

# Determination of Factors Affecting Transportation Mode Choice of Turkish Domestic Airline Passengers

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## RESEARCH ARTICLE

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## Abstract

Increasing demand in the transportation sector is closely related to the level of meeting passengers' demands. For this reason, many studies are being carried out in many parts of the world, especially in European and Far Eastern countries, aiming to determine the factors that affect passengers' choice of transportation mode. The aim of this study is to determine the main and sub factors affecting the choice of transportation mode for domestic airline passengers traveling in Türkiye. Within the scope of the study, a face-to-face survey was conducted to 407 passengers at Sabiha Gökçen Airport. Then, exploratory factor analysis was performed with the obtained data. Three main factors that emerged as a result of the analysis were named "Trip Factor", "Transportation Mode Factor" and "Safety and Comfort Factor", taking into account the literature review, expert opinions and the characteristics of the items. While on-time departure / punctuality, total travel time and travel at the requested time are the variables that have the highest impact on the choice of transportation mode. Previous accidents/incidents, transportation cost to airport/station and entertainment service in the cabin/wagon emerged as the variables with the lowest impact.

*This study is based on the doctoral thesis of the first author under the supervision of the second author*

## 1. Introduction

In order to achieve success in many areas such as transportation, health and tourism, it is very important to know the factors affecting customer preference and, if not known, to determine them. For this reason, determining such factors and increasing them to the desired level is frequently on the agenda of industry stakeholders and businesses (Chen, et al., 2020). Accurate prediction of passengers' choice of transportation mode is vital for the transportation industry's future planning and decisions (Findlay, Chia, & Singh, 1997). Therefore, identifying these factors and understanding their impact on changing demand has become one of the main focus areas of research in the field. Studies on the air transportation demand of a country or a region begin with the selection of a few relevant measurable factors, such as forecast variables. These variables are selected based on their relevance, previous studies, and data availability. Due to the nature of forecasting studies, data for these variables are generally created in time series format. Researchers then use econometric or statistically based analytical models to investigate the effects of predictor variables on transportation mode choice (Wang & Gao, 2021). The accepted truth in all modes of transportation is that; The way to increase passenger demand for businesses is through passenger satisfaction. For this reason, the factors affecting passengers' choice of transportation mode are constantly

investigated under different headings and under different names in the literature. In this study, the criteria that airline passengers take into consideration when choosing the mode of transportation are discussed (Chen Z., et al., 2021). Furthermore, factors and factor impact on the choice of transportation mode are determined. Eventually, sub-factors are listed under 3 main factors by considering literature review, expert opinions and the properties of the sub factors.

This research contributes to the literature in several ways. Firstly, the identified main and sub-factors can provide information about passengers' perspectives on different types of transportation. Secondly, results will provide resources for upcoming studies about passenger transportation mode selection. Finally, findings may be used for transportation sector management on investment of new transport projects.

In literature section, previous studies have been mentioned. Then conceptual model along with hypotheses are presented in third section. In forth section study method has been explained. Research scales are presented and explained in result and discussion section. Finally, outcomes and recommendations were discussed in conclusion section.

## 2. Literature

There are many studies in the literature on airline passengers' choice of transportation mode. Research on airline

passengers' transportation mode choices has a wide range of literature to understand how various factors influence these choices. These factors include cost, time, comfort, safety, environmental impacts and personal preferences. In this section, studies on relevant subject will be given.

Demographic features of passenger are notable factor affecting mode choice (Budd & Ison, 2017; Wensveen, 2023). Need and desire of people generally change by their gender, age, income statuses etc. So that, institutions should make allowance for this information (Tyrinopoulos & Antoniou, 2013; Nadeeshan & Mudunkotuwa, 2018; Buehler, 2011). Since each feature has their own criteria, they need to be investigated individually before analyzing as a block variable set. For example, young passengers tend to fly more and are often price sensitive, while older passengers may prioritize comfort (Demirsoy, 2012). However, when other variables included, interaction grade of age factor may be at negligible level.

Transportation cost and travel time are quite vital factors in selection process. Since price and time prominent variable for customer, they give weight to these criteria more than others (Park & Ha, 2006; Shi, Hussain, & Kong, 2022; Xia & Zhang, 2016; Zhang, Wan, & Yang, 2019; Li, Tian & Li 2016). Moreover, frequency and comfort factors are also found as critic factor on passenger choices (Pagliara, Vassallo, & Román, 2012; Yang & Zhang, 2012).

One of the factors that effecting passenger choice is location of airport. While an increase is seen at central airports, there was a decrease in flights at secondary airports (Zhang, Wan, & Yang, 2019; Behrens & Pels, 2012; Loo, 2008; Liu, 2017).

Since accidents and problems during flight have significant effect on passengers, safety and user friendly operation process are also important for passenger to choice transportation mode (Chang, 2013).

During decision process, lots of factors affect passenger's choice, this factor may be economic, demographic, psychologic, environmental and technologic. Different studies express different result on choice criteria. In the following part, most found factors affecting passenger's transportation mode choice is defined and discussed in more detail.

### 3. Factors Affecting Passengers' Transportation Mode Choice

#### 3.1. Total travel time

Total travel time is among the important factors affecting passengers' preference criteria (Boonekamp, Zuidberg, & Burghouwt, 2018). Shortening travel time means more trips, allowing passengers to reach their desired destination as quickly as possible (Belobaba, Odoni, & Barnhart, 2015). Airline passengers may have to spend long periods of time at airports for check-in and security screening procedures. The time taken for these operations may vary depending on factors such as the size of the airport, time of day and security measures taken. While advanced check-in options and expedited security lanes can help reduce time spent at the airport, these factors still increase overall travel time for airline passengers (Shi, Hussain, & Kong, 2022).

#### 3.2. Travel Frequency

While the frequency can be increased by planning more trips during the day or week, the number of seats offered can also be increased by low frequency flights with high seat capacity.

However, studies in the literature show that the capacity variable is strongly related to the frequency variable (Boonekamp, Zuidberg, & Burghouwt, 2018). In order to increase travel frequency, businesses direct their flights to points that have many connections with other points. In this way, the concentration of central points creates a great synergy. As a result of this effect, passengers can find more and more frequent connecting flights when they reach the hub point.

#### 3.3. On Time Departure / Punctuality

Another factor that passengers take into consideration when making their choice is the on-time performance of the flights (Boonekamp, Zuidberg, & Burghouwt, 2018). The difference between the planned take-off time and the real-time take-off time indicates the success of the on-time performance. It has been concluded that especially business travelers are more sensitive to flight delays (Prousaloglou & Koppelman, 1999, pp. 197-198).

#### 3.4. Travel at the Requested Time

The variable of the travel taking place at the requested time is closely related to the travel frequency and scheduled flight service. The availability of scheduled flights increases passengers' trust in the relevant business, as it requires a more corporate structure (Duval & Schiff, 2011). The impact of scheduled service availability on international tourism has been the subject of frequent research, especially in 2010 and thereafter (Tveteras & Roll, 2014). Previous academic literature directly estimates the effects of airlines on international arrivals. Later studies revealed that scheduled flights and the frequency of these flights have a positive and significant relationship on passenger demand (Koo, Tan, & Duval, 2013; Koo, Lim, & Dobruszkes, 2017).

#### 3.5. Ticket Price

Beyond many factors in the supply-demand relationship, the ticket price (pricing) factor is considered one of the most important tools available to businesses to stimulate sales and increase revenue (Wang & Gao, 2021). For this reason, most studies use average ticket prices as a predictive variable to explain the variability of passenger demands (Hazledine, 2017). Low-cost carriers (LCCs) tend to connect relatively smaller markets compared to full-service and regional carriers and HSR transportation. Such airlines aim to attract additional demand by offering low fares (Ghosh & Terekhov, 2015). Therefore, the proportion of passengers traveling with LCCs is another factor affecting the demand for airlines offering low fares (Boonekamp, Zuidberg, & Burghouwt, 2018)

#### 3.6. Transportation Cost to Airport/Station

Although passengers prefer to travel quickly and comfortably between two cities, the cost of transportation to the station where they will use the mode of transportation can sometimes significantly change the choices made (Phang, 2003). For this reason, passengers are more inclined to choose modes of transportation that are close and have public transportation. This tendency is more common especially in underdeveloped or underdeveloped countries (Banister & Berechman, 2000).

### 3.7. Transportation Time to Airport/Station

People whose transportation time significantly affects the choice of transportation mode are generally passengers traveling for business and private purposes (Macit, 2020). The longer the total travel time, including the transportation time to the airport/station, will decrease at the same rate as the passenger's desire to choose the relevant mode of transportation (Tengilimoğlu & Öztük, 2021). Throughout Turkey, train stations are located in more central locations than airports, however, multiple transportation options are provided to airports. For this reason, it is more likely to be preferred over airlines, especially for short-distance travel.

### 3.8. Public Transportation to Airport/Station

The importance of transportation to stations has been explained in previous titles based on different features. Access to stations by public transportation is important in terms of both time and cost. Public transportation is among the important services that enable frequent trips to the station and transportation at low costs (Saatcioglu & Yasarlar, 2012).

### 3.9. Previous Accidents/Incidents

Since the perception of safety has an important place for passengers, accidents and incidents occurring in a transportation sector affect passengers' choices of transportation mode (Su, Luan, Yuan, Zhang, & Zhang, 2019). Especially elderly passengers and passengers who are not familiar enough with the process in the transportation sector may have a perception that safety is reduced when accidents or incidents occur. This situation may lead to a shift in passenger preferences towards other modes of transportation (Marzuoli, et al., 2014).

### 3.10. Perception of safe transportation

In the 21st century, where transportation has become extremely important, safety is a major concern for passengers traveling for both business and other purposes. When it comes to choosing the safest mode of transportation, it is stated both in the statistics announced by the countries and in the literature that air and rail transportation are reliable and safe options (Silla & Kallberg, 2012).

### 3.11. Safety / Security Procedures

In environments with intense human and cargo flow, safety and security practices are extremely important. These practices include various measures to protect passengers, personnel and belongings from potential dangers and to provide a trouble-free travel opportunity. Since passengers are in areas that pose many potential safety risks during their waiting, departure and arrival processes, various security measures such as security screenings, digital and controlled doors, side barriers, regular announcements and visual displays are implemented at stations and airports (Wei, Guo, Dong, & Li, 2012). Within the scope of security and surveillance, the stations are equipped with advanced surveillance systems, including CCTV cameras and monitoring stations (Szatmári, 2021).

### 3.12. Entertainment Service in the Cabin/Wagon

All services offered by the carrier to passengers, from the ticket purchasing process to post-travel services, can be included in the comfort factor. Convenience in ticket sales,

loyalty programs, in-flight entertainment and food/beverage offerings are examples of these services. However, the research and expert opinions reveal that passengers evaluate their service perception based on the service provided during the travel (Proussaloglou & Koppelman, 1999). Especially passengers who have two different travel options with similar travel times tend to choose the mode of transportation that offers better catering and entertainment opportunities (Zhang & Findlay, 2014; Kopsch, 2012; Li & Sheng, 2016; Sofany, 2016).

## 4. Method

The survey used in the study was compiled in line with expert opinions, based on the scale in the literature (Gürsoy, Kuşakcı, Tanrıverdi, & Akyıldız, 2020) and related surveys (Dalkic, Balaban, Tuydes-Yaman, & Celikkol-Kocak, 2017; Yoo, 1995). Afterwards, demographic characteristics and travel-related criteria that affect passengers' choice of transportation mode are included. The created survey was adapted to the scope of the research after 10 pilot applications in the first stage and 30 pilot applications in the second stage. Survey was planned to conduct for airline passengers traveling on the Istanbul-Ankara and Istanbul-Konya lines, which have the opportunity to travel by both airline and YHT transportation in the Turkish domestic market. Since the survey will be carried out in cleared areas of airport, necessary permissions were first requested from the local authorities to which the related airports are affiliated. Only Sabiha Gökçen Airport officials responded positively to permit requests. Then, after a second permission was obtained from the airport's terminal authority, the survey was conducted on the specified days and hours. The surveys were administered face to face to passengers waiting for boarding in front of the boarding gates at Sabiha Gökçen Airport. After removing incomplete and incorrect surveys, 407 surveys suitable for evaluation were obtained. Then, by carrying out an exploratory study, exploratory factor analysis was carried out, which allows data consisting of many variables to be represented with a smaller number of variables (factors).

## 5. Result and Discussion

Descriptive statistics of the data obtained are shown in Table 1. 50.6% (206 people) of the passengers participating in the research are men and the remaining 49.4% (201 people) are women. It was also determined that 40.3% of the participants were 21-30 years old. This data is followed by passengers between the ages of 31-40 with 22.1%. The lowest average age group, with 9.3%, is passengers between the ages of 18-20. Passengers were asked about the level of education they had completed and 44% of the passengers declared that they had a bachelor's degree. This data is followed by passengers with high school education or below with 22.4%. The number of passengers with doctoral level education has the lowest rate at 4.9%. When asked who paid the ticket fee, a significant majority of the passengers, 57.7%, answered that they paid the ticket fee themselves. In other words, it seems that both the passenger and the customer are often the same person. One of the most important effects of this situation is that all the positive and negative services experienced by the passenger during the travel directly affect the choice of the next mode of transportation. The rate of those whose company or family-relative covers the ticket fee is 19.9% and 18.4%,

respectively. It was observed that the number of passengers whose friend paid the ticket fee or who had a free-gift ticket had the lowest percentage at 2%. 31.9% of the passengers travel for business purposes, 31.2% for visiting purposes, 19.4% for holiday purposes and 10.1% for education purposes. The remaining 7.4% travel for different purposes (funerals, disasters, etc.).

**Table 1** Descriptive statistics

		Frequency	Percent
Gender	Women	201	49.4
	Man	206	50.6
	<b>Total</b>	<b>407</b>	<b>100.0</b>
Age	51 and above	52	12.8
	41-50	63	15.5
	31-40	90	22.1
	21-30	164	40.3
	15-20	38	9.3
	<b>Total</b>	<b>407</b>	<b>100.0</b>
Payer	Free-Gift	8	2.0
	Friend	8	2.0
	Company	81	19.9
	Family	75	18.4
	Passenger (own)	235	57.7
	<b>Total</b>	<b>407</b>	<b>100.0</b>
Travel Purpose	Business	130	31.9
	Tourism	79	19.4
	Education	41	10.1
	Visitation	127	31.2
	Others	30	7.4
	<b>Total</b>	<b>407</b>	<b>100.0</b>

The basic assumption for most parametric tests is that the data collected within the scope of the research are suitable for normal distribution, individually or in multiple forms (Islamoglu & Alniacik, 2019). In order to understand the normal distribution of the data set, skewness and kurtosis values must be examined (Kline, 2016). Skewness and kurtosis values being within  $\pm 2$  indicate normal distribution (George & Mallery, 2010). As a result of the analysis, it is seen that these values are between -1.545 and +.702 (Table 2.). These results can be interpreted as the data set being normally distributed and all items being within acceptable limits. In addition, the means of the items in the scale vary between 2.8231 and 4.1499, and their standard deviations vary between 1.19508 and 1.61555.

**Table 2** Skewness and Kurtosis Values

Label	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
S1 Total travel time	-1.321	.121	.465	.241
S2 Ticket Price	-.831	.121	-.378	.241
S3 Travel frequency	-.801	.121	-.604	.241
S4 On Time Departure / Punctuality	-1.327	.121	.702	.241
S5 Travel at the Requested Time	-1.117	.121	.191	.241
T1 Transportation Time to Airport/Station	-.905	.121	-.485	.241
T2 Public Transportation to Airport/Station	-.628	.121	-1.126	.241
T3 Transportation Cost to Airport/Station	-.159	.121	-1.440	.241
K1 Convenience in ticket transactions	-1.021	.121	-.189	.241
K2 Interior seating arrangement in the Cabin/Wagon	-.487	.121	-1.180	.241
K3 Entertainment Service in the Cabin/Wagon	.144	.121	-1.376	.241
E1 Previous Accidents/Incidents	-.208	.121	-1.545	.241
E2 Perception of safe transportation	-.634	.121	-1.124	.241
E3 Safety / Security Procedures	-.519	.121	-1.200	.241

The 407 surveys obtained meet the requirement of being 10 times the number of variables and at least 384 samples with a 95% confidence interval, regardless of the number of variables (Conroy, 2018).

### 5.1. Exploratory Factor Analysis

Firstly, KMO (Kaiser-Meyer-Olkin) sample adequacy analysis was performed to determine sample adequacy and Bartlett test was performed to test the suitability of the data for factor analysis (Capik, Gozum & Aksayan, 2002; Karasar, 2005). As shown in Table 3, the KMO coefficient of the scale is 0.821 and the Bartlett test result is significant at the  $p < 0.05$  significance level. The fact that the KMO value is 0.821 indicates that the sample is sufficient for factor analysis, and the significant Bartlett test result indicates that the data is suitable for factor analysis.

**Table 3** KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	Bartlett's Test of Sphericity	
.821	Approx. Chi-Square	2064.570
	df	91
	Sig.	.000

As a result of the analysis conducted on the reliability level of the scale in the study, Cronbach's Alpha value was found to

be 0.842 (Table 4). Based on this result, the alpha coefficient obtained for all items shows that the applied survey can be considered reliable.

**Table 4** Cronbach’s Alpha Value

Reliability Statistics		
Cronbach Alpha	Cronbach's Alpha Based on Standardized Items	N
.842	.838	14

It is accepted that variance ratios ranging between 40% and 60% are sufficient to determine the number of factors (Tavsancil, 2019; Kline P., 1994). Additionally, factors with eigenvalues of +1 or greater need to be taken into account (Alpar, 2016; Field, 2005). Principal component analysis was used to find the factors in the explanatory factor analysis, and the oblimin rotation method was used to determine the number of factors - assuming there was a correlation between at least two factors. As a result of the analyses, a 3-factor structure emerged that explained 55.977% of the total variance in the 14-item scale and had an eigenvalue over 1.00. Alpar and Field express that; in factor analysis, factor loadings between 0.30 and 0.40 are accepted as the lowest acceptable levels (Alpar, 2016; Field, 2013). However, as a result of the first analysis, two items (K1 and K2) were removed from the analysis because the factor loadings of some items in the scale were below 0.30 (Alpar, 2016; Field, 2005). As a result of the second analysis, the factor loadings of the 12 items in the scale are between 0.341 and 0.785, as shown in Table 5.

**Table 5** Factor Loads of Components

	Communalities	
	Initial	Extraction
S1	1.000	.527
T4	1.000	.361
S3	1.000	.563
S4	1.000	.612
S5	1.000	.451
T1	1.000	.596
T2	1.000	.761
T3	1.000	.732
K3	1.000	.341
E1	1.000	.699
E2	1.000	.785
E3	1.000	.773

Extraction Method: Principal Component Analysis.

In addition, it was observed that the new factors obtained - with a higher value than the first analysis - explained 60% of the total variance (Table 6). This reveals that the factor loadings of the 12 items have application significance.

**Table 6** Final Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	4.136	34.468	34.468	4.136	34.468	34.468	3.296
2	1.902	15.851	50.320	1.902	15.851	50.320	2.442
3	1.163	9.690	60.010	1.163	9.690	60.010	3.028
4	.960	8.002	68.011				
5	.765	6.376	74.388				
6	.701	5.845	80.232				
7	.549	4.576	84.809				
8	.505	4.204	89.013				
9	.439	3.659	92.672				
10	.360	3.001	95.673				
11	.322	2.686	98.359				
12	.197	1.641	100.000				

Extraction Method: Principal Component Analysis.

When the distribution of factor loadings was examined as a result of factor analysis, it was seen that the variable coded S2 (Ticket Price) was loaded under the transportation mode factor. For this reason, it was removed from the trip factor set and listed under the transportation mode factor and named as T4. Factors that emerged (Table 7) were named "Trip Factor", "Transportation Mode Factor" and "Safety and Comfort Factor", taking into account the literature review, expert

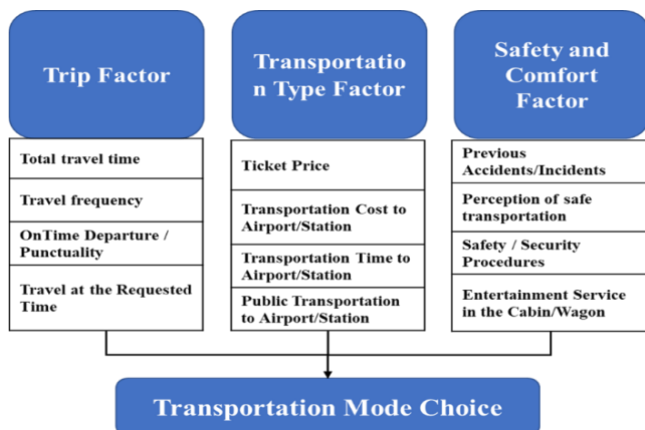
opinions and the characteristics of the items. The “Trip Factor” dimension consists of four items (S1, S3, S4, S5), the “Transportation Mode Factor” dimension consists of four items (T1, T2, T3, T4), and the “Safety and Comfort Factor” dimension consists of four items (E1, E2, E3, K3). Additionally, Cronbach's Alpha values within each factor are shown in Table 7.

**Table 7** Factors, Component Loads and Cronbach's Alpha per Factor

Factors	Components	Factor Loads			Cronbach's Alpha Per Factor	
		1	2	3		
Safety and Comfort Factor	E3	.874			0.813	
	E1	.873				
	E2	.849				
	K3	.531				
Trip Factor	S4	.767			0.695	
	S1	.749				
	S3	.743				
	S5	.548				
Transportation Mode Factor	T3	-	.852		0.750	
	T2	-	.822			
	T1	-	.640			
	T4	-	.475			

Extraction Method: Principal Component Analysis.  
 Rotation Method: Oblimin with Kaiser Normalization.  
 a. Rotation converged in 6 iterations.

As a result of the analysis, factors affecting transportation mode choice of Turkish domestic airline passengers listed under 3 main factors shown in Figure 1. The items such as total travel time, travel frequency, on-time departure and travel at the requested time, which have a significant impact on the transportation mode choice of airline passengers, are listed under the "Trip Factor". Ticket price, transportation cost to airport/station, transportation time to airport/station and public transportation to airport/station items are listed under the "Transportation Mode Factor". Finally, items on previous accidents/incidents, perception of safe transportation, safety / security procedures and entertainment service in the cabin/wagon are listed under the "Safety and Comfort Factor".



**Figure 1.** Factors Affecting Transportation Mode Choice of Turkish Domestic Airline Passengers

Analysis results are examined and factor impacts on the choice of transportation mode are shown, in Table 8.

**Table 8** Factors, Component Loads and Cronbach's Alpha per Factor

Codes	Label	Mean Impact (out of 5)	Std. Error
S1	Total travel time.	4.1425	1.29201
S2	Ticket Price	3.7789	1.29617
S3	Travel frequency	3.7912	1.33653
S4	On Time Departure / Punctuality	4.1499	1.19508
S5	Travel at the Requested Time	4.0098	1.25156
T1	Transportation Time to Airport/Station	3.7936	1.39374
T2	Public Transportation to Airport/Station	3.5479	1.53033
T3	Transportation Cost to Airport/Station	3.1327	1.54317
K1	Convenience in ticket transactions	3.8943	1.34499
K2	Interior seating arrangement in the Cabin/Wagon	3.4472	1.49269
K3	Entertainment Service in the Cabin/Wagon	2.8231	1.49157
E1	Previous Accidents/Incidents	3.1941	1.61555
E2	Perception of safe transportation	3.5627	1.54262
E3	Safety / Security Procedures	3.4791	1.52126

It is quite essential to understand criteria with high impact rate to foreseen and attract more passenger. Table 8 shows that punctuality, total travel time and travel at the requested time are the most crucial choice factor in this study followed by convenience in ticket transactions, transportation time to airport/station, travel frequency and ticket price (all above 3,77).

It is quite understandable that passengers expect their trips to start and end on time. On-time departure shows that the transportation mode is reliable and professional, which increases the likelihood that passengers will choose the same transportation mode again (David Mc A, 2016). This fact is also related to travel at requested time because if company has a high delay rate, that refers to low on time departure/arrival. Total travel time is also stick with the delays. Each delay could possibly cause more travel time. Transportation time to airport/station is a complementary factor that seriously affects total traffic time. Airports/stations that are difficult to access may cause passengers to choose alternative ones. Fast and reliable public transport connections to airports/stations should be provided. Integration of metro, train and bus lines into the airport/station shortens transportation time (Rimjha et al. 2021).

Another factor that is brought up after analysis is convenience in ticket transactions. Ease of ticket sales is an important factor in passengers' choice of transportation mode. Passengers prefer fast, reliable and user-friendly ticket purchasing processes when making their travel plans. Since this factor is at the beginning of the travel experience, it directly affects passengers' overall satisfaction and preferences (Buhalis & Law, 2008). Companies must offer passengers an omni-channel experience by integrating both physical and digital ticket sales points. Kiosks, self-service machines and mobile applications can be part of this integration.

Passengers' income levels affect their sensitivity to ticket prices. Passengers in lower income groups are more sensitive to ticket prices and generally prefer cheaper modes of transportation (Hensher, 2001). This is an important point that transportation companies should pay attention to in their pricing strategies. The success of low-cost airline companies helps us to see how important the ticket price is in passenger preferences. These companies have managed to reach a wide customer base with their low price strategies (Francis et al., 2007).

Findings indicates that other factors such as public transportation to airport/station, transportation cost to airport/station, interior seating arrangement in the cabin/wagon and entertainment service in the cabin/wagon are less effective on passenger choice compared to factors explained above.

## 6. Conclusion

Accurate prediction of passengers' choice of transportation mode is vital for the transportation industry's future planning and decisions. Therefore, identifying these factors and understanding their impact on changing demand has become one of the main focus areas of research in the field. Previous transportation studies often relied heavily on economic and logistical factors, such as cost, time, and convenience. By incorporating behavioral theories, this study aligns with a growing body of literature that emphasizes the psychological and social dimensions of travel behavior. This approach helps in understanding the underlying motivations and perceptions that drive passengers' choices, providing a more holistic view. In this study, by using exploratory factor analysis, the factors affecting the transportation mode choice of domestic airline passengers traveling in Turkey and the importance levels of these factors were determined. The three factors that emerged as a result of the analysis were named "Trip Factor", "Transportation Mode Factor" and "Safety and Comfort Factor", taking into account the literature review, expert opinions and the characteristics of the items. The findings contribute to a more nuanced understanding of how different factors, such as socio-demographic characteristics and trip attributes, affect transportation mode choice. When the analysis results are examined, on-time departure / punctuality (S4), total travel time (S1) and travel at the requested time (S5) are the variables that have the highest impact on the choice of transportation mode. Passengers place a high value on reliability and the ability to adhere to schedules. This variable reflects the importance of minimizing delays and ensuring that flights depart and arrive as scheduled. Airlines should invest in technologies and processes that improve operational efficiency, such as advanced scheduling systems, real-time tracking, and automated maintenance systems for quick turnaround times and efficient handling of delays. The significance of total travel time underscores the role of convenience in travel behavior so that passengers prefer modes that offer the quickest route to their destination. Airlines should implement online check-in, mobile boarding passes, and self-service kiosks to reduce time spent at the airport. Moreover, they may enhance connectivity between airports and city centers through partnerships with local transportation providers which are offering seamless transfers and shuttle services. Travelling at requested time aligns with theories emphasizing the importance of temporal flexibility in travel choices. It can be easily seen that the ability to choose travel times fit personal schedules is crucial for passenger satisfaction. Airline companies should incorporate AI and

machine learning algorithms to predict demand fluctuations and optimize flight schedules accordingly. They can also establish or enhance code-sharing agreements with other airlines to increase the number of available flight options at various times.

Previous accidents/incidents (E1), transportation cost to airport/station (T3) and Entertainment Service in the Cabin/Wagon (K3) emerged as the variables with the lowest impact. This study contributes to the literature by reporting highest factors of passenger choice and their weight among others and by providing empirical evidence from the Türkiye. Since each country has their own socio-economic features and regional variations in transportation infrastructure result may differ from one market to another.

Since this study was carried out by taking into account the data received from passengers between the Istanbul-Konya and Istanbul-Ankara lines between the 2022 autumn and 2023 spring seasons, the findings are limited to the relevant time and cities. It would be appropriate to increase the time interval and city pairs in order to make more comprehensive comments on the subject and to analyze passengers' preference criteria in depth. So that it will serve as a better guideline for studies aiming to explore similar topics in different contexts.

## Ethical approval

Not applicable.

## Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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