

MEASUREMENT OF SERVICE QUALITY IN AIR TRANSPORTATION¹

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—Abstract—

Aviation is a fast, safe and comfortable way of travelling and in recent years aviation has become more accessible. For that reason, air traffic is getting busier year by year. In Turkey, aviation traffic started in the first years of the Republic and expanded when the private sector started to play a large role in the market in the 2000s. In 2003, Turkey had 26 airports but by 2015 the number had grown to 55, and the number of passengers had risen from 35 million to 155 million. The number of companies was increasing, and it was necessary to consider not only ticket prices but also other benefits because of the competition. Service quality and satisfying expected service quality helps companies to gain an advantage in competition, and a customer's service satisfaction level defines purchasing behavior. This study aims to define the service quality dimensions. Accordingly, the study was conducted with 300 passengers over the age of 18 travelling through Adana Şakirpaşa Airport, which is the sixth biggest airport in Turkey. Face to face surveys were used to gather data and the SERVQUAL scale was used to analyse customer perception and service quality.

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1. INTRODUCTION

Alongside technological, economic and sociological developments in the world, the share of the service sector in the economy is increasing. In recent years, it has taken a 12% share of the gross national product (GNP) (<http://www.kalkinma.gov.tr/Pages/TemelEkonomikGostergeler.aspx>), and demand in the transport sector, which has an important place in the Turkish economy, has grown by approximately 8%. Air transport is the fastest and safest means of transport, and it has made significant developments recently. Demand for roads is rising by 7.6% every year, for railways by 2%, and for sea transport by 5%, while demand for air transport has risen by more than 16% annually (Ministry of Development, 2014: 13). Along with the technological revolution and the beginning of the development of the civil aviation sector in the 20th century, consumers' search for speed and comfort, the completion and increase of infrastructure services, and increased need for travel for such reasons as tourism and trade are factors which have led to the development of airline companies. The competitive environment caused by the increase in the number of airlines has made it necessary to consider different service factors other than prices. Even though air transport is preferred over other transport methods for its ease, speed and reliability, product and generic competition are high. According to the figures of the International Civil Aviation Organization (ICAO) for the end of 2014, the number of fare-paying passengers in the world exceeded three billion, and 50 million tons of cargos were carried.

In Turkey, the Government Airline Operation was founded, and under its present name of Turkish Airlines (THY) it was until 1989 the only airline company operating in the country. In the liberalization process begun in the second half of the 1980s, private entrepreneurship which began in all sectors was also seen in airlines. A new era began with the foundation of Sun Express Airlines as a partnership between THY and Lufthansa in 1989, Pegasus in 1990, and Onur Air in 1992, and this brought competition. At the beginning of the 21st century, air transport companies became much more active: 35 million passengers were carried in 2003, but this annual figure reached 166 million by the end of 2014. In

the same period, the number of airports rose from 26 to 55. Despite this, 90% of the movement of these 166 million passengers took place in only 10 of these airports (www.dhmi.gov.tr).

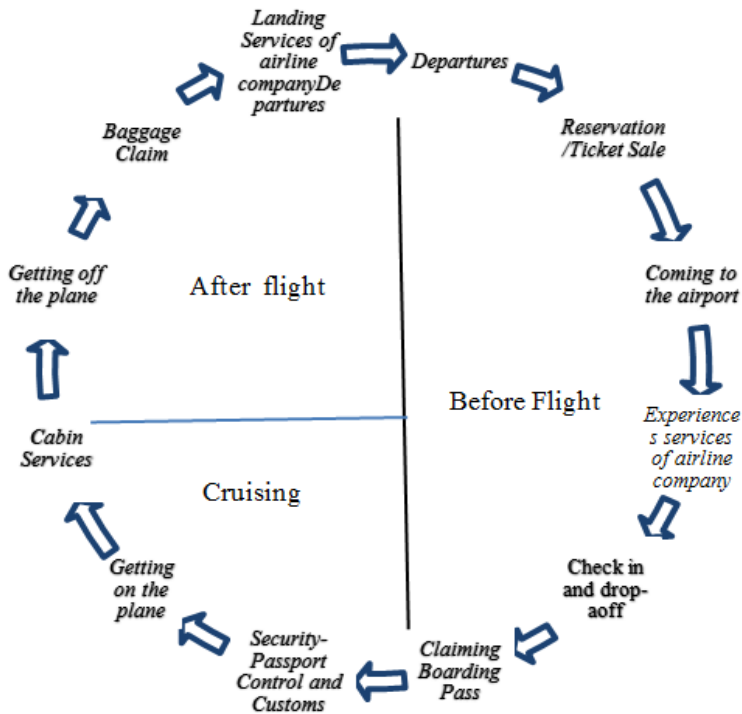
This study was conducted with the aim of determining the travel preferences of passengers using Şakirpaşa Airport, a regional airport, the factors affecting these preferences and their satisfaction with travel services.

2. THE SERVICE SECTOR and SERVICE QUALITY

The service sector has a wide reach in the general economy, and because of qualities such as intangibility, heterogeneity, synchronicity and lack of need for keeping stocks, it is different from the output of other sectors. Within the service sector, people, whether providing or receiving the service, play an important part. In addition, consumption of the service at the time it is produced, the existence of various distribution channels, frequent difficulties of management of demand according to capacity, and difficulty in evaluating customer service have given rise to the need to determine expected and perceived service. However, all these qualities at the same time make the measurement of service quality difficult. The first work on service quality measurement was begun in the second half of the 1980s at the same time as the increase in importance of the sector. In studies of service quality and customer satisfaction, it was seen that the relationship between expected service and perceived service quality directly determined subsequent customer behavior (Pekkaya and Akıllı, 2013: 77). The main methods used to measure service quality are scales known as SERVQUAL and SERVPERF. The SERVQUAL scale was developed by Parasuraman et al. in 1988. It is widely used in different areas and is frequently met in the literature, and has 22 items and five dimensions. These dimensions are concreteness (physical structure, equipment, apparent staff), reliability (reliability of promised service and providing it quickly), responsiveness (willingness to help the consumer in situations relating to the service, guarantee (workers' knowledge and in this regard trust created in the customer) and empathy (showing interest in and paying attention to customers individually) (Parasuraman et al., 1988: 13). The other scale, SERVPERF (Cronin and Taylor, 1992), is used to measure perceived service quality. This scale, unlike the default of service quality of Parasuraman that service quality is a function of customer expectations and perceptions, maintains that service quality is only affected by perceptions and focuses only on

the effects on service quality of customer perceptions. In the model developed with the view that the SERVQUAL model was inadequate to model service quality, it was maintained that where 22 propositions were used on the SERVQUAL scale, service quality was unidimensional, only performance was focused on and customer expectations were left out (Türk, 2009: 402). Against this, there are studies which show that the SERVPERF scale is five-dimensional (Bülbül and Demirer, 2008:183). Even though the two models use the same propositions, the SERVQUAL model is seen to be used more widely. This frequency of use is also affected by the fact that the propositions suit every area of the service sector. This method is frequently used in such branches of the service sector as the ready food industry (Eleren et al., 2007), accommodation services (Aydın, 2005), public and local government services (Filiz et al., 2010; Donnelly et al., 1995), health services (Saleh and Ryan, 1991; Uzun, 2001; Yağcı and Duman, 2006; Özer et al., 2007), retailing (Dabholkar et al., 1995; Zhao et al., 2002; Nakip et al., 2006), library services (Bulgan and Gürdal, 2005), in the measurement of higher education service quality (Yılmaz et al., 2007; Lupo, 2013; Abili et al., 2012), and in the evaluation of museum services (Nowacki, 2005), transport services (Şenel et al., 2014) and banking (Yavaş et al., 2004; Altan and Atan, 2004; Yılmaz et al., 2007; Ladhari et al., 2011).

Figure 1. The process of buying passenger service in air transport
(Gerede, 2015: 10)



The basic objective of airlines is to provide a secure and comfortable flight and at the same time to ensure customer satisfaction throughout the service process. The passenger's expectation is to receive quality service, and to have a safe and comfortable journey (Figure 1). The final decision on service quality is given by the passenger. Therefore, in order to keep up with competition, it is important for airlines to correctly understand passengers' expectations, and measuring service quality is important for this. In this area, the SERVQUAL model and difference analysis are frequently used to measure service quality (Fick and Ritchie, 1991; Elliott and Roach, 1993; Sultan and Simpson, 2000; Park, 2007; Cheng and Chang, 2005; Nicolini and Salini, 2006). In Turkey, the number of studies has increased along with the development of the sector (Aksoy et al., 2003; Okumuş and Asil, 2007; Pakdil and Aydın, 2007; Aktepe and Şahbaz, 2010; Karaca, 2011; Ataman et al., 2011; Aydın and Yıldırım, 2012; Pekkaya and Akıllı, 2013; Yıldız and Erdil, 2013; Başfıncı and Mitra, 2015).

3. MATERIAL AND METHOD

The raw material for the study consisted of the data obtained face to face by questionnaire from passengers aged over 18 years travelling through Adana Şakirpaşa Airport. The questionnaires were developed in April 2015. Adana Şakirpaşa Airport is the sixth largest airport in Turkey in terms of passenger capacity. The number of fare-paying passengers can be determined approximately, but the population of the study is harder to estimate. In cases where it is difficult or impossible to determine the sampling frame, non-random sampling is preferred (Nakip, 2006). For this reason, a simple random sampling method was used in this study.

It is possible to attain correct results by determining a simple sampling volume. In marketing studies, accepted and applied sample volumes are determined according to the type of study. It is specified in various studies that a sample volume of between 300 and 500 is suitable for this type of study (Gegez, 2010). In this study, 300 questionnaires were given, which is within these limits. Data were analyzed using principal component and confirmatory factor analysis to establish the modified SERVQUAL scales. Also, multivariate analysis of variance (MANOVA) is used to determine between criteria affecting preferences in choice of airline and some socio-demographic information.

4. FINDINGS

Data obtained from the questionnaires was first evaluated with descriptive statistics in order to show the factors relating to the travel demands and preferences of the passengers in the study. The questionnaire contained questions both on air travel and on socio-demographic information. Table 1 contains the participants' socio-demographic characteristics. It shows that approximately 59% of the participants were male, 50.4% were educated to university degree level or higher, 61% were working and only 7.3% did not have social security. It was found that 28.6% were white-collar workers, 9.6% were blue-collar workers and 31.5% were self-employed. The monthly income of 70.4% of the participants was below 3000 ₺ (Turkish Liras). The passenger profile consisted of young people.

Table 1. Descriptive Data

	Frequency	%		Frequency	%
Gender			Education		
Female	124	41.3	Literate+ primary school	19	6.3
Male	176	58.7	Middle school	23	7.7
Age			High school	107	35.7
18-25	113	37.7	University	143	47.7
26-33	93	31.0	Postgraduate	8	2.7
34-41	38	12.7	Income (month/person)		
42-49	22	7.3	< 1 500 TL	116	38.7
50 and over	34	11.3	1 500-3 000 TL	95	31.7
Work status			3 001-5 000 TL	58	19.3
Working	183	61	5 001-7 000 TL	11	3.7
Not working	105	35	7 001-10 000 TL	8	2.7
Retired	12	4.0	10 001 and above	12	4.0
Profession			Social security		
White collar	88	28.6	SGK	261	87
Blue collar	31	9.6	Private insurance	14	4.7
Self employed	97	31.5	Green card	3	1.0
Other	84	27.9	None	22	7.3

Approximately half of the people interviewed travelled at most three times a year (46%). The fact that 32% of the most recent trips were for purposes of work was because the time when the questionnaire was given was not a special holiday period. Direct flights are limited, and most connections are made through a few centers, so that most journeys were made to or from Istanbul, Ankara and Izmir. Istanbul came first as the destination of approximately 36% of journeys.

An examination was made of the most-chosen airlines for domestic flights, and Pegasus was found to be in first and third place, and THY in second place (Table 2). Pegasus Airlines is second after THY in age and number of destinations. At the same time its frequent promotions and its large number of inflexible ticket choices had a great effect on passenger choices. Only 2% of passengers chose to fly Business Class (Table 2). Companies with departures from Adana were mostly low-cost ticket sellers without a choice of first class, and this affected the number of passengers choosing this class. Both the commission taken by the

airlines on ticket sales by agents and by telephone and the advanced online services offered by the companies caused an increase in ticket sales on the internet. This was confirmed by the data of the study. Approximately 80% of participants in the study bought their tickets online, and approximately 87% used a credit card. The short distance from the airport to Adana city center increased the use of private transport, and private cars were frequently used for transport to the airport (48.7%), and the use of public transport was approximately 11%. Shuttle services were only chosen by passengers from outside the province of Adana. However convenient and safe the travel choices offered by the airlines may be, as in all service sectors, problems may be encountered in this area arising from human activity. Approximately 15% of passengers said that they had experienced problems with the airline, the main one of which was damage to luggage, and the second was delayed flights (Table 2).

International travel demands and preferences were examined, and these were found to be lower than domestic demand. There is a high density of domestic fare-paying passenger flights at Adana airport, but there are relatively few international arrivals and departures. The effect of the small number of direct journeys and the higher price of international journeys mean that the number of journeys is lower than at other airports. In April 2015 when the questionnaires were given, 1 456 703 internal journeys were recorded at the airport with 195 824 international flight passengers (www.dhmi.gov.tr). Participants in the study were asked about international journeys which they had made in 2014, and approximately one person in four stated that they had travelled abroad (26.3%). These trips were mostly to European countries or to northern Cyprus (Table 2). The preferred European countries were Germany and the Netherlands, where many Turks live. Cyprus was the second-choice international destination because it is close and because of the length of its holiday season.

Table 2. Travel Habits and Preferences

Number of journeys	Frequency	Percentage
1-3	138	46.0
4-6	73	24.3
7-10	28	9.3
11-14	22	7.3
15-20	11	3.7
> 20	28	9.3
Last three cities visited		
İstanbul	108	35.9
Ankara	30	9.9
İzmir	26	8.6

Purpose of last trip		
Work	95	31.7
Holiday	92	30.6
Pleasure trip	64	21.3
Education	34	11.3
Health	8	2.7
Other	7	2.3
International travel preference		
Europe	11	13.9
Cyprus	10	12.6
Europe	6	7.5
Domestic airline preference		
THY	161	53.7
Pegasus	81	27.0
Pegasus	63	19.3
Means of reaching the airport		
Private vehicle	146	48.7
Taxi	61	20.3
Shuttle service	58	19.3
City bus	32	10.7
Other	3	1.0
Most encountered problems (first three)		
Luggage	15	34.0
Delays	14	32.8
Service quality	6	13.6
Preferred travel ticket		
Economy class	293	97.7
Business class	7	2.3
Place of ticket purchase		
Agent	39	13.3
Online	239	79.7
Telephone	9	3.0
Sales offices	12	4.0
Ticket payment method		
Cash	37	12.3
Credit card	260	86.7
Miles / Points	3	1.0

Participants' airline choices were evaluated with propositions on a three-way Likert scale. The responses were evaluated from the frequency values as percentages. The criteria most taken into account when choosing the airline were found to be first, generally arriving and leaving on time, second, direct flight, and third, ease of buying a ticket online. In contrast, the model of plane and the possibility of using miles or points were found not to be seen as important criteria in making a choice. Free gifts from the company or a history of accidents had a

medium level of importance in people's choices. The most important criterion for passengers was landing and take-off on time (93.7%) (Table 3).

Table 3. Criteria affecting preferences in choice of airline

	Disagree	Undecided	Agree
Promotional tickets	13.0	5.7	81,3
Miles or points	43.4	9.0	47,2
Model of aircraft	49.6	14.0	36,4
Free food and beverages	28.7	7.7	63,6
Company's history of accidents	25.0	7.0	68,0
Flight times	9.3	4.3	86,4
Direct flights	5.3	1.3	93,4
Flexible/convertible ticket	9.0	4.3	86,7
Ease of buying ticket online	4.7	2.3	93,0
Attitude/behaviour of staff	4.0	3.7	92,3
Usually landing and taking off on time	4.0	2.3	93,7
Space between seats and seat width	14.7	6.7	78,6
Baggage limits	17.0	5.3	77,7
Shuttle service	16.7	7.7	75,6

We used multivariable regression analysis to determine whether there was an association between preferences criteria and education and profession. The criteria for passengers were analyzed Pillai's Trace ($0.006 < 0.05$) and Wilk's Lambda ($0.005 < 0.05$) for education. Also for the profession of Pillai's Trace ($0.034 < 0.05$) and Wilks' Lambda ($0.032 < 0.05$) was found (Table 4 and 5). These are below from 0.05. The difference between criteria and education and profession is important statistically.

Table 4. MANOVA on Criteria affecting preferences in choice of airline and education

Multivariate Tests^a

Effect	Value	F	Hypothesis df	Error df	Sig.
Intercept Pillai's Trace	,874	137,315 ^b	14,000	277,000	,000
Wilks' Lambda	,126	137,315 ^b	14,000	277,000	,000

	Hotelling's Trace	6,940	137,315 ^b	14,000	277,000	,000
	Roy's Largest Root	6,940	137,315 ^b	14,000	277,000	,000
Education	Pillai's Trace	,346	1,490	70,000	1405,000	,006
	Wilks' Lambda	,695	1,504	70,000	1322,871	,005
	Hotelling's Trace	,385	1,516	70,000	1377,000	,005
	Roy's Largest Root	,183	3,675 ^c	14,000	281,000	,000

a. Design: Intercept + Education

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Table 5. MANOVA on Criteria affecting preferences in choice of airline and profession

Multivariate Tests^a

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	,931	263,036 ^b	14,000	275,000	,000
	Wilks' Lambda	,069	263,036 ^b	14,000	275,000	,000
	Hotelling's Trace	13,391	263,036 ^b	14,000	275,000	,000
	Roy's Largest Root	13,391	263,036 ^b	14,000	275,000	,000
Profession	Pillai's Trace	,421	1,285	98,000	1967,000	,034
	Wilks' Lambda	,643	1,292	98,000	1748,174	,032
	Hotelling's Trace	,465	1,296	98,000	1913,000	,030
	Roy's Largest Root	,160	3,210 ^c	14,000	281,000	,000

a. Design: Intercept + profession

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

5. FACTOR ANALYSIS AND MEASUREMENT OF SERVICE QUALITY

The 22 propositions on the SERVQUAL scale were prepared taking into account previous studies on the airline sector, and factor analysis was performed. Reliability of the scale was measured with the Cronbach Alpha test, and was found to be 0.925. When basic component analysis was conducted in the factor analysis, the varimax rotation method was used. Table 4 shows the results of the initial solution, the rotation solution and variance values. The number of factors was decided on the basis of the eigenvalue, variance and cumulative variance criteria. Factors with an eigenvalue of more than 1 were chosen, variables with a factor load of 0.5 or more were taken into account, and it was found that five factor variances explained 67.413%. The KMO (Kaiser-Meyer-Olkin measure of sampling adequacy) calculated to test the suitability of the variables for analysis

was found to be 0.928, Bartlett's test was 3376.599, S. Der.=210, and $p=0.000$. These values showed that the data was in accordance with the factor analysis. The structural validity of the scale was seen with high variance and high factor loads varying between 0.516 and 0.839. The variance explaining each dimension is given in parentheses in the table.

Table 6. Results of Factor Analysis

Reliability (explanatory variance 21.786%)	Factor Loads
Answering passengers' questions adequately	.794
Customers will feel safe in transactions	.780
Employees will have the knowledge to answer customers' questions	.778
Employees will consistently courteous with customers	.715
The behaviour of employees will in still confidence in customers	.710
Employees will always be willing to help customers	.652
The customer services unit should deal willingly with problems and complaints	.525
Assurance (explanatory variance 14.101%)	
Promise to do something by a certain time	.824
A sincere interest in solving customer's problem	.745
Perform the service right the first time	.742
Insist on error free records	.624
Reliable airline	.516
Responsiveness (explanatory variance 12.306%)	
Employees response quickly	.803
Declares the time of the provided service in full	.680
Airline acts willingly to protect the interest of passengers	.547
Empathy (explanatory variance 10.471%)	
Employees give customers personal attention	.820
Operating hours convenient to all their customers	.759
Understand the specific needs of customers	.713
Tangibles (explanatory variance 8.749%)	
Attractive internal and external appearance	.839
Attractive material	.828
Modern looking equipment	.545
Bartlett's Test of Sphericity	3376.599
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.928
Total variance (%)	67.413

Five factors were obtained with 21 propositions which had factors loads of more than 0.5. These factors were named reliability, assurance, responsiveness, empathy, and tangibles dimensions. It was seen that the five dimensions on the SERVQUAL scale were not similar to those in works on quality measurement

relating to airline services. Okumuş (2007) had 16 propositions and five different dimensions, Çelikkol et al. (2012) had 14 propositions and three dimensions, Önüt et al. (2008) had four dimensions, Başfırcı and Mitra had 20 propositions and five dimensions, and Okumuş and Asil (2007) had 22 propositions and five dimensions for local passengers and seven dimensions for foreign passengers. These findings are an indicator that there is no standard classification in service quality in airline transport services. The variability can be explained by differences in target population and the experimental design and hypotheses of the research.

The five basic dimensions determined in the study explain 67.413% of the total variance, and the greatest contributing factor was determined to be reliable staff (21.786%). Because they are in direct contact with passengers before and during the journey, the staff's confidence-inspiring behavior, skills at solving problems and ability to give direct and satisfactory answers to passengers were the topics which had the most positive expectations. In the study by Okumuş and Asil (2007) also, reliable staff was the dimension which was in first position with local passengers. Variables relating to the provision of correct and reliable service were named the assurances dimension, and explained 14.101% of variance. The third dimension was responsiveness, and included the responsibilities of both the staff who are directly concerned with passenger requests and the management, and showed willingness in the provision of services. It was seen that in this study as in many others the importance of the dimensions named physical environment and empathy came last. It can be said that passengers pay more attention to the actual service provided by staff and management. Flying for short distances and lower cost flight caused passengers to attach less importance to physical conditions.

6. CONCLUSIONS

In recent years in the air travel sector, developments both in infrastructure and in service providing businesses and the expansion of the global market in international transport have forced change and competition in the public sector and in businesses. The basic element in competition is difference. The ability of a business to create this difference is connected to its ability to know its customers' desires and expectations and to meet them. Joining this skill to customer loyalty is especially important for airlines, which have a need for high infrastructure and investment capital. Developments in the sector have

necessitated an increase in studies on determining passenger request satisfaction. In particular, the way a generally subjective concept like quality is determined or in which areas it shows particular homogeneity have come to the head of the questions which need answering. The abstractness of service necessitates subjective and indirect measurement in the assessment of quality. Scales developed for this purpose are often used in airline management. There are undoubted benefits which the results of studies conducted on various profiles will create for businesses which are active in the sector now or will be in the future. At the head of the most important findings of the study were that the passenger profile was made up from the young population and that there was no great income difference between those benefitting from the service. Direct flights, cheap tickets, take-offs and landings on time and staff attitude and behavior were found to be effective factors in the choice of airline. In this, THY and Pegasus, with a greater number of routes and more direct flights, were preferred. Recently, although the increasing importance of niche markets has shown itself in airline management, it has not taken its place in the rankings because of the small number of passengers, but it is answering an important need. This in turn shows the importance accorded by businesses to customer expectations and requests. Thus travel possibilities are offered from Adana to alternative airports other than the cities considered as standard. More demand for this convenience for passengers will cause an increase of this example.

According to measurements from the SERVQUAL scale, five dimensions were determined at different levels of importance from other studies, and the most important dimension was reliable and adequate staff. It is a natural result that this dimension came out as important because passengers were in one-to-one interaction with the person providing the service. It was concluded that airlines were evaluated for flight training and passenger security and that the physical environment was given less importance because flights were mostly short-distance and low-cost.

This study was conducted specifically at Adana airport and has the particular importance that this is a regional airport and at the same time it has the importance of being the first study conducted in this region. However, a limitation is that the number of international flights was low, so that it was applied only to passengers on domestic flights. Studies relying on this kind of horizontal section data show the situation at the time when the questionnaires were given.

However, customer demand is dynamic, and in order to follow changes in this dynamic structure and to act in accordance with it necessitates the repetition of information gathering at regular intervals.

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