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RESEARCH ARTICLE



Passengers' Perceptions of Chinese Airlines' Service Quality: A Mixed Methods Analysis of User-generated Content

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ABSTRACT

This study examined passengers' perceptions of the main Chinese airlines' service quality based on user-generated content (i.e., quantitative ratings and narratives shared online), as well as investigating whether market segmentation can be based on traveler type. Text reviews and the associated ratings of service attributes, overall satisfaction, and intention to recommend were gathered from the Skytrax website for four top Chinese airlines. The research relied on mixed methods, namely, econometric modeling (i.e., multiple and logistic regression) and mixed context analysis. The most influential variable in terms of explaining overall satisfaction and intent to recommend is value for money. Different traveler types are homogeneous in their ratings of the most important attributes, but market segmentation can be based on other variables. The content analysis revealed seven main themes: recommendation, core service, seat comfort, food and beverages, ground service, value for money, and in-flight entertainment. The results contribute to the literature by clarifying service quality attributes' impacts on intention to recommend and overall satisfaction among different traveler types. Analysis of specific user-generated content segments also provided a deeper understanding of the key concepts passengers use to describe their experiences and of differences according to airline reviewers' origin (i.e., Western and Eastern).

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KEYWORDS

Service quality; user-generated content; intention to recommend; Chinese airlines; market segmentation

关键词

服务质量; 用户生成内容; 推荐意愿; 中国航空公司; 市场细分

旅客对中国航空公司服务质量的感知:基于混合分析法的用户生成内容研究

摘要

本研究对中国主要航空公司服务质量的旅客评价 (UGC, 网上评价与评分) 进行分析, 并研究了通过旅客分类进行市场细分的可行性。本研究数据来源为Skytrax网站上旅客对中国四大航空公司服务质量的文字评论, 以及对相关服务子项的评分, 整体满意度评分和旅客推荐意愿。主要研究方法为混合分析法, 即计量分析法建模 (多元回归和逻辑回归) 和混合内容分析法。在解释整体满意度与旅客推荐意愿方面, 性价比这一变量的影响最为显著。不同旅客分类中, 影响最显著的子项是相同的, 但市场细分可基于其他子

项。内容分析揭示了七个主题:推荐度, 核心服务, 座椅舒适度, 机上餐食, 地面服务, 性价比和机上娱乐。研究结果有助于丰富不同旅客细分中服务质量子项对旅客推荐意愿和整体满意度影响的研究文献。针对特定旅客评价内容分析有助于更深入的认识旅客描述体验的关键概念, 以及不同评论者来源国 (东方或西方国家) 的差异

Introduction

Passengers' perceptions of airline service quality play an important role in perceived value (Chen et al., 2019), satisfaction (Chow, 2014; Jiang & Zhang, 2016), intention to recommend (Ban & Kim, 2019), and loyalty (Farooq et al., 2018). Service quality is thus seen as the most important airline attribute in terms of generating competitive advantages (Chen et al., 2019). Previous studies have developed various scales to measure service quality in the airline industry, which are based on survey data (see, Li et al., 2017 for a review). More recently, a few researchers have discussed the advantages of examining user-generated online content to understand more fully passengers' satisfaction with their flight experiences (Ban & Kim, 2019; Brochado et al., 2019; Lacic et al., 2016). The cited literature advocates analyzing this online content as an alternative to traditional survey data in service quality studies (Zhang & Cole, 2016).

Narratives shared online offer direct illustrations of travelers' perceived service quality criteria (Zhang & Cole, 2016) and allow researchers to identify the main themes in travelers' descriptions of their experiences' quality (Brochado et al., 2019). Web 2.0 users spontaneously share different content such as photos, videos, texts, and ratings (Hausmann et al., 2018), which can be understood as cyberspace word of mouth (i.e., electronic word of mouth; Zhang & Cole, 2016). User-generated content is widely thought to be a 'natural setting for the study of travelers' lived experiences' (Zhang & Cole, 2016, p. 16), and this content 'provides immediately available information that is also uncontaminated by researchers during data creation and collection' (Hookway, 2008). Online reviews are a vital source of information for companies seeking to understand customers' product or service evaluations and firm performance in comparison with the competition (Chen et al., 2019; Clow & Baack, 2018). Careful analyses of this content are a necessary part of decision-making processes that contribute to high-quality service provision (Yakut et al., 2015).

In the airline industry, passengers share their reviews and ratings online in the post-purchase phase for everyone to see, and these contents are viewed as trustworthy by other passengers (Brochado et al., 2019). Quantitative and qualitative online reviews (Chatterjee, 2019) can, therefore, be used to study airline service quality (Lacic et al., 2016). In addition, Chatterjee (2019) suggests that service attributes' impact on outcome variables can be expected to vary according to the air travel service context. Brochado et al. (2019), in turn, identified the main narratives associated with value for money ratings and proposed that future studies could focus on whether the dimensions of passengers' overall experiences vary according to TripAdvisor® classifications (i.e., families, couples, solo, business, and friends). The current research answered Brochado et al. (2019) and Chatterjee's (2019) calls for further research by exploring whether

selected attributes' effect on both overall satisfaction and intent to recommend changes for different market segments (i.e., traveler type) based on passengers' quantitative ratings.

Previous studies have confirmed that airline service quality varies around the world (Punel et al., 2019). Some authors have thus suggested that this topic 'should be studied at ... minor ... analysis levels such as regions' (Alkhatib & Migdadi, 2018, p. 197) because each region possesses unique characteristics. Chatterjee (2019) also argues that airlines' origin can influence customer outcomes. The present study thus focused on China, which is the world's second largest aviation market (International Civil Aviation Organization, (2020). 2019).

To improve passengers' satisfaction and intent to recommend, each Chinese airline must understand its clients' perceptions of service quality to identify and meet these passengers' needs. Various studies have already investigated Chinese airlines' service quality (Chen et al., 2019; Chow, 2015; Jiang & Zhang, 2016). However, a review of the relevant literature revealed that no research has evaluated service quality-related issues using user-generated content. The current research, therefore, analyzed both online ratings using econometric methods (Punel et al., 2019) and online reviews using content analysis based on Leximancer software functions and narrative analysis techniques (Brochado et al., 2019). This methodological approach responds to Ban and Kim's (2019, p. 14) call for research that goes beyond frequency analysis of words in online reviews to conduct content analysis in order to 'understand the additional meaning of words.'

The present study specifically analyzed reviewers' ratings to identify the main determinants of airline passengers' overall satisfaction and intention to recommend and to test whether these determinants vary according to traveler type. The additional narrative analysis of relevant Web reviews also offered a deeper understanding of each service quality dimension's meaning regarding Chinese airlines. The current research thus addressed the following research questions:

- What are the main service quality attributes correlated with passengers' overall perceptions of airline experiences and intention to recommend Chinese airlines?
- Does each attribute's impact vary according to traveler type?
- What are the main narratives shared online by passengers that can be linked with each service quality dimension in relation to Chinese airlines?

Literature review

Due to services' intangibility and heterogeneity and their simultaneous production and consumption, the quality of services is difficult to define and measure (Lovelock & Wirtz, 2016). The cited authors define service quality as 'the user's ... [perception of services] as consistently meeting or exceeding [the] customer[s] expectation[s]' (Lovelock & Wirtz, 2016, p. 551). Service quality assessment in the airline industry varies in some ways from evaluations in other sectors (Feng & Jeng, 2005). This industry encompasses a chain of core and peripheral services (Anderson et al., 2008), ground and in-flight services (Li et al., 2017), and pre-, in-, and post-flight services (Chen & Chang, 2005) that are different from those of other service industries.

Airline service quality dimensions

Nadiri et al. (2008) developed an airline service quality scale (i.e., AIRQUAL) that covers eight dimensions of airline service quality: airline tangibles, terminal tangibles, personnel, empathy, image, customer satisfaction, repurchase intention, and word-of-mouth communication. The AIRQUAL model has also been adopted by other researchers (Ali et al., 2015; Farooq et al., 2018).

Anderson et al. (2008) argue that airline services have six attributes. The first is interaction with personnel during the entire journey including service attitude and wait time at check-in counters, efficiency in boarding, information provided, responsiveness of onboard services, and the appropriateness of baggage delivery. The next four attributes are the aircraft and cabin's cleanliness, condition, and general appearance; personal space, seating space, and arm- and legroom; in-flight food quantity and quality; and in-flight noise and air quality and flights' smoothness. The last attribute is timeliness, that is, punctuality of departure and arrival.

Chow (2014) analyzed Chinese passengers' complaints and identified factors influencing complaints and dissatisfaction, such as on-time performance, baggage mishandling problems, weather conditions, and individual characteristics. In another study, Chow (2015) found that improved on-time performance enhances passenger satisfaction while increasing expectations of on-time performance reduces satisfaction. In addition, Jiang and Zhang (2016) identified three airline service factors: in-flight entertainment, frequent flyer program, and airlines' response to flight delay and passenger complaints.

Gupta's (2018) research further considered seven main attributes based on a service quality model (i.e., SERVQUAL). These are tangibility; reliability, security, and safety; responsiveness; assurance; effective communication and employees' service; ticket pricing and airline image and additional features. Farooq et al. (2018) report finding that only five dimensions of service quality, namely, 'airline tangibles; terminal tangibles; personnel services; empathy[;] and image,' are significant and positive factors in service quality and satisfaction.

Finally, Li et al. (2017) specifically analyzed in-flight service quality and proposed criteria and subcriteria, using data gathered with a SERVQUAL-based survey. The identified attributes are employees (i.e., cabin crew service), facilities (e.g., seats), entertainment and catering quality, flight schedule and information, support service (i.e., travel-related service), and physical environment (e.g., air, thermal, and sound comfort).

Professional institutions (e.g., International Air Transport Association [IATA] and Skytrax) have also developed a set of attributes used to assess airline service quality (Alkhatib & Migdadi, 2018). The IATA considers the following dimensions: booking procedure, check-in, lounge, boarding procedure, cabin, seat, cabin crew, in-flight entertainment, food and beverages, and arrival. The consulting company, Skytrax, considers seat comfort, staff, food and beverage, entertainment, ground service, and value for money.

Airline service quality studies using Skytrax data

Skytrax's air travel review website (see www.airlinequality.com) has become the main source of user-generated content for the airline industry. Each online review by an airline

traveler consists of 5-point ratings of the 6 airline service dimensions, a 10-point rating of overall satisfaction, a binary evaluation (i.e., yes/no) of intent to recommend the airline to other travelers, and a free-form text review (Lacic et al., 2016). Guests' ratings can be understood as attitudinal variables, while intent to recommend is a behavioral outcome (Chatterjee, 2019).

Recent service quality studies have highlighted the advantages of analyzing user-generated content, including travelers' ratings and reviews (Brochado et al., 2019). Previous research on the airline industry has examined numerical ratings (Yakut et al., 2015), text reviews (Brochado et al., 2019; Kwon et al., 2021), or a combination of these types of data (Ban & Kim, 2019; Lacic et al., 2016; Punel et al., 2019; Shadiyar et al., 2020). More specifically, regression analysis has been conducted to process online ratings (Ban & Kim, 2019; Chatterjee, 2019; Shadiyar et al., 2020), whereas content analysis methods have been employed with text reviews, including text mining, sentiment analysis (Kwon et al., 2021; Punel et al., 2019), Leximancer functions, and narrative analysis (Brochado et al., 2019).

For example, Yao et al. (2015–24) applied a text mining approach based on a vector space model to identify the words passengers use most frequently in their reviews of the entire Chinese airline industry. The cited research revealed that the most popular words are flight, seat, service, time, and food. In addition, Ban and Kim (2019), Chatterjee (2019), and Shadiyar et al. (2020) used quantitative ratings and text reviews. The cited authors examined the relationships between six service quality factors: seat comfort, staff, food and beverages, entertainment, ground service, and value for money. All three studies listed above focused on both overall passenger satisfaction and intent to recommend as outcome variables. In a second step, Ban and Kim (2019) and Shadiyar et al. (2020) employed convergence of iterated correlations analysis to cluster the main keywords in online narratives into six groups: seat comfort, staff, entertainment, ground service, value for money, and airline brand.

Punel et al. (2019), in turn, analyzed a large dataset of quantitative ratings and text reviews to study whether passengers' travel experiences vary according to geographical location and cabin class. Text mining was applied to identify the most frequently used words in the reviews and calculate sentiment scores (i.e., either positive or negative). Kwon et al. (2021), in contrast, used topic modeling and sentiment analysis to identify the most important words in online reviews. The cited study identified six main themes: in-flight meal, entertainment, seat class, seat comfort, airline, and staff service. Delays stood out as the main issue related to passenger dissatisfaction.

Brochado et al. (2019) further conducted content analysis combining Leximancer and narrative analysis of airline passengers' online text reviews. The cited researchers identified the key dimensions as post-purchase behaviors, service, staff, airport operations, flight, entertainment, ticket class, and in-flight tangibles. Brochado et al. (2019) also identified the most typical passenger narratives for each theme. Table 1 provides a brief summary of the cited studies and other research based on Skytrax.

Hypotheses

Ban and Kim (2019), Chatterjee (2019), and Arasli et al.'s (2020) studies revealed that the service quality dimensions used in the Skytrax platform to assess airline experiences (i.e., seat comfort, cabin crew, food and beverages, in-flight entertainment, ground service,

Table 1. Selected service quality studies based on Skytrax data.

Author	Research Context	User-generated Contents	Data Analysis
Yakut et al. (2015)	1,494 airline reviews	Numerical ratings	K-means cluster analysis and principal component analysis
Yao et al., (2015–24)	7,466 reviews and 25 airlines	Text reviews	Content analysis (vector space model)
Brochado et al. (2019)	1,200 reviews and 6 airlines	Text reviews and value for money numerical ratings	Content analysis (Leximancer and narratives)
Ban and Kim (2019)	9,632 reviews and 10 airlines	Numerical ratings and text reviews	Regression and content (CONCOR) analyses
Punel et al. (2019)	40,510 reviews	Numerical ratings and text reviews	Content (text mining and sentiment analysis) and path analysis
Chatterjee (2019)	41,397 customer reviews and 362 airlines	Numerical ratings and text reviews	Regression and content analyses
Shadiyar et al. (2020)	1,693 reviews and 5 airlines	Numerical ratings and text reviews	Regression and content analyses
Kwon et al. (2021)	14,000 reviews and 27 airlines	Text reviews	Content analysis (i.e., topic modeling and sentiment analysis)

and value for money) are positively correlated with overall satisfaction and intent to recommend. Shadiyar et al. (2020) confirmed that all six Skytrax dimensions have a positive relationship with overall customer satisfaction for the Commonwealth State Airlines group. Chatterjee (2019) also reports similar results.

In addition, Ban and Kim's (2019) study and Arasli et al.'s (2020) findings for the Korean airlines group reveal that the only dimension related to overall satisfaction that is not statistically significant is entertainment. Ban and Kim's (2019) results include that 5 out of the 6 Skytrax dimensions are associated with intent to recommend, with the exception being ground service. The model estimated by Shadiyar et al. (2020) detected different significant dimensions for the two groups of companies under analysis: seat comfort and value for money for Commonwealth State Airlines and staff, ground service, and value for money for the Korean airlines.

Based on the literature review's findings, the present research model assumed that Skytrax's six service quality attributes have a positive relationship with overall satisfaction and intention to recommend. The following hypotheses were formulated for this study:

H1: Seat comfort has a positive impact on (a) overall satisfaction and (b) intent to recommend.

H2: Cabin crew service has a positive impact on (a) overall satisfaction and (b) intent to recommend.

H3: Food and beverages have a positive impact on (a) overall satisfaction and (b) intent to recommend.

H4: In-flight entertainment has a positive impact on (a) overall satisfaction and (b) intent to recommend.

H5: Ground service has a positive impact on (a) overall satisfaction and (b) intent to recommend.

H6: Value for money has a positive impact on (a) overall satisfaction and (b) intent to recommend.

Previous investigations have found further that market segments can influence satisfaction and online reviews' content. More specifically, this stream of research has focused on heterogeneous value for money ratings (Brochado et al., 2019), nationality (Punel et al., 2019), and cabin classes (i.e., business, economy, and premium economy; Yakut et al., 2015). Brochado et al. (2019) suggested that future research should also include traveler type as a segmentation variable. A final market segmentation hypothesis was thus added to the current research:

H7: Service quality dimensions' impact on (a) overall satisfaction and (b) intent to recommend varies according to traveler type.

Methodology

Research context

China is the second largest aviation market in the world (International Civil Aviation Organization, (2020). 2019). In 2019, China's 62 airlines registered a total transportation turnover of 129.325 billion ton-kilometer, 659.934 million passengers, and 12.311 million flight hours (Civil Aviation Administration of China [CAAC], 2020). To analyze China's airline service quality, the present study focused on passenger evaluations of the flagship brands termed the 'big four' airlines – Air China (China National Aviation Holding Company), China Eastern Airlines, China Southern Airlines, and Hainan Airlines. These companies are the four largest aviation groups, representing approximately 85% of this country's total airline transportation turnover in 2019 (CAAC, 2020). China Southern Airlines account for 25.2% of the market, followed by China National Aviation Holding Company (24.6%), China Eastern Airlines (19.5%), and Hainan Airlines (15.6%).

Data collection and description

The data were gathered from the Skytrax website (see www.airlinequality.com). Skytrax is a London-based company that regularly conducts passenger opinion surveys of service quality in the civil air industry, so this firm is recognized as a leader in air travel research (Lacic et al., 2016). Skytrax is, therefore, a reliable, well-established source of information about perceptions of airline service quality (Punel et al., 2019). Passenger reviewers need to present the relevant autonyms and proof of flight, but these individuals can also choose to hide that information. Data were extracted from the website using Python software. After removing cases with missing values, the valid data sample consisted of 2,035 cases (i.e., quantitative and qualitative feedback).

All the airline reviews selected are in English, and their length ranges between 150 to 3,500 characters. Passengers evaluate their trip overall by rating the experience from 1 to 10 and indicating their intention to recommend (i.e., 'Recommended' or 'Not recommended'). They also assess their trip in terms of six service attributes – seat comfort,

cabin staff service, food and beverages, in-flight entertainment, ground service, and value for money – on a scale from 1 to 5. The dataset also included information about the passengers' country of origin and type of traveler (i.e., solo leisure, couple leisure, family leisure, and business travelers).

The reviews were written by passengers from 62 countries. More than 7 out of every 10 reviews were written by individuals from Eastern Asia (27%), North America (26%), and Europe (20%). Approximately 23% of the reviewers were from China. In addition, about half (47%) of the passengers traveled alone. The sample also included couple leisure (17%), family leisure (15%), and business travelers (21%).

Data treatment

This study used a two-step mixed-methods approach. In the quantitative step, regression analysis of quantitative online ratings was conducted to test hypotheses H1a through H6a. Overall satisfaction ratings comprised the dependent variable, with values ranging from 1 to 10. The six service quality dimensions (i.e., seat comfort, cabin staff service, food and beverages, in-flight entertainment, ground service, and value for money) were the independent variables.

The regression coefficients were estimated for each traveler type (i.e., solo leisure, couple leisure, family leisure, and business travelers) to test H7a. Then, logistic regression was conducted to test H1b through H6b as the dependent variable was binary (1 = 'Recommended'; 0 = 'Not recommended'). This type of regression was also run for each traveler type to test H7b. The reviewers' intention to recommend was compared to their ratings of six service quality dimensions (i.e., independent variables).

In the qualitative step, Leximancer functions and narrative analysis techniques were applied to identify the main narratives in passengers' online reviews for each service quality dimension. Leximancer has been used in hospitality and tourism research (Arasli et al., 2021, 2020; Brochado et al., 2019; Cassar et al., 2020; Rodrigues et al., 2022) to transform natural language into semantic patterns with minimum intervention by researchers. Leximancer functions include semantic analysis (i.e., identification of main concepts) and relational analysis (i.e., the ways in which concepts are interrelated), with results presented as concept maps. To ensure the final concept map's validity (Smith & Humphreys, 2006), stability analysis was carried out by testing different map rotations, and reproducibility was checked by identifying the main themes for each airline. Finally, correlation validity was confirmed by comparing the main themes identified with Skytrax ratings. The results provide a better understanding of each service quality dimension's meaning with regard to Chinese airlines.

Results

Descriptive statistics

The overall rating the passengers gave the airline companies is 6.99 out of 10 (standard deviation [SD] = 3.07), and 73.6% reviewers in the sample recommended the airline company they used. The service quality attributes were evaluated on a scale from 1 to 5.

Cabin staff service received the highest average evaluation (4.12), followed by value for money (4.02). The attribute given the lowest scores was in-flight entertainment (3.45).

A one-way analysis of variance test was run seven times. The results revealed differences by traveler type in the average ratings of overall satisfaction and the six service quality attributes (see, Table 2). The chi-squared test also highlighted an association between intent to recommend and type of traveler. The passengers who did not recommend the airline reviewed rated their overall satisfaction on average lower (mean $[M] = 2.21$; $SD = 1.55$), while those who recommended the airlines gave higher ratings ($M = 8.54$; $SD = 1.14$; $F = 10.02$; $p = 0.00$).

Determinants of overall service quality perceptions

Overall results

The results reveal that all six quality dimensions positively correlate with passengers' overall satisfaction, which means hypothesis H1a to H6a are supported for the Chinese airlines under study. The model estimates show that value for money has the strongest influence on global satisfaction ratings. The second and third variables with the highest impact are cabin staff service and ground service. The fourth, fifth, and sixth most influential attributes are seat comfort, food and beverages, and in-flight entertainment, respectively.

Results by traveler type

The second step concentrated on testing hypothesis H7a (i.e., heterogeneity in responses linked to traveler types), so the overall service quality rating was regressed on the six service quality attributes for each traveler category (see, Table 3). These attributes have a statistically significant relationship with the solo, couple, and family groups. In the model estimated for business travelers, only five variables are statistically significant, as in-flight entertainment proved to be the exception to the rule.

Table 2. Descriptive statistics.

Variable	Descrip-tive Statistics	Type of Traveler					ANOVA (F)	Chi-squared (χ^2)
		All	Solo	Couple	Family	Business		
Overall rating	M	6.86	6.99	6.17	6.93	7.08	$F = 5.47$	***
	SD	3.07	2.99	3.29	3.10	2.97		
Seat comfort	M	3.69	3.70	3.46	3.75	3.81	$F = 10.74$	***
	SD	1.27	1.25	1.37	1.26	1.22		
Cabin staff service	M	4.02	4.12	3.63	4.03	4.09	$F = 4.53$	***
	SD	1.43	1.36	1.56	1.40	1.43		
Food and beverages	M	3.50	3.55	3.25	3.54	3.55	$F = 5.30$	***
	SD	1.39	1.35	1.46	1.35	1.41		
Inflight entertainment	M	3.37	3.45	3.13	3.44	3.33	$F = 11.22$	***
	SD	1.32	1.27	1.42	1.31	1.35		
Ground service	M	3.58	3.69	3.16	3.57	3.66	$F = 4.83$	***
	SD	1.51	1.48	1.60	1.53	1.43		
Value for money	M	3.94	4.02	3.71	3.87	3.99	$F = 7.27$	***
	SD	1.37	1.30	1.51	1.41	1.35		
Recommend (a)	N	1,498	719	218	231	330	$\chi^2 = 22.00$	***
	%	73.60	75.70	63.60	74.50	76.40		

^AAssessed on a binary scale (1 = 'Recommended'; 0 = 'Not recommended'); $F = F$ statistic; $\chi^2 = \text{Chi-squared statistic}$; *, **, and *** statistically significant at the 5%, 1%, and 0.1% level, respectively.

Table 3. Multiple linear regression.

	Overall		Solo		Couple		Family		Business	
	<i>B</i>		<i>B</i>		<i>B</i>		<i>B</i>		<i>B</i>	
	(t)		(t)		(t)		(t)		(t)	
(Constant)	−0.190	***	−0.210	***	−0.178	***	−0.178	***	−0.169	***
	(−25.857)		(−19.046)		(−10.458)		(−9.561)		(−10.374)	
Seat comfort	0.028	***	0.020	***	0.043	***	0.032	***	0.021	**
	(9.158)		(4.673)		(5.638)		(3.876)		(3.144)	
Cabin staff service	0.048	***	0.045	***	0.036	*	0.052	***	0.060	***
	(15.497)		(10.322)		(4.527)		(6.511)		(8.639)	
Food and beverages	0.024	***	0.027	***	0.032	***	0.016	*	0.016	*
	(7.975)		(6.362)		(4.107)		(2.289)		(2.361)	
Inflight entertainment	0.016	***	0.022	***	0.014	***	0.015	*	0.012	
	(5.597)		(5.363)		(2.167)		(2.354)		(1.93)	
Ground service	0.043	***	0.045	***	0.051	***	0.048	***	0.029	***
	(16.594)		(11.914)		(7.784)		(6.793)		(5.145)	
Value for money	0.073	***	0.077	***	0.056	***	0.073	***	0.088	***
	(23.965)		(17.492)		(7.597)		(8.398)		(12.766)	
ANOVA <i>F</i>	2871.490	***	1365.15	***	472.88	***	468.166	***	579.98	***
<i>R</i> -squared	89%		90%		89%		90%		89%	

B = beta coefficient; *t* = test statistic; *, **, and *** statistically significant at the 5%, 1%, and 0.1% level.

The variable that improves passengers' perceptions with, on average, the strongest impact on overall ratings is the same for all traveler groups – value for money. The second highest coefficient varies according to traveler type: ground service for the solo and couple leisure groups and cabin staff service for family and business travelers. The third highest coefficient is ground service for family and business travelers, cabin staff service for solo leisure, and seat comfort for couple leisure.

The attributes with the least impact on overall satisfaction is in-flight entertainment for couple, family, and business travelers and seat comfort for leisure solo travelers. In addition, improved perceptions of seat comfort, food and beverage, and ground service have, on average, a higher impact on overall service quality ratings for couples than for the other groups. A more favorable perception of cabin staff service and value for money generates a stronger impact on business travelers versus other types.

Determinants of intention to recommend

Overall results

The logistic regression's results reveal the model fits the data well as the percentage of correct classifications is 97%. The Wald test confirmed that the only variable that does not have a statistically significant relationship with intention to recommend the airline reviewed is in-flight entertainment. According to the model estimates, the most important attributes are – in descending order by strength of impact – value for money, ground service, cabin staff service, seat comfort, and food and beverages. Passengers who give value for money higher scores are more likely to recommend the airline brand in question. Hypothesis H1b, H2b, H3b, H5b and H6b are thus verified, but H4b is not.

Table 4. Logistic regression coefficients.

	Overall		Solo		Couple		Family		Business	
	exp(B)		exp(B)		exp(B)		exp(B)		exp(B)	
	(Wald)		(Wald)		(Wald)		(Wald)		(Wald)	
Constant	0.000	***	0.000	***	0.000	***	0.000	***	0.000	***
	(212.002)		(97.583)		(36.208)		(27.726)		(36.592)	
Seat comfort	1.678	***	1.412		2.839	***	2.110		1.142	
	(10.96)		(1.934)		(7.598)		(2.168)		(0.122)	
Cabin staff service	2.189	***	2.190	***	1.486		2.304	*	2.815	***
	(32.468)		(14.732)		(1.537)		(3.77)		(10.536)	
Food and beverages	1.831	***	2.120	***	1.755		1.760		1.603	
	(14.707)		(9.41)		(2.108)		(1.821)		(1.929)	
Inflight entertainment	0.736		0.750		0.827		0.996		0.679	
	(3.818)		(1.442)		(0.244)		(0.001)		(1.108)	
Ground service	2.506	***	2.794	***	2.920	**	1.894	***	2.171	***
	(50.05)		(27.662)		(9.891)		(2.992)		(7.227)	
Value for money	5.663	***	5.690	***	5.626	***	5.309		7.371	***
	(84.202)		(39.319)		(15.257)		(9.938)		(16.006)	
% correct classifications	97%		96.7%		96%		98%		97%	
Nagelkerke R-squared	91%		91%		93%		92%		91%	

Exp(B) = odds ratio; Wald = Wald chi-squared test.

Results by traveler type

To test hypothesis H7b, four logistic regressions were run, one for each traveler type. The Wald tests showed that 5 out of the 6 variables are statistically significant for the solo leisure group, and 3 for the couple leisure, family leisure, and business travelers (see, Table 4). The variable that exhibits the strongest impact on intent to recommend for the four groups is value for money. The variable that has the second greatest effect is ground service for solo leisure and couple leisure travelers and cabin staff service for family and business travelers. The variable with the third highest impact on recommendations is cabin staff service for solo leisure travelers, seat comfort for couple leisure, and ground service for families and business. Hypothesis H7b, therefore, was supported. Seat comfort is only statistically significant in the logistic regression for couples.

Content analysis of passengers' reviews

Content analysis of the selected reviews uncovered 12 main themes. The latter were then grouped into eight dimensions: recommendation, core services, and the six service quality dimensions assessed by Skytrax (i.e., seat comfort, cabin staff service, food and beverages, ground service, value for money, and in-flight entertainment). The theme flight (core service) is the central theme in the concept map that is linked with all other themes. Figure 1 presents the map of the themes and concepts generated by Leximancer.

Recommendation

The recommendation theme includes the concepts of (intent to) recommend (count = 1,253, relevance = 44%) and airline (1,085, 40%). These concepts are mainly linked with positive or negative post-purchase behaviors related to the airline companies.

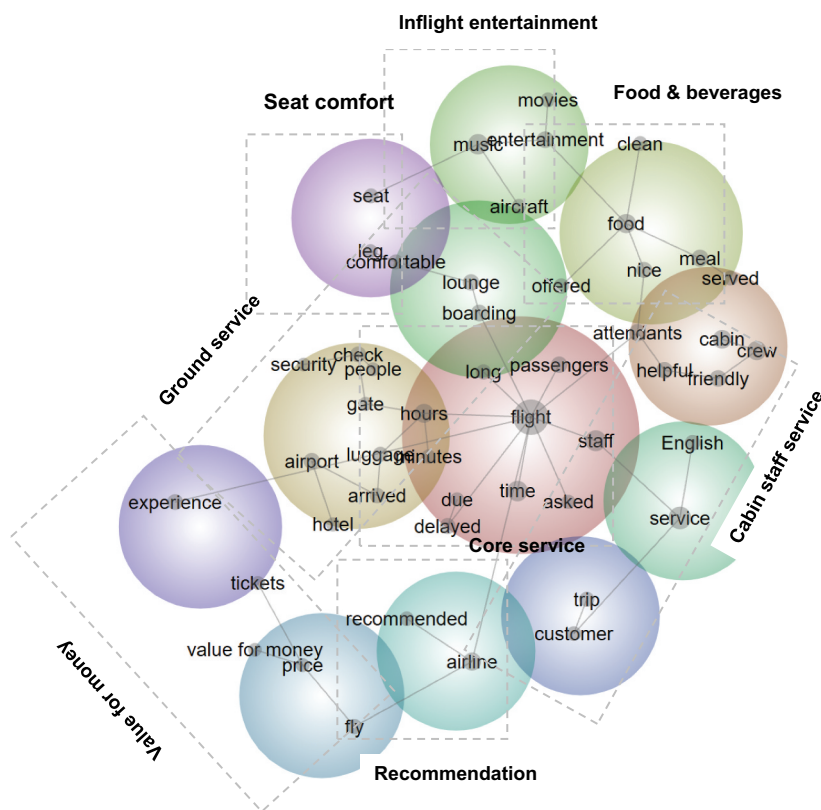


Figure 1. Leximancer map of themes and concepts.

Satisfied passengers recommended the airlines to others and wrote about their intentions to remain loyal to the airline in question. One review reads, '[w]e recommend the airline to all our friends and family and look forward to our next [t]rip' (airline: China Southern, nationality: Australia, traveler type: couple leisure, overall satisfaction: 9, recommend: yes). Some comments link recommendations with positive value for money assessments, and this attribute has the most significant correlation with intent to recommend in the regression analysis. One passenger said, '[I w]ould highly recommend China Southern Airlines to anyone looking for a great value for money international flight' (China Southern Airlines, the United Kingdom [UK], couple leisure, 9, yes).

Dissatisfied passengers wrote about their negative post-purchase behaviors. A reviewer asked, '[w]ould I recommend this airline? Probably not considering there are better airlines to choose from' (China Southern Airline, Ireland, couple leisure, 3, no).

In-flight core services

The in-flight core service theme includes the concepts of flight (3,943, 100%), passengers (541, 26%), long (wait) (366, 21%), hours (915, 35%), minutes (200, 17%), delay (441, 23%), (un)due (delays) (181, 17%), time (1,253, 44%), and (questions) asked (232, 18%). The passengers' comments are associated with their overall in-flight experience, the flight schedule, takeoff, and landing.

Satisfied passengers described their flight experience as ‘happy,’ ‘the best,’ ‘pretty nice,’ ‘very good,’ ‘pleasant,’ ‘wonderful,’ ‘perfect long-haul,’ ‘excellent,’ ‘lovely,’ ‘enjoyable,’ ‘relaxed,’ and ‘smoothed [sic],’ as well as ‘exceeded expectations.’ Dissatisfied passengers depicted their flight as ‘very disappointing,’ ‘the worst,’ or ‘miserable.’

Reviewers happy with their flights wrote that ‘[t]he takeoff and landing were very stable, so I did not suffer any ear problems. The flight was also quite on time . . . [in terms of its] arrival’ (Hainan Airlines, China, business, 8).

In contrast, passengers with canceled or delayed flights shared details of their negative experiences. One reviewer recalled:

[Flying from] Beijing to Vancouver . . . [m]y connecting flight from Beijing to Delhi was three hours late which resulted in me [sic] missing my [b]us from Delhi to Punjab which I had booked tickets for. While coming back the flight was again delayed from Beijing to Vancouver . . . We were very disappointed with the whole experience. (Air China, Canada, family leisure, 2)

However, other passengers related how a canceled flight could still be a good experience:

I had a terrible experience with my flight cancelled and had trouble communicating. I was booked on a flight the next morning despite arriving 5 hours early. Then the agent stepped in and navigated me through the process of changing my flight. She managed to get me on a flight that was already 2 hours delayed. Her service was amazing as she ensured I was checked in and rang me to advise me when my flight was finally boarding at 10PM that night. (China Southern Airlines, Australia, business, 3)

Changes in flights and planes can also be beneficial for passengers:

My family had a great trip on Hainan Airlines from Boston to Shanghai Pudong. [We were t]hrilled that they introduced this non-stop flight[,] saving hours on the total journey to China. I really enjoyed and prefer the Boeing 787 compared to the 777-300ER [because of the f]ast [b]oarding/deplaning since the plane is much smaller than the 777-300ER, especially the number of economy seats (only 177 on Hainan compared with say Emirates long haul 777-300 ER at 304). (Hainan Airlines, the United States [US], family leisure, 9).

Seat comfort

The seat comfort theme includes the concepts of seat (1,402, 48%), leg (351, 21%), and comfort (652, 29%). Passengers are assigned airline seats during their journey. Reviews are mainly related to seat comfort, seat pitch, seat width, amenities, and seating preferences.

One satisfied passenger shared, ‘[t]here was ample leg room and seats were spacious. The bathrooms were clean and well-stocked’ (Hainan Airlines, Canada, solo, 9, seat comfort: 5). Seat amenities are also included in happy reviewers’ descriptions. A passenger wrote, ‘Hainan Airlines provides [a] pillow, eye-shade, toothbrush and earplug which makes me sleep better’ (Hainan Airlines, US, solo leisure, 9, 4).

Dissatisfied passengers describe negative experiences with seat comfort. A relevant review reads:

[T]here is a major problem with this airline[:] . . . the smallest seat pitch I have encountered even on a domestic flight let alone a long haul 12 hour flight. Even some of our taller oriental friends were struggling with it. (China Southern Airlines, New Zealand, solo leisure, 3, 1)

Positive and negative experiences with how the four airlines manage seating preferences and requests are also mentioned. A business traveler said, 'I got [the] seat . . . I wished [for]' (China Southern Airlines, the Netherlands, business, 8, 4). Another reviewer reported, '[I a]rrived early, [and] made [a] seat request. [The c]heck in staff totally ignored you [sic] and gave you [another] seat that was allocated. No explanation, nothing[, was offered, and n]o smile, no apologies' (China Eastern Airlines, Singapore, business, 3, 2).

The main reason for complaints about seating preferences is not being able to sit with fellow travelers. One passenger stated, '[m]y friend and I paid for seats together[. Y]es[, we] bought the seating option and then when we checked in, they did not have our seats together and couldn't make it so [sic]' (China Eastern Airlines, Canada, solo leisure, 1, 2). Another review reads, '[we flew] Hanoi to Brisbane via Guangzhou, and [our] child [was] forced to sit separately from . . . [us]. [Even a]s an Skyteam Elite Plus member (Platinum on Lotusmiles), [our] seating request was completely ignored despite multiple emails and [a] written confirmation that the request was . . . [received]' (China Southern Airlines, n. a., family leisure, 2, 1).

Cabin staff service

The cabin staff service theme includes the concepts of trip (448, 23%), customer (346, 21%), service (1,748, 56%), English (461, 24%), crew (997, 37%), friendly (staff) (578, 27%), helpful (crew) (522, 25%), and attendants (637, 28%). The comments shared about cabin staff service include positive and negative adjectives and the staff's ability to fix unexpected problems.

Satisfied passengers use positive adjectives to describe the crew, such as 'helpful,' 'hard working,' 'professional,' 'excellent,' 'friendly,' 'super nice,' 'careful,' 'polite,' 'patient,' 'efficient,' 'hospitable,' 'warm,' 'courteous,' 'well trained,' 'enthusiastic,' 'proactive,' and 'kind.' Examples of negative adjectives are 'rude,' 'not very friendly,' 'terrible,' and 'unpleasant.' Criticisms include the staff '[show] no respect,' 'speak extremely poor [E]nglish,' and 'made me [feel] really disappoint[ed].'

A typical comment is as follows:

The cabin crew assisted me to my seat upon boarding . . . I am truly delighted with the hospitality and assistance rendered by the cabin crew throughout the entire journey. The cabin crew are always around to check if the passenger require[s] any beverages after the in[-]flight meal. They even came to inform me [of] the latest temperature [i]n the destination prior to landing. (China Southern Airlines, Malaya, solo leisure, 8, cabin staff service: 5)

Another review states, '[g]ood service [was] provided by the crew with friendly smiles' (China Eastern Airlines, Malaysia, business, 7, 4).

The assistance given to specific market segments, such as senior and young passengers, triggered positive reviews. A passenger wrote, 'I was travelling with my grandma who required wheelchair assistance, and the cabin crew were very accom[m]odating and attentive to her needs. They were also polite and helpful in all other areas' (China Southern Airlines, Malaysia, solo leisure, 9, 5). Another reviewer said:

[On the flight from] Sydney to Guangzhou [the c]rews [sic] are [sic] friendly[.] I [had] my 10 months old son with me, and [the] crews are [sic] very nice and patient when we need[ed]

something. They gave my son . . . toys to play [with] when he was crying. I will choose China [S]outhern [A]irline again because [of] the good service . . . they provide. (China Southern Airlines, Australia, family leisure, 9, 5)

A typical negative comment is as follows:

It's like the flight attendants have to be unfriendly to work with this airline. I was on four different flights and on every flight they were very unfriendly. For example, on one flight I was sleeping and I didn't hear that the plane was going to land, so the flight attendant came and pushed the bottom of the backrest [upright] so hard that I nearly hit my head on the seat in front of me. Besides they never really talked to me when they brought food. (Air China, Germany, business, 1, 1)

One of the most common type of comment about the staff is their language skills. A passenger wrote, '[the f]light[s] were on time and flight attendants were attentive with good English and regular [drinking] water services' (Air China, UK, solo leisure, 7, 4). A dissatisfied reviewer reported, '[t]he service from flight attendants ranged from adequate to borderline rude and their English ability was very lacking so many passengers could not understand the announcements' (Air China, US, solo leisure, 1, 2).

Activities such as cleaning during the flight are also valued by passengers. One review reads:

One thing I love the most about Hainan is that the toilets are always clean! Trust me when I say the sanitary condition of cabin toilets are important for people spending 12 hours or more on international flights, because you will use the toilets at least once . . . I saw the flight attendants cleaning the toilets on an hourly basis with air freshener. (Hainan Airlines, Canada, solo leisure, 9, 4)

A more tangible component of the staff – uniforms – also generates positive and negative comments. A solo traveler observed, '[the staff wore the m]ost attractive and impressive flight attendant uniforms' (Hainan Airlines, Canada, solo, 9, 5). Another passenger said, '[t]he attendant[s] of China Southern Airlines are beautiful and friendly, but they have the most ugly [sic] uniforms I . . . [have ever seen] in my past 10 years of international flights' (China Southern Airlines, China, family leisure, 5, 2).

Food and beverages

The food and beverage theme includes the concepts of food (1,131, 41%), nice (presentation) (501, 25%), meal (701, 30%), (food and beverages) served (323, 20%), and clean (tray) (306, 20%). Passenger reviews shared online are mainly related to taste, the number of options available, variety, quality assessments, size of portions, and availability of special meal options.

Positive adjectives linked with food are 'tasteful,' 'careful[ly] presented,' 'great,' 'perfect,' 'pleasant,' and 'quite pleasant.' Negative adjectives include 'horrible,' 'terrible,' 'mediocre,' and 'below average.' In addition, passengers shared online narratives about the drinks selection (i.e., tea, coffee, water, juices, beer, and wines).

A satisfied passenger wrote:

I thought the food generally was pretty good. I love that they give the option to pre-select a low calorie or fruit platter . . . for no [extra] cost. In addition, they set up a little spread in the back of the plane with all sorts of beverages and snacks so . . . [everyone] could help themselves at any time. They came around plenty of times with water and tea. [You have to

a]sk for [b]ing [s]hui or ice water because typically the Chinese prefer [their] water hot. (Hainan Airlines, US, family leisure, 9, food and beverages: 5).

A passenger unhappy with the food and beverages stated:

It was pretty amazing how they managed to serve food and drink to hundreds of people so quickly. Speaking of food, it was horrible. I was looking forward to having something better than what you get these days on airlines, but with some authentic Chinese flavor. Granted, horrible means merely below average in the context of airline food I think if they stepped up their game here, they could really stand out as an airline. (Hainan Airlines, US, solo, 9, 3)

Other passengers complained about the amount of food. One reviewer said, '[the f]ood is small [sic] and bad. I took a picture of one of my "sandwiches". It was [a] 6" bun with 2" x 2" [slice] of bologna. It was all dry bread' (China Eastern Airlines, US, solo, 1, 1).

The availability of special vegetarian options, vegan meals, or even halal food is also a topic mentioned in passengers' reviews. A satisfied client reported:

We bought some vegan food before leaving Sydney, but we finished . . . [it] all in Hong Kong. I told the crew I was wondering if they . . . [could give] us some vegan food, and she told me they had some extra vegan and vegetarian meals today, [so] lucky us, we . . . [could] have some. We . . . [were] so grateful for their great kindness and professionalism. (China Southern Airlines, Australia, couple, 9, 4)

Another passenger stated, '[our r]equests for [h]alal food [were] honored' (Air China, US, couple, 9, 5).

In-flight entertainment

The in-flight entertainment theme comprises the concepts of entertainment (684, 29%), movies (341, 21%), music (130, 15%), and aircraft (274, 19%). Passengers post online comments about a wide range of in-cabin entertainment, such as games, movies, television series, and in-flight connectivity (i.e., Wi-Fi). The reviews also include an assessment of equipment (e.g., personal television screens and headphones).

The reviewers described the array of in-flight entertainment offered. Regarding movies and television series, passengers wrote about the number of options available and opportunities for the staff to satisfy Western and Eastern clients. One individual said, '[t]he media in front of the seat included lots of entertainments [sic], including movies, music, games, journey maps[,] etc.' (Hainan Airlines, China, solo leisure; 9, in-flight entertainment: 5).

Another topic that stimulated comments is the in-flight entertainment equipment. A relevant review reads, '[t]he on-board entertainment system was upgraded with bigger screens, more intuitive user interface and more diverse contents' (China Southern Airlines, China, Solo leisure, 10, 5). Another comment states, 'the entertainment system . . . [is] from [the time of the] dinosaur[s]' (Air China, Hong Kong, solo leisure, 1, 2). A third passenger complained that '5 hrs [sic] into the flight I was told I could not listen to my music on [my] iPhone[.]' (China Southern Airlines, Australia, family, 9, 4).

Reviewers also commented about the Wi-Fi service. One individual stated, '[m]y biggest complaint about this flight is that there is no Wi[-]Fi service' (China Southern Airlines, Australia, family, 9, 4). An additional client noted, 'Internet [connectivity], even

[if] sometimes [it] slow[ed] down and overload[ed], was the most important service I need[ed] during the travel [sic]' (Hainan Airlines, US, solo, 9, 4).

Ground service

The ground service theme includes the concepts of security (130, 15%), check(-in or -out counter) (454, 24%), people (171, 16%), gate (177, 16%), luggage (336, 21%), airport (551, 26%), (time) arrived (384, 22%), and hotel (225, 18%). The narratives about this theme are mainly related to services provided inside airport terminals, such as check-in counter services, departure and arrival gates, staffing operations, and luggage handling.

Typical comments about check-in services are as follows. A review reads, '[regarding the] Guangzhou to Beijing return, both flights [were] on time and [the] service was good. I ... [could] use mobile check-in and passed security with [a] QR-code as well' (China Southern Airlines, China, business, 8, ground service: 5). One passenger wrote, 'Beijing to Seattle was the first long-haul flight with Hainan Airlines for me. The check-in procedure kept me waiting in line for half an hour. Only 3 counters opened for 250+ economy passengers' (Hainan Airlines, US, solo leisure, 9, 4).

Passengers on nonstop flights gave details about their experiences, including the following:

Because of the delay in Amsterdam I missed my connection flight from Guangzhou to Sydney, but the ground staff was already informed and every passenger received a ticket for the next available flight and was offered ... [a] stay at a nearby [h]otel to refresh themselves. (China Southern Airlines, Australia, business, 9, 5)

Another import ground service issue is luggage. A reviewer reported:

[I flew from] Guangzhou to San Francisco via Wuhan. I didn't realize it's a non-direct flight when I booked the ticket ... [the] first time. In my opinion, a stopover flight is a complicated thing, but my luggages [sic] ... [went] directly to San Francisco and transit [service] in Wuhan ... [was] efficient. The ground staff are helpful and patient. (China Southern Airlines, China, business, 8, 5)

Another passenger said:

Upon arriving at Manila only 2 out of [our] 10 luggage [pieces] arrived, a ground staff [member] spoke to us and after verifying our claim stub he told us that the remaining luggage ... [was] still at [sic] Beijing ... After inspecting our luggage ... we found out that 2 of our hard case spinner ... [bags were] broken. The luggage is almost brand new, [and] this ... [was] the only second time we [had] use[d] it ... [I]t will not break unless it[']s not properly handled. No apologies ... [were offered], [and] they said it[']s normal for a case to break. Again this is normal to them. (Air China, Canada, family leisure, 3, 1)

Value for money

The value for money theme includes the concepts of experience (707, 30%), tickets (242, 18%), value for money (422, 23%), price (278, 19%), and (way to) fly (647, 28%). An example of a positive value for money assessment is, '[a]dding up their competitive ticket pricing [confirmed that] it was great value for money' (China Eastern Airlines, the Netherlands, solo, 9, value for money: 5). One passenger stated, '[f]or the price I paid, it was remarkable value for money' (Hainan airlines, UK, solo leisure, 7, 5). A negative comment about value for money reads '[c]onsidering that I paid over \$1k [thousand] for

this economy ticket, this is one of the worst value for money I [have] ever had' (China Eastern Airlines, Singapore, solo leisure, 1, 1).

Discussion

To answer the first question (i.e., What are the main service quality attributes correlated with passengers' overall perceptions of airline experiences and intention to recommend Chinese airlines?), the first step comprised estimating the impact of Chinese airlines' service attributes on clients' overall satisfaction. The analyses also focused on these service quality dimensions' effects on passengers' intention to recommend based on online ratings data. The results reveal that all six service quality dimensions (i.e., seat comfort, cabin staff service, food and beverages, in-flight entertainment, ground service, and value for money) positively correlate with passengers' overall satisfaction. In addition, five dimensions affect clients' intention to recommend – the exception being in-flight entertainment.

The findings for in-flight entertainment are in accordance with Arasli et al.'s (2020) results but differ from those reported by Ban and Kim (2019), who found that in-flight entertainment was irrelevant in terms of explaining variations in overall satisfaction ratings. The present overall results agree with Ban and Kim (2019), Shadiyar et al. (2020), and Yakut et al.'s (2015) findings, confirming that value for money is the most important service attribute in all models. The second most important attribute for overall satisfaction is cabin staff service, while intention to recommend is more affected by ground service.

The current results extend previous research (e.g., Yakut et al., 2015) by revealing heterogeneous responses related to traveler type. The present research included estimating 8 regression models, namely, 2 for each of the 4 traveler types defined by Skytrax: solo leisure, couple leisure, family leisure, and business travelers. The objective was to answer the second research question (i.e., Does each attribute's impact vary according to traveler type?). The results for the overall satisfaction model indicate that the 6 attributes are important to 3 groups of travelers. The only exception is the variable of in-flight entertainment for the business group. In the intention to recommend model, 5 variables are statistically significant for the solo leisure group, but only 3 were confirmed for couple leisure, family leisure, and business travelers. All traveler types see value for money as the most important variable. In Yakut et al.'s (2015) study, value for money also proved to be the most influential attribute for business and economic class travelers.

The second most important variable according to traveler type is ground service for the solo and couple leisure groups and cabin staff service for family and business travelers. The dimensions of seat comfort and ground service have a higher impact on both overall satisfaction and intention to recommend for couples compared with these two dimensions' effect for other traveler types. This result supports Brochado et al.'s (2019) finding that couples value tangible components in tourism services. Cabin staff service, in turn, has a stronger impact on outcome variables for business travelers. Chatterjee (2019) suggests that cabin staff service's stronger effect on full-service versus low-cost airlines might be explained by a construal-based representation of traveler service.

The present study further conducted content analysis of online reviews to answer the third research question (i.e., What are the main narratives shared online by passengers that can be linked with each service quality dimension in relation to Chinese airlines?). Leximancer software functions and narrative analysis of online text reviews produced innovative results regarding each service quality dimensions' meaning for Chinese airline passengers. These clients place great value on the flights' schedule, takeoff, and landing while describing their in-flight experiences. The narratives reveal that seat comfort is determined by not only seat pitch and width but also amenities offered to enhance their comfort and the respect paid to their seating preferences.

Regarding cabin staff service, the analysis showed that passengers pay attention to both the staff's attitudes and ability to deal with unexpected events. Western passengers further consider the crew's language skills to be an important variable. For example, passengers complain when staff members lack English skills or when these professionals are perceived as borderline rude. Narratives about food and beverages talk about variety, quality, and portions. Airline clients also appreciate the availability of special meal options. Ground service is mainly linked with the airport terminal, including check-in counter services, departure and arrival gates, staff operations, and luggage handling.

The results for in-flight entertainment provide some fresh insights with reference to previous studies' findings (Brochado et al., 2019, 2019). Passengers value not only the equipment and options available but also opportunities to use their own equipment (i.e., tablets or smart phones) during the flight. In contrast to previous studies of airline traveler reviews using Leximancer (Brochado et al., 2019), the present narrative analysis highlighted the challenges airlines face in terms of satisfying both Western and Eastern clients, who exhibit different preferences for in-flight entertainment's content.

Conclusions

The above study sought to answer three research questions regarding passengers' perceptions of four main Chinese airlines' service quality. This research also explored market segmentation based on traveler type using both quantitative ratings (i.e., econometric analysis) and online reviews' narratives (i.e., content analysis).

Theoretical implications

This study's findings offer significant theoretical contributions. First, the results provide a deeper understanding of passengers' experiences with Chinese airline companies based on user-generated online content, that is, online ratings (i.e., based on econometric methods) and text reviews (i.e., based on Leximancer functions and narrative analysis). Second, this research extended previous studies' findings (e.g., Ban & Kim, 2019) by showing that the main determinants of service quality and intention to recommend Chinese airlines vary according to traveler type. The latter should prove to be an effective segmentation variable.

Last, the results add to Punel et al.'s (2019) work by providing further details about how passengers' expectations vary across different nationalities. The analysis of Web reviews using Leximancer confirmed the selected service quality dimensions' stability for Chinese airlines. However, subsequent narrative analysis revealed that Western and Eastern

passengers have contrasting needs in different dimensions, including staff members' language skills, food and beverages preferences, and in-flight entertainment options.

Managerial implications

These findings have managerial implications for Chinese airlines regarding understanding and confirming customers' needs and perceptions of service quality, which provide opportunities to improve passengers' experiences and strengthen their brand preference. In addition, the results have important connotations for dealing with customers' recommendations through user-generated online content.

First, Air China (2019), China Eastern Airlines (2019), China Southern Airlines (2019), and Airlines (2019), p. 2018 annual reports show that these companies are committed to developing an international strategy. However, international routes' passenger load factor and average revenue-passenger kilometers are below those of domestic routes. Thus, Chinese airlines must improve their ability to stimulate brand preference by increasing customers' satisfaction. Since the present study was based on ratings and reviews written by passengers from 62 countries, the results provide Chinese airlines a better understanding of international customers' perceptions of service quality and the determinants of their satisfaction. These results can be used to perform competitive benchmarking with each airlines' main competitors.

Second, perceptions of value for money is crucial for all types of travelers, as well as being positively related with overall satisfaction and intention to recommend. Given the heterogeneity found in different service quality attributes' contributions to explaining post-purchase behaviors, traveler type could prove to be an important market segmentation variable for airline companies. Because the content analysis identified in-flight core services as an important dimension, Skytrax might also consider adding this variable to its website's set of service quality attributes.

Limitations and avenues for future research

Finally, despite these significant theoretical and managerial implications, this study also suffered from some limitations that need to be considered when applying the findings. First, the data were extracted from the Skytrax website, and the reviews analyzed are in English, which indicates that the results may have limitations regarding Chinese passengers' preferences. Punel et al. (2019) found that airline service quality expectations vary worldwide, so future research could conduct content analysis of reviews written in Chinese.

The present study's results confirm that service quality perceptions and determinants of overall satisfaction and loyalty are heterogeneous when traveler type is considered. Additional studies should focus on identifying other market segmentation variables (e.g., occasions, nationality) and testing for heterogeneity of the dimensions of each segment based on the narratives shared online. Researchers may also want to study the coronavirus disease-19 pandemic's effect on reviews' narratives and airline service quality dimensions that were not considered in this study and that merit future research. Finally, the present results and those of previous scholars (Ban & Kim, 2019; Chatterjee, 2019; Shadiyar et al., 2020) highlight ground services' importance to airline service quality, so future studies could also focus on other research contexts such as Chinese airports.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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