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RESEARCH PAPER

Determinants of quality in airline service: the user's view of a developing country

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ABSTRACT

Goal: This paper aims to identify the dimensions that impact the perception of the quality of Brazilian air services in the eyes of customers, using a questionnaire based on the SERVPERF model adapted for the service studied as a data collection instrument.

Design/Methodology/Approach: The research used a quantitative approach, in which 810 questionnaires were analyzed using Structural Equation Modeling methodology.

Results: The results showed that the relationship between quality perceived by clients and the dimensions of quality Tangibles and Empathy were those confirmed by Structural Equation Modeling in this research. The fact that the study is exploratory, and temporal indicates that in this period, Brazilian consumers attach more importance to the environment and appearance of aircraft, equipment, and employees of the companies and that their needs are met in a personalized way.

Limitations of the investigation: Only Tangibles and Empathy dimensions were confirmed.

Practical implications: With the feedback of the customer, including the constant need for an accuracy of the assumptions and hypotheses studied in this paper, an airline can identify what the real needs of its customer must be met and, in its strategic planning, identify the possible actions to be implemented, such as the priority of the investments, and, thus, to be able to increase the competitive advantage, offering the clients what they prioritize.

Originality/Value: The information brought by this research can support the development of business strategies oriented in aspects related to tangible elements and empathy in the service to add value to the service perceived by the clients, contributing to the development of the activity and the sector.

Keywords: Service quality dimensions, Structural Equation Modeling, SERVPERF, the perception of passengers.

INTRODUCTION

The civil aviation sector stands out worldwide for its tradition of providing digital works. In Brazil, the sector made in 2018, 967 million domestic and international flights, 117.5 million passengers were transported in the same year, of which 23.9 million for international flights. Thus, the sector. In addition, the sector raised about 43 billion reais, being a sector of great importance for the Brazilian economy (ANAC, 2018; Pereira; Mello,2020).

The dynamics of the air transport market naturally generate potential market concentration characteristics, yet there is competition in the sector. Due to various factors such as fossil fuel price uncertainties, accident losses, legal barriers to business start-ups, and high inward

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investment, this sector operates in an environment where few companies operate. In Brazil, the scenario is no different: in 2018 the country had four large companies operating in all regions of the country, with domestic market dominated by (31%), followed by GOL (29%), LATAM (25 %) and AVIANCA (11%), the latter declared bankruptcy in 2019 and no longer operates in Brazil (Cade, 2017; ANAC, 2018; Wolff; Abreu; Caldas, 2019).

The high level of competition between airlines, and with the free choice of customers who do not seek only price, but also quality (Artigues et al., 2012; Wittman, 2014; Koo; Caponecchia; Williamson, 2016), the main concern of airlines which strive to offer a high-quality service is to retain loyalty and supply (Gilbert; Wong, 2003; Chou et al., 2011; Mansi et al., 2012). Regarding this point, Liou, Yen, and Tzeng (2008) argue that, although airline customer satisfaction is directly related to the organization's image on the market, companies need to prioritize a safe and quality service delivery. According to Graham (2008), today's passengers are increasingly sophisticated and have experienced flight purchases, and quality of service becomes critical to them, as well as cost-benefits offered by companies.

Consequently, there is a need to evaluate the quality of services provided by airlines, however this is hard to measure, since it includes several mandatory items defined by the International Air Transportation Association (IATA), such as ticket reservation, ticket issuance, check-in and check-out procedures, onboard services, baggage procedures, pre-flight and post-flight services. Other items are taken into consideration by the customers such as safety procedures, flight comfort, aircraft cleaning, the accuracy of services provided and flight punctuality (Feng; Jeng 2005; Collins; Rose; Hess, 2012).

The Brazilian civil aviation market is developing and is seeking to attract new airlines to the country, aiming to create greater competitiveness among companies, which would lead to an improvement of the system, reducing the cost and bringing more innovation (Ministério da Infraestrutura, 2019).

Due to the great importance of the air sector in Brazil and in the world, the quality of air services should be studied, since the high customer satisfaction and loyalty increase the profitability and the growth of the organizations, having quality as the propeller for competitiveness. Considering the importance of the sector in the economy and the problematization exposed so far, this research aims to answer the followincg question: What are the factors that influence the perceived quality of air services in the Brazilian market?

To answer this research question, this paper aims to identify the dimensions that impact the perception of the quality of Brazilian air services in the eyes of customers, using a questionnaire based on the SERVPERF model adapted for the service studied as a data collection instrument. The multivariate Structural Equation Modeling (SEM) technique was applied to validate the theoretical relations of quality measurement in services proposed by SERVPERF.

In operations management, the SERVQUAL and SERFPERF models are the most used and versatile tools for quality assessment (Falcão et al., 2017). The first model aims to assess the difference between expectation and perception, while the second focuses on user perception. Among the main criticisms of SERVQUAL, it is possible to highlight the induction of estimating that the expectation for a given item will always be maximum. In this way, the rational use of SERVPERF as opposed to SERVQUAL was chosen in this study.

The SERVPERF model was developed by Cronin and Taylor (1992) based on the dimensions of SERVQUAL, but differentiated from it due to its theoretical basis, which would be composed only of the customer's perception, thus disregarding expectations, since quality service is a customer attitude based on their perceptions through consumption. Cronin and Taylor (1992) highlight in the results of the study that SERVPERF is more efficient than the SERVQUAL proposal, since the model produces better results in the evaluation of service quality and, therefore, the evaluation estimates are more reliable and present higher explained variance (Cronin; Taylor, 1992).

The final conceptual model proposed in this paper evidenced that the dimensions Tangibles and Empathy are significant for the formation of the quality perceived in the air services. The dimensions Responsiveness, Reliability, and Assurance were not confirmed in the conceptual model, for this reason, they were removed from the model to obtain a better consistency, as recommended in the literature by Hair et al. (2006).

Thus, the main contribution of this paper is the information to support the development of business strategies oriented in aspects related to tangible elements and empathy in the service, to add value to the service perceived by the clients, contributing to the development of the activity and of the sector. For the academy, the contribution is in the improvement of the theme, and the elaboration of more in-depth studies that help to give more robustness to what was proposed in this research. In addition, from accurate information to service quality literature.

This paper is structured into five sections. The next section presents the theoretical background, which outlined the state of the art regarding perceived quality measurement and Quality in Air

Transport Service. The third section presents the research methodology, description of the data collection and the specification of the proposed model. In section four the empirical results are described. Finally, in section five are the conclusions drawn from the research results.

2 THEORETICAL BACKGROUND

In this section, the main findings regarding the Perceived quality measurement and the Quality in Air Transport Service will be presented.

2.1 Perceived quality measurement

The comparison of the consumers' expectations on a particular service and the real perceptions of the performance of this service by the consumers results in the perceived quality of the service (Bahia; Natel, 2000; Ahrholdt et al., 2016).

According to Akter et al. (2019), an organization's quality performance must be measured from the point of view of consumers since quality measurement is defined by the judgment or perceptions of the service's customers about the excellence of the service provided.

In the air transport service, the perceived quality can be measured by the perception of the services provided by the Airlines. And according to Boulding et al. (1993), the perception of service quality is highly related to the intention of acquiring the service.

Measurement of perceived quality can lead to identification and forecasting of customer's needs and visualization of new consumer's behaviors (Chen; Li; Liu 2019; Wang et al., 2020).

These views are of vital importance in the airline industry, which is a complex chain in which users' expectations and perceptions are divided into several stages during service delivery (Chen; Chang, 2005).

2.2 Quality in Air Transport Service

At all times the services are directly or indirectly linked to our lives and measuring the quality of services through customer's perception is a challenging proposal within an organization. In this case, it is necessary to understand that this satisfaction is something broader, and more intangible. In this way, setting quality in service is limited to specifying the dimensions of the service (Ostrowski et al., 1993; Bezerra; Gomes 2015).

Based on this perspective, perceived quality in service is an element of the consumer's satisfaction and it is conceptualized as the result of the characteristics of the sector, such as heterogeneity, intangibility, inseparability, and consumption (Parasuraman et al., 1985). Specifically, when it comes to air transport services, the characteristics described above have been present, so it can be classified as a service factory since this type of process has a low labor intensity, a low degree of customization and customer interaction (Schmenner, 1995). Due to the characteristics of the sector and the increase flights in Brazil, it is necessary to study the passenger's perception regarding the quality of the service provided by the airlines.

The studies of Gilbert and Wong (2003) sought to identify the quality dimensions that impacted the satisfaction of passengers departing from Hong Kong airport. The authors concluded that the dimension assurance, safety, and security aspect are the most important for the analyzed group. Pakdil and Aydın (2007) performed a similar analysis to the previous one at a Turkish airline using SERVQUAL scores weighted by loadings derived from factor analysis. The authors concluded that the responsiveness dimension was the most important for passengers, while the dimension of availability was the least important one.

Chou et al. (2011) used the SERVQUAL Model coupled with fuzzy logic to evaluate the quality of services provided by Taiwan Airlines. In the study, the authors concluded that reliability and assurance dimensions are the most important for the passengers surveyed. These findings are in convergence with Zeithaml et al. (1990) and Sultan and Simpson (2000).

Park and Park (2016) have used Structural Equation Modeling to analyze which air service quality dimensions can influence airline image restoration, airline satisfaction, recovery satisfaction and behavioral intentions of airline passengers. The survey was conducted at two airports in South Korea. Among the dimensions that may influence the company's image restoration were the promptness and behavioral intention.

Considering the general characteristics of the SERVPERF model proposed by Cronin and Taylor (1992) and the attributes considered important in the literature on air quality, the dimensions, and variables used in this work to compose the conceptual model proposed by this work can be summarized in Table 1.

Table 1 - Quality dimensions and variables in airlines

Dimensions	Variables	References
D1 – Tangibles	Q1: Modern equipment	Parasuraman et al., 1985; Zeithaml et al., 1990; Cronin and Taylor, 1992; Gilbert and Wong, 2003; Pakdil and Aydın, 2007; Chou et al, 2011; Hussain et al., 2015.
	Q2: Clean environment	
	Q3: Team appearance	
	Q4: Internal environment	
D2 – Reliability	Q5: Time information	Parasuraman et al., 1985; Zeithaml et al., 1990; Cronin and Taylor, 1992; Yang et al., 2012; Jiang, 2013; Basfirinci and Mitra, 2015; Lupo, 2015.
	Q6: Helped in trouble	
	Q7: Correct the first time	
	Q8: Took off on time	
	Q9: Correct records	
D3 – Responsiveness	Q10: Information about services	Parasuraman et al., 1985; Zeithaml et al., 1990; Cronin and Taylor, 1992; Liu and Lee, 2016; Jeeradist et al., 2016; Jiang and Zhang, 2016.
	Q11: Employee available	
	Q12: Willingness to help	
	Q13: Prompt service	
D4 – Assurance	Q14: Trust in the team	Parasuraman et al., 1985; Zeithaml et al., 1990; Cronin and Taylor, 1992; Chen, 2016; Ghorabaee et al., 2017.
	Q15: Security in service	
	Q16: Educated and friendly	
	Q17: Resources to accomplish tasks	
D5 – Empathy	Q18: Individual attention	Parasuraman et al., 1985; Zeithaml et al., 1990; Cronin and Taylor, 1992; Park and Park, 2016; Liu and Lee, 2016; Ghorabaee et al., 2017.
	Q19: Suitable times	
	Q20: Affordable Communication	
	Q21: Loyalty Programs	
	Q22: Understand the needs	

As shown in Table 1, the five dimensions and twenty-two variables proposed by Parasuraman et al. (1988) and Cronin and Taylor (1992) were used in several works to evaluate the quality perceived by the customers of the services of the airlines in Brazil. The use of quality dimensions serves as a basis for an assessment of the quality of services provided by airlines in Brazil and, consequently, the continuous improvement of the service provided.

3 METHODOLOGY

3.1 Data collection and description

The study is based on a sample of 810 users of the airline service in Brazil, aged over 18 years. The data collection was performed in one month. Convenience sampling was used in the research, data were collected through an online form. The sample size was based on the conditions for good fit of structural equation modeling.

The questionnaire was constructed based on the SERVPERF model developed by Cronin and Taylor (1992). Adapted for the service provided by the airlines, the SERVPERF model seeks to evaluate the quality of the services according to the client's perception regarding the five quality dimensions described in the theoretical background. This model was chosen in view of the adjustment for measuring the quality of service found in the literature, as well as the smaller length of the form, when compared to other models found in the literature.

The questionnaire was divided into three parts. The first part aimed to identify the profile of the interviewees. In the second part, the objective was to capture the client's perception of the service provided through 22 questions related to the quality dimensions investigated, where the answers ranged from 1 (totally disagree) to 5 (totally agree). Questions 18, 19, 20, 21 and 22 were adopted in the normal scale and not on the inverted scale, as proposed by Cronin and Taylor (1992). Finally, it aims to get an overall assessment of the customer's last flight experience.

The profile of the sample was analyzed using basic descriptive statistics and presented in Table 2. Among these, the majority is composed of 65% females and 35% males. Most respondents are young individuals, as 49% were between 18 and 24 years old. Regarding education 65% of individuals have University education (completed or attending). Regarding the last airline on which the respondent flew, the most frequent were GOL and TAM. Finally, respondents were asked whether they used miles for the last trip, 360 (44%) of respondents did not use miles for travel and

450 (56%) of respondents used miles for travel.

Table 2 - Respondent's socioeconomic profile

Variable	Characteristic	Quantity	Total	Percentage
Age	18-24	400	810	49%
	25-34	324		40%
	35+	86		11%
Sex	Male	284	810	35%
	Female	526		65%
Education level	Elementary School	100	810	12%
	High school	129		16%
	University education	526		65%
	Postgraduate studies	55		7%

3.2 Model specification

Considering that the scale proposed by Cronin and Taylor (1992) the SERVPERF Model has its validity attested from numerous publications related to measuring the quality of services in the most diverse areas, it was not considered necessary to prepare a Confirmatory Factor Analysis to investigate the validity of the latent constructs proposed by the model.

To identify and analyze the variables that explain the perceived quality of the airline services, the SEM methodology was used to test empirically a set of relationships through a model that operates the theory (Klem, 1995; Maruyama, 1998; Cao; Xu; Douma, 2012). According to Hair et al. (2006), Cao, Mokhtarian, and Handy (2007) and Zand and Rezaei (2020), the SEM development stages are: development of a theoretical model, construction of a path diagram, choice of data entry matrix type, evaluation of data analysis matrix, evaluation of Measures of model adjustment and modification of model estimates.

In this work, the data were evaluated for adequacy, through the evaluation of normality, by means of the non-parametric test of asymmetry and kurtosis and a check of missing data. It was used the IBM SPSS Amos 20 Software to estimate the SEM of this research, and the evaluations were performed using the Maximum Likelihood Method (ML). Thus, the developed model is presented in Figure 1. The latent variables are shown in the ellipses and the observed variables are shown in the rectangles. The arrows in the model represent the perceived quality of the observed variables.

Figure 1 - Measurement of perceived quality in passenger transport services

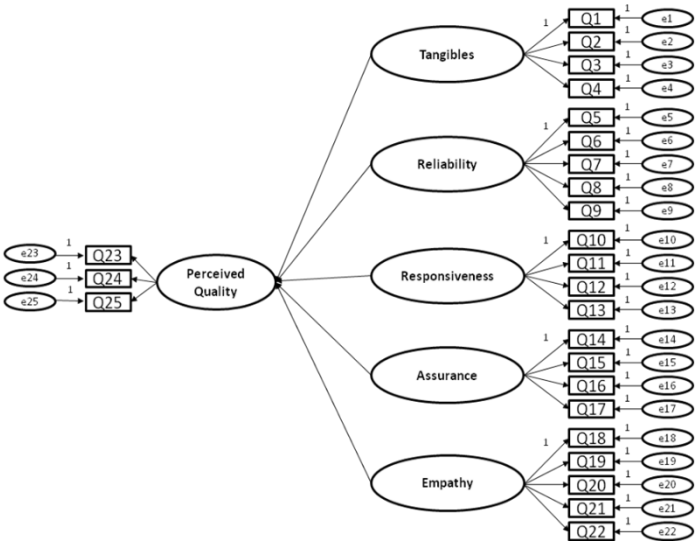


Figure 1 presents the conceptual model for measuring the perceived quality of passenger transport services. These constructs show the relationship between the five dimensions of quality and perceived quality. The proposed model was validated using SEM. From the dimensions presented in Table 1, the five hypotheses were developed and presented below:

H1: The dimension tangibles positively affect the perceived quality.
H2: The Reliability dimension positively affects perceived quality.
H3: The Responsiveness facilities dimension positively affect the perceived quality.
H4: The Assurance dimension positively affect the perceived quality.
H5: The Empathy dimension positively affects perceived quality.

4. EMPIRICAL RESULTS

The SEM estimation was performed by the IBM SPSS Amos 20 Software, initially, a structural equation model was proposed, testing the conceptual model presented in Figure 1. Table 3 presents the occasional relationships between the SERVPERF questions and the quality dimensions, the results of the SEM Model, as well as which theoretical constructs explain or not the quality dimensions.

Table 3 - The initial model for service quality dimensions and SEM results

Latent Variables	Casual relationships	Standardized Estimators	Critical Value	P	Result
Tangibles	Q2 <-- D1	0,598			
	Q3 <-- D1	0,479	0,132	5,985	Not supported
	Q4 <-- D1	0,687	0,15	7,344	Not supported
	Q1 <-- D1	0,644	0,168	7,191	Not supported
Reliability	Q6 <-- D2	0,6			
	Q7 <-- D2	0,51	6,505	***	Supported
	Q8 <-- D2	0,657	7,678	***	Supported
	Q5 <-- D2	0,612	7,374	***	Supported
	Q9 <-- D2	0,668	7,74	***	Supported
Responsiveness	Q10 <-- D3	0,559			
	Q11 <-- D3	0,682	8,193	***	Supported
	Q12 <-- D3	0,848	8,884	***	Supported
	Q13 <-- D3	0,74	8,563	***	Supported
Assurance	Q15 <-- D4	0,829			
	Q16 <-- D4	0,737	11,484	***	Supported
	Q17 <-- D4	0,648	10,256	***	Supported
	Q14 <-- D4	0,653	10,332	***	Supported
Empathy	Q20 <-- D5	0,532			
	Q21 <-- D5	0,416	5,57	***	Supported
	Q22 <-- D5	0,599	7,175	***	Supported

	Q19 <-- D5	0,402	5,422	***	Supported
	Q18 <-- D5	0,508	6,448	***	Supported
Percived quality (PQ)	PQ <-- D1	0,357	5,33	***	Supported
	PQ <-- D2	-0,16	-2,877	0,004	Supported
	PQ <-- D3	-0,013	-0,263	0,793	Not supported
	PQ <-- D5	0,914	7,947	***	Supported
	PQ <-- D4	0,105	2,058	0,04	Supported

According to Hui and Zheng (2010), it is recommended for data analysis that the regression has a p-value < 0.05 and the critical ratio > 1.96. According to Table 3, it is possible to observe that there was a good fit between the theoretical model and the empirical model in the dimension's reliability, responsiveness, assurance and empathy, p-valor and critical ratios adjusted with the recommendation of the theory are perceived.

However, the tangible dimension does not present significant adjustments since the critical valuations are below 1.96 and the p-values are greater than 0.05. In the general model of perceived quality, it was observed two insignificant variables, reliability, and responsiveness, according to the values of its regression coefficient, near zero and critical ratios lower than 1.96. Considering the p-value and critical ratio of the relationships between dimensions and perceived quality, it was observed that the tangibles, assurance, and empathy dimensions are significant.

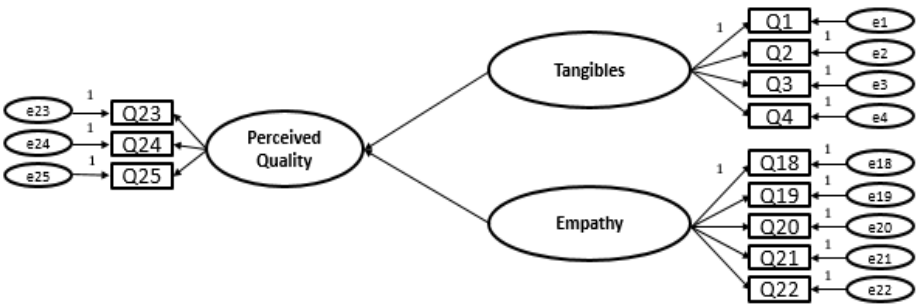
Table 4 presents the Model fit measures. The CMIN/df is the ratio of the chi-square test/degrees of freedom, in the proposed model this index had a higher value than the recommended one, so the model is not stable, and it does not converge properly. The NFI tends to underestimate the fit in small samples, in which case the index indicates that the model does not have a good fit, the NFI has been corrected and the comparative fit index (CFI) has been created in which it demonstrates that the adjustment is not good either. The Root Mean Square Error of Approximation (RMSEA) is one of the criteria with more information regarding modeling in covariance structures, so the index of the model showed that the adjustment is poor.

Table 4 - Overall evaluations of the SEM results

Model fit measures	Results of research	Good fit
CMIN/df	5.088	≤ 5.0
CFI	0.616	≥ 0.9
NFI	0.567	≥ 0.9
RMSEA	0.120	≥0.05 and ≤0.08

Although the majority of the theoretical relations proposed by the SERVPERF model was confirmed, the model did not present an adequate adjustment according to the goodness of fit indicators, the general adjustment indicator, the indicators of incremental and parsimonious adjustment were below the one suggested by Hair et al. (2006). In front of the table presented, the model was successively repeated until the best fit was found, according to Figure 2.

Figure 2 - Re-specified quality model perceived in air services



Due to these values, a new model was proposed, which eliminated the transgressor estimations, containing only the variables that were significant for the determination of the perceived quality in the air passenger transport service, as presented in Table 5.

Table 5 - The final model for service quality dimensions and SEM results.

Latent variables	Casual relationships	Standardized Estimators	Critical Value	P	Result
Tangibles	Q2 <-- D1	0,587			
	Q3 <-- D1	0,47	6,016	***	Supported
	Q4 <-- D1	0,701	7,58	***	Supported
	Q1 <-- D1	0,675	7,483	***	Supported
Empathy	Q20 <-- D5	0,473			
	Q21 <-- D5	0,208	3,193	0,001	Supported
	Q22 <-- D5	0,525	6,022	***	Supported
	Q19 <-- D5	0,294	4,369	***	Supported
	Q18 <-- D5	0,464	5,582	***	Supported
Percived quality (PQ)	PQ <-- D1	0,32	4,452	***	Supported
	PQ <-- D5	0,948	7,234	***	Supported

According to Table 5, the re-specified model presented a significant adjustment for p-value and critical value, indicating that the tangibility and empathy dimensions explain the perception of quality in air services for the sample surveyed. The significance of the model can be verified by means of the goodness of fit indicators presented in Table 6.

Table 6 - Overall evaluations of the SEM results of the final model

Model fit measures	Results of research	Good fit
CMIN/df	2.544	≤ 5.0
CFI	0.933	≥ 0.9
NFI	0.90	≥ 0.9
RMSEA	0.074	≥0.05 and ≤0.08

According to the goodness of fit indicators, the re-specified model presented the CMIN/df, NFI, CFI, RMSEA within the appropriate specifications, as suggested by the literature (Hair et al. 2006; Byrne; Vijver, 2017; Mulyadi, 2019). That is, the model is stable, and it does converge properly, in addition to presenting a good fit.

Regarding the reliability of the SERVPERF scale used for quality measurement in air passenger transport, the scale can be considered valid since the composite reliability is higher than 0.5 as recommended in the literature, Ping (2004). The reliability analysis is presented in Table 7.

Table 7 - Reliability indicators

Latent variables	Composite reliability
Tangibles	0.704
Empathy	0.500
Perceived Quality	0.617

Considering the aspects presented, a bibliographical review was carried out, to compare the results of the research with that found by other authors, and the information is presented in Table 8.

Table 8 - Quality dimensions for airline customers

Quality Dimensions	Location of study	Method used	References
Assurance and Responsiveness;	Japan	SERVQUAL	Gilbert and Wong (2003)
Responsiveness;	Turkey	SERVQUAL	Pakdil and Aydin (2007)
Reliability and Assurance;	Taiwan	SERVQUAL	Chou et al. (2011)
Responsiveness and Tangibles	South Korea	SERVQUAL	Kim and Lee (2011)
Reliability, Responsiveness and Assurance	Turkey	SERVQUAL	Kenan and Seda (2012)
Assurance and Reliability	Australia	Model proposed by Gilbert and Wong's (2003)	Jiang (2013)
Responsiveness	South Korea	Model proposed by the authors	Park and Park (2016)
Tangible and Empathy	Indonesia	SERVQUAL	Sari and Rinawati (2018)
Assurance and Responsiveness	Brazil	SERVQUAL	Santana et al. (2018)
Assurance and Empathy	Iran	SERVQUAL	Mojaveri, Khorasani and Ahmadvand (2019)
Responsiveness, Assurance and Empathy	Malaysia	SERVQUAL	Virappan and Chan (2020)
Tangibles and Empathy	Brazil	SERVQUAL and SERVPERF	Carvalho and Medeiros (2021)
Reliability and Responsiveness	Brazil	SERVQUAL and Kano model	Albuquerque, Melo and Medeiros (2021)

The SEM Re-specified model to measure the quality perceived in air services did not confirm the hypotheses H2: The Reliability dimension positively affect perceived quality, H3: The Responsiveness facilities dimension positively affect the perceived quality and H4: The Assurance dimension positively affect the perceived quality. Thus, the findings in this article diverged from the findings in Gilbert and Wong (2003), Pakdil and Aydin (2007), Chou et al. (2011), Kenan and Seda (2012), Jiang (2013), Park and Park (2016), Santana et al. (2018) and Albuquerque, Melo, and Medeiros (2021), that is, the studies showed different dimensions of quality as the most important for the consumer in the researched location, with the responsiveness dimension being the most repeated among them.

The SEM Re-specified model confirmed the hypotheses H1: The Tangibles dimension positively affect perceived quality and H5: The Empathy dimension positively affects perceived quality. According to the literature review, the confirmed tangibility dimension is in line with the findings in the works of Kim and Lee (2011) applied to low-cost airlines in South Korea, Sari and Rinawati (2018) applied in Indonesian Full -Service Carrier Airlines and Carvalho and Medeiros (2021) applied to an opinion of tourists about airlines' service at Brazil. The empathy dimension was also confirmed by the SEM Re-specified model, this result is converging with the findings of Sari and Rinawati (2018), Mojaveri, Khora-sani and Ahmadvand (2019), Virappan and Chan (2020) and Carvalho and Medeiros (2021).

With this, it was verified that the Brazilian airline customers attribute greater importance to issues related to the aesthetic and technological aspects of equipment, aircraft comfort, operating capacity and the aspects related to the care and individualized care provided to the clients. While in most of the surveyed countries customers are more concerned about the need/demand for speed in the process of ticket purchases, check-in, baggage clearing, flight cancellation, and problem-solving and on-time punctuality.

5. CONCLUSION

The application of the SERVPERF scale for the measurement of perceived quality in the

passenger air transport sector was partially adjusted, since the relationship between perceived quality and quality dimensions Responsiveness, Reliability and Assurance were not confirmed using SEM.

The results of Hussain et al. (2015) suggests that service quality, perceived value, and brand image have a positive impact on customer satisfaction and the Park and Park (2016) findings emphasize that the dimension promptness has a positive influence on the quality of the service provided by airlines, however, in this research the results were different.

Because it is an exploratory temporal study, at a specific moment, the results found in this article demonstrate that only the relation between the Tangibles and Empathy dimensions were confirmed. This fact suggests that in the current context of the passenger air transport sector in Brazil, the appearance of the aircraft's internal equipment and the environment, as well as the appearance of flight attendants, pilots, and the ground crew, are important for the aggregation of perceived quality of the service. For the customers who participated in the sample, it was also verified that it is important, for a better perception of quality of the service, a team that understands the needs of the users and develops personalized attention to the customers.

The highlight of the passenger satisfaction survey for the fourth quarter of 2018, published by the Ministry of Infrastructure, among the best services offered by airlines, whose evaluation is made with grades from 1 to 5, the latter being the largest possible, are: the cordiality and helpfulness of the check-in staff who got the highest grade of 4.73; followed by queuing time at the check-in (self-service) with the note 4.63 and quality of the information provided by the airline with the note 4.52 (Ministério da Infraestrutura, 2019).

Another relevant point to be considered is the fact that the National Civil Aviation Agency (ANAC), responsible for granting authorization for new airlines to fly within the country, authorized in 2018, three new airlines that work with low-cost model, which are Avian Airlines, Norwegian Air, Sky Airline (VEJA, 2018) and, in February 2019, the airline Flybondi received this authorization (Airway, 2019). With this in less than a year, four low-cost airlines have entered the market. Thus, in a highly competitive market, the four largest Brazilian airlines must make management decisions that focus on actions with a greater degree of adjustment of the services produced

Prado (2017) shows in a recent survey that there are differences of up to $642 for the same national route. The two smallest national aviation companies, Azul and Avianca, together, hold 30% of domestic flights. Although they cannot compete in terms of rates with Gol and Tam, the two largest national companies, they are focused on offering better services to customers such as hot food and more space between the seats, which is, the tangible dimension.

In this way, with the feedback of the customer, including the constant need for an accuracy of the assumptions and hypotheses studied here, an airline can identify which real needs of its customer must be met and, in its strategic planning, identify the possible actions to be implemented, such as the priority of the investments, and, thus, be able to increase the competitive advantage, offering clients what they prioritize. Therefore, the information brought by this research can support the development of business strategies oriented in aspects related to tangible elements and empathy in the service to add value to the service perceived by the clients, contributing to the development of the activity and the sector. It is noteworthy that this paper contributes in a practical way with the encouragement of policies for the promotion of ANAC in order to continuously improve the quality management system and, consequently, improve the service provided to the customer.

The research also brings benefits to the academia due to the fact that it contributes to new research to improve the theme, and the preparation of more in-depth studies that help to give more robustness to what it proposed in this research. Furthermore, we provide accurate information to the service quality literature.

As a suggestion for future research, we indicate applying the procedure adopted in this work also in other countries, which provides a comparison between different cultures and the analysis of airline customer satisfaction in a broader way. Moreover, it would be interesting to evaluate separately the quality of airport and in-flight airline services.

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REFERENCES

Ahrholdt, D.C., Siegfried, P.G., & Christian, M.R. (2017), "Enhancing Service Loyalty: The Roles of

Delight, Satisfaction, and Service Quality", Journal of Travel Research, Vol. 56, No. 4, pp. 436-50.

Airway (2019), "Flybondi of Argentina receives operating authorization to operate in Brazil", Available at: https://airway.uol.com.br/flybondi-da-argentina-recebe-autorizacao-de-funcionamento-para-operar-no-brasil/. Accessed on: February 5, 2020.

Akter, S., Wamba, S.F., & D'Ambra, J. (2019), "Enabling a transformative service system by modeling quality dynamics", International Journal of Production Economics, Vol. 207, No. 1, pp. 210-226.

Albuquerque, A.P.G., Melo, F.J.C., & Medeiros, D.D. (2021), "Airline quality assessment towards strategic tourism management improvements", Tourism Review, Vol. ahead-of-print, No. ahead-of-print.

ANAC – National Civil Aviation Agency (2018), "Air Transport Directory", Available at: https://www.anac.gov.br/assuntos/dados-e-estatisticas/mercado-de-transporte-aereo/anuario-do-transporte-aereo/dados-do-anuario-do-transporte-aereo. Accessed on: March 20, 2020.

Artigues, C., Bourreau, E., Afsar, H.M., Briant, O., & Boudia, M. (2012), "Disruption management for commercial airlines: methods and results for the ROADEF 2009 Challenge", European Journal of Industrial Engineering, Vol. 6, No. 6, pp. 669-689.

Bahia, K. & Nantel, J. (2000), "A reliable and valid measurement scale for the perceived service quality of banks", International Journal of Bank Marketing, Vol. 18, No. 2, pp. 84-91.

Basfirinci, C. & Mitra, A. (2015), "A cross cultural investigation of airlines service quality through integration of SERVQUAL and the Kano model", Journal of Air Transport Management, Vol. 42, No. 1, pp. 239-248.

Bezerra, G.C.L. & Gomes, C.F. (2015), "The effects of service quality dimensions and passenger characteristics on passenger's overall satisfaction with an airport", Journal of Air Transport Management, Vol. 44-45, No. 3, pp. 77-81.

Boulding, W., Kalra, A., Staelin, R., & Zeithaml, V.A. (1993), "A dynamic process model of service quality: from expectations to behavioural intentions", Journal of Marketing Research, Vol. 30, No. 1, pp. 7-27.

Byrne, B. & Vijver, F.V. (2017), "The Maximum Likelihood Alignment Approach to Testing for Approximate Measurement Invariance: A Paradigmatic Cross-Cultural Application", Psicothema, Vol. 29, No. 4, pp. 539-551.

CADE (2017), "Passenger and cargo air transport market", Available at: http://www.cade.gov.br/acesso-a-informacao/publicacoes-institucionais/publicacoes-dee/Mercado_de_transporte_aereo_de_passageiros_e_cargas.pdf. Accessed on: April 8, 2020.

Cao, X., Mokhtarian, P.L., & Handy, S.L. (2007), "Do changes in neighborhood characteristics lead to changes in travel behavior? A structural equations modeling approach", Transportation, Vol. 34, No. 5, pp. 535-556.

Cao, X.J., Xu, Z., & Douma, F. (2012), "The interactions between e-shopping and traditional in-store shopping: an application of structural equations model", Transportation, Vol. 39, No. 5, pp. 957-974.

Carvalho, R.C. & Medeiros, D.D. (2021), "Assessing quality of air transport service: A comparative analysis of two evaluation models", Current Issues in Tourism, Vol. 24, No. 8, pp. 1123-1138.

Chen, I.S. (2016), "A combined MCDM model based on DEMATEL and ANP for the selection of airline service quality improvement criteria: A study based on the Taiwanese airline industry", Journal of Air Transport Management, Vol. 57, No. 10, pp. 7-18.

Chen, L., Li, Y.Q., & Liu, C.H. (2018), "How airline service quality determines the quantity of repurchase intention - Mediate and moderate effects of brand quality and perceived value", Journal of Air Transport Management, Vol. 75, No. 1, pp. 185-197.

Chen, Y. & Chang, Y.H. (2005), "Examining airline service quality from a process perspective", Journal of Air Transport Management, Vol. 11, No. 2, pp. 79-87.

Chou, C.C., Liu, L.J., Huang, S.F., Yih, J.M., & Han, T.C. (2011), "An evaluation of airline service quality using the fuzzy weighted SERVQUAL method", Applied Soft Computing, Vol. 11, No. 2, pp. 2117-2128.

Collins, A.T., Rose, J.M., & Hess, S. (2012), "Interactive stated choice surveys: a study of air travel behaviour", Transportation, Vol. 39, No. 1, pp. 55-79.

Cronin, J.J. & Taylor, S. (1992), "Measuring service quality: A reexamination and extension", Journal of Marketing, Vol. 56, No. 3, pp. 55-68.

Falcão, L., Jerônimo, T.B., Melo, F.J.C., Aquino, J.T., & Medeiros, D.D. (2017), "Using the SERVQUAL model to assess mall service quality and customer satisfaction", Brazilian Journal of Operations and Production Management, Vol. 14, No. 1, pp. 82-88.

Feng, C.M. & Jeng, K.Y. (2005), "Analyzing airline service improvement strategy through importance and performance analysis", Journal of the Eastern Asia Society for Transportation Studies, Vol. 6, No. 1, pp. 782-797.

Ghorabaee, M.K., Amiri, M., Zavadskas, E.K., Turskis, Z., & Antucheviciene, J. (2017), "A new hybrid simulation-based assignment approach for evaluating airlines with multiple service quality criteria", Journal of Air Transport Management, Vol. 63, No. 8, pp. 45-60.

Gilbert, D. & Wong, R.K.C. (2003), "Passenger expectations and airline services: a Hong Kong based study", Tourism Management, Vol. 24, No. 5, pp. 519-532.

Graham, A. (2008), Managing Airports: An International Perspective, third ed., Butterworth Heinemann-Elsevier, Oxford.

Hair, J.F.J., Black, W.C., Babin, B.J., Anderson, R.E., & Tatham, R.L. (2006), Multivariate Data Analysis, Prentice-Hall, Upper Saddle.

Hussain, R., Nasser, A.A., & Hussain, Y.K. (2015), "Service quality and customer satisfaction of a UAE-based airline: An empirical investigation", Journal of Air Transport Management, Vol. 42, No. 1, pp. 167-175.

Jeeradist, T., Thawesaengskulthai, N., & Sangsuwan, T. (2016), "Using TRIZ to enhance passengers' perceptions of an airline's image through service quality and safety", Journal of Air Transport Management, Vol. 53, No. 6, pp. 131-139.

Jiang, H. (2013), "Service quality of low-cost long-haul airlines - The case of Jetstar Airways and AirAsia X", Journal of Air Transport Management, Vol. 26, No. 1, pp. 20-24.

Jiang, H. & Zhang, Y. (2016), "An investigation of service quality, customer satisfaction and loyalty in China's airline market", Journal of Air Transport Management, Vol. 57, No. 10, pp. 80-88.

Kenan, A. & Seda, Y. (2012), "Merenje kvaliteta usluge alatom 'SERVQUAL' za različite turske vazduhoplovne kompanije", Serbian Journal of Management, Vol. 7, No. 2, pp. 219-230.

Kim, Y.K. & Lee, H.R. (2011), "Customer satisfaction using low cost carriers", Tourism Management, Vol. 32, No. 2, pp. 235-243.

Klem, L. (1995), "Path Analysis", in Grimm, L.G. & Yarnold, P.R. (Eds.), Reading and Understanding Multivariate Statistics, American Psychological Association, Washington, DC.

Koo, T.T.R., Caponecchia, C., & Williamson, A. (2016), "How important is safety in making flight choices? Evidence from simple choice experiments", Transportation, Vol. 43, No. 1, pp. 1-17.

Liou, J.J.H., Yen, L., & Tzeng, G.H. (2008), "Building an effective safety management system for airlines", Journal of Air Transport Management, Vol. 14, No. 1, pp. 20-26.

Liu, C.H.S. & Lee, T. (2016), "Service quality and price perception of service: Influence on word-of-mouth and revisit intention", Journal of Air Transport Management, Vol. 52, No. 4, pp. 42-54.

Lupo, T. (2015), "Fuzzy SERVPERF model combined with ELECTRE III to comparatively evaluate service quality of international airports in Sicily", Journal of Air Transport Management, Vol. 42, No. 1, pp. 249-259.

Mansi, R., Hanafi, S., Wilbaut, C., & Clautiaux, F. (2012), "Disruptions in the airline industry: math-heuristics for re-assigning aircraft and passengers simultaneously", European Journal of Industrial Engineering, Vol. 6, No. 6, pp. 690-712.

Maruyama, G.M. (1998), Basics of Structural Equation Modeling, Sage Publications, London.

Ministério da Infraestrutura (2018), "Airport performance report - 4th quarter 2018 - October to November", Available at:

http://infraestrutura.gov.br/images/AVIACAO_CIVIL/PESQUISA_SATISFACAO/2018/4T/Relatório_trimestral_-_4º_Tri_2018_-_GERAL.pdf. Accessed on: January 21, 2020.

Ministério da Infraestrutura (2019), "Federal Government works to develop airline industry in Brazil", Available at: http://transportes.gov.br/ultimas-noticias/9112-governo-federal-trabalha-para-desenvolver-setor-aéreo-no-brasil.html. Accessed on: April 8, 2020.

Mojaveri, H.S., Khorasani, A., & Ahmadvand, K. (2019), "Presenting modified Servqual model to evaluate flight attendant services: Iran Air case study", Journal of Airline and Airport Management, Vol. 9, No. 1, pp. 14-23.

Mulyadi, A. (2019), "Modeling of tourists, local population, natural and cultural resources toward ecotourism product (case study in Seagrass Trikora Conservation Area)", Society and Business Review, Vol. 10, No. 10, pp. 1-20.

Ostrowski, P.L., O'Brien, T.V., & Gordon, G.L. (1993), "Service Quality and Customer Loyalty in the Commercial Airline Industry", Journal of Travel Research, Vol. 32, No. 2, pp. 16-24.

Pakdil, F. & Aydin, O. (2007). "Expectations and perceptions in airline services: An analysis using weighted SERVQUAL scores". Journal of Air Transport Management, Vol. 13, No. 4, pp. 229-237.

Parasuraman, A., Zeithaml, V.A., & Berry, L.L. (1985). "A conceptual model of services quality and its implications for future research". Journal of Marketing, Vol. 49, No. 4, pp. 41-50.

Park, J.J. & Park, J.W. (2016). "Investigating the effects of service recovery quality elements on passengers' behavioral intention". Journal of Air Transport Management, Vol. 53, No. 6, pp. 235-241.

Pereira, D.D.S. & Soares de Mello, J.C.C.B. (2020). "Brazilian airports network evaluation". Brazilian Journal of Operations & Production Management, Vol. 17, No. 1, pp. 1-10.

Prado, M. (2017). "Airfare has a variation of R$ 2,000, according to research". Folha de São Paulo. Available at: http://www1.folha.uol.com.br/mercado/2017/09/1919179-tarifa-aerea-chega-a-ter-variacao-de-r-2000-segundo-pesquisa.shtml. Accessed on January 17, 2020.

Santana, T.A.A. et al. (2018). "Análise do desempenho das companhias aéreas brasileiras através da escala SERVQUAL". Revista Gestão da Produção Operações e Sistemas, Vol. 13, No. 1, p. 105.

Sari, D.P. & Rinawati, D.I. (2018). "Airline service quality analysis using integration of fuzzy Servqual, PGCV index, and TRIZ methods in Indonesian full-service carrier airlines". International Journal on Advanced Science, Engineering and Information Technology, Vol. 8, No. 3, pp. 918-923.

Schmenner, R.W. (1995). Service Operations Management, Prentice Hall, Englewood Cliffs, NJ.

Sultan, F. & Simpson, M.C. (2000). "International service variants: airline passenger expectations and perceptions of service quality". Journal of Services Marketing, Vol. 14, No. 3, pp. 188-216.

VEJA. (2018). "Brazil targets low-cost airlines". Available at: https://veja.abril.com.br/. Accessed on February 21, 2019.

Virappan, T.M. & Chan, T.J. (2020). "Predictors of Corporate Reputation through Service Quality: A Study of Air Asia Customers Perspectives". Journal of Business and Social Review in Emerging Economies, Vol. 6, No. 2, pp. 789-798.

Wang, Y., Zhang, M.Z.Z., & Hexian, W. (2020). "The Impact of Service Quality and Customer Satisfaction on Reuse Intention in Urban Rail Transit in Tianjin, China". SAGE Open.

Wittman, M.D. (2014). "Are low-cost carrier passengers less likely to complain about service quality?". Journal of Air Transport Management, Vol. 35, No. 4, pp. 64-71.

Wolff, M., Abreu, C., & Caldas, M.A.F. (2019). "Avaliação do transporte rodoviário: uma revisão da literatura". Revista Brasileira de Gestão de Operações e Produção, Vol. 16, No. 1, pp. 96-103.

Yang, K.C., Hsieh, T.C., Li, H., & Yang, C. (2012). "Assessing how service quality, airline image and customer value affect the intentions of passengers regarding low cost carriers". Journal of Air Transport Management, Vol. 20, No. 5, pp. 52-53.

Zand, H. & Rezaei, B. (2020). "Investigating the impact of process and product innovation strategies on business performance due to the mediating role of environmental dynamism using structural equations modeling". Brazilian Journal of Operations & Production Management, Vol. 17, No. 2, pp. 1-15.

Zeithaml, V.A., Parasuraman, A., & Berry, L.L. (1990). Delivering Quality Service: Balancing Customer Perceptions and Expectations. New York: The Free Press.

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