
2021

What Factors Predict a Consumer's Willingness to Purchase a Subscription-Based Airline Program?

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Crouse, S. R. (2021). What Factors Predict a Consumer's Willingness to Purchase a Subscription-Based Airline Program?. *Journal of Aviation/Aerospace Education & Research*, 30(2). <https://doi.org/10.15394/jaaer.2021.1889>

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Introduction

The aviation industry has suffered greatly due to the novel Coronavirus (COVID-19). The aviation industry must adapt and find new, innovative ways to entice customers to return revenue streams. One new approach that is explored in this study is a subscription-based model for aviation. The subscription-based model would allow passengers to pay a set price per month for a certain number of flights without additional charges and possibly gain additional benefits from the airline. Factors that influence a customer have been well researched in many industries; however, limited research has been conducted in aviation. A growing trend is subscription services, which involves a recurring payment for use of a product or service. Adding a recurring revenue bundle will allow airlines to reinvest into products and infrastructure. The subscriptions may also help airlines prepare for financial burdens from unforeseen circumstances, much like the COVID-19 pandemic. The current study will explore different factors which may predict a consumer's willingness to purchase (WTP) a subscription-based airline ticket. These 13 possible predictors are age, gender, ethnicity, education level, employment status, annual income, number of current subscriptions, number of roundtrip flights per year, flight habits (early boarding, alone or with others, domestic or international, pleasure or business), and the perceived value (PV) scale (Zeithaml, 1988).

Literature Review

Subscriptions are available for almost all services (i.e., meal boxes, Netflix, Microsoft 365, Cellphones, etc.) and aviation should be no different. A survey conducted by WestMonroe found that the average American spends approximately \$238.00 per month on subscription services (Moogimane, 2019). The cost associated with a subscription-based airline ticket would be significantly higher, but the current study will not explore price points, rather demand for the

service. While there is limited research into the type of consumer that would purchase a subscription based-ticket, many other markets have been thoroughly studied (Newton et al., 2018; Qu, & Hill, 2018; Villamediana-Pedrosa et al., 2020). A few small startups have tried to capitalize on this market, such as OneGo, Wanderift, and SkyHi. Major U.S. carriers, such as United, only provide subscriptions for add-ons such as luggage, seat choice, and club memberships (United, n.d.). The hypothetical model for the current study will include airfare and additional add-ons from a major U.S. carrier.

Customer Relationship Scale

Customer Relationship Management is the strategy of managing the relationship with the customer to maintain a competitive business. Demo et al. (2018) developed and validated a relationship scale for airlines to use with their customers. This scale uses a customer-focused strategy that aims to deliver superior value to customers through the quality of services provided. Their scale provided four first-order factors (customer loyalty, purchasing experience, flight experience, and customer service). Customer loyalty pertained to trust, brand recognition, expectations, attitude, and recommendations. Purchasing experience and flight experience were interactions with the service that could influence their future purchasing preference. These factors include luggage experience, on-board services, food, timeliness, and comfort of flight. Customer service was focused on appearance, security, credibility, and courtesy (Demo et al., 2018). The current study will leverage the findings from this research in the instrument's scenario. Specifically, purchasing and flight experience factors will be incorporated into the study through the additional of several perks for the subscription holder (i.e., first checked bag free, free standby upgrades, early boarding to planes, free premium beverages inflight, and free on-board wi-fi).

Retaining Subscriptions

One of the challenges to subscription services is the high turnover rate. Poor customer service is identified as the reason that as many as 75% of customers will stop frequenting a business that they have been loyal to in the past (Newton et al., 2018). The study also identified that individuals with high variety-seeking behaviors tended to have a negative influence on a consumer's perception towards the service. These perceptions include product quality, pricing, and commitment to the product (Newton et al., 2018). Quality and pricing are factors for consumer perceiving value in the service, making their perception a significant indicator of their willingness to retain membership. While Newton et al.'s (2018) research was in the wine industry, its findings can be applied to the current exploratory study when creating the scenario. While a direct comparison is not implied, it is possible that some of the characteristics of wine club subscriptions could prove to be significant in the current study.

Predictors of Television Subscriptions

Qu and Hill (2018) investigated customers that had a higher possibility of purchasing premium plans and increasing. Cable television is a highly competitive market that uses subscription-based sales models. This study used demographic and lifestyle information of 100,000 customers and their television package data. Due to the exploratory nature of this study and lack of literature related to subscriptions in aviation, the researcher proposes to use the predictors from Qu and Hill (2018) and apply them to the current aviation study, specifically the demographic identifiers from this study. As with Newton et al. (2018), a direct comparison of television subscriptions and aviation is not implied; however, it is possible that some of the predictive demographics could prove to be significant in the current study.

Perceived Value

If an individual finds a service useful, it can be a strong predictor of the individual's behavior. The PV of a service can often indicate how useful it is to a consumer. Thus, perceived value can be represented by the following statement: "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given" (Zeithaml, 1988, p. 14). The PV scale, based upon Zeithaml (1988), can be found in Appendix A.

Prior Studies on Willingness to Pay in Aviation

Several studies have explored consumer's WTP in aviation. Walters et al. (2018) explored consumers' willingness to pay for new airports that use renewable resources. Shahrabani and Sharon (2019) explored consumer's WTP for airline security in the wake of terrorist incidents. Ragbir et al. (2021) examined how knowledge of sustainability can increase a consumer's WTP for green initiatives. However, to date, no prior studies have explored a consumer's WTP a subscription-based ticket and presents a gap in literature.

Current Study

The purpose of this study is to determine significant factors that predict a consumer's willingness to purchase a subscription-based airline ticket. The study explored 13 possible predictive factors, backed by literature, for this study. The study used a two-stage approach, building a regression equation and then constructing model fit.

Methods

Participants

This study sampled 521 participants who are citizens of the United States. Participants were recruited through a convenience sample via Amazon's[®] Mechanical Turk[®] (MTurk). Prior to collection of data, the study received approval through Embry-Riddle Aeronautical

University's Institutional Review Board. The researcher has a current certificate on the ethical treatment of human subjects through the Collaborative Institutional Training Initiative. Criteria was set to ensure the validity of the findings; participants were required to have completed more than 100 tasks, 98% or higher rating, and be a U.S. citizen.

Design

This study used a quantitative method with a non-experimental research design. A two-stage approach was used to develop a model to predict a consumer's WTP a subscription-based airline ticket. Stage 1 created a regression equation through backward stepwise regression of data from 239 participants. The second stage conducted a model fit for the regression equation with a separate data set of 240 participants.

Procedure

The data was randomly divided into two separate datasets to facilitate the two-stage approach. Stage 1 consisted of 261 total participants. Twenty-two cases were selected for removal because of missing data, leaving 239 (122 women, 117 men) participants with an average age of 38.24 ($SD = 11.23$) years old. Stage 2 consisted of 260 total participants. Twenty cases were selected for removal because of missing data, leaving 240 (127 women, 111 men) valid participants with an average age of 38.44 ($SD = 12.19$) years old.

This method has been applied to previous studies and has been proven to be a successful approach (Rice et al., 2019; Winter et al., 2019). Employing a two-stage approach is valuable for creating predictive models (Pedhazur, 1997). The sample size was determined using G*power with settings of an estimated medium effect size = .15, alpha = .05, power = .95, and 13 predictors to result in a minimum total sample size of 189. This requirement was exceeded by Stage 1 having 239 participants and Stage 2 having 240 participants.

Materials and Stimuli

Participants were provided with a link to Google Forms from MTurk. They were required to complete electronic consent prior to entry into the study. After consenting, they were provided with the instructions for the study. All questions were randomized to prevent ordering effects. After answering questions regarding demographic and flight habits, they were presented with the same scenario, first with the PV scale, then the WTP scale, on two separate pages. The participants read the following scenarios:

Imagine that you have just been offered a subscription-based airline ticket from a major U.S. airline. The following information is given about the subscription:

1. This subscription-based ticket allows the holder to fly up to six (6) round trip flights per month, in the contiguous United States, without any additional charges.
2. This subscription-based ticket allows the holder reduced companion fares, first checked bag free, free standby upgrades, access to airport lounges, early boarding to planes, free premium beverages inflight, and free on-board wi-fi.
3. The ticket holder must enter into a 12-month agreement at the time of purchase. An early termination fee of three (3) months or the total cost of all tickets, whichever is less, may apply.

The participants were instructed to rate the scenario using a valid Likert scale which can be found in Appendix A (PV scale) and Appendix B (WTP scale). After this was complete, participants were debriefed, provided with their code for payment, and released from the study.

The survey took between 5 – 10 minutes to complete for the participants.

Results

Data analysis used a two-stage approach with Stage 1 creating an equation and Stage 2 assessing the equation. The purpose was to develop a predictive model to identify a consumer's WTP a subscription-based airline ticket. The dependent variable for the model fit was the WTP scale (Walters et al., 2018). Upon initial analysis of the data, several predictors were compressed due to a lack of other factors. Ethnicity had seven possible selections but was compressed to Caucasian or Non-Caucasian due to 77% of respondents identifying as White or Caucasian. Education level was changed from six possible answers to bachelor's degree or higher or less than a bachelor's degree, as respondents reported a bachelors or higher in 70.2% of responses. Employment status had four possible answers but was reduced to Employed or Unemployed due to 80.6% of participants responding with employed.

Reliability Analysis

The PV Scale and WTP scale had their consistency measured using a Cronbach's alpha test. Coefficients from data set 1 were .925 and .962 respectively, while coefficients from data set 2 were .933 and .962 respectively. This indicates the scale had an extremely high level of internal consistency. Thus, the average was used for the analysis.

Stage 1 – Development of the Regression Equation

The first stage used backward stepwise regression to remove any statistically insignificant values and develop a predictive equation for the dependent variable (WTP). Due to this being an exploratory study, backwards stepwise regression was selected and chosen over forward regression to minimize suppressor effects (Field, 2018). The criteria set for removal was a cut-off of $p < .10$.

There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.7. There was homoscedasticity, meaning same variance, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. There were no independent variables with multicollinearity, as assessed by the correlations and tolerance collinearity statistics. Multicollinearity is when two variables overlap in the variance of the model. Two cases were assessed as outliers by being greater than ± 3 standard deviations and were removed for the analysis. An inspection of Cook's and Mahalanobis's Distance revealed no highly influential points. Cook's distance identifies influential outliers in a set of predictors while Mahalanobis's distance is the distance between two points in a multivariate space and also identifies outliers. The standardized residuals were normally distributed, as assessed from a visual inspection of the histogram and P-P Plot. Standardized residuals are a ratio that is represented by the difference between the observed count and the expected count in regression.

Willingness to Purchase

The resulting model for the WTP a subscription-based airline ticket resulted in three significant predictors: perceived value, employment status, and if a customer pays for early boarding. Regression coefficients and standard errors can be found in Table 1.

Table 1*Multiple Regression Results for WTP*

WTP	<i>B</i>	95% CI for <i>B</i>		<i>SE B</i>	β	R^2	ΔR^2
		<i>LL</i>	<i>UL</i>				
Model						.776	.774
Constant	-.017	-.223	.189	.105			
Employment	-.207*	-.395	-.020	.095	-.068*		
Early Boarding	.156**	.093	.220	.032	.161**		
Perceived Value	.923**	.849	.998	.038	.801**		

Note. Model = “Backward” method in SPSS Statistics; *B* = unstandardized regression coefficient; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *SE B* = standard error of the coefficient; β = standardized coefficient; R^2 = coefficient of determination; ΔR^2 = adjusted R^2 .

* $p < .05$, ** $p < .001$

These factors create the following equation: $Y = -0.017 + 0.923X_1 - 0.207X_2 + 0.156X_3$.

This equation is defined as *Y* being the predicted value, -0.017 being the constant, X_1 the perceived value, X_2 is employment status, and X_3 is if the customer pays for early boarding. This suggests that as a consumer’s perceived value and their likelihood to pay for early boarding increases, so does their WTP, and as they move from employed to unemployed, their likelihood to purchase decreases. R^2 for the overall model was 77.6% with an adjusted R^2 of 77.4%, a large effect size, according to Cohen (1988). The model was statically significant, $F(3, 235) = 272.02$, $p < .001$.

Stage 2 – Assess Model Fit

To assess model fit, three methods were used. First, an independent samples t-test conducted between actual WTP score ($M = 1.86$, $SD = 1.26$) from Stage 2 and predicted WTP score ($M = 1.89$, $SD = 1.15$) from Stage 2 found $t(478) = -.307$, $p = .759$ with a mean difference of -.034, suggesting a good model fit. Next, a Pearson’s bivariate correlation was conducted between the values resulting in $r(240) = .869$, $p < .001$, suggesting a strong correlation and

further signifying a good fit. Finally, the cross-validated R^2 was calculated ($R^2 = .77$). The extremely low difference ($R^2 = .776$, $R'^2 = .770$) is further suggestion of a good fit.

Discussion

The summary of the multiple regression can be found in Table 1. The most significant predictor of a consumer's WTP a subscription-based airline ticket was their perceived value of the ticket. It would make sense that as a person perceives value in an item, their willingness to buy the item would increase; value is intrinsic in eye of the consumer. Support for PV can be found throughout the literature (Demo et al., 2018; Newton et al., 2018).

The second most significant predictor was employment status. The results showed that as a person moved from employed to unemployed (unemployed, retired, or disabled), they were less likely to be willing to purchase the subscription. This could be due to those who are unemployed generally have less disposable income which would cause them to find less value in the subscription-based ticket. A similar argument could be made for retired or disabled people due to generally being on a fixed income with less disposable income to use on a seemingly extravagant purchase.

The last predictor was if a customer frequently paid for early boarding. The question "I typically pay for early boarding" was presented to participants with a Likert scale from -2 to 2, with -2 being strongly disagree and 2 being strongly agree. The mean score was -.74 ($SD = 1.26$), meaning that on average, participants almost always disagreed or were neutral to this statement. Customers who frequently pay for early boarding are more likely to purchase the subscription. This may be in part to the scenario including free early boarding, encouraging those who already frequently pay for early boarding to find a greater value in the product, thus increasing their likelihood of purchasing the ticket.

Practical Applications

One practical application based upon the results of this research is based upon PV. Since PV was the highest contributing factor to the equation, subscription-based tickets should be marketed as providing extreme value. For example, future research can explore factors that influence a consumer's PV. Additionally, the aviation industry could explore other ways that consumers measure value.

The next practical application is further research on subscription-based airline tickets adding additional variables. Now that researchers have a basic understanding of factors that can influence a consumer's WTP and see that there is a possible demand for these services, a number of experimental approaches can be taken. Researchers can create scenarios with different price points to determine when consumers stop perceiving value from the proposed ticket, conducting both within-subjects and between-subjects approaches to determine if there is a difference based upon how they are presented to the individuals. Additionally, research can be conducted with different classes of tickets (i.e., coach or first-class).

Finally, this study yields an interesting predictor in those who frequently pay for early boarding. Future research can explore if this predictor would be present in the regression model if free early boarding were removed from the scenario. If this finding is replicated without free early boarding, further research could be conducted to better understand that relationship. The overall applications of this paper can be applied to airline marketing and research for development of subscription-based airline tickets and the types of consumers who would be willing to purchase them.

Limitations

As with all studies, there are several limitations in this study. The first involves the use of Amazon's® MTurk (MTurk) for participant recruitment. The convenience sample from MTurk limits the generalizability of this study's findings to those who are a member of MTurk. Prior studies indicate that this data is similar to laboratory produced data (Buhrmester et al., 2011; Germine et al., 2012; Rice et al., 2017), but additional laboratory studies could be conducted to replicate the findings of the current study, which would increase the study's external validity.

Another limitation is the collection of attitudinal data versus behavioral data. While attitudes do correlate with behavior (Ajzen, 1991; Ajzen & Fishbein, 1980, 2005), this study can only be generalized to attitudinal perceptions. However, further research can be conducted on behavior data based upon this study.

The third limitation is the scenario itself. No price was given for the subscription cost, so it limits the perceived value of the scenario to the intrinsic properties of the services offered. With that being said, the participants still found value in the scenario, but that value is not able to be quantified from this study. Future studies should offer scenarios with different price points to determine where the perceived value point breaks and conduct a cost-benefit analysis to determine if the model is profitable.

Finally, due to this study being exploratory, it used backward stepwise regression. This method carries the risk of overfitting and underfitting the model (Field, 2018), which creates a limitation to this study. A future study, building on this research, could use different statistical regression approaches, like hierarchical regression, which may result in the predictors gaining additional external validity.

Conclusions

The purpose of this study was to determine factors that significantly predict a consumer's willingness to purchase a subscription-based airline ticket. The study created a regression equation based upon results of a survey. The data was analyzed in two stages, Stage 1 resulting in three significant predictors, and Stage 2 validating the model. The variance explained in the model was 77.6% with the consumer's perceived value being the most predictive variable. Further studies that expand on this study should explore what a consumer values in a subscription-based ticket. Another study could look at the possible link between PV and employment status and if the current COVID-19 pandemic creates this relationship.

Acknowledgements

This research paper could not have been completed without the guidance and mentorship from Dr. Steven Hampton and Dr. Scott Winter.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Prentice-Hall.
- Ajzen, I., & Fishbein, M. (2005). The influence of attitudes on behavior. In D. Albarracín, B. T. Johnson, & M. P. Zanna (Eds.), *The handbook of attitudes*, (pp. 173–221). Erlbaum.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's mechanical turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6(1), 3-5. <https://doi.org/10.1177/1745691610393980>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Psychology Press.
- Demo, G., Rozzett, K., Fogaça, N., & Souza, T. (2018). Development and validation of a customer relationship scale for airline companies. *BBR. Brazilian Business Review*, 15(2), 105–119. <https://doi.org/10.15728/bbr.2018.15.2.1>
- Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Sage.
- Germine, L., Nakayama, K., Duchaine, B. C., Chabris, C. F., Chatterjee, G., & Wilmer, J. B. (2012). Is the web as good as the lab? Comparable performance from web and lab in cognitive/perceptual experiments. *Psychonomic Bulletin & Review*, 19(5), 847-857. <https://doi.org/10.3758/s13423-012-0296-9>
- Moogimane, D. (2019). *America's relationship with subscription services*. Retrieved March 24, 2021, from <https://www.westmonroe.com/perspectives/point-of-view/americas-relationship-with-subscription-services>

- Newton, S. K., Nowak, L. I., & Kelkar, M. (2018). Defecting wine club members: An exploratory study. *International Journal of Wine Business Research*, 30(3), 309-330. <https://doi.org/10.1108/IJWBR-06-2017-0038>
- Pedhazur, E. J. (1997). *Multiple regression in behavioral research: Explanation and prediction* (3rd ed.). Harcourt Brace College Publishers.
- Qu, Y., & Hill, W. W. (2018). Predictors of customer's subscriptions to movie and sport packages. *Journal of Marketing Development and Competitiveness*, 12(4), 80-94. <https://doi.org/10.33423/jmdc.v12i4.201>
- Ragbir, N. K., Rice, S., Winter, S. R., & Choy, E. C. (2021). Emotions and caring mediate the relationship between knowledge of sustainability and willingness to pay for greener aviation. *Technology in Society*, 64, 101491. <https://doi.org/10.1016/j.techsoc.2020.101491>
- Rice, S., Winter, S. R., Doherty, S., & Milner, M. (2017). Advantages and disadvantages of using internet-based survey methods in aviation-related research. *Journal of Aviation Technology and Engineering*, 7(1). <https://doi.org/10.7771/2159-6670.1160>
- Rice, S., Winter, S. R., Mehta, R., & Ragbir, N. K. (2019). What factors predict the type of person who is willing to fly in an autonomous commercial airplane? *Journal of Air Transport Management*, 75, 131–138. <https://doi.org/10.1016/j.jairtraman.2018.12.008>
- Shahrabani, S., & Sharon, T. R. (2019). Willingness to pay for airline security. *International Journal of Culture, Tourism and Hospitality Research*, 13(2), 153-166. <https://doi.org/10.1108/IJCTHR-06-2018-0080>
- United.com – Airline Tickets, Travel Deals and Flights. (n.d.). Retrieved March 16, 2021, from <https://www.united.com/ual/en/us/subscription/home>

- Walters, N. W., Rice, S., Winter, S. R., Baugh, B. S., Ragbir, N. K., Anania, E. C., . . . Milner, M. N. (2018). Consumer willingness to pay for new airports that use renewable resources. *International Journal of Sustainable Aviation*, 4(2), 79-98.
<https://doi.org/10.1504/IJSA.2018.094227>
- Winter, S. R., Thropp, J. E., & Rice, S. (2019). What factors predict a consumer's support of environmental sustainability in aviation? A multi-model analysis. *International Journal of Sustainable Aviation*, 5(3), 190-204. <https://doi.org/10.1504/IJSA.2019.103502>
- Villamediana-Pedrosa, J. D., Vila-López, N., & Küster-Boluda, I. (2020). Predictors of tourist engagement: Travel motives and tourism destination profiles. *Journal of Destination Marketing and Management*, 16, 100412. <https://doi.org/10.1016/j.jdmm.2020.100412>
- Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing*, 52(3), 2-22.
<https://doi.org/10.1177/002224298805200302>

Appendix A

Perceived Value Scale (Zeithaml, 1988)

1. I think a subscription-based airline ticket is useful.

Strongly disagree Disagree Neither Agree or Disagree Agree Strongly agree

2. A subscription-based airline ticket would be something valuable for me to own.

Strongly disagree Disagree Neither Agree or Disagree Agree Strongly agree

3. There would be value in using a subscription-based airline ticket.

Strongly disagree Disagree Neither Agree or Disagree Agree Strongly agree

4. If subscription-based airline ticket were available, I think it would be beneficial to use one.

Strongly disagree Disagree Neither Agree or Disagree Agree Strongly agree

5. A subscription-based airline ticket would be beneficial to me.

Strongly disagree Disagree Neither Agree or Disagree Agree Strongly agree

Appendix B

Consumer WTP Scale (Walters et al., 2018)

1. I would be willing to pay for a subscription-based airplane ticket in this situation.

Strongly disagree Disagree Neutral Agree Strongly agree

2. I would be comfortable paying for a subscription-based airplane ticket in this situation.

Strongly disagree Disagree Neutral Agree Strongly agree

3. I would have no problem paying for a subscription-based airplane ticket in this situation.

Strongly disagree Disagree Neutral Agree Strongly agree

4. I would be happy to pay for a subscription-based airplane ticket in this situation.

Strongly disagree Disagree Neutral Agree Strongly agree