hospitality stay.
- Topic 18 focused on welcoming and communicative staff.

Airbnb and Dissatisfaction.



Hotel and Dissatisfaction.



Annexe I. Simplified SHAP bar plot.

\* Bars display mean(|SHAP value|) (average impact on model output magnitude). The blue colour means a topic is positively correlated with the target variable.

- Topic 7 regarding a whole and comfortable brand building with lovely facilities.
- Topic 9 associated with staff interactions, focused on recommendations, advice or tips, and suggestions to know how to enjoy yourself like a local.

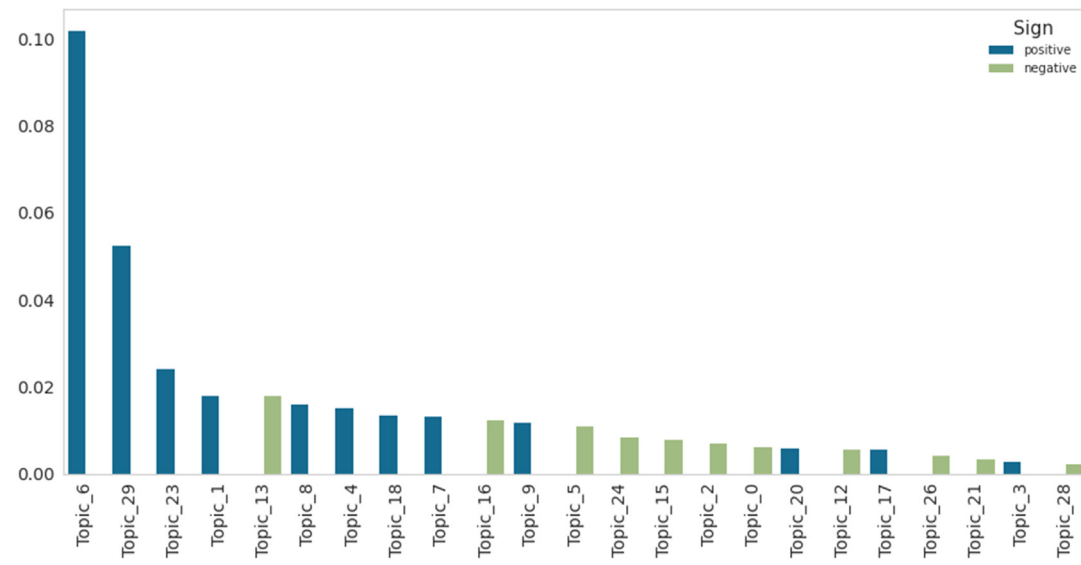
Although guests expect similar features, our topics suggest different features supporting the competitive advantage between the two types of accommodation. The crucial satisfaction criteria differentiating Airbnb from the hotel are site-specific factors, e.g., distance to the old town (topic 8). In the case of hotels and compared to Airbnb, the main features relate to topics 24 and 26, that are associated with checking in/out, professionalism, fast and convenient replies, and scheduled messages to keep in touch with guests. The most relevant

features that impact guest perceptions about hotel service quality are thus based on efficient and appropriate interactions between staff and guests. As Xu and Li (2016, p. 63) conclude, “staff performance seemed to be amongst the most influential factors in determining customer satisfaction [...] that can strengthen the customer’s relationship with the hotels”.

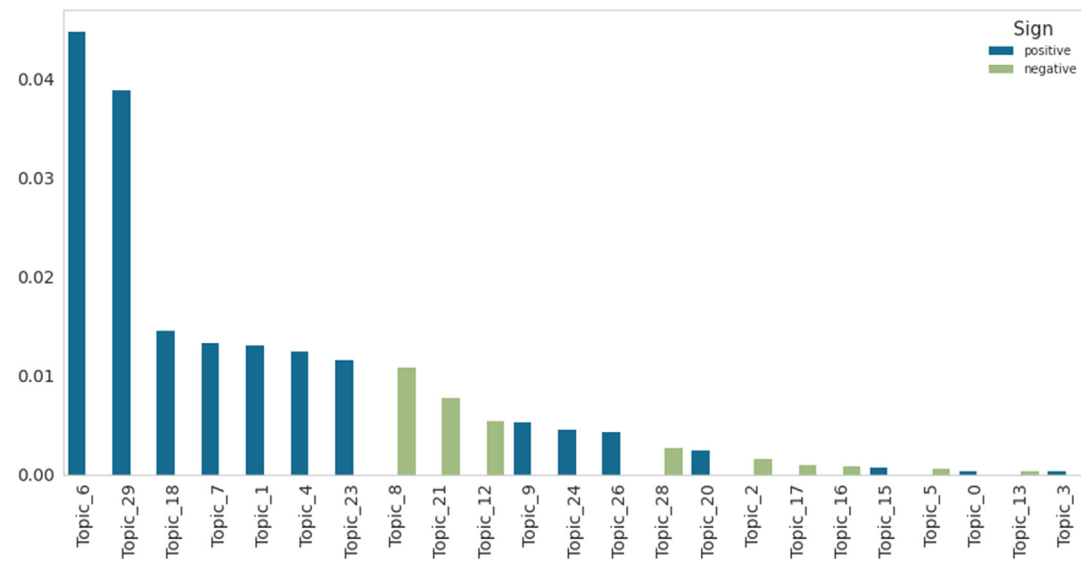
Discussion

The emergence of the sharing economy and P2P accommodation platforms, such as Airbnb, has disrupted the traditional lodging industry, creating a highly competitive environment. In this regard, our research seeks to determine whether Airbnb and hotels compete directly or complement each other in the tourist accommodations

Airbnb and Satisfaction.



Hotel and Satisfaction.



Annexe II. Simplified SHAP bar plot.

\* Bars display mean(|SHAP value|) (average impact on model output magnitude). The blue colour means a topic is positively correlated with the target variable.

market or whether the relationship between these two types of accommodations is more complex than simple substitution or complementarity. Specifically, our study explores the factors influencing guest satisfaction and dissatisfaction in Airbnb accommodations and hotels and their differential effects.

Our proposals indicate that both types of accommodations need to identify and promote their unique strengths and features to differentiate themselves and avoid direct competition. To this end, our research shapes the changing landscape of the lodging industry and informs of strategies for developing sustainable and competitive accommodations. Specifically, our study contributes to the literature by examining the similarities and differences between guest satisfaction and dissatisfaction with Airbnb accommodations and hotels. Additionally, it provides valuable information for hospitality

professionals seeking to attract and retain guests in this new, competitive hospitality environment.

One essential contribution of our study is emphasising the distinction between needs and desires. Understanding the necessary and sufficient conditions for guest satisfaction is crucial in designing more effective marketing policies. By meeting necessary and sufficient conditions, hotels and Airbnb hosts can increase customer loyalty, generate positive reviews, and drive repeat business. In other words, our study helps hospitality professionals make informed decisions and improve guest experiences in this rapidly evolving industry.

In summary, our research offers insights into the factors contributing to guest satisfaction and dissatisfaction in the tourist accommodations market, providing valuable information for academics and

hospitality professionals. Furthermore, our study adds to the ongoing debate about whether Airbnb and hotels compete directly or complement each other. The higher the overlap (or similarity) of the preferences (or conditions) that promote satisfaction and the revisit intention of using Airbnb or hotels, the greater the potential threat of substitution.

### Research approach

The study used a method that transformed guest narratives into a structured form to identify the underlying characteristics. Our approach enabled researchers to recall the aspects that mattered to guests and their evaluations of various aspects of hospitality. In particular, the study applied NLP and the CTM approach to increase topic coherence and competitive topic diversity. CTM uses pre-trained language representations (here, a specific version of BERT) to support topic modelling. BERT is an ultimate enhancement in machine learning, such as sentiment classification, and topic modelling. Our fine-tuning approach fitted a small number of parameters. This approach therefore enabled: (1) overcoming the disadvantages of probabilistic generative topic modelling (i.e., LDA and PLSA could not fit into short texts appropriately due to severe data sparsity); (2) expanding previous studies based on structural scales; and (3) applying large-scale data sources following an exploratory approach.

Moreover, the use of transformers in our study of NLP is essential due to their effectiveness in processing and understanding language. For example, transformers allow us to learn contextual relationships between terms and phrases and to focus on relevant parts of the input sequence and have led to significant improvements in the accuracy of NLP. Transformers play a critical and further role in advancing NLP research and applications. In addition, although they have some challenges or limitations that hinder their applicability or scalability for NLP tasks, our research highlights the importance of using novel techniques to interpret hidden semantic structures in the data.

The study also applied NCA analysis to interpret the necessary conditions and answer the question of which critical characteristics of accommodation provide the most accurate and best separation of the two classes of accommodation (that is, Airbnb and hotels). Furthermore, the study considered the moderating effect of the accommodation type in differentiating the direction or strength of the relationship between hospitality characteristics and (dis)satisfaction strategies.

Therefore, the approach used in our study demonstrates the importance of data mining approaches in the academic domain. Using these techniques, researchers can identify the essential aspects of guests and their evaluations of different aspects of hospitality. As O'dell (2007) notes, "experiences are highly personal, subjectively perceived, intangible, ever fleeting and continuously on-going" (p. 15). Our approach even provides a more fine-grained understanding of hospitality services and can inform concerning the design of more effective policies and practices in the hospitality industry. However, using pre-trained language representations may lead to some loss of accuracy in topic modelling.

Beyond the above considerations, the study's interpretation of topics on guest (dis)satisfaction may face limitations due to the availability and quality of the data used for analysis. Firstly, it is essential to note that our study's sample size and generalisability may be limited because we collected data from a specific location. Thus, the results may not apply to other populations or regions. Therefore, research should study other destinations with different personalities and cultural backgrounds, seasonality patterns of tourists, or tourist attractions to generalise the findings.

Furthermore, guests' cultural scripts or demographic characteristics, such as age or income, affect customer narratives. Future studies should also focus on accommodations located downtown and in the surroundings of transport hubs such as airports, ports, and P2P

accommodation with different categories (i.e., entire apartments, private rooms, or shared rooms). Finally, as Sainaghi and Baggio (2020) acknowledge, a disadvantage lies in differentiating business guest segments on the one hand and those of leisure guests on the other hand.

Moreover, the study's methodology may not capture the entire range of guest experiences, as the analysis focused on narratives and may not include all aspects of hospitality services that matter to guests. In addition, the study's approach may be biased towards positive experiences since the data collection relied on guests' voluntary participation, and guests who had negative experiences may have been less likely to participate.

### Main results

Our study identifies differences and similarities between Airbnb and hotels by examining the impact of various features (or topics) on guest (dis)satisfaction and further revisiting intention. Firstly, our study reveals that the key necessary conditions for (dis)satisfaction in both types of accommodation are similar but differ in their order of importance.

- Regarding Airbnb, proximity to tourist attractions, staff recommendations and staff interactions and professionalism are the three most important themes for guest satisfaction.
- Additional services, the quality of area facilities, staff interactions, and professionalism are the most important themes regarding dissatisfaction with Airbnb.
- In hotels, the quality of facilities, additional services, staff interactions, and professionalism are the three most important themes for guest satisfaction.
- In hotels, the most important topics concerning dissatisfaction are the overall experience with the family and the length of the trip, scheduled responses and messages to keep in touch with guests, and perceived trust in the property's photos.

The higher the overlap (or dissimilarity) of the preferences or conditions that promote satisfaction with using Airbnb or hotels, the greater (or lower) the potential threat of substitution. In this regard, beyond singular aspects, our results suggest that Airbnb and hotels could be substitutive services concerning the conditions of need, as guests highlight experiences and prioritise similar topics (as necessary conditions) in their choice of accommodation. Although check-in/out by unprofessional hosts appears to underperform compared to traditional hotels (e.g., Huang & Yu, 2019), the quality and professionalism of the staff (e.g., desk, pleasant, efficient, reception, professional, member, polite, attentive, amongst other terms) were here considered critical by guests staying in Airbnb housing and hotel guests.

Secondly, the classification analysis further supports this conclusion, as the essential topics associated with each accommodation type are distinct. For example, regarding the topics that classify Airbnb and hotels, the essential topics associated with Airbnb are scheduled responses and messages to stay in touch with guests, helpfulness of staff, and cleanliness and functional design. On the other hand, in hotels, the most relevant topics are properties with features that enhance the customer experience, spacious accommodation, professionalism and ease of staff check-in/out. In addition, family experience is an essential feature concerning Airbnb, while memorable experiences, spectacular views, and additional services, such as reservations and waiting times, are essential topics in hotels. These differences highlight the unique value propositions of each accommodation type, which can coexist and cater to different guest needs.

Thirdly, our study found that both Airbnb and hotels share a similar set of topics that contribute to guest dissatisfaction, with the overlap of topics suggesting (in this case) a potential threat of substitution between the two types of accommodation. Likewise, while Airbnb

and hotels have common topics that affect guest experiences, the research findings also indicate that they may complement each other, given their unique features that appeal to guest preferences.

- The topics that most impact guest dissatisfaction with both types of accommodation include pedestrian-orientated infrastructure, hospitable and communicative staff, an evolving feeling of community, location-based problems, noise complaints, value for money, in-accommodation amenities, additional services, and accommodation size and type.

Our results thus illustrate a power shift from hosts to guests. Farmaki and Kaniadakis (2020, p. 5) note that there emerges a “limboing between hotel-style and flat-sharing approaches” regarding the importance of “providing a safe, clean, and functional environment and being hospitable”. Hosts likely preserve a welcome feeling to compensate for being in residential neighbourhoods rather than a downtown tourism area and compete with the hotels offering comparable services. Airbnb has become a guest-orientated P2P platform, *i.e.*, the sharing economy model also focuses on customers.

On the other hand, hotels emphasise replies and scheduled messages to keep in touch with guests and feel at home or have hedonic comfort while staying in a hospitality accommodation. Tussyadiah and Zach (2015, p.9) conclude that “to appeal to consumers’ social and environmental motivations, hotels could make guest experiences more personal (*e.g.*, staff meaningfully interact with guests) and socially responsible”. By providing regular updates and responding promptly to guest inquiries, hotels can create a more personalised and attentive experience that helps guests feel comfortable and at home during their stay. This communication also helps to build trust and establish a sense of familiarity between guests and staff. Like Airbnb stays, hotels also develop evolving feelings of communion with friends and strangers (*cf.* Arnould & Price, 1993).

- Our study found that Airbnb and hotels have different features that support their competitive advantages. For example, crucial satisfaction criteria differentiating Airbnb from hotels are site-specific factors, such as proximity to cultural monuments and distance to major attractions. On the other hand, hotels prioritise efficient and appropriate interactions between staff and guests, with staff performance being amongst the most influential factors in determining customer satisfaction. This focus on service quality is vital for hotels, as they typically have to compete with other hotels in their immediate vicinity and must differentiate based on their service level.

In addition, Airbnb often relates to providing unique and personalised experiences that allow guests to feel like locals and immerse themselves in the culture of a destination. However, beyond the opportunity to receive valuable local knowledge from the hosts, “the opportunity to interact with locals, and (...) the opportunity to have an authentic local experience” (Guttentag *et al.*, 2018, p.14) is not extracted here as an essential characteristic - amongst the first ones- that impact guest satisfaction with the stay in an Airbnb apartment.

Consequently, accommodation providers should identify and prioritise the factors influencing guest satisfaction and dissatisfaction to stay competitive in the hospitality sector. The following discussion focuses on key aspects highlighted in the above-mentioned main results.

#### *The communicative character of host and staff and their professionalism*

Our study identifies guest satisfaction and dissatisfaction conditions in hotels and Airbnb accommodations. Overall, one of the most

significant differences between Airbnb and hotels is the role of hosts *versus* staff. As Guttentag (2015) notes, the traditional economy (*e.g.*, hotels) could have a competitive opportunity in staff professionalism. Though the sharing economy rhetoric is associated with sustainability and local consumption, the role of the host is also crucial for P2P accommodation experiences (Lee & Kim, 2018; Tussyadiah & Zach, 2017).

In line with our results, Guttentag (2016) and Tussyadiah and Zach (2017) find that the feel welcome topics (“social interactions with hosts and hosts’ efforts to welcome and accommodate guests”, *cf.* Tussyadiah & Zach, 2017, p. 645) are associated with higher ratings. Previous studies have shown that the feeling of security and comfort from personal interaction with hosts is essential for the hedonic value of experiences and intentions to return (Lee & Kim, 2018; Lalicic & Weismayer, 2018). In particular, the quality of interaction between the hosts and guests is relevant in shaping the guests’ experience (Tussyadiah & Zach, 2017). In addition, the hosts’ behaviour and attitude, such as being friendly, attentive, and polite, can also personalise guests’ perception of Airbnb and their likelihood to return or recommend it to others (Mody *et al.*, 2019; Farmaki & Kaniadakis, 2020).

Similarly, staff performance is critical to customer satisfaction and loyalty in hotels. The professionalism and competence of the staff in providing quality services and addressing guests’ needs impact guest satisfaction. As Xu and Li (2016, p. 63) propose, “staff performance seemed to be amongst the most influential factors in determining customer satisfaction [...] that can strengthen the customer’s relationship with the hotels”. Guests are more likely to choose hotels over Airbnb accommodations due to the quality and professionalism of the staff (Guttentag, 2015). In addition, friendly and polite interactions between staff and guests can improve their perception of the hotel and increase their likelihood of returning or recommending it to others.

In short, the efficient and appropriate interactions between accommodations managers and guests are here critical to guest satisfaction and dissatisfaction with Airbnb and hotels. Furthermore, hospitable and communicative staff are significant for satisfied and dissatisfied guests in both accommodations (Xu & Li, 2016). Therefore, hosts and hotel staff should focus on providing high-quality services and addressing guests’ needs promptly and efficiently. For instance, hotels need to find ways to incorporate the social and interpersonal aspects of P2P accommodation, such as personal interaction with hosts, into their services to remain competitive. Digital technology could also improve guest communication, offer personalised services, or promote social and environmental responsibility to appeal to consumers’ motivations. These strategies would help hotels compete with P2P accommodation platforms and meet guest expectations.

#### *Property characteristics*

Our study finds that property characteristics significantly influence satisfaction in both types of accommodation, and property development and maintenance must be invested in to give guests a memorable and enjoyable experience to attract them and differentiate themselves from their competitors. Our study finds that property characteristics and value for money are critical factors in shaping guest experiences in both Airbnb and hotels. For instance, property characteristics, such as a terrace overlooking the city or room amenities, enhance the guests’ delight and contribute to their overall satisfaction (Belarmino *et al.*, 2019). In addition, traditional hotels have established reputations for providing safe and secure accommodations.

In this regard, an issue related to P2P accommodation platforms is the lack of consistency in service quality. On the one hand, hotels typically adhere to established standards and protocols to provide

consistent service. On the other hand, Airbnb accommodations vary widely in quality, cleanliness, and amenities. This inconsistency can therefore concern guests who expect a certain level of comfort and quality during their stay.

### Location

Our study found that accessibility was a critical factor in customer satisfaction with Airbnb accommodations and hotels. From a (complimentary) sufficiency logic, people walking quietly and peacefully from the accommodation to hotspots is also one of the most impactful (sufficient) features for both types of accommodation on guest (dis)satisfaction. In particular, hotels cannot change their locations, and guests amplify (in their narratives) the advantage of the transportation hubs. "Location and accessibility (...) help customers find the hotel easily, provide a good view of the surroundings, and save time for customers seeking to visit nearby places of interest" (Xu & Li, 2016, p. 61; cf. also Sim et al., 2006). Based on the highest proportion of mentions in hotel reviews, hotel managers should highlight advantages related to site-specific characteristics, for instance, a strategic closeness to tourist hotspots or transportation hubs beyond core services.

In addition, there have been concerns about the impact of Airbnb on local communities, with accusations of contributing to gentrification and displacing long-term residents. Although these concerns can affect guests' perceptions, who are increasingly aware of their travel choices' social and environmental impacts, Airbnb has traditionally proven to be a popular option for travellers looking for unique and authentic experiences. Many guests appreciate staying in local neighbourhoods, interacting with hosts, and enjoying a more personalised travel experience. Surprisingly, the prospects of engaging with the local community and the potential to immerse oneself in an authentic local experience (Guttentag et al., 2018, p.14) have not been identified as crucial features - amongst the first ones- that significantly influence guest satisfaction with their stay in an Airbnb accommodation.

Furthermore, our results suggest that hotels should emphasise advantages related to location-specific characteristics, such as strategic proximity to tourist hotspots or transport hubs, beyond their core services to attract more customers. Highlighting location-specific features, such as proximity to tourist attractions or transportation hubs, could also attract more customers and provide a more holistic and satisfying experience.

Finally, it is vital to consider the controversial aspects of these P2P platforms from the guest's perspective. One of the primary concerns for guests is safety and security, which is often a top priority when choosing a place to stay. While traditional hotels have strict security measures in place, such as keycard access, CCTV cameras, and round-the-clock security personnel, Airbnb places the responsibility on hosts to ensure the safety and security of guests. As a result, this can concern guests, mainly when staying in unfamiliar locations where they may not know the area well.

### Amenities in accommodation

Belarmino et al. (2019) conclude that room amenities emerge as a predominant topic for hotel guests, for instance, coffee, toiletries, or furniture. Amenities in the accommodation provide benefits associated with staying in a home and influence the comments amongst Airbnb hotel guests. Although enjoying the comfort of a home is not here highly mentioned amongst the main topics with a significant impact on (dis)satisfaction, noise pollution and in-accommodation amenities impact both types of accommodation. For instance, the noise would create unsatisfactory assessments during the Airbnb stay (cf. Gao et al., 2022). In particular, although Tussyadiah and Zach (2017, p. 647) reveal "no significant effect of the comfort of a home"

(i.e., homey and peaceful atmosphere and the hosts' hospitality) on ratings, the noise would here create unsatisfactory assessments.

To sum up, our results show a change of power from hosts to guests. Farmaki and Kaniadakis (2020) point out that there is a limbo between the hotel and the apartment-sharing approach and the importance of security, a clean and functional environment and hospitality.

### Value for money

A more global concept that pure cost savings could remain a dominant motive amongst Airbnb travellers (Guttentag, 2015; Tussyadiah, 2015), value for money is a fundamental factor in booking Airbnb and hotel accommodation on dissatisfaction.

Value for money is a significant factor in booking both types of accommodations. Our study finds that guests are generally attracted to a combination of practical factors, such as cost savings and interactions with hosts or staff, rather than experiential drivers, i.e., a balance between affordability and personalised experiences to increase satisfaction. For instance, the growing sharing supply creates severe competition and forces (in conjunction with the reputational capital of the hosts; Ikkala & Lampinen, 2014, 2015) "hosts (...) set the standards high and adjust the prices" (Lalicic & Weismayer, 2018).

In sum, it suggests that both types of accommodation must balance their pricing strategies with providing high-quality service and personalised experiences to ensure guest satisfaction and revisit intention.

Finally, the pricing structure of Airbnb and hotels may also contribute to their differences. Airbnb accommodations are more affordable than traditional hotels, which may be attractive to budget-conscious travellers. On the other hand, hotels often provide higher service and amenities, which can justify their higher prices. Overall, these factors may contribute to the differences between Airbnb and hotels. However, further research is needed to fully understand the underlying factors contributing to these differences and how they may influence guest satisfaction and loyalty.

To sum up, based on the findings of our study, both Airbnb and hotels can promote their high-quality service and personalised experiences to ensure guest satisfaction and revisit intention by implementing the following recommendations:

- Develop and maintain a high level of professionalism amongst staff, including training in communication, problem-solving, and customer service skills.
- Emphasise the unique features and strengths of the accommodation, i.e., personalised interactions with hosts in the case of Airbnb and the quality and professionalism of staff in the case of hotels. On the one hand, focus on personalised interactions with guests by offering local recommendations or customised services, such as arranging a private city tour or a cooking class with a local chef. On the other hand, emphasise the quality and professionalism of staff by highlighting their credentials and expertise, such as certifications, industry experience, or awards. Also, showcase the hotel's unique features, such as a luxury spa, an exclusive dining experience, or an art collection.
- Invest in property development and maintenance to enhance the quality of accommodation, such as offering amenities and features necessary to guests, such as a terrace with a view or comfortable furniture. On the one hand, ensure the property is in excellent condition by investing in regular maintenance, repairs, and upgrades. This can include installing new appliances or furniture, repainting or redecorating, or adding new amenities like a hot tub or a home theatre system. On the other hand, it should be ensured that the hotel's infrastructure, facilities, and equipment are well-maintained and up-to-date. This can include investing in energy-

efficient technologies, modernising the design and decor of the rooms, or upgrading the fitness or conference centre.

- Offer competitive pricing strategies that balance cost savings with high-quality service and personalised experiences. For example, on the one hand, offer discounted rates for more extended stays or repeat guests, or provide a referral programme that rewards guests for referring new customers. On the other hand, loyalty programmes can be provided that reward frequent guests with unique perks, such as room upgrades, late check-out, or free meals.
- Ensure precise and responsive communication with guests throughout their stay to foster a welcoming environment and establish a strong relationship. On the one hand, respond promptly to guest inquiries or concerns via email, phone, or messaging platforms. Provide clear and detailed instructions for check-in and check-out, and offer a 24/7 support line for emergencies. On the other hand, provide guests with a concierge service that can help them with transportation, dining reservations, or entertainment options. Also, provide regular updates on hotel events or promotions via email or social media, and offer a dedicated hotline for customer service.

By implementing these recommendations, Airbnb and hotels can attract more guests and differentiate themselves from competitors. Additionally, promoting high-quality service and personalised experiences can help to enhance guest satisfaction and revisit intention, which can lead to positive reviews and an increased reputation. By identifying key differences and features that impact guest (dis)satisfaction, the present study provides valuable insights into the potential substitution or complementarity between Airbnb and hotels in the tourist accommodation domain.

## Conclusion

Our study contributes to the literature on hospitality services by providing insights into the factors influencing guest satisfaction and dissatisfaction in Airbnb and hotels. Our research also highlights the importance of distinguishing between statements of need and satisfaction and using novel techniques to interpret the semantic structures hidden in the data. By applying these approaches, researchers can better understand hospitality services and inform the design of more effective policies and practices in the hospitality industry.

Overall, our study has revealed similarities and differences in the necessary conditions for producing (dis)satisfactory guest experiences between Airbnb and hotels. Although both accommodation types share common themes of guest dissatisfaction, such as noise complaints, value for money, and staff professionalism, they differ in prioritising essential topics. For example, guests of Airbnb emphasise the importance of proximity to tourist attractions and staff recommendations, whereas hotel guests prioritise facilities and staff professionalism. Furthermore, while Airbnb offers unique and personalised experiences, hotels prioritise efficient and appropriate interactions between staff and guests. Our findings have significant implications for hospitality providers seeking to enhance guest experiences and improve guest satisfaction and loyalty by identifying and prioritising the factors influencing guest (dis)satisfaction. Our study's findings can help hospitality managers design effective policies and strategies to enhance guest experiences and improve guest satisfaction and loyalty.

Therefore, our study highlights the importance of offering guests a balance between affordability and personalised experiences to increase satisfaction and suggests that hotels may need to incorporate social and interpersonal aspects into their services to remain competitive. Our research thus has significant implications for hospitality professionals seeking to attract and retain guests in a dynamic and diverse industry. By focusing on high-quality and professional

staff, offering personalised experiences and promoting social and environmental responsibility, hotels can compete with P2P accommodation platforms and offer guests a more holistic and satisfying experience.

Finally, guest (dis)satisfaction is subjective and can vary significantly amongst guests, making it difficult to identify universal factors influencing (dis)satisfaction. Additionally, the rise of the sharing economy has led to concerns about the impact of short-term rentals on residential communities, and the legality of such rentals in some regions has become a contentious issue. Moreover, while P2P accommodation platforms like Airbnb may offer unique and personalised experiences for guests, there is a lack of standardisation and regulation compared to traditional hotels, which could lead to potential risks for guests. Therefore, it is crucial to ensure that guests are well-informed and aware of any potential risks when choosing Airbnb accommodations.

## Data availability statement

Not applicable.

## Declaration of Competing Interest

Not applicable.

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