



INVESTIGATE AIRPORT SERVICE QUALITY- A CASE STUDY OF AIRPORTS IN SHANGHAI

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ABSTRACT

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Evaluating service quality is a critical task for airports aiming to identify aspects of airport service that contribute to differences in passenger satisfaction. The purpose of this paper is to investigate the airport service quality from passengers' perspectives at two airports (Pudong and Hongqiao Airports) under the management of Shanghai Airport Authority (SAA) in China. Surveys at SAA have found that there are significant differences between passengers' expectations and actual perceptions of service quality at SAA, which imply that SAA is advised to improve its service quality and reduce passenger dissatisfaction towards components comprising service quality as a whole. The components for which the largest gaps were found between expectation and actual perception were identified as "Shop and restaurant prices", "Free Wi-Fi access", "Play areas for children", "Departure punctuality", and "Various restaurants providing different kinds of food". The results reveal that there are significant differences between gender, nationality and main travel purpose groups: women tend to assign significantly higher scores than men; domestic travellers reported high satisfaction than international ones; and passengers travelling for holiday and academic-related purposes reported higher satisfaction than those travelling for business. There is a positive correlation between airport service quality and passengers' overall satisfaction at SAA. This paper aims to provide useful information for government officials in the identification of potential issues posed to passengers and that should be addressed by airport management.

Contribution/Originality: This study is the first attempt to investigate airport service quality from passenger's perspective, rather than from airport's perspective. The paper's primary contribution is its findings in passenger's perception and expectation according to different demographic groups, and their varying impact on passenger's satisfaction and airport preferences in China.

1. INTRODUCTION

Passenger satisfaction is strongly correlated with the service quality of an airport (Abdul *et al.*, 2015). Francis *et al.* (2003) defined airport service quality as "the perceived level of service delivered to the airport user". Over the past decade, there have been considerable efforts on the parts of airports toward improving the quality of their service. Airport service quality often influences travellers' impressions of a city, which may then further impact the commercial and touristic activities they undertake in that city. Therefore, it is important to evaluate passengers' satisfaction with an airport's service quality (Yeh and Kuo, 2003). Moreover, Chu *et al.* (2011) believe that

improving airport service quality can enhance the efficiency of airport management, particularly for large hub airports such as Shanghai Pudong International Airport. Airports should also understand both passengers' perception and the expectation of their services, for otherwise a misunderstanding can result in financial and market losses (Bogicevic *et al.*, 2013). Previous studies have indicated the importance of service quality in the airport industry. Enhancing overall airport service quality is important since it exerts significant influence on passenger flow volume (Yeh and Kuo, 2003). Finally, Arif *et al.* (2013) have observed that maintaining high service quality is critical as service recovery can be quite difficult.

Shanghai Pudong International Airport (PVG) and Shanghai Hongqiao international Airport (SHA) are both located in Shanghai, and under the management of SAA. Both airports handle domestic and international flights. According to the annual report by CAAC (2016) the passenger numbers at PVG and SHA were 60 million and 39 million respectively in 2015. Among all airports in China, these two airports were ranked the second and the sixth respectively in terms of passenger traffic in that year. Due to rapid economic growth in China, air transport demand is also undergoing significant growth. Thus many foreign airlines have started operating their businesses in China. Those airlines monitor the service quality of different airports in order to choose their gateway (Francis *et al.*, 2003). Although the Chinese airport industry has expanded very quickly during the past several decades, little research has been carried out to assess airport service quality in Chinese airports, yet it is very important to gain a clear picture of this area.

The aim of this study is to identify and analyse service quality from airline passengers' perspectives at PVG and SHA in Shanghai, China.

2. LITERATURE REVIEW

According to Pabedinskaitė and Akstinaitė (2014) there are various methods for evaluating and improving airport service quality. A service quality gap model proposed by Parasuraman *et al.* (1985) suggests that service quality is a function of the differences between expectation and performance along the quality dimensions. One of the suggested gaps is the difference between consumers' expected and perceived service. Customer perceptions are subjective assessments of actual service experiences received, while customer expectations are beliefs about service delivery that can serve as reference points against which customer services are evaluated (Zeithaml and Bitner, 2003; Tsai *et al.*, 2011). For any organisation seeking to build long-term relationships with its customers, the gap between customer expectations and perceptions needs to be identified and minimised accordingly.

Graham (2012) has identified that managing the quality of airport services has become more important since the 1980s. Similarly, Francis *et al.* (2003) discussed the importance of quality airport operations in the current competitive air transport market. The importance of commerce compels airports to improve their service quality while reducing costs. Airports need to ensure that the level of service quality they provided is consistent with the contract requirements of third party organizations. It is helpful for an airport to adopt quality management systems in order to manage service quality due to the pressure to commercialize airports. Mansor and Syed Redhwan (2012) point out that service environment and service personnel are interrelated and have a deep impact on the development of service quality. Fodness and Murray (2007) have identified service quality as one of the most important factors influencing airport appeal. To avoid loss of passengers, high service quality can also improve the non-aeronautical revenues from restaurants and duty-free shops. Yeh and Kuo (2003) mentioned that service quality at an airport can strongly influence further business and tourism activities in that city, making the maintenance of service quality levels a significant task. The evaluation of service quality at an airport can be the managing tool for the airport itself. Competition between airports in Asian regions is growing increasingly tense, especially since most airports aim to become a hub airport in their region in order to attract more passengers. Therefore, it is important for these airports to manage their efficiency. Airport service quality is a critical factor

contributing to management efficiency since service quality can reflect how an airport responds to passenger needs (Chu *et al.*, 2011).

The measurement of service quality can be divided into objective and subjective measures. These measures can help managers understand quality. Subjective measures are based on passengers' perspectives including comment cards and customer surveys. Service quality management is a critical part of airport operation as a long-term strategy for increasing revenue, and some airports have established their own policies on quality. In some cases, airports use ISO 9000 standards to guide them through the elements in need of special attention (Graham, 2012).

Abdul *et al.* (2015) argue that customer satisfaction can increase the profitability, performance and brand awareness of an organization. Similarly, Garver (2003) believes a company could gain competitive advantage from customers' satisfaction. Customers choose the products they are satisfied with most. Therefore the operational performance of a company should be measured from a customer's point-of-view. Liou *et al.* (2011) found that airports were more focused on operational standards since 1987. Although more government agencies have developed methods for evaluating and improving airport service quality, the author believed that a survey is more effective in better illuminating customer attitudes rather than supplier attitudes. Similarly, Park (2007) has stated that only customers could measure the quality of an organization's service due to the absence of universal quality standards applicable to all airports.

Chen and Chang (2005) explained the importance of understanding both airline passengers' perceptions and expectations of service quality at an airport. A misunderstanding of passengers' needs results in poor resource allocation. Service quality for an airport can be measured by the perceived level of service delivered to airport users (Francis *et al.*, 2003; Zeithaml *et al.*, 2013; Jiang and Zhang, 2016). Park (2007) indicates that comparing customers' expectations and perceptions of the service quality could be used to measure overall customer satisfaction and the performance of an organization. The author believes that maintaining quality is an important task for an organization under competitive pressure. Understanding passengers' expectations helps airports to create value by prioritizing services that customers perceive to be the most important. Airports can better understand the issues they face in terms of service quality using the insight and practices of other service industries.

There are three main categories of airport passengers, namely departing, arriving and transfer passengers. They have different needs in terms of services and airport facilities (Park and Se-Yeon, 2011). Bezerra and Gomes (2015) discovered that passenger demographics heavily influenced passengers' perceptions of service quality. Martín-Cejas (2006) discussed the perception of tourism service quality. Reliability was found to be a major component when it came to airport service quality, since consistent efficiency of airport infrastructures directly impact tourists' first impressions of their holiday. Chao *et al.* (2013) found that not only can passenger demographic influence expectations and perceptions of airport service quality, other factors such as flight information also contributed to this. Passenger needs often revolve around these factors. In particular, evaluating satisfaction from passengers of varying national and cultural backgrounds is important since international airports are incredibly multicultural. Passengers of differing backgrounds experience the same airport services but report significant differences in service quality expectations and perceptions (Pantouvakis and Renzi, 2016).

Ariffin and Yahaya (2013) examined the influence of an airport's image on foreign tourists' satisfaction. The results showed a positive correlation between airport image appeal and tourist satisfaction, with national identity playing a key role in this relationship. An airport is not only a port for arrivals and departures but also a hub for international tourists. Therefore national identity needs to be taken into account when establishing airport image. In the current environment, airports should improve their service quality to delight their customers.

Previous literature suggests that high service quality and passenger satisfaction levels constitute a good measurement of whether airports are maintaining their competitive positions. It also provides theoretical methods for this study.

3. METHODOLOGY

3.1 Sample and Data Collection

The primary data was collected through surveys at PVG and SHA from 9th February to 31st of March 2016. These were timed to coincide with the opening hours of the airports, and conducted between Monday and Sunday from morning to night flights to minimise any biases in the results. The surveys were conducted in the check-in areas, restaurants, cafe bars, bookshops, and waiting lounges before security checks at PVG and two terminals at SHA.

Selection of service items in survey questionnaire is important when studying airport service quality gaps. Fodness and Murray (2007) investigated 65 airport service quality themes and concluded that customer-driven service quality enhancements affect passengers' perceptions of the airport's overall attractiveness relative to its competitors. Tsai *et al.* (2011) examined four service attributes covering 12 airport service areas at Taoyuan International Airport, and diagnosed managerial strategies for gap reduction. The Airports Council International (ACI) initiated the Airport Service Quality (ASQ) benchmarking program in 2006, which monitors the opinions of air passengers at the departure gate. ASQ surveys are currently conducted at more than 300 airports around the world. This commercial survey covers 34 key areas and divides airport services into eight categories.

Informed by previous literature and the survey questions used by ACI, the questionnaire for this study was divided into three sections: the first contained questions regarding respondents' socio-demographic characteristics including age, gender, education, nationality and income; the second collected passengers' flight information, including purpose of travel, travel frequency, and cabin class; and the third was composed of 53 items regarding airport service quality (Fodness and Murray, 2007; Liou *et al.*, 2011; Park and Se-Yeon, 2011; Tsai *et al.*, 2011; Graham, 2012; Bogicevic *et al.*, 2013; Ku and Chen, 2013; Pabedinskaitė and Akstinaitė, 2014). Respondents were asked to indicate their "expectation" and "perception" separately according to their experiences of using PVG and SHA Airport services and facilities during the past 12 months. Each item was rated using a five-point Likert scale, ranging from "1=strongly dissatisfied" to "5=strongly satisfied". There were two versions of the questionnaires—Chinese and English. Respondents were required to complete a two-page survey questionnaire. The survey took approximately 10 minutes to complete and was completely anonymous and voluntary.

A sample size of at least 384 respondents was considered adequate as this provided a 95% confidence level (Denscombe, 2010). Total 443 questionnaires were distributed and 390 were filled, making the response rate 88%. There were 197 (50.51%) responses from PVG and 193 (49.49%) responses from SHA.

3.2. Statistical Analysis Method

The SPSS 23 software package was used for data analysis in the study. Descriptive statistics were used to describe the mean, variance and the categories and characteristics of data. T-test, Analysis of variance (ANOVA), and Multivariate analysis of variance (MANOVA) were used to help understand the difference between perception and expectation among different demographic groups; multiple regression was employed to examine the relationship between service quality and customer's satisfaction.

3.3. Hypotheses Formulation

Previous study investigating airport service quality indicated that one of the methods for assessing service quality was to analyze passengers' expectations and perceptions (Fodness and Murray, 2007; Pabedinskaitė and Akstinaitė, 2014). Marketing research regarding customers' attitudes toward services has focused on perceived service quality. Perceived service quality is defined as the customer's assessment of the overall excellence or superiority of the service (Zeithaml, 1988). Parasuraman *et al.* (1985) considered a customer's assessment of overall service quality to depend on the gap between expectations and perceptions of actual performance levels. This leads to the first hypothesis:

Hypothesis 1 (H1): *There is a significant difference between customers' expectations and perceptions of service quality at SAA.*

Peterson and Wilson (1992) suggested that understanding what determined customer satisfaction and identifying variables and/or factors related to customer satisfaction were a prerequisite to effectively interpret and utilize customer satisfaction ratings. Socio-demographic variables such as income, age, social class, gender, occupation, education, and marital status have been identified in the literature as having a significant influence on the dimensions of service quality (Oyewole, 2001; Clemes *et al.*, 2008; Jiang, 2013; Jiang and Zhang, 2016). Thus, Hypothesis 2 is formulated as follows:

Hypothesis 2 (H2): *The demographic variables influence customers' perceptions and expectations regarding service quality at SAA.*

The third and the fourth hypotheses are derived from personal needs. There are three major reasons for which passengers need to travel: for business, for holiday and to visit friends/relatives, and it is believed that each group's expectations would be different (Gilbert and Wong, 2003). It is also believed that domestic and international passengers gain different impressions of service quality at the airport.

Hypothesis 3 (H3): *There are significant differences in perceptions of airport service quality between different travel groups: business, tourist, VFR (visiting friends/relatives), study and others at SAA.*

Hypothesis 4(H4): *There are significant differences between domestic and international passengers in terms of their perceptions of the airport service quality at SAA.*

To achieve a high level of customer satisfaction, most researchers suggest that a high level of service quality should be delivered by the service provider as it is normally considered an antecedent of customer satisfaction (Cronin and Taylor, 1992; Anderson *et al.*, 1994; Cronin *et al.*, 2000). It is commonly believed that higher service quality can lead to a customer's higher overall satisfaction and subsequently to positive behavioural intentions.

The relationship between customer satisfaction and perceived service quality has been demonstrated by numerous studies (LaTour and Nancy, 1979; Tse and Wilton, 1988; Fornell, 1992). Thus, Hypothesis 5 is formulated as follows:

Hypothesis 5 (H5): *The quality of airline service has a positive effect on passenger satisfaction.*

4. RESULTS

4.1. Sample Characteristics

Table 1 presents a summary of the demographic and basic travel information of the respondents. The collected sample shows that 57.7 per cent were male and 42.3 per cent were female. Most of travellers held bachelor degrees (40.5 per cent), followed in frequency by diplomas (31.8 per cent) and post graduate degrees (15.1 per cent). The majority of the passengers were mainland Chinese (69.7 per cent) and these were followed by European (11 per cent). Business travellers accounted for 28.2 per cent of the sample. 87.4 per cent of the passengers were travelling in economy class.

4.2. Mean, T-test and GAP analysis (Difference between Perceptions and Expectations)

T-test was used to test whether there significant differences existed between Expectations and Perceptions (H1). Table 2 shows that all perception scores are lower than expectation scores and p-values for all 52 questions are less than 0.05, which means that significant differences exist between Expectations and Perceptions for all items of airport service qualities, so H1 is accepted.

The five items displaying the largest gaps (difference between expectation and perception scores) are: item 39 ("Shop and restaurant prices"), item 2 ("Access to free Wi-Fi"), item 32 ("Play areas for children"), Item 21 ("Departure punctuality"), and Item 38 ("Various restaurants providing different kinds of food"). These significant discrepancies suggest that passengers could have felt most disappointed by these services.

The top five service attributes that participants assigned the highest expectation scores to are item 6 (“Convenient location and sufficient number of baggage trolleys”, mean=4.34), item 24 (“Availability of lifts, passenger conveyors, escalators and air-bridges”, mean=4.32), item 43 (“Airport terminal lighting”, mean=4.29), item 5 (“Clarity of external signage indicating directions to terminals; parking areas; etc.”, mean=4.25), and item 21 (“Airport terminal cleanliness and beauty”, mean=4.27). Thus, it appears that airport passengers attached significant importance to the most basic yet essential services of their travel. On the other hand, passengers assigned relatively low expectation scores to other factors, such as item 32 (“Children’s playing area”, mean=3.59), item 36 (“Ease of medical service access”, mean=3.72) and item 11 (“Waiting time for next flight”, mean=3.76).

Table-1. Sample characteristics (N=390).

	Frequency	Percent (%)		Frequency	Percent (%)
Age group			Gender		
less than 20	25	6.4	Male	225	57.7
21 - 30	123	31.5	Female	165	42.3
31 - 40	129	33.1	Education background		
41 - 50	67	17.2	High school or below;	49	12.6
51 - 60	25	6.4	Diploma	124	31.8
>60	21	5.4	Bachelor	158	40.5
Nationality			Postgraduate or above	59	15.1
Chinese (Mainland)	272	69.7	Cabin class always choose		
Chinese (Hong Kong, Taiwan or Macau)	7	1.8	First class	7	1.8
Asian (Except Mainland China, Hong Kong, Taiwan and Macau)	22	5.6	Business class	42	10.8
European	43	11	Economy class	341	87.4
North American	15	3.8	Main purpose of travel		
South American	2	0.5	Business	110	28.2
Oceania	6	1.5	Visiting friends/relatives	26	6.7
Others	23	5.9	Tourism/holiday	205	52.6
			Study	26	6.7
			Others	23	5.9

The five highest perceptions of service attributes are assigned to item 6 “Convenient location and sufficient number of baggage trolleys” (mean=4.16), item 43 (“Airport terminal lighting”, mean=4.16), item 42 (“Airport terminal cleanliness and beauty”, mean=4.10), item 24 (“Availability of lifts, passenger conveyors, escalators and air-bridges”, mean=4.09), and item 48 (“Airport terminal safety”, mean=4.07). Passengers assigned lower ratings to item 39 (“Shop and restaurant prices”, mean=3.05), item 33 (“Ease of medical service access”, mean=3.24), and item 26 (“Access to free Wi-Fi”, mean=3.28), which are among the least satisfactory items observed.

In addition, ranking airport service quality attributes from the airline passengers’ perspective is also a critical task since understanding the service quality attributes that passengers perceive as being the most important and the service quality that passengers dissatisfied with the most can assist airports to set a benchmark for improvement (Fuchs and Weiermair, 2004). The ranking is based on the mean of expectations and perceptions. The results are shown in Table 3 as well.

Table-2. Mean, T-test and GAP results.

Question	Item	Expectations		Perceptions		T-value	P-value	Gap P-E Mean
		Mean	SD	Mean	SD			
Q1	Public transportation to/from airport. E.g. waiting time; taxi availability; accessibility; etc.	4.12	0.89	3.74	0.87	5.94	0.000	-0.37
Q2	Waiting time and cost of car parking	3.82	0.9	3.43	0.91	6.03	0.000	-0.39
Q3	Car park availability	3.83	0.91	3.48	0.89	5.33	0.000	-0.34
Q4	Service quality of car rental facilities	3.77	0.89	3.36	0.83	6.66	0.000	-0.41
Q5	Clarity of external signage indicating directions to terminals; parking areas; etc.	4.28	0.84	4.05	0.9	3.73	0.000	-0.23
Q6	Convenient location and sufficient number of baggage trolleys	4.34	0.84	4.16	0.88	2.96	0.005	-0.18
Q7	Check-in waiting time	3.98	0.92	3.54	0.98	6.48	0.000	-0.44
Q8	Efficiency of check-in procedures	4.04	0.85	3.67	0.92	5.85	0.000	-0.37
Q9	Self-check-in facilities	3.96	0.93	3.68	1	4.09	0.000	-0.28
Q10	Transfer connection time	3.86	0.88	3.51	0.87	5.66	0.000	-0.35
Q11	Waiting time for next flight	3.76	0.93	3.33	0.92	6.57	0.000	-0.44
Q12	Immigration inspection waiting time	3.79	1.07	3.5	1.09	3.68	0.001	-0.29
Q13	Immigration inspection processing time	3.77	0.99	3.59	1.04	2.38	0.024	-0.17
Q14	Security clearance waiting time	3.87	0.89	3.46	0.96	6.14	0.000	-0.41
Q15	Security clearance processing time	3.93	0.9	3.57	0.94	5.32	0.000	-0.35
Q16	Information visibility	4.26	0.86	3.96	0.95	4.5	0.000	-0.29
Q17	Information desk availability	4.24	0.87	4	0.95	3.7	0.000	-0.24
Q18	Ease of access to flight information	4.26	0.83	3.96	0.95	4.72	0.000	-0.30
Q19	Clarity of airport service signs	4.26	0.79	4.01	0.93	4.05	0.000	-0.25
Q20	Accuracy of flight information board	4.17	0.9	3.81	0.98	5.36	0.000	-0.36
Q21	Departure punctuality	3.96	0.97	3.39	1.1	7.77	0.000	-0.58
Q22	Washrooms availability	4.22	0.91	3.98	0.98	3.54	0.001	-0.24
Q23	Adequate seating in departure lounges	4.14	0.93	3.7	1.03	6.33	0.000	-0.44
Q24	Availability of lifts, passenger conveyors, escalators and air-bridges	4.32	0.86	4.09	0.9	3.68	0.001	-0.23
Q25	Comfort of departure lounges	4.03	0.88	3.64	0.86	6.3	0.000	-0.39
Q26	Free Wi-Fi	3.98	1.15	3.28	1.31	7.96	0.000	-0.70
Q27	Internet kiosk availability	3.87	1.06	3.34	1.13	6.78	0.000	-0.53
Q28	Charging station availability	3.89	1	3.4	1.09	6.6	0.000	-0.49
Q29	Walking distance and time spent between check-in desk to immigration	4.05	0.87	3.66	0.86	6.23	0.000	-0.39
Q30	Walking distance and time spent between immigration and departure gate	4.01	0.87	3.55	0.88	7.29	0.000	-0.46

Q31	Duration of unloading passengers from the aircraft	4.02	0.85	3.65	0.85	6.14	0.000	-0.37
Q32	Play areas for children	3.59	1.12	2.89	1.09	8.81	0.000	-0.70
Q33	Ease of access of medical services	3.72	0.99	3.24	0.97	6.85	0.000	-0.48
Q34	Baggage delivery time	3.92	0.95	3.44	0.97	6.94	0.000	-0.48
Q35	Commercial services e.g. banks, post office	4.03	0.86	3.61	0.93	6.6	0.000	-0.42
Q36	Money exchange	3.98	0.87	3.65	0.93	5.09	0.000	-0.33
Q37	Various shops providing different kinds of products	4.07	0.87	3.66	0.99	6.25	0.000	-0.42
Q38	Various restaurants providing different kinds of food	4.05	0.87	3.47	0.98	8.6	0.000	-0.57
Q39	Shop and restaurant prices	3.81	1.03	3.05	1.05	10.22	0.000	-0.76
Q40	Shops and restaurants' services quality	3.93	0.9	3.38	0.96	8.27	0.000	-0.55
Q41	Overall airport physical layout	4.18	0.83	3.93	0.87	4.02	0.000	-0.24
Q42	Airport terminal cleanliness and beauty	4.27	0.83	4.1	0.91	2.67	0.012	-0.17
Q43	Airport terminal lighting	4.29	0.8	4.16	0.87	2.24	0.033	-0.13
Q44	Airport facilities allocation and space design	4.22	0.81	4.02	0.85	3.31	0.002	-0.20
Q45	Presence of silence zones	3.92	0.94	3.42	1.05	6.97	0.000	-0.50
Q46	Presence of business centers	3.95	0.91	3.6	0.96	5.21	0.000	-0.35
Q47	Washrooms sanitary condition	4.11	0.87	3.72	1.04	5.69	0.000	-0.39
Q48	Airport terminal safety	4.27	0.82	4.07	0.88	3.28	0.002	-0.20
Q49	Response to passengers' complaints and comments	4.01	0.94	3.61	0.99	5.72	0.000	-0.39
Q50	Friendliness of the staff	4.13	0.92	3.77	0.98	5.32	0.000	-0.36
Q51	Reliability of the staff	4.13	0.89	3.79	0.94	5.22	0.000	-0.34
Q52	Service efficiency	4.1	0.92	3.71	0.97	5.83	0.000	-0.39

Table-3. Exploratory Factor Analysis (EFA) (Standard Factor Loadings).

	Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Eigen value	Variance explained
	Airport Access										
Q1	Public transportation to/from airport. E.g. waiting time; taxi availability; accessibility; etc.	0.68								2.4	0.42
Q2	Waiting time and cost of car parking	0.73									0.37
Q3	Car park availability and standard	0.78									0.32
Q4	Service quality of car rental facilities	0.68									0.43
Q5	Clarity of external signage indicating directions to terminals; parking areas; etc.	0.53									0.51
Q6	Convenient location and sufficient number of baggage trolleys	0.55									0.5
	Check-in										
Q7	Check-in waiting time		0.77							2.6	0.34
Q8	Efficiency of check-in procedures		0.81								0.26
Q9	Self-check-in facilities		0.74								0.39
Q10	Transfer connection time		0.79								0.28
Q11	Waiting time for next flight		0.7								0.44
	Immigration and Security										
Q12	Immigration inspection waiting time			0.76						2.37	0.48
Q13	Immigration inspection processing time			0.77							0.39
Q14	Security clearance waiting time			0.92							0.13
Q15	Security clearance processing time			0.89							0.16
Q16	Information visibility										0.24
	Information										
Q17	Information desk availability				0.82					1.6	0.23
Q18	Ease of access to flight information				0.84						0.24
Q19	Clarity of airport service signs				0.81						0.23
Q20	Accuracy of flight information board				0.79						0.36
Q21	Departure punctuality				0.75						0.6
	General airport facilities										
Q22	Washrooms availability					0.67				1.38	0.45
Q23	Adequate seating in departure lounges					0.69					0.44
Q24	Availability of lifts, passenger conveyors, escalators and air-bridges					0.72					0.35
Q25	Comfort of departure lounges					0.78					0.3

Q26	Free Wi-Fi					0.74					0.61
Q27	Internet kiosk availability					0.8					0.41
Q28	Charging station availability					0.75					0.44
Q29	Walking distance and time spent between check-in desk to immigration					0.75					0.34
Q30	Walking distance and time spent between immigration and departure gate					0.79					0.28
Q31	Duration of unloading passengers from the aircraft					0.71					0.36
Q32	Play areas for children					0.63					0.75
Q33	Ease of medical service access					0.72					0.47
Q34	Baggage delivery time					0.75					0.4
	Shopping facilities and catering										
Q35	Commercial services e.g. banks, post office						0.69			1.12	0.39
Q36	Money exchange						0.7				0.39
Q37	Various shops providing different kinds of products						0.83				0.23
Q38	Various restaurants providing different kinds of food						0.81				0.26
Q39	Shop and restaurant prices						0.77				0.44
Q40	Shops and restaurants' services quality						0.83				0.25
	Airport environment										
Q41	Overall airport physical layout							0.83		1.04	0.21
Q42	Airport terminal cleanliness and beauty							0.82			0.22
Q43	Airport terminal lighting							0.85			0.18
Q44	Airport facilities allocation and space design							0.79			0.25
Q45	Presence of silence zones							0.77			0.36
Q46	Presence of business centres							0.73			0.38
Q47	Sanitary condition of washrooms							0.76			0.32
Q48	Airport terminal safety							0.75			0.28
	Staff services										
Q49	Response to passengers' complaints and comments								0.85		0.24
Q50	Friendliness of the staff								0.89		0.17
Q51	Reliability of the staff								0.89		0.16
Q52	Service efficiency								0.89		0.17
Cronbach's Alpha		0.807	0.855	0.897	0.88	0.916	0.881	0.913	0.929		

Airport Access (Factor 1), Check-in (Factor 2), Immigration and Security (Factor 3), Information (Factor 4), General Airport Facilities (Factor 5), Shopping Facilities and Catering (Factor 6), Airport Environment (Factor 7), and Staff Service (Factor 8).

4.3. Exploratory Factor Analysis (EFA)

To assess and reduce the dimensionality of the service item scale, Exploratory Factor Analysis (EFA) was performed on the 52 items using the Principal Factor/Component (PF) method, followed by Varimax rotation. Table 3 shows the results of the factor analysis test for the 52 variables. The Kaiser-Meyer-Olkin (KMO) value, which is a measure of sampling adequacy, was found to be 0.944, suggesting that the factor analysis had proceeded correctly and that the sample was adequate.

The results of the Bartlett's Test of Sphericity were also significant, which indicated that the factor analysis processes were correct and suitable for testing multidimensionality. All of the items loaded more than 0.50 which met the requirement of a factor loading of 0.30 to be significant for a sample size of 350 or greater (Hair *et al.*, 1998). Eight factors were extracted and labeled as Airport Access (Factor 1), Check-in (Factor 2), Immigration and Security (Factor 3), Information (Factor 4), General Airport Facilities (Factor 5), Shopping Facilities and Catering (Factor 6), Airport Environment (Factor 7), and Staff Service (Factor 8). Cronbach's Alpha reliability test was used to determine the reliability of the data Table 3.

4.4. MNOVA and ANOVA Analysis

The one-way MANOVA test was used to examine whether there are differences between the demographic variables in relation to the perception and expectation scores.

Regarding Expectations, MNOVA analyses confirmed that there was a significant multivariate effect for Gender $F(1,388)=1.979$, $p=0.003$; Nationality $F(7,382)=1.979$, $p<0.001$; Domestic/International $F(1,388)=8.165$, $p<0.001$; and Travel Purpose $F(4,385)=2.614$, $p=0.007$. The univariate ANOVA tests conducted after the MANOVA tests revealed that women tended to assign significantly higher scores than men; Chinese travellers were more satisfied than other nationalities; Domestic travellers were happier than international ones; and passengers travelling for holiday and academic-related purposes were more satisfied than those travelling for business and other purposes.

In terms of Perceptions, MNOVA analyses showed a significant multivariate effect for Education $F(3,386)=0.875$, $p=0.029$; Nationality $F(7,382)=13.656$, $p<0.001$; and Domestic/International $F(1,388)=3.913$, $p<0.001$. One-way ANOVA results confirmed that passengers with postgraduate degrees were more satisfied than other groups; Passengers from South America were more satisfied than others and domestic passengers were more satisfied than international travellers. Thus, H2, H3 and H4 are accepted.

4.5. Multiple Regression Analysis

Correlation and multiple regression analyses were conducted to test H5 (to examine the relationship between airport service quality and passengers' overall satisfaction). The dependent variable in model 1 was overall satisfaction, and the independent variables were Airport Access, Check-in, Immigration and Security, Information, General Airport Facilities, Shopping Facilities and Catering, Airport Environment, and Staff Service as determined from the factor analysis. Pearson Correlation tests showed that significant positive relationship exists between most of the air travel service quality dimensions and overall satisfaction. The F-test $\{(F = 65.564, p < 0.001)$, expectation; $(F = 73.714, p < 0.001)$, perception} also showed that there was sufficient evidence to substantiate the usefulness of this model. The coefficient of determinant of the regression model is 0.579 (expectation) and 0.608 (perception), indicating that 57.9% (expectation) and 60.8% (perception) of variance in air travel service quality are explained by the eight service quality dimensions.

Table 4 summarizes analysis results. For expectation, Factor 2 (Check-in), Factor 4 (Information), Factor 7 (Airport Environment), and Factor 8 (Staff Service) are positively and significantly correlated with the overall satisfaction $R^2 = 0.579$, $F(8, 381) = 65.564$, $p < .001$; For perception, Factor 3 (Immigration and Security), Factor 4 (Information), Factor 5 (General Airport Facilities), Factor 7 (Airport Environment), and Factor 8 (Staff Service)

are positively and significantly correlated with the overall satisfaction $R^2 = 0.608$, $F(8, 381) = 73.714$, $p < .001$. Therefore, H5 is partially accepted.

Table-4. Multiple Regression Analyses.

Type			Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Expectations	1	(Constant)	.521	.186		2.804	0.005
		Airport Access	.112	.066	.090	1.703	0.089
		Check-in	-.113	.056	-.106	-2.034	0.043
		Immigration and Security	.071	.046	.077	1.542	0.124
		Information	.160	.062	.143	2.571	0.011
		General airport facilities	-.031	.081	-.028	-.377	0.706
		Shopping facilities and catering	.041	.063	.039	.648	0.517
		Airport environment	.305	.073	.269	4.164	0.000
Perceptions	1	Staff services	.340	.055	.364	6.176	0.000
		(Constant)	.173	.179		.968	0.334
		Airport Access	.052	.059	.039	.882	0.378
		Check-in	.006	.050	.006	.127	0.899
		Immigration and Security	.080	.037	.088	2.163	0.031
		Information	.174	.049	.163	3.538	0.000
		General airport facilities	.129	.064	.102	2.022	0.044
		Shopping facilities and catering	-.025	.049	-.024	-.502	0.616
Airport environment	.230	.060	.204	3.841	0.000		
Staff services	.331	.042	.369	7.795	0.000		

5. CONCLUSION

Service quality is one of the most important factors affecting passengers' satisfaction at an airport and consequently strongly influences further commercial activities and revenues of the airport. This research aims to assess the service quality at two airports in Shanghai through conducting a survey among passengers using the airport. The results have shown that all the perception scores were lower than the expectation scores, which implies that there is room for SAA to improve its service quality. Passengers were most satisfied with "Convenient location and sufficient number of baggage trolleys", "Availability of lifts, passenger conveyors, escalators and air-bridges", "Airport terminal lighting", "Airport terminal cleanliness and beauty", and "Airport terminal safety", and were less satisfied with "Play areas for children", "Shop and restaurant prices", "Ease of medical service access", and "Free Wi-Fi".

Understanding the relationship between demographic factors and passengers' expectations and perceptions can help the airport management to design and implement improvement programs that target specific customer segments. This study shows that female passengers tended to care more about "airport environment" items while male passengers placed higher value on airport facilities. Domestic and older passengers had higher expectations of airport service quality and they also gave higher ratings for existing airport services at SAA. It appears that Chinese citizens were more satisfied with most of the service items in comparison to travellers from other countries. Airport management needs to work with airlines to address their concerns and improve their airport experience, especially for foreign passengers. Hopefully, the results from this research can aid these two airports to gain a better understanding of passengers' needs in order to improve their service quality and gain a sustainable competitive advantage, thereby increasing their revenues.

This study has some limitations. First, it has only focussed on the airports in Shanghai, China. Due to differences in culture, this study may not be suitable for airports in other regions of China or countries. Second, the sample size is relatively small in this study, so a larger sample may be needed for future research. Finally, this study may be extended to all airports in China in the future to investigate if other airlines in China have the same implication.

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