OmniaScience

Journal of Industrial Engineering and Management
JIEM, 2022 – 15(4): 587-613 – Online ISSN: 2013-0953 – Print ISSN: 2013-8423
https://doi.org/10.3926/jiem.3893

How Do Full-Service Carriers and Low-Cost Carriers Passengers Perceived Service Dimensions, Passengers' Satisfaction, and Loyalty Differently? An Empirical Study

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Received: January 2022
Accepted: August 2022

Abstract:

Purpose: In this study, group differences between full-service carriers (FSC) and low-cost carriers (LCC) in loyalty constructs are investigated, revealing the relationship between service quality and loyalty. This work focuses on five dimensions, including tangibility, empathy, assurance, responsiveness, and reliability, constitute service quality.

Design/methodology/approach: 248 questionnaires were collected in the first half of 2019. The antecedents of customer loyalty are explored, and the group differences between FSC and LCC are analyzed. For assessing the path model with the consideration of group variance, the Partial Least Squares Multiple Group Analysis (PLS-MGA) was adopted to analyze the differences of the estimated inter-group coefficient.

Findings: Our findings suggest that service assurance, service empathy, and service reliability positively impact the value perceived. The impact of service empathy on customer satisfaction in FSC is significantly diverse from LCC. Several suggestions are provided to FSC and LCC on improving their services in view of passengers' wants and interests.

Originality/value: With the data collected at the Hong Kong International Airport (HKIA), this study examined the relationships among service quality, perceived value, customer satisfaction, and customer loyalty and divided service quality into five dimensions. The findings showed that assurance, empathy, and reliability of service quality positively affect the value perceived, and the effects of responsiveness and tangibility of service quality on perceived value are insignificant. Among the five aspects of service quality, assurance, reliability, responsiveness, and tangibility of the service quality are the pre-conditions of customer satisfaction. However, only the reliability of service is the antecedent of customer loyalty. Besides, the value perceived positively affects customers to be satisfactory and loyal. Furthermore, satisfaction degree also significantly influences the degree of customers' loyalty. As to the role of airline types, the sole effect is on customers' satisfaction is service empathy, with a significant difference between FSC and LCC.

Keywords: PLS-MGA, service quality, perceived value, customer satisfaction, customer loyalty

To cite this article:

Chow, Y.T.H., Li, C.H., Mak, S.L., Li, S.P., Tong, P.S., Fan, C.K., & Keung, K.L. (2022). How do full-service carriers and low-cost carriers passengers perceived service dimensions, passengers' satisfaction, and loyalty differently? An empirical study. *Journal of Industrial Engineering and Management*, 15(4), 587-613. https://doi.org/10.3926/jiem.3893

1. Introduction

Competition in the airline field is becoming increasingly severe. Airlines should not just focus on customer satisfaction, but develop a competitive advantage as well, so as to increase customer retention rate, customer loyalty and to generate substantial profits (Batouei, Iranmanesh, Nikbin & Hyun, 2019; Lee, Chen & Trappey, 2019; Ng, Lee, Zhang & Keung, 2020). Full-Service Carriers (FSC) and Low-Cost Carriers (LCC) adopt dissimilar strategies; LCC highlights low prices and provides no-frills service (Suk, Kim & Kim, 2020). In contrast, FSC provides service of different levels and believes that professional service helps boost customer satisfaction and loyalty. Ticket prices However, required sales effort towards loyal customers is much lower than to first-time customers in a sustainable competition for the market (Kunhikrishnan & Srinivasan, 2019; Pal & Chunchu, 2019; Patnaik, Agarwal, Panda & Bhuyan, 2020; Reichheld & Teal, 2001), and sustainable competitive advantages should go beyond price competitions for the FSC-LCC competition (Akamavi, Mohamed, Pellmann & Xu, 2015; Rajaguru, 2016). Chiou and Chen (2012) conclude that the failure in delivering high-quality service could not be compensated with the low-fare strategy of LCC. An appropriate degree of service quality will improve the degree of satisfaction of customers (Ng, Lee, Chan, Chen & Qin, 2020; Ng, Lee, Chan & Qin, 2017), bolstering loyalty as well as shifting customer tendency from favorable purchase to returning purchase commitment (Chen, Zhang, Chu & Yan, 2019; Oliver, 2014). The formation of customer loyalty and satisfaction is especially significant for airline industries to generate revenue, improve profitability and gain customer base (Ahrholdt, Gudergan & Ringle, 2019; Brady, Voorhees & Brusco, 2012; Deng, Zhao, Yang, Li, Li & Liu, 2018; Givoni & Chen, 2017; Liang & Shiau, 2018; Yaylali, Çelik & Dilek, 2016). Thus, this study explores the influence of service quality on customer loyalty to help airlines evaluate passengers' preferences, understand the factors affecting their ticket purchase decisions, and reinforce service quality management.

Parasuraman, Zeithaml and Berry (1985) divided the service quality into service tangibility, empathy, assurance, responsiveness, and reliability, and their definitions are as follows:

1. Service tangibility can be described as the physical facilities in-flight such as the tools and equipment for providing services, in-flight entertainment (newspapers or movies), and food and beverage service.
2. Service empathy is associated with the ability to understand and handle individual needs, such as providing meals via the pre-order system and arranging seats that passengers prefer.
3. Service assurance is the capability of employees to encourage passengers' trust and confidence, such as employee knowledge and courtesy.
4. Service responsiveness means that the employees are ready and willing to help passengers tackle service problems (cancellation of flight and loss of baggage) and provide likely prompt reply or solution.
5. Service reliability includes the ability to perform the promised services accurately and unfailingly, for instance, convenience and accuracy in reservation and ticketing, accuracy in accounting, and punctuality of boarding. Flight safety is also a crucial factor in in-service reliability.

Some researchers have confirmed that service quality can positively affect customer satisfaction (Hu & Di Paolo, 2009; Kuo, Wu & Deng, 2009; Lee, Ng, Chan, Choy, Tai & Choi, 2018; Van den Berg, Kroesen & Chorus, 2020;

Yilmaz & Ari, 2017) and customer loyalty (Makanyeza & Chikazhe, 2017). However, the impact of each dimension of service quality is not conclusive (Zheng, Xia, Li, Li & Liu, 2021). For example, service reliability is regarded as the most influential determinant of customer satisfaction in some researchprojects (Mittal & Lassar, 1998), but there is also proof that it cannot affect customer satisfaction (Kitapci, Dortyol, Yaman & Gulmez, 2013). Additionally, the empathy factor has a non-significant effect on customer satisfaction, as Leong, Hew, Lee and Ooi (2015) found. In contrast, Rahman, Hasan and Mia (2017)'s research suggested that there is a significant positive correlation between empathy and customer satisfaction. The impact of all dimensions of service quality on the satisfaction and loyalty of customers is worth examining (Fan, Zheng & Li, 2022; Xia, Zheng, Huang & Liu, 2021; Zhang, Zheng, Peng, He, Lee & Tang, 2022).

Moreover, the relationship between service quality and customers' behaviors (e.g., customer satisfaction and customer loyalty) between the two types of airlines often yields conflicting results in previous researches. For instance, Chiou and Chen (2010) suggested that improving service quality alone without providing a low fare would not increase customer satisfaction and return rates since LCC customers already expect to receive no-frills service. Kos-Koklic, Kukar-Kinney and Vegelj (2017) also found that the extent of customer satisfaction with an LCC was decided to a lesser extent by the service quality. Compared with FSC, thus, the LCC passengers have negligible expectations on service quality, while both service quality and perceived value drive the recommendation behavior of FSC consumers for money (Rajaguru, 2016). Nevertheless, Leong et al. (2015) suggested that there was no significant distinction between FSC and LCC in terms of the impact of service quality. Loureiro and Fialho (2017) also showed that there were no significant differences between the two types of airlines. Therefore, it is worth exploring the differences between the two types of airlines regarding service quality on satisfaction and loyalty of the customer, with the impact of each dimension of service quality considered. Our study is original in theoretical aspects that enable us to deal with the following relevant research issues:

1. Each dimension of service quality have the same impact on the formation of customer loyalty?
2. What role does the type of airlines play in the influence of the service quality on the formation of customer loyalty?

This paper is organized as follow: **Section 2** provides the theoretical background and the proposed hypotheses. **Section 3** presents the data collection process and variable measurements. The custom-build questionnaire's reliability and validity analysis and the hypotheses testing results are shown in **Section 4**. **Section 5** provides discussions of the results. The conclusions, limitations of this study, and future work are presented in **Section 6**.

2. Theoretical Background and Hypotheses Development

2.1. Service Quality and Perceived Value

Perceived value is associated with the difference between sacrifices (costs) and receivables in terms of the customers' needs and wants (Lapierre, 2000). Perceived value can be increased when a high-quality product or service is obtained with less money (Kuo et al., 2009). The service quality perceived by customers serves as a key performance indicator (KPI) of a company (Forster, Hergeth, Naujoks, Krems & Keinath, 2020; Izogo, 2017), and is also an important indicator to measure whether the price is worth the money. Therefore, the higher the service quality, the more value the customers gain. Hussain, Al Nasser and Hussain (2015), Kuo et al. (2009) and Lee et al. (2018) have provided evidence to support that service quality can create a positive influence on perceived value.

Service quality can be divided into five dimensions. Mittal and Lassar (1998) described service reliability as a technique quality, while service assurance, empathy, responsiveness, and tangibility belong to functional quality. Service reliability is always deemed to be the most influential factor of service quality. Hence, good service reliability means that the customers can receive service with high accuracy and convenience, which can increase the perceived value of customers (Risitano, Romano & Sorrentino, 2020). Service tangibility affects the practical responses of customers in a more direct way (De Vos, 2019). According to environmental psychology, an excellent tangible physical environment is crucial in producing excitement, pleasure, and relaxation for customers (Chen, Li & Liu, 2019; Woo, 2019), which can help increase the perceived value. Service empathy brings individualized attention to the customers (Mittal & Lassar, 1998). Service assurance highlights the knowledge and courtesy of

employees and the encouraging trust and confidence (Izogo, 2017). Service responsiveness emphasises that prompt replies or solutions can be provided when needed and can mitigate the bad feelings of customers, especially when they are facing urgent problems.

This paper, therefore, proposes that each dimension of service quality has a positive impact on perceived value:

> ***H1:*** *Service assurance (H1a), service empathy (H1b), service reliability (H1c), service responsiveness (H1d), and service tangibility (H1e) positively influence perceived value.*

2.2. Service Quality and Customer Satisfaction

Customer satisfaction is reflected by the cognitive or affective reaction to the received service based on the customer's experience (Abenoza, Cats & Susilo, 2019). It can be generated when the perceived service performance exceeds expectations, and implies the level that customers like or dislike the service they have experienced (Meesala & Paul, 2018; Punel, Al Hajj Hassan & Ermagun, 2019). Service quality is an essential mediator of airline passengers' satisfaction (Shah, Syed, Imam & Raza, 2020).

The five dimensions belonging to service quality can influence customer satisfaction positively. Due to employee knowledge and courtesy, service assurance can make a good impression on customers and positively affect an airline's evaluation (Skarin, Olsson, Friman & Wästlund, 2019). Additional efforts coupled with corresponding actions should be made to understand and fulfill customers' individualized needs and wants. Furthermore, service empathy, which is defined as the ability to satisfy customized requirements, can win customers' affection and improve their satisfaction level. Service reliability is associated with the judgment of the service's core aspects and is identified as the most crucial driver of customer satisfaction (Shiwakoti, Jiang & Nguyen, 2021). Service responsiveness ensures that customers can enjoy the service without the need to worry about any possible adverse effects stemming from unforeseeable problems, as employees are expected to respond to customer's problems quickly. Service responsiveness can affect customers' cognition of the service performance positively. The positive impact of the pleasant physical environment may help reduce negative affective responses due to the poor quality of other aspects (Park, Lee & Nicolau, 2020). As a result, tangibility is a critical factor in improving customer satisfaction.

Some researchers studied the impact of each dimension of service quality on customer satisfaction. Clemes, Gan, Kao and Choong (2008) showed the positive impact of service assurance on service quality, positively influencing customer satisfaction. Chen, Li et al. (2019) suggested that both airline tangibles and terminal tangibles had an active influence on customer satisfaction and re-purchase intention. Kitapci et al. (2013) discovered that service empathy, responsiveness, assurance, and tangibility actively affect consumers' contentment. Rahman et al. (2017) showed that these dimensions, except service assurance, positively correlated with consumer satisfaction. Meesala and Paul (2018) held that service reliability and responsiveness also impacted customer satisfaction. Yang and Chao (2017) suggested that the concept of customer satisfaction towards business firms can also apply to customer satisfaction in the airfreight forwarding industry. Hence, the following hypothesis is proposed:

> ***H2:*** *Service assurance (H2a), service empathy (H2b), service reliability (H2c), service responsiveness (H2d), and service tangibility (H2e) are positively connected with customer satisfaction.*

2.3. Service Quality and Customer Loyalty

When facing intense competition, obtaining customer satisfaction can only be considered as the baseline and should not be the goal for the continuous development of a company; instead, more effort should be put into achieving customer loyalty (Farooq, Salam, Fayolle, Jaafar & Ayupp, 2018). A loyal customer can be identified as an individual who willingly returns to purchase the service (Meesala & Paul, 2018). Service quality is a critical indicator of companies' performance (Izogo, 2017) and is judged on airline resources and skills (Leon & Martín, 2020). Such resources can help a company develop abilities and comparative advantage, which are difficult to imitate (Munoz, Laniado & Córdoba, 2020). Therefore, achieving a satisfactory level of service quality can promote customer retention and build customer loyalty with unique, attractive aspects of a company.

According to Leong et al. (2015), service reliability, tangibility, and responsiveness can positively influence customer loyalty. Customers who receive reliable services are more likely to return and give recommendations to others (Izogo, 2017). The tangibles can help generate feelings of excitement and pleasure, which is crucial in developing customers' re-purchase intentions and willingness to recommend (Wakefield & Blodgett, 1999). Prompt replies and solutions can reduce customers' worry about something that cannot be dealt with effectively create confidence in the companyin which by increasing re-purchase intentions. Besides, understanding and fulfilling customers' individualised needs and wants is essential to develop a unique emotional bonding between customers and airline companies (Laming & Mason, 2014). Service assurance can inspire customers' trust and confidence towards the company, fostering more returning customers. Therefore, this paper proposes the following hypothesis:

H3: *Service assurance (H3a), service empathy (H3b), service reliability (H3c), service responsiveness (H3d), and service tangibility (H3e) positively affect customer loyalty.*

2.4. Perceived Value and Customer Satisfaction

Customers' satisfaction is "customers" judgement on service experience, which is closely associated with the sacrifices and benefits (i.e., perceived value). Perceived value refers to customers assessing the value and equitableness of products/services considering expense-and-benefit (Jeng & Lo, 2019). Hence, a higher perceived value means the service is worth the price paid and can lead to a better service experience. Several studies empirically implied that perceived value has a strong association with customer satisfaction (Munoz & Laniado, 2021). Hu and Di Paolo (2009) found that excellent customers' value could lead to higher customer satisfaction, positively influencing the firms' image and resulting in a higher customer returning rate. Such that, a higher perceived value can increase customer satisfaction.

Customers make their purchase decision based on the trade-off between gain and loss. Consequently, the higher the perceived value is, the larger the re-purchase intention (Huang & Liu, 2020; Mas-Machuca, Marimon & Jaca, 2021). Chen, Zhang, Chu and Yan (2019) and Chen, Li and Liu (2019) found that perceived value and customer satisfaction could impose an influence on post-purchase intention directly and positively. Rajaguru (2016) supported that perceived value, as a critical indicator, played an important role in behavioral intention and customer satisfaction. Therefore, it is worth studying how perceived value is connected with perceived service quality and further linked to customer satisfaction and loyalty. In this regard, the following hypothesis is proposed:

H4: *Perceived value positively influences customer satisfaction.*

H5: *Perceived value positively influences customer loyalty.*

2.5. Customer Satisfaction and Customer Loyalty

Customer satisfaction means the overall subjective rating and comments received after the post-purchase assessment of products or services (Kim & Lee, 2011). It is a critical factor that most businesses, particularly in the aviation field, would like to achieve (Munusamy & Chelliah, 2011). A higher level of customer satisfaction indicates that the airline has a higher customer retention rate and a greater possibility of acquiring potential new customers (Munoz & Laniado, 2021).

Furthermore, satisfaction is found to be an antecedent of loyalty for the customer (Forgas, Moliner, Sánchez & Palau, 2010; Lee et al., 2018). Kuo et al. (2009) discovered that there is an evident and positive connection between customer satisfaction and post-purchase intention. Customer satisfaction positively influences the customer's will to return and their intention to recommend service (Kos-Koklic et al., 2017; Ng, Chen, Lee, Jiao & Yang, 2021). El-Adly (2019) found that customers' behavioural inclinations could be affected positively by increased satisfaction. Airlines will attempt to set up different customer relationship management systems to increase their loyal customer base within the aviation industry. Satisfied passengers tend to purchase the service from their favourite airlines (Lee et al., 2018; Oliver, 2014). On other transport modes such as high-speed rails, customer satisfaction could also be seen in maintaining the customers' loyalty (Chou, Lu & Chang, 2014; Yilmaz & Ari, 2017). It is a likely hypothesis that:

H6: *For customers satisfaction creates a positive influence on loyalty.*

2.6. Types of Airlines

There are notable differences in the in-flight service provided by FSC and LCC (Huo, Keung, Lee, Ng & Li, 2020; Keung, Lee & Ji, 2021; Keung, Lee, Ng & Yeung, 2018; Ng, Keung, Lee & Chow, 2020; Ng, Lee, Zhang et al., 2020). FSC provides a full complementary service, while LCC offers basic flight service with paid add-on services (Chiou & Chen, 2010). Passengers' expectations of the service of FSC and LCC could be different. Intuitively, customers' wants and needs are likely to differ depending on their choice of type of air carriers (Lee et al., 2018; Lin & Huang, 2015), and the operating strategies used by FSC and LCC will affect customers' attitudes accordingly (Kim & Lee, 2011). Therefore, variances between the two groups in the formation of customer loyalty can be expected.

LCC relies heavily on the price-to-value ratio, and keeping expenses low is a primary driver for LCC passengers. However, FSC survives on a balance between value for money and the quality of service (Ng, Lee, Chan & Lv, 2018; Rajaguru, 2016). Compared with LCC passengers, FSC customers are more concerned about the service quality and tend to hold higher expectations. In other words, they tend to enjoy the services provided by the FSC. Meanwhile, the customers' final attitude depends on whether their expectations are met. Service quality may positively influence perceived value, customer satisfaction, and customer loyalty for passengers between FSC and LCC airline.

Compared with customers of FSC, consumers of LCC are more sensitive toward value for money, and they have lower expectations of the quality of service (Rajaguru, 2016). Customers of LCC expect basic service only when they decide to choose to fly with an LCC. As a result, it is not viable to increase passenger numbers by improving service quality alone without offering a low fare (Avogadro, Malighetti, Redondi & Salanti, 2021). Thus, customer satisfaction for different groups of customers has different drivers, with perceived value having different effects on customer satisfaction and customer loyalty between two types of airlines.

FSC passengers' will return and recommend based on the value for money and the quality of service they have received. However, while low fare helps LCC attract customers, it does not necessarily result in the customer's loyalty (Chou, 2015; Shen & Yahya, 2021). Rajaguru (2016) showed that it is unlikely for LCC passengers to recommend the low-cost airline to other consumers. Since LCC customers' primary concern is the cost-effectiveness of the service provided, it is hard to develop loyalty to a brand (Fageda, Jiménez & Perdiguero, 2011; Soyk, Ringbeck & Spinler, 2021). Furthermore, Kos-Koklic et al. (2017) also found that satisfaction may have different effects on fostering repeat customers in different age groups. Therefore, customer satisfaction from the different types of airlines is likely to create a varied type of impact on customer loyalty.

Consequently, the hypotheses are proposed as follow:

H7a: *The influence of service assurance on perceived value is subject to the type of airline.*

H7b: *The influence of service empathy on perceived value is subject to the type of airline.*

H7c: *The influence of service reliability on perceived value is subject to the type of airline.*

H7e: *The influence of service responsiveness on perceived value is subject to the type of airline.*

H7f: *The influence of service tangibility on perceived value is subject to the type of airline.*

H7g: *The influence of service assurance on customer satisfaction is subject to the type of airline.*

H7h: *The influence of service empathy on customer satisfaction is subject to the type of airline.*

H7i: *The influence of service reliability on customer satisfaction is subject to the type of airline.*

H7j: *The influence of service responsiveness on customer satisfaction is subject to the type of airline.*

H7k: *The influence of service tangibility on customer satisfaction is subject to the type of airline.*

H7l: *The influence of service assurance on customer loyalty is subject to the type of airline.*

H7m: *The influence of service empathy on customer loyalty is subject to the type of airline.*

H7n: *The influence of service reliability on customer loyalty is subject to the type of airline.*

H7o: *The influence of service responsiveness on customer loyalty is subject to the type of airline.*

H7p: *The influence of service tangibility on customer loyalty is subject to the type of airline.*

Figure 1 shows the proposed theoretical model and hypotheses.

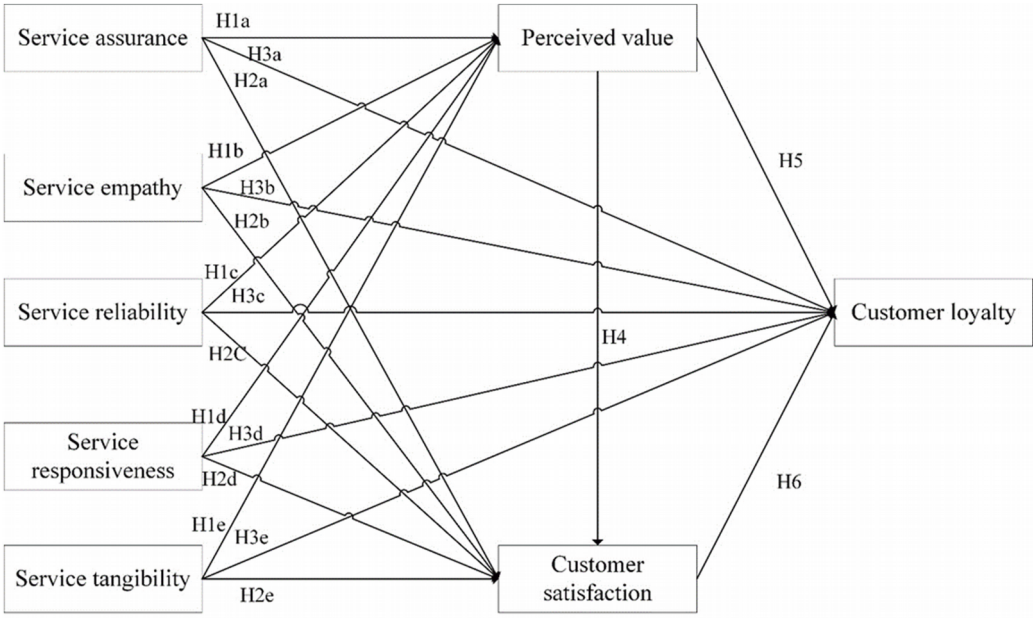

Figure 1. Theoretical model and hypotheses

3. Methodology

3.1. Partial Least Squares Structural Equation Modeling

As an alternative for the Covariance-based Structural Equation Modelling, the PLS-SEM provides more flexibility for data requirements. It can reliably assess very complex models using only bits of observations instead of imposing distributional assumptions on the data (Sarstedt, Ringle, Smith, Reams & Hair Jr, 2014). The benefit of PLS-SEM is that it offers a prediction model assessment and is fit for use in prediction-oriented modeling. Hence, PLS-SEM performs well even when the sample size given is small. Moreover, the Partial Least Squares Multi-Group Analysis (PLS-MGA) is a non-parametric significance test method based on PLS-SEM bootstrapping results and can be used to detect differences in group-specific results. Therefore, the relationship between service quality and customer loyalty can be examined by PLS-SEM and deployed for investigating group differences between FSC and LCC. The SmartPLS version three was adopted in the analysis (Ringle, Wende & Becker, 2015).

3.2. Data Collection

The survey was conducted at the Ground Transportation Centre (GTC) of the Hong Kong International Airport (HKIA) from January 2019 to June 2019. The location is directly connected to the arrival hall located on 5/F of Terminal 1, and departure passengers would usually alight at departure hall drop-off only bus stop, located on 7/F of Terminal 1. Only arrival passengers who declared they have just taken a flight to Hong Kong are invited to participate in the survey. For each round of the field study, the same set of surveys were utilised, and the same type of passengers (either FSC or LCC passengers) were invited for the study. 300 questionnaires were collected, and all subjects were voluntary and anonymous. After filtering out the surveys with missing data and incomplete responses, 248 surveys were valid and qualified for analysis. The raw response rate was 82.7% (248/300).

Table 1 reports the descriptive statistics of respondents. The proportion of males is 61.29%, while that of females is 38.71%. Most of the respondents are aged between 20 and 40 and with "Leisure" as their traveling purpose. About two-thirds of the respondents hold a bachelor's degree. There are 117 FSC passengers (47.18%) and 131 LCC (52.82%) passengers.

Attributes	Total sample (N = 248)		FSC Passengers (N = 117, 47.18% of total sample)		LCC Passengers (N = 131, 52.82% of total sample)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Gender						
Male	152	61.29%	67	57.26%	85	64.89%
Female	96	38.71%	50	42.74%	46	35.11%
Age						
20 or below	38	15.32%	20	17.09%	18	13.74%
21-30	151	60.89%	65	55.56%	86	65.65%
31-40	43	17.34%	26	22.22%	17	12.98%
41-50	6	2.42%	2	1.71%	4	3.05%
51-60	5	2.02%	0	0.00%	5	3.82%
61 or above	5	2.02%	4	3.42%	1	0.76%
Education level						
Secondary School or below	40	16.13%	23	19.66%	17	12.98%
Associate Degree / Higher Diploma	40	18.55%	24	20.51%	22	16.79%
Bachelor's degree	146	58.87%	62	52.99%	84	64.12%
Postgraduate Degree or above	16	6.45%	8	6.84%	8	6.11%
Travel Purpose						
Business	18	7.26%	13	11.11%	5	3.82%
Leisure	215	86.89%	99	84.62%	116	88.55%
Study tour/academic conference	15	6.05%	5	4.27%	10	7.63%

Freq.: Frequency; Percent: Percentage (%)

Table 1. Respondents' characteristics (N=248)

3.3. Measurements

A multi-item measurement scale – 7-point Likert scale (1 means strongly disagree, and 7 refers to strongly agree) – was used.

Service quality is measured by the following five aspects: assurance (three items), empathy (two items), reliability (three items), responsiveness (three items), and tangibility of service (two items). The measurement of each dimension is built on the work of Parasuraman et al. (1985), Kim and Lee (2011) and Rajaguru (2016). The perceived value of customers is related to their needs and wants and can be defined as the difference between the sacrifices (costs) and the receivables (Lapierre, 2000). The perceived value of customers is measurable by two items (Rajaguru, 2016). Customer satisfaction is essential for customer retention and is closely related to a company's profits, and it is also measured by two items (Kim & Lee, 2011). Customer loyalty can be indicated by two kinds of behaviors: willingness to return and recommend the carrier to other customers (Yang & Peterson, 2004). Therefore, customer loyalty is measured by these two aspects with two items.

4. Results

4.1. Reliability and Validity Analysis

Variables		Standardised factor loading
Customer Loyalty	LY1: I always and am willing to recommend airline X to my friends, family members and relatives.	0.943
	LY2: I intent to re-purchase air transport from airline X in my next journey.	0.942
Customer satisfaction	CS1: I am satisfied with the overall service performance of airline X.	0.926
	CS2: The service provided by airline X fulfils my needs and wants	0.926
Perceived value	PV1: I am satisfied with the services provided by airline X, and it is worth to pay money, time and effort.	0.905
	PV2: The ticket price is fair with regards to the service.	0.856
Service assurance	SA1: The ground staff and cabin crew of airline X are courteous with me.	0.882
	SA2: The ground staff and cabin crew of airline X are confident to answer my queries.	0.824
	SA3: Employees of airline X deliver their airline service pledge.	0.702
Service empathy	SE1: The ground staff and cabin crew of airline X always understand my needs and wants.	0.914
	SE2: Employees of the airline are able to provide customised service.	0.926
Service reliability	SReli1: I think that error-free service is important to airline X.	0.832
	SReli2: The solution provided airline X is timely and effectively.	0.784
	SReli3: Airline X has a standardised service anytime.	0.856
Service responsiveness	SRespon1: The ground staff and cabin crew of airline X are helpful.	0.864
	SRespon2: The ground staff and cabin crew of airline X offer a timely respond and service to my request.	0.895
	SRespon3: Airline X provides an immediate follow-up action to my complaint.	0.710
Service tangibility	ST1: Airline X provides comfortable and clean cabin environment and seats.	0.894
	ST2: Airline X provides updated in-flight recreation facilities.	0.861

Table 2. Results and measurement of the confirmatory factor analysis

	1	2	3	4	5	6	7	8
1. Customer satisfaction								
2. Customer loyalty	0.832							
3. Perceived value	0.838	0.747						
4. Service assurance	0.828	0.495	0.59					
5. Service empathy	0.681	0.551	0.696	0.605				
6. Service reliability	0.862	0.789	0.672	0.609	0.711			
7. Service responsiveness	0.854	0.603	0.576	0.879	0.669	0.820		
8. Service tangibility	0.911	0.697	0.636	0.876	0.726	0.991	0.905	

Table 3. Heterotrait-monotrait ratio of correlations HTMT

The measured items, including the standardized factor loading, the Cronbach's alpha (α), the Composite Reliability (CR), and the Average Variance Extracted (AVE), constitute the measurement reliability of the study. The acceptance criteria are stated as follows: Standardised factor loading greater than 0.700; α higher than 0.700; CR greater than 0.800 and AVE higher than 0.500. The results and measurements of the confirmatory factor analysis are presented in Table 2. The standardized factor loading changes from 0.702 to 0.943, α ranges from 0.703 to 0.874, CR varies between 0.847 and 0.941, and AVE presents the value between 0.650 and 0.888. The Fornell-Larcker's method (Fornell & Larcker, 1981) has been criticized on detecting discriminant validity. The Heterotrait-monotrait ratio of correlations (HTMT) offers a better evaluation of the detection of discriminant criteria (Henseler, Ringle & Sarstedt, 2015). In Table 3, the results of the HTMT matrix under bootstrapping method are less than 1, which indicates that every construct is distinct from other constructs. and reveals the discriminant validity concerning each concept at the item level. The correlations of the latent variables loaded of higher value than other constructs. The collinearity among constructs, the in-sample explanatory power, blindfolding-based cross-validated redundancy measures, the model's out-of-sample predictive power are evaluated, statistical significance of the paths; coefficients and the relevance of paths' coefficients that are within the suggested range provided by Marin-Garcia and Alfalla-Luque (2019). Therefore, the proposed model is valid and reliable with a good fit (Carrión, Nitzl & Roldán, 2017; Hair, Risher, Sarstedt & Ringle, 2019; Henseler, Ringle & Sinkovics, 2009; Sanchez-Franco, Cepeda-Carrion & Roldán, 2019; Shmueli, Ray, Velasquez-Estrada & Chatla, 2016).

4.2. Hypotheses Testing Using Non-Discriminated Sample

The proposed model with the non-discriminated sample was evaluated, and the estimated path coefficient, Standardised beta coefficients (β), T-statistic, and p-value are presented in Figure 2 and Table 4. Following Huang and Shiau (2017), the fitness of the PLS-SEM model was evaluated using the Standardised Root Mean Residual (SRMR). The value of SRMR was 0.072, which is less than 0.1, which indicates a good fit.

Service assurance (β=0.187, p<0.05), service empathy (β=0.321, p<0.01), and service reliability (β=0.261, p<0.05) positively related to perceived values. However, the effects of service responsiveness and service tangibility on perceived value are not significant. H1a, H1b, and H1c are supported, while H1d and H1e are not supported. Service assurance (β=0.220, p<0.05), service reliability (β=0.239, p<0.05), service responsiveness (β=0.166, p<0.05) and service tangibility (β=0.124, p<0.05) positively influence satisfaction degree of customers, whereas the impact of service empathy is not significant. Therefore, H2a, H2c, H2d, and H2e are evidenced except for H2b. Concerning the direct relationship among five dimensions of service quality and customer loyalty, only service reliability (β=0.201, p<0.05) has a significant positive impact on customer loyalty, supporting H3c; H3a, H3b, H3d, and H3e are not supported. The effects of perceived value on customer satisfaction (β=0.297, p<0.01) and customer loyalty (β=0.160, p<0.05) are significantly positive, providing support for H4 and H5. Customer satisfaction (β=0.595, p<0.01) is related to customer loyalty, supporting H6.

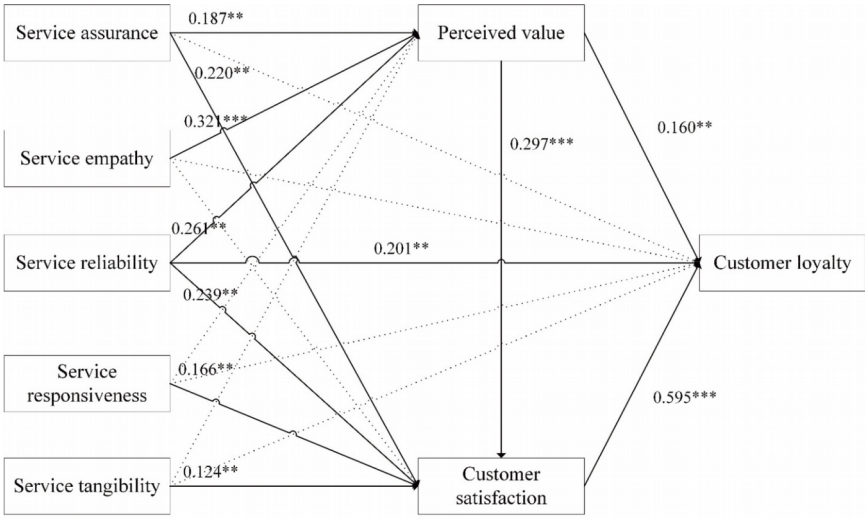

Figure 2. PLS-SEM result of structural equation model with non-discriminated sample

Hypotheses	Path	β	T-statistic	*p*/Sig.	Result
H1a	Service assurance → perceived value	0.187	2.208	<0.05	Accepted
H1b	Service empathy → perceived value	0.321	4.125	<0.01	Accepted
H1c	Service reliability → perceived value	0.261	2.945	<0.05	Accepted
H1d	Service responsiveness → perceived value	-0.029	0.305	N.S.	Rejected
H1e	Service tangibility → perceived value	-0.005	0.062	N.S.	Rejected
H2a	Service assurance → customer satisfaction	0.220	3.052	<0.05	Accepted
H2b	Service empathy → customer satisfaction	0.011	0.170	N.S.	Rejected
H2c	Service reliability → customer satisfaction	0.239	3.384	<0.05	Accepted
H2d	Service responsiveness → customer satisfaction	0.166	2.247	<0.05	Accepted
H2e	Service tangibility → customer satisfaction	0.124	1.986	<0.05	Accepted
H3a	Service assurance → customer loyalty	-0.062	0.943	N.S.	Rejected
H3b	Service empathy → customer loyalty	0.005	0.073	N.S.	Rejected
H3c	Service reliability → customer loyalty	0.201	2.735	<0.05	Accepted
H3d	Service responsiveness → customer loyalty	0.020	0.272	N.S.	Rejected
H3e	Service tangibility → customer loyalty	-0.056	1.986	N.S.	Rejected
H4	Perceived value → customer satisfaction	0.297	6.047	<0.01	Accepted
H5	Perceived value → customer loyalty	0.160	2.460	<0.05	Accepted
H6	Customer satisfaction → customer loyalty	0.595	6.992	<0.01	Accepted

Note – Sig.: Significance, N.S.: Not Significant

Table 4. Summary of the hypothesis testing results for the airline industry in Hong Kong

Service assurance (β=0.187, p<0.05), service empathy (β=0.321, p<0.01), and service reliability (β=0.261, p<0.05) positively related to perceived values. However, the effects of service responsiveness and service tangibility on perceived value are not significant. H1a, H1b, and H1c are supported, while H1d and H1e are not supported. Service assurance (β=0.220, p<0.05), service reliability (β=0.239, p<0.05), service responsiveness (β=0.166, p<0.05) and service tangibility (β=0.124, p<0.05) positively influence satisfaction degree of customers, whereas the impact of service empathy is not significant. Therefore, H2a, H2c, H2d, and H2e are evidenced except for H2b. Concerning the direct relationship among five dimensions of service quality and customer loyalty, only service reliability (β=0.201, p<0.05) has a significant positive impact on customer loyalty, supporting H3c; H3a, H3b, H3d, and H3e are not supported. The effects of perceived value on customer satisfaction (β=0.297, p<0.01) and customer loyalty (β=0.160, p<0.05) are significantly positive, providing support for H4 and H5. Customer satisfaction (β=0.595, p<0.01) is related to customer loyalty, supporting H6.

4.3. Discriminated Sample by the Types of Airlines

The sample is divided into two groups: FSC and LCC. Partial Least Squares-based Multi-Group Analysis (PLS-MGA) was used to analyze the group difference (Carrión et al., 2017; Henseler, 2012; Marin-Garcia & Alfalla-Luque, 2019). The PLS-MGA was adopted with bootstrapping method with the sub-samples of 500. Table 5 presents standardized coefficient, standard deviation, significant level, and path results for the group of FSC and the group of LCC.

4.3.1. Structural Equation Modelling Considering Full-Service Carrier Only

Figure 3 presents the path analysis of the FSC group. The effects of service assurance (β=0.297, p<0.05) and service empathy (β=0.314, p<0.05) on perceived value are positive and significant, which support H1a and H1b. However, the effects of service reliability, service responsiveness, and service tangibility on perceived value are

non-significant. Hence H1c, H1d, and H1e are not supported. The direct effects of the five dimensions of service quality on customer loyalty are all negligible, so H3a, H3b, H3c, H3d, and H3e should be rejected.

Hyp.	Path	FSC				LCC			
		β	S.D.	*p*/Sig.	Result	β	S.D.	*p*/Sig.	Result
H1a	Service assurance → perceived value	0.297	0.15	<0.05	Accepted	0.176	0.107	N.S.	Rejected
H1b	Service empathy → perceived value	0.314	0.143	<0.05	Accepted	0.356	0.082	<0.01	Accepted
H1c	Service reliability → perceived value	0.183	0.156	N.S.	Rejected	0.210	0.116	<0.1	Accepted
H1d	Service responsiveness → perceived value	-0.032	0.167	N.S.	Rejected	-0.031	0.114	N.S.	Rejected
H1e	Service tangibility → perceived value	-0.064	0.182	N.S.	Rejected	0.048	0.111	N.S.	Rejected
H2a	Service assurance → customer satisfaction	0.220	0.11	<0.05	Accepted	0.197	0.072	<0.01	Accepted
H2b	Service empathy → customer satisfaction	-0.135	0.112	N.S.	Rejected	0.114	0.046	<0.05	Accepted
H2c	Service reliability → customer satisfaction	0.171	0.122	N.S.	Rejected	0.294	0.084	<0.01	Accepted
H2d	Service responsiveness → customer satisfaction	0.229	0.12	<0.1	Accepted	0.111	0.066	<0.1	Accepted
H2e	Service tangibility → customer satisfaction	0.240	0.109	<0.05	Accepted	0.045	0.069	N.S.	Rejected
H3a	Service assurance → customer loyalty	0.011	0.105	N.S.	Rejected	-0.066	0.078	N.S.	Rejected
H3b	Service empathy → customer loyalty	-0.078	0.107	N.S.	Rejected	0.086	0.072	N.S.	Rejected
H3c	Service reliability → customer loyalty	0.134	0.129	N.S.	Rejected	0.234	0.092	<0.05	Accepted
H3d	Service responsiveness → customer loyalty	-0.123	0.105	N.S.	Rejected	0.093	0.094	N.S.	Rejected
H3e	Service tangibility → customer loyalty	0.074	0.163	N.S.	Rejected	-0.101	0.091	N.S.	Rejected
H4	Perceived value → customer satisfaction	0.264	0.083	<0.05	Accepted	0.340	0.059	<0.01	Accepted
H5	Perceived value → customer loyalty	0.132	0.078	<0.1	Accepted	0.192	0.101	<0.1	Accepted
H6	Customer satisfaction → customer loyalty	0.702	0.125	<0.01	Accepted	0.451	0.124	<0.01	Accepted

Note – Sig.: Significance, N.S.: Not Significant

Table 5. Summary of the hypothesis testing results for discriminated sample by the types of airlines

Similar to the results of the non-discriminated sample, service assurance (β=0.220, p<0.05), service responsiveness (β=0.229, p<0.1), and service tangibility (β=0.240, p<0.05) are found positively influencing the customer satisfaction in the FSC group. However, service empathy and service reliability are reported as non-significant to customer satisfaction. Hence, H2a, H2d, and H2e are supported, while H2b and H2c are not supported. Besides, perceived value is positively related to customer satisfaction (β=0.264, p<0.05) and customer loyalty (β=0.132, p<0.1), in support of H4 and H5. The positive effect of customer satisfaction (β=0.702, p<0.01) on customer loyalty is also significant, supporting H6.

Figure 4 shows the findings of the path analysis for the LCC group. Service empathy (β=0.356, p<0.01) and service reliability (β=0.210, p<0.1) positively affect perceived value, while the effects of service assurance, service responsiveness, and service tangibility on perceived value are not significant. As a result, H1b and H1c are supported, with H1a, H1d and H1e rejected.

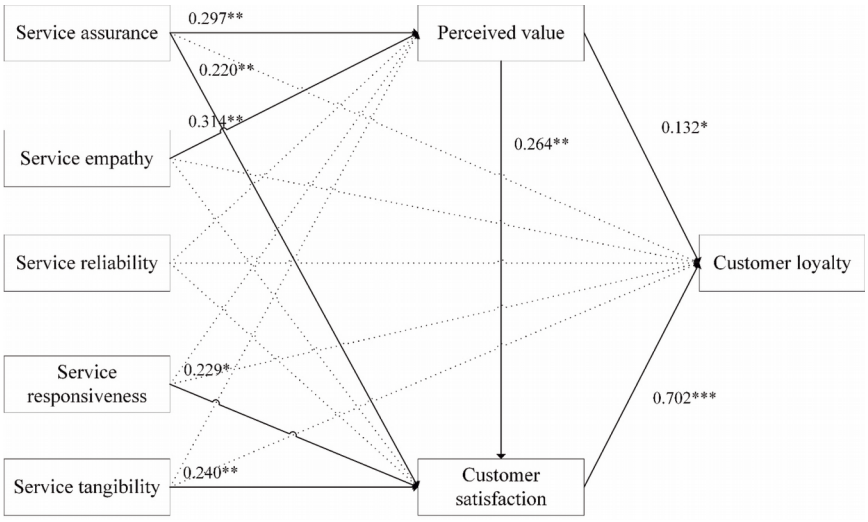

Figure 3. PLS-MGA result of structural equation model for FSC

Customer satisfaction is positively related to four variables: service assurance (β=0.197, p<0.01), service empathy (β=0.114, p<0.1), service reliability (β=0.294, p<0.01) and service responsiveness (β=0.111, p<0.1), supporting H2a, H2b, H2c, and H2d. The effect of service tangibility on customers to be satisfactory is non-significant, hence rejecting H2e.

In the five dimensions of service quality, only service reliability (β=0.234, p<0.05) positively influences customer loyalty, supporting H3c. The effects from assurance, empathy, responsiveness, and tangibility of service have negligible effects on customer loyalty, dismissing H3a, H3b, H3d, and H3e.

Similar to the situation of the non-discriminated sample and the FSC group, perceived value is positively related to customer satisfaction (β=0.340, p<0.01 and customer loyalty (β=0.192, p<0.1), in support of H4 and H5. Meanwhile, customer satisfaction (β=0.451, p<0.01) positively influences customer loyalty, supporting H6.

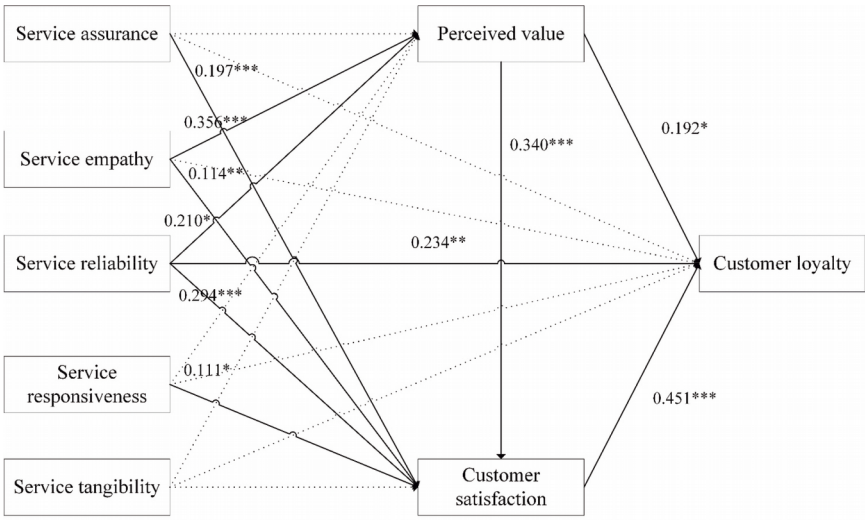

Figure 4. PLS-MGA result of structural equation model for LCC

The group analysis results for FSC and LCC are different, and we hereby further elaborate on the significance of the recorded difference. Table 6 presents the differences between the two groups. The results suggested that the effect of service empathy on customer satisfaction (β=-0.249, p<0.1) was significantly different for FSC and LCC. Specifically, for FSC, the effect of service empathy has a negative but negligible effect on customer satisfaction. However, the effect is positive and significant for LCC.

Hypothesis	Path	FSC	LCC	Result
		β	β	
H1a	Service assurance → perceived value	0.297**	0.176	0.121
H1b	Service empathy → perceived value	0.314**	0.356***	-0.042
H1c	Service reliability → perceived value	0.183	0.210*	-0.027
H1d	Service responsiveness → perceived value	-0.032	-0.031	-0.001
H1e	Service tangibility → perceived value	-0.064	0.048	-0.112
H2a	Service assurance → customer satisfaction	0.220**	0.197***	0.023
H2b	Service empathy → customer satisfaction	-0.135	0.114**	-0.249*
H2c	Service reliability → customer satisfaction	0.171	0.294***	-0.123
H2d	Service responsiveness → customer satisfaction	0.229*	0.111*	0.118
H2e	Service tangibility → customer satisfaction	0.240***	0.045	0.195
H3a	Service assurance → customer loyalty	0.011	-0.066	0.077
H3b	Service empathy → customer loyalty	-0.078	0.086	-0.164
H3c	Service reliability → customer loyalty	0.134	0.234**	-0.100
H3d	Service responsiveness → customer loyalty	-0.123	0.093	-0.216
H3e	Service tangibility → customer loyalty	0.074	-0.101	0.175
H4	Perceived value → customer satisfaction	0.264***	0.340***	-0.076
H5	Perceived value → customer loyalty	0.132*	0.192*	-0.060
H6	Customer satisfaction → customer loyalty	0.702***	0.451***	0.251

Note: *, p<0.1; **, p<0.05; ***, p<0.01

Table 6. Hypothesis test results for FSC and LCC

5. Discussion and Implications

For the non-discriminated sample, assurance, empathy, and service reliability are the three antecedents of perceived value, while the impacts of service's responsiveness and tangibility on perceived value are not significant. In the airline industry, even if customers can receive a quick reply or solution, additional costs and inconvenience would be incurred on customers experiencing severe issues, such as flight cancellation (Alderighi & Gaggero, 2018; Lambelho, Mitici, Pickup & Marsden, 2020; Xiong & Hansen, 2013). Airlines should try to eliminate such problems as costs increase significantly when problems occur. Nevertheless, only limited gains are perceived by customers towards the quick response of airlines. Benefits perceived by customers will increase as excitement towards tangible physical environment manifest. However, in the case of FSC, as the passengers are well aware of the amount of tangible they can expect according to the ticket price, their perceived values will not be proportional to the amount said tangibles which they will be provided it. This led to the negligible impact of service tangibility towards customers' perceived values.

Overall, services empathy is shown to have the most significant effect on perceived value. In other words, handling and understanding customers' needs is the key to increase the benefits perceived by customers. However, service empathy has a negligible influence on customer satisfaction, while the remaining four dimensions were shown to have positive effects. This is consistent with Leong et al. (2015) and Meesala and Paul (2018) findings but contradicts with the results from Rahman et al. (2017). This implies that satisfying individual needs can increase the benefits perceived by customers significantly. However, it is not enough to improve customer satisfaction. Interestingly, there is a positive connection between perceived value and customer satisfaction, which is in step with the conclusions of Kuo et al. (2009), Hu and Di Paolo (2009) and El-Adly

(2019). It is believed that service empathy can affect customer satisfaction indirectly by positively influencing perceived value. As a result, five aspects of service quality have positive effects on customer satisfaction directly or indirectly.

Service reliability is the most compelling factor affecting service quality (Mittal & Lassar, 1998). Unsurprisingly, only service reliability has a positive effect on fostering loyalty in customers, which is in line with the result of Izogo (2017), implying that reliable service can increase customers' intentions to return and the willingness of recommending the service. Meanwhile, it is noteworthy that service reliability has a more significant effect on customer loyalty than the other four aspects of service quality and is also the second most influential factor affecting perceived value. Furthermore, service reliability is the only aspect that positively influences perceived value, customer satisfaction, and customer loyalty. Besides, perceived value and customer satisfaction have a positive influence on customer loyalty directly. Consequently, assurance and empathy of service dimension can indirectly affect customer loyalty via perceived value, while service responsiveness and service tangibility can promote loyalty indirectly via customer satisfaction. However, service reliability plays a vital role in affecting customer loyalty positively via both perceived value and customer satisfaction.

For FSC, service assurance and service empathy are two pre-conditions of perceived value. In contrast, for LCC, service empathy and service reliability positively influence perceived values. For both of them, service empathy is the most influential factor for perceived value, implying that customized service is an important factor in affecting customers' perceived value. Service assurance has a significant positive influence on perceived value for FSC but is of less significance for LCC. This suggests that crew's behaviours, which will affect passenger's trust and confidence, are detrimental in determining the perceived values of customers flying with FSC. However, customers flying with LCC focus more on practicality and rationality, only paying for services that they require. Thus, it is more difficult for them to be impressed by employees' knowledge and courtesy. According to the results, for the customers of LCC, whether their individual needs are satisfied and whether the service is reliable are critical factors in determining their perceived values.

For FSC, service tangibility is the most important driver for customer satisfaction, while it only offers a negligible positive influence on customer satisfaction for LCC. For FSC, service tangibility is the most influential element in assessing the service quality of an airline. Based on the expectancy-disconfirmation model (Oliver, Rust & Varki, 1997), customer satisfaction is a mix of their expectations and reality. Therefore, the above finding suggests that the real tangibles tend to be better than the expectation of customers choosing FSC, while the real tangibles tend to be similar to the expectation of customers choosing LCC. In addition, service reliability appears to be the most influential factor for determining customers' satisfaction flying LCC, while the opposite is true for FSC customers, contributing little to the satisfaction level. This implies that FSC customers' expectations on service reliability is similar to their actual experiences, while the service reliability provided to LCC customers are significantly better than their expectation.

Of all the links discussed in this study, the difference in the effect of service empathy on customer satisfaction is outstanding between FSC and LCC. This study indicates that actual service empathy is slightly worse than the expectation for FSC, while the actual service empathy displayed is much better than the expectation for LCC. It is a fact that LCC offers many choices for customers, and customers have high flexibility in choosing the service and can pay for what they want. The customers can imagine what kind of services they would receive (Chiou & Chen, 2010), and it is easier for customers to make rational expectations on the service. Compared with them, customers of the FSC may tend to expect a higher standard of service. With the increasingly severe competition in the airline industry, most airline companies have paid much attention to providing individual care and enhancing passengers' psychological experiences on the services provided. The differences between the service provided by FSC and LCC on the empathy aspect seem to be distinct. Therefore, the difference in the customers' expectations could likely explain the significant difference between the groups of FSC and LCC in the relationship between service empathy and customer satisfaction.

For FSC, the impact of five dimensions on customer loyalty is non-significant. However, service assurance and service empathy can affect customer loyalty indirectly via value perceived, and service assurance, service responsiveness, and service tangibility foster customer loyalty via customer satisfaction. Interestingly, while no

direct or indirect linkages are found between customer loyalty and service reliability for FSC, there are both direct and indirect influences in LCC. This implies that FSC should put more effort into improving service reliability to improve customer loyalty. The employees should be well-trained to provide consistent and accurate service, and attention should also be paid to handling suggestions and complaints from the customers. As for LCC, service reliability is directly related to the loyalty of customers. Besides, empathy and reliability of service positively foster customer loyalty through higher perceived value and customer satisfaction. Assurance and responsiveness of service can affect customers' loyalty via customer satisfaction. That said, no direct or indirect correlation can be found between the tangibility of service and the customer's loyalty. This suggests that the tangibles of LCC could not exceed the expectations of customers, and this aspect is the weakness of LCC.

6. Conclusion

With the data collected at the HKIA, this study examined the relationships among service quality, perceived value, customer satisfaction and customer loyalty, and divided service quality into five dimensions. The findings show that assurance, empathy and reliability of service quality positively affect the value perceived. The effects of responsiveness and tangibility of service quality on perceived value are insignificant. Among the five aspects of service quality, assurance, reliability, responsiveness and tangibility of the service quality are the pre-conditions of customer satisfaction. However, only the reliability of service is the antecedent of customer loyalty. Besides, the value perceived positively affects customers to be satisfactory and loyal. Furthermore, satisfaction degree also significantly influences the degree of customers' loyalty. As to the role of airline types, the sole effect is on customers' satisfaction is service empathy, with a significant difference between FSC and LCC.

The following are the main contributions and conclusions of this study. Firstly, the impacts of each dimension of service quality are examined. Many researchers focus on the effect of service quality, but the relationships between each dimension of service quality and value perceived, satisfaction, and loyalty of customers are not conclusive. There are even contradicting findings from different studies. This study focuses on the evidence from Hong Kong, and the results provide references for airlines, especially for those with hubs in Hong Kong. This helps them understand the role of each dimension of service quality in the formation of customers satisfaction and loyalty. Secondly, the group differences between FSC and LCC were analyzed by PLS-MGA. Due to the variances between the two groups, different results were shown when the theoretical model is examined separately with the FSC and LCC samples. The conclusions found in this research can provide references for FSC and LCC on determining suitable policies to address customers' concerns. After truly understanding the consideration factors of the end-users, airlines shall be able to set appropriate policies for customer retention, considering their different competitive strategies.

The investigation is subjected to several limitations. Regarding the construct representation of the hypothesis model, one may notice that the proposed research measures the service dimensions of the ground staff and cabin crews in FSC and LCC only. There will be other dimensions affecting the service quality, passengers' satisfaction, and their loyalty to the airlines that are worth further study in the future. The predictive maintenance and preventive maintenance assisted with multiple Internet-of-Things and cloud-based scheduling system could be further considered as one of the paramters affected the service quality (Fan et al., 2022; Li, Feng, Guo, Wang, Li, Liu et al., 2020; Li, Ng, Fan, Yuan, Liu & Bu, 2021; Li, Fan, Zheng & Wang, 2021; Li, Zheng, Fan & Wang, 2021; Li, Zheng & Zheng, 2021; Xia et al., 2021; Xia, Zheng, Li, Gao & Wang, 2022; Zheng et al., 2021). The adoption of a smart product service system could also affected the service quality in future (Fan et al., 2022; Li, Fan, Zheng & Wang, 2021; Li, Zheng, Fan & Wang, 2021; Li, Zheng & Zheng (2021); Wang, Chen, Li, Zheng & Khoo, 2021; Wang, Chen, Zheng, Li & Khoo, 2019, 2021; Zhang, Ye, Peng, Peng, Tang & Xiang, 2020; Zheng, Lin, Chen & Xu, 2018; Zheng, Wang, Sang, Zhong, Liu, Liu et al., 2018). The considereation of sustainability would be also considerable as one of the dimensions which may affect the passengers' satisfaction and its loyalty (Lin, Liu, Man & Ren, 2019; R. Lin, Lu, Yang, Shen & Ren, 2021; Liu, Lin, Man & Ren, 2019; Liu, Lin & Ren, 2021).

Furthermore, the impact of the pandemic also changes the business model of FSC and LCC. For example, there is a significant reduction in the number of transfer flights, with airlines attempting to restructure their flight

routes from hub-and-spoke to point-to-point systems (Li, Yiu, Yu & Ng, 2021; Yiu, Ng, Li, Zhang, Li, Lam et al., 2022). We may also expect that the competition between FSC and LCC will adjust according to the introduction of new business models. The value of air tickets, promotion effect, discount, and special offers may also affect the construct of the hypothesis model. In addition, this study focused on the situation of Hong Kong and obtained some interesting results. The sample size could be increased to examine the theoretical model and the model could be applied and extended to other countries' airports for further studies in the future. Besides, this study mainly concentrates on the formation of customer loyalty from the perspective of service quality, while the other factors (e.g., the switching cost between FSC and LCC) that may affect customer loyalty were not considered. For example, some customers continue to choose an airline due to the high switching costs. Thus, how switching costs affect customer loyalty is an interesting topic worth exploring in the future. Still, the study conceptualized the situation in Hong Kong and provided managerial insights to the airline industry, or even could be a reference by the national aviation authorities when considering the slots allocation. The mediating effect of perceived value and customer satisfaction on attitudinal and behavioral loyalties is also one of the research directions in this work.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The research was supported by the Division of Business and Hospitality Management, College of Professional and Continuing Education, The Hong Kong Polytechnic University, Hong Kong SAR, China. The authors would like to express their appreciation to the Hong Kong International Airport for their assistance with the data collection.

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Appendix A. Descriptive analysis of overall airline

Items		Descriptive				
		$\bar{x}$	σ	Median	Kurtosis	Skewness
Customer loyalty	LY1	5.20	1.10	5.00	1.56	-0.72
	LY2	5.09	1.08	5.00	2.80	-1.25
Customer satisfaction	CS1	5.29	1.08	5.00	2.68	-0.97
	CS2	5.22	1.06	5.00	1.04	-0.53
Perceived value	PV1	5.05	1.09	5.00	0.85	-0.56
	PV2	4.93	1.20	5.00	-0.07	-0.32
Service assurance	SA1	5.47	1.08	6.00	2.37	-0.95
	SA2	5.29	1.02	5.00	0.71	-0.61
	SA3	4.56	1.56	5.00	-0.31	-0.50
Service empathy	SE1	5.10	1.15	5.00	0.71	-0.62
	SE2	5.03	1.06	5.00	0.46	-0.53
Service reliability	SReli1	4.88	1.34	5.00	0.69	-0.86
	SReli2	5.07	1.01	5.00	-0.15	-0.24
	SReli3	5.37	1.06	5.00	0.95	-0.67
Service responsiveness	SRespon1	5.33	1.05	6.00	1.07	-0.80
	SRespon2	5.16	1.01	5.00	-0.07	-0.33
	SRespon3	5.03	1.19	5.00	0.18	-0.56
Service tangibility	ST1	5.38	0.95	5.00	0.31	-0.31
	ST2	5.40	0.99	6.00	0.38	-0.58

Appendix B. Descriptive analysis of FCS airline

Items		Descriptive		
		$\bar{x}$	σ	Median
Customer loyalty	LY1	4.89	1.03	5.00
	LY2	5.12	1.07	5.00
Customer satisfaction	CS1	5.13	1.08	5.00
	CS2	4.99	1.05	5.00
Perceived value	PV1	5.21	1.06	5.00
	PV2	4.58	1.08	5.00
Service assurance	SA1	5.21	1.21	6.00
	SA2	5.36	1.13	5.00
	SA3	4.98	1.47	5.00

Items		Descriptive		
		$\bar{x}$	σ	Median
Service empathy	SE1	5.03	1.21	5.00
	SE2	5.07	1.09	5.00
Service reliability	SReli1	5.09	1.11	5.00
	SReli2	5.39	1.21	5.00
	SReli3	5.31	1.05	5.00
Service responsiveness	SRespon1	4.97	1.21	6.00
	SRespon2	5.05	1.04	5.00
	SRespon3	5.10	1.13	5.00
Service tangibility	ST1	5.28	1.09	5.00
	ST2	5.18	1.07	6.00

Appendix C. Descriptive analysis of LCC airline

Items		Descriptive		
		$\bar{x}$	σ	Median
Customer loyalty	LY1	5.51	1.03	5.00
	LY2	5.06	1.18	5.00
Customer satisfaction	CS1	5.45	0.97	5.00
	CS2	5.45	1.05	5.00
Perceived value	PV1	4.89	1.03	5.00
	PV2	5.28	1.11	5.00
Service assurance	SA1	5.73	1.31	6.00
	SA2	5.22	1.21	5.00
	SA3	4.14	1.41	5.00
Service empathy	SE1	5.17	1.19	5.00
	SE2	4.99	1.08	5.00
Service reliability	SReli1	4.67	1.09	5.00
	SReli2	4.75	1.27	5.00
	SReli3	5.43	1.04	5.00
Service responsiveness	SRespon1	5.69	1.19	6.00
	SRespon2	5.27	1.03	5.00
	SRespon3	4.96	1.14	5.00
Service tangibility	ST1	5.48	1.07	5.00
	ST2	5.62	1.09	6.00

Appendix D. Correlation Table

	LY 1	LY 2	CS 1	CS 2	PV 1	PV2	SA 1	SA 2	SA 3	SE 1	SE 2	SR eli1	SR eli2	SR eli3	SR espon1	SR espon 2	SR espon 3	ST 1	S T 2
LY1	1																		
LY2	0.767	1																	
CS1	0.776	0.588	1																
CS2	0.645	0.626	0.691	1															
PV1	0.657	0.571	0.668	0.506	1														
PV2	0.701	0.622	0.680	0.479	0.715	1													
SA1	0.381	0.183	0.445	0.211	0.560	0.569	1												
SA2	0.334	0.196	0.388	0.245	0.230	0.448	0.588	1											
SA3	0.301	0.160	0.268	0.133	0.383	0.393	0.473	0.359	1										
SE1	0.387	0.320	0.499	0.331	0.560	0.564	0.458	0.364	0.254	1									
SE2	0.420	0.367	0.444	0.345	0.485	0.5822	0.369	0.248	0.247	0.453	1								
SReli1	0.525	0.554	0.464	0.504	0.497	0.386	0.215	0.196	0.110	0.363	0.280	1							
SReli2	0.547	0.504	0.495	0.407	0.659	0.578	0.437	0.472	0.288	0.492	0.349	0.602	1						
SReli3	0.440	0.452	0.515	0.447	0.542	0.490	0.370	0.348	0.264	0.398	0.272	0.466	0.488	1					
SRespon1	0.429	0.351	0.452	0.269	0.634	0.516	0.527	0.542	0.439	0.424	0.287	0.325	0.495	0.526	1				
SRespon2	0.441	0.407	0.478	0.320	0.613	0.511	0.471	0.515	0.380	0.417	0.322	0.320	0.556	0.527	0.700	1			
SRespon3	0.324	0.280	0.404	0.243	0.428	0.432	0.370	0.330	0.341	0.450	0.321	0.274	0.460	0.352	0.395	0.466	1		
ST1	0.481	0.396	0.460	0.362	0.483	0.743	0.537	0.342	0.391	0.326	0.346	0.457	0.488	0.499	0.444	0.486	0.380	1	
ST2	0.342	0.483	0.347	0.464	0.284	0.206	0.122	0.101	0.140	0.173	0.113	0.569	0.308	0.344	0.193	0.230	0.138	0.459	1