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Government Seat Pitch Regulation of Commercial Airlines: A Multi-Study of Consumer Perceptions

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Since deregulation of the airline industry in the 1970s, the distance between seats on commercial aircraft referred to as seat pitch has been decreasing. What used to be around 35 inches has now reduced to 28-31 inches depending on the type of airline and fare class purchased. As a result, some consumer advocacy groups have filed litigation and pressed the U.S. Congress to regulate a minimum seat pitch. These advocacy groups primarily cite safety concerns in the event of an emergency evacuation of the aircraft or health concerns such as deep vein thrombosis, which can occur from extended sitting periods and cramped quarters. Counter-arguments relate to consumers price sensitivity as it relates to airfare purchases, and their ability to purchase upgrades, such as seats with greater seat pitch, for additional fees. Therefore, the purpose of these studies was to identify consumer perceptions on government involvement in airline seat pitch and to create and validate a statistical model to predict a passenger's support of government regulation of seat pitch. The findings indicate that approximately 60% of passengers felt the government should regulate seat pitch. Perceptions of regulation value, disgust, happiness, Republican political affiliation, Hispanic ethnicity, Asian ethnicity, and high school level of education were significant predictors of support for government regulation of commercial airline seat pitch. The model explains 53.7% of the variance, and three separate, secondary assessments suggested good model fit and a valid model was produced. The practical applications of these findings are discussed.

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As airlines work to evaluate and develop their pricing models, a recent trend of the last three decades has been the decrease in seat pitch (Mendoza, 2017). Seat pitch is defined as the distance on one seat to the same point on the seat ahead of or behind it. During the 1970s, seat pitch ranged from 31 to 35 inches while today it has been reduced to 28 inches on some of America's low-cost carriers (Glusac, 2018). However, this condensing of seat pitch is not restricted to low-cost carriers. As the three remaining legacy carriers (American, Delta, and United) identify ways to compete with low-cost carrier offerings, American Airlines, in 2017, considered deploying a section of their aircraft which would have had seat pitch reduced from 31 inches to 28 inches (Silk, 2017), however, the airline subsequently retracted that proposal (Glusac, 2018). With reduced seat pitch comes a tradeoff of concerns for passengers.

Passengers are feeling more cramped and discomfort on flights. Meanwhile, airlines continue to evaluate ways to maximize profits, often through increasing seats on aircraft. However, the increased number of seats on aircraft have some advocates concerned about not just passenger comfort, but safety and health concerns related to the reduction in seat pitch. Concerns over safety, such as the regulatory requirement that commercial aircraft be completely evacuated in less than 90 seconds in an emergency or passenger health threats such as deep vein thrombosis (DVT) are cited arguments in favor of governmental regulation. Earlier studies have examined consumer's willingness to pay for upgrades on flights (Balcombe, Fraser, & Harris, 2009; Kuo & Jou, 2017; Lee & Luengo-Prado, 2004), such as premium economy offerings with more seat pitch, customer satisfaction (Koklic, Kukar-Kinney, & Vegelj, 2017), and passenger loyalty (Akamavi, Mohamed, Pellmann, & Xu, 2015). However, a gap in the literature has been identified in regard to evaluating passenger's perspectives on governmental regulation of seat pitch. Therefore, the purpose of these current studies is to 1) identify passenger perceptions on government regulation of seat pitch and 2) determine which factors help predict a passenger's support for or against government regulation of seat pitch on commercial airlines.

Types of Product Offerings for Commercial Airline Travel

The discussion on seat pitch, in part, relates to the types of product offerings available to the consumer, and it is worth distinguishing between these products. Airlines in the United States are typically classified into three offerings: full-service carriers (FSCs), low-cost carriers (LCCs), and ultra-low-cost carriers (ULCCs). FSC airlines in the United States, especially for the three legacy carriers, frequently have multiple product offerings aboard the same aircraft which typically result in three offerings: first/business class, premium economy, and economy. First/business class usually comes with a much higher fare but includes items such as a meal and complimentary alcoholic beverages. Premium economy is a newer offering made available in the economy section, and there remains a considerable amount of variance in this product's offering. At a minimum, it can be a seat with a few more inches of legroom, or it could be as extensive as including meal and beverage service. Most FSCs now all offer some form of premium economy service on their mainline aircraft (excluding perhaps regional feeder aircraft). The last section provided is the economy section. This section has relatively standard service with minimal seat pitch and usually only non-alcoholic beverage service and a snack, with larger meals for purchase.

The two other types of carriers which are not legacy carriers are low cost and ultra-low-cost carriers. On LCCs, there is typically only one class of cabin and all extras, except for beverages, are an additional charge (Kim & Lee, 2011). Meanwhile, ULCCs typically charge additional fees for all other features from selecting your seat before the flight to carry-on baggage charges to a glass of water. The logic of the ULCCs is that you only pay for what you, as the individual consumer, need to use during the flight. As a result of the increased competition in the marketplace between legacy, LCCs, and ULCCs, all

airlines have needed to assess their product offerings (Koklic, Kukar-Kinney, & Vegelj, 2017), and this is part of the reason for reduced seat pitch throughout the industry. This reduction in seat pitch and consideration of the low-cost carrier model is being considered for both short-haul and long-haul international flight operations (Daft & Albers, 2012; Francis, Dennis, Ison, & Humphreys, 2007; Pels, 2008; Wensveen & Leick, 2009).

Advocating for Governmental Regulation of Commercial Airline Seat Pitch

Passenger advocacy groups, such as FlyersRights.org, have been working through legal options to attempt and request the Federal Aviation Administration (FAA) regulate seat size on commercial aircraft (Glusac, 2018). On July 2, 2018, the FAA issued a letter stating that they are not responsible for regulating passenger comfort and thus not responsible for regulating seat size (FAA, 2018). These groups have also been advocating Congress issue legislation which would require the FAA to regulate seat size, although so far, these efforts have been unsuccessful.

Advocacy organizations are particularly concerned with safety issues of increasing the number of seats on commercial aircraft and passenger health concerns. In the event of an emergency, FAA regulations require commercial aircraft must be evacuated within 90 seconds or less. While the FAA addressed this in their decision letter against regulating seat pitch, critics suggest that the trials for which aircraft manufacturers conduct these tests fail to include all members of the population, such as the elderly. A recent study (Lijmbach, Miehlke, & Vink, 2014) evaluated the elderly's ability to in- and egress from commercial aircraft seats and found that they do take significantly more time than younger members of the population and also support themselves more through touching armrests and backrests.

Another concern for passengers is related to health concerns (Elliott, 2018). Medical issues, such as deep vein thrombosis, pulmonary embolism, and restricted mobility could all be detrimental issues of sitting in a cramped area for an extended period (Mendoza, 2017). However, these health concerns are also related to the length of the flight and resulting time spent in these limited spaces. Research conducted on the most favorable seat pitch for passenger overall well-being found that the optimal seat pitch was between 34-40 inches (Kremser, Guenzkofer, Sedlmeier, Sabbah, & Bengler, 2012).

Mendoza (2017) acknowledged the tradeoffs between health risks, price, and airline seat size regulation. His research indicated that airline pricing is highly driven by competition, and as a result, caused passengers to evaluate their health, safety, and comfort concerns. Of concerns with the regulation of seat pitch would be the resulting price increase of such an action, which passengers would have much less control over than their comfort levels on a commercial airline flight.

Perspectives Against Regulating Seat Pitch

The airline's standpoint toward seat pitch on commercial aircraft, at least as expressed by two current airline CEOs is simple: if you want more space, pay for it (McCartney, 2018). In a recent interview by the Wall Street Journal, the CEOs of American Airlines and Delta Airlines were interviewed regarding their strategies and perspectives on seat pitch. Their view is to try and diversify their product offerings to allow consumers to decide for themselves as to what features they are willing to tolerate or pay to upgrade. This strategy is seen as a way for FSCs to try and compete with the LCC and ULCC business models.

Findings from research studies in the last 15 years suggest that passengers may be willing to pay for the additional products and legroom they desire. When comparing two programs, Lee and Luengo-Prado (2004) found United had success when they implemented a premium economy section of seating, to which consumers could upgrade, compared to American Airline's strategy at the time, which was *more*

room throughout coach. The findings suggested that consumer's saw value in both having the choice and the enhanced product offerings given the additional fee. The multiple seating sections also allowed United to offer cheaper fares to leisure travelers, who may be more price sensitive, and market their premium economy offerings to business travelers who may be more willing to upgrade their fare class and seat. This concept was also supported by Balcombe, Fraser, and Harris (2009) who found that, at least in principle, consumers would be willing to pay for upgrades in service.

Further research within the last few years supports the initial indication of the late 2000s, and the data seems to suggest that passengers value having choices. Kuo and Jou (2017) identify that there is a large number of travelers who were not willing to pay for upgraded, premium economy service. However, they also acknowledged that the "price sensitive business traveler" and "comfort seeking leisure" passengers may be two specific demographics who would be willing to purchase upgrades (Kuo & Jou, 2017, p. 141). For passengers willing to upgrade, their findings indicated that passengers would be willing to pay between \$138 for short flights, \$309 for medium flights, and \$545 for long flights. Kurtulmusoglu, Can, and Tolon (2016) identified a low-cost airline as the preferred airline in their sample of participants. Participants in their study indicated that their primary concerning factor was ticket cost, followed by punctuality, and ease of booking. Therefore, it is possible that these participants respond well to a low-cost model where the ticket prices are lower, with the ability to upgrade services if they desire. These studies tend to suggest that passengers, in general, see value in being able to purchase items unbundled, such as obtaining the lowest ticket cost, and then selecting upgraded features, if they so decide. Due to consumers' focus on price sensitivity, it is possible that government regulation of seat pitch, which would likely result in increased fares, may not be something that most consumers would support but would rather be in control of their purchasing choices and value assessment for ancillary revenue items.

Current Studies

As seat pitch on commercial aircraft decreases, concerns have been addressed as to whether or not the government should regulate this distance on commercial airlines. Advocates in favor cite safety and health concerns as justification primarily. Those against government involvement frequently address the complex nature of airline pricing and the offerings of seats with greater legroom as upselling items for passengers who are willing to pay for it. However, an existing gap in the literature exists as to what consumers think about government involvement in regulating seat pitch. Study 1 identifies consumer perceptions toward commercial airline seat pitch, while Study 2 investigates which types of factors would predict a passenger's support of government involvement in seat pitch regulation. Therefore, the purpose of these studies is to identify consumer perceptions toward government regulation of commercial airline seat pitch and to identify which factors would predict a passenger's support for or against government regulation of the same. Due to the exploratory nature of these studies, hypotheses were not produced.

Study 1 – Methods

Participants

One hundred and ninety-one (77 females) participants were recruited for this study. Participants reported an average age of 38.01 ($SD = 14.48$) years old, and the participants were recruited from Amazon's Mechanical Turk (MTurk). MTurk is an online population of worldwide participants who are willing to complete online human intelligence tasks (HITs) in exchange for a small amount of monetary compensation. Prior studies have demonstrated that data collected from MTurk is as valid as normal laboratory data (Buhrmester, Kwang, & Gosling, 2011; Germine et al., 2012; Rice, Winter, Doherty, & Milner, 2017). To participate in this study, participants needed to be at least 18 years old and have flown on a commercial airline within the previous 12 months. Additionally, the researcher specified MTurk participants needed to be from the United States, have completed at least 100 prior tasks

successfully on MTurk, and had a cumulative HIT approval rating of 90 or higher. MTurk allows researchers to set minimum participant criterion to help ensure quality data. The HIT approval rating of 90 or higher and the completion of 100 prior tasks were purposefully established to avoid any negative influences that could exist through using online platforms, such as MTurk, for data collection. No anomalies were found in the initial data analysis.

Materials and Stimuli

Participants were first provided with an electronic consent form which they signed digitally indicating that they were over 18 years old. They also stated that they had flown commercially within the preceding 12 months to be eligible for the study. Following this, they were presented with the following information regarding commercial airline seat pitch:

Seat pitch refers to the space between a point on one seat and the same point on the seat in front of it. For many carriers, the pitch in Economy class is 29 to 32 inches (74 to 81 cm). More seat pitch can mean more legroom, but legroom is also affected by the thickness of the seat back. Airlines have claimed that a reduction of seat pitch can be compensated for by a thinner seat-back design. (https://en.wikipedia.org/wiki/Airline_seat).

Following this description, participants were asked questions to rate their approval of government regulation of commercial seat pitch using a Likert-type rating system, with a neutral option of zero. Participants answered questions related to how strongly they felt toward or against government regulation, their optimal seat pitch distance, and whether or not airlines should be allowed to keep existing seat pitch distances if the government regulated a higher standard. Next, they were asked a series of questions to measure their affect toward the government regulation of seat pitch. Following this, participants were asked a series of demographic questions such as gender, the frequency of travel, political affiliation, height, weight, age, and education level. Lastly, participants were provided with some open-ended questions to gather their perceptions of the advantages and disadvantages of government regulation of commercial airline seat pitch. At the conclusion of the study, participants were debriefed, compensated, and dismissed.

Design and Ethics

The study used a non-experimental design and descriptive statistical analysis to provide data on passenger perceptions toward seat pitch on commercial airliners. The Institutional Review Board (IRB) of the subject university reviewed the study and all associated materials before any data was collected. Additionally, the researcher held a current Collaborative Institutional Training Initiative (CITI) certificate on research with human participants.

Study 1 – Results

The findings from Study 1 provide descriptive data on passenger's perceptions toward government regulation of commercial airline seat pitch. Overall, approximately 60% of passengers agreed or strongly agreed that the government should regulate seat pitch on commercial airliners, while just under 24% disagreed or strongly disagreed and approximately 17% responded as neutral. The findings are presented in Figure 1.

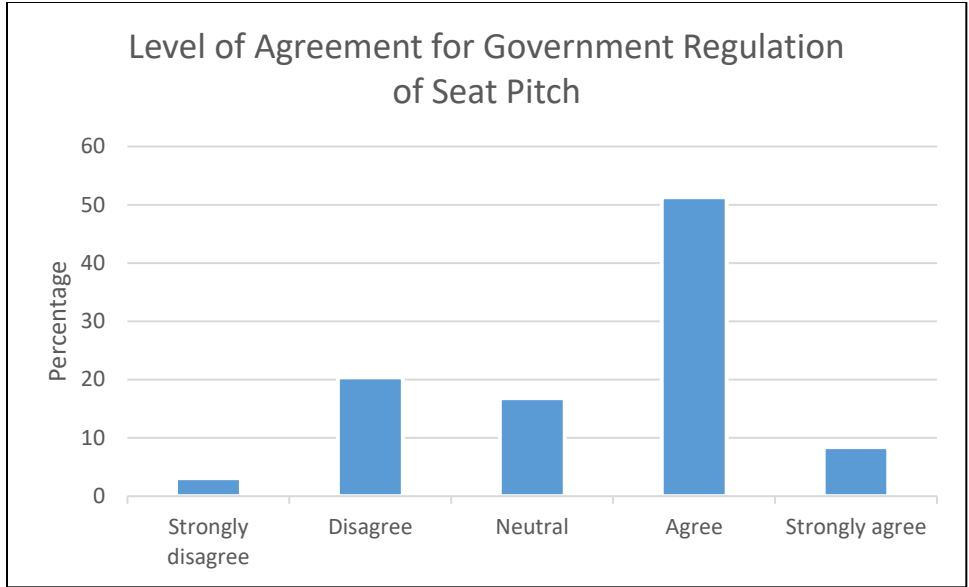


Figure 1. Passenger’s level of agreement toward government regulation of commercial airline seat pitch.

Participants were also asked to rate on a spectrum from 27 inches to 32 inches, with an option of None, as to where they felt the government should set the minimum for commercial airline seat pitch. Figure 2 presents the findings, and the data suggests that most passengers felt the minimum should be around 30 to 31 inches.

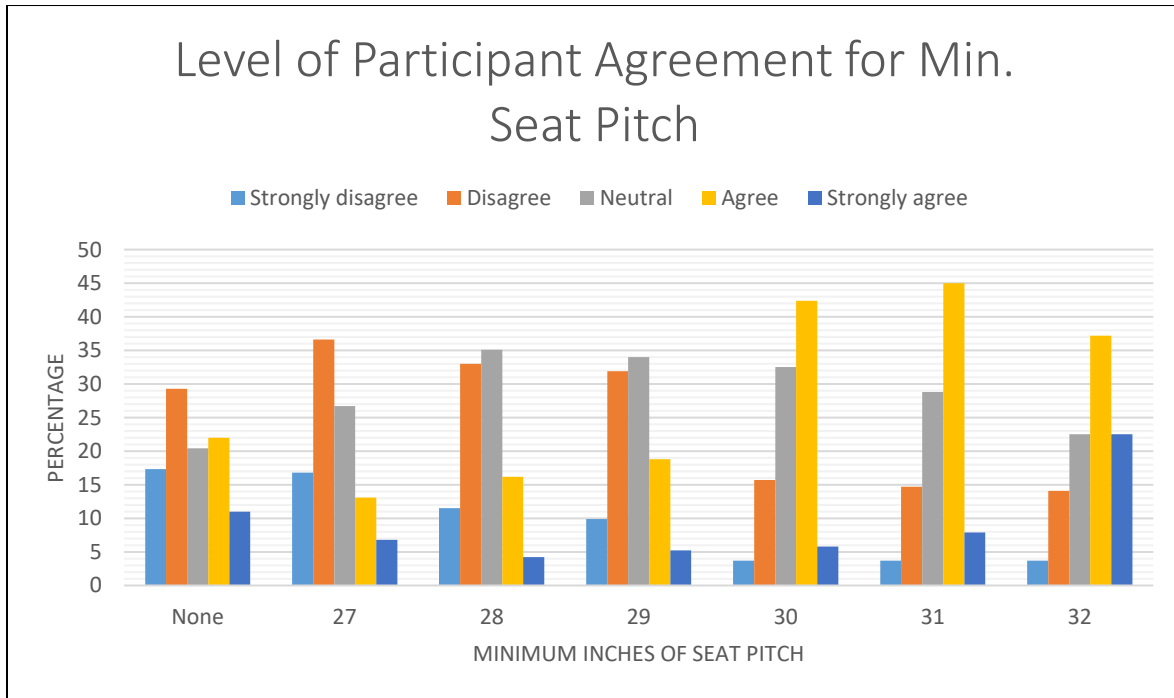


Figure 2. Participant ratings for their level of agreement with what distance of seat pitch minimum should be set by the government.

Passengers were also asked if the government were to set a minimum, which was a greater distance than airlines currently had installed on their aircraft, should the airlines be able to maintain their existing seat pitch or be required to increase it. Approximately 65% of passengers said airlines should be required to increase the seat pitch to the newly regulated minimum while only 38% felt airlines should be allowed to maintain existing seat pitch. These findings are highlighted in Figure 3.

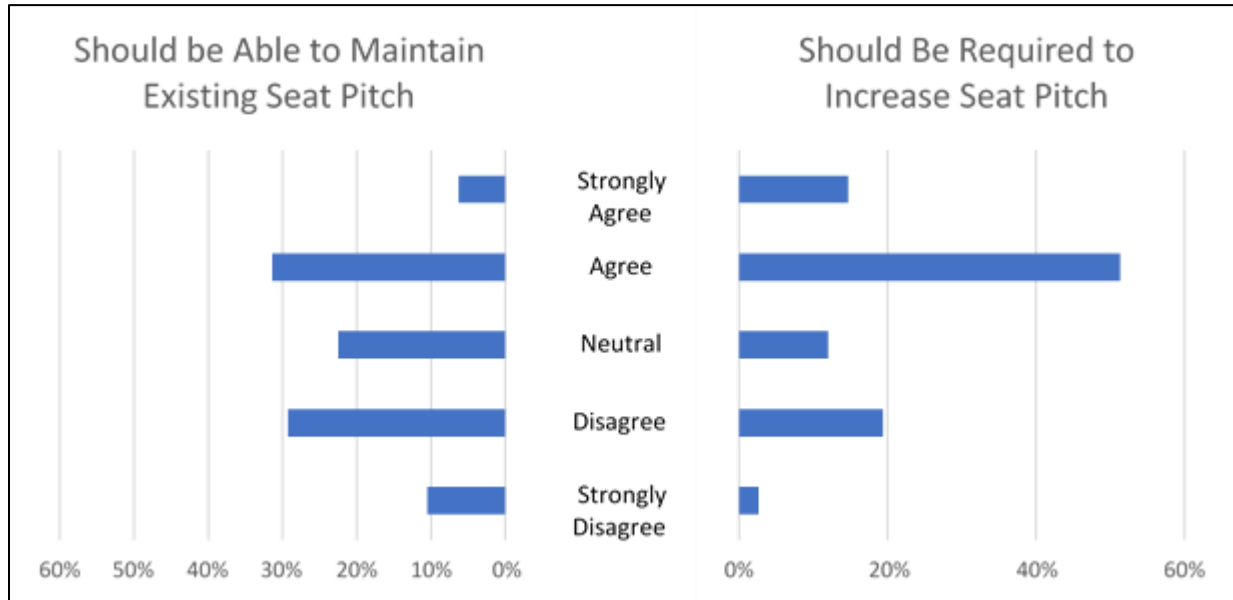


Figure 3. Participant responses on whether airlines should be able to maintain existing seat pitch or should be required to increase seat pitch if the government would regulate a minimum which is higher than currently installed on their aircraft.

The final quantitative results examined for any significant relationships between height, weight, and income on support of government regulation support. A Spearman’s correlation found no significant relationships between height, $r_s(189) = .055, p = .446$, weight, $r_s(189) = -.097, p = .184$, income, $r_s(188) = -.030, p = .686$, and support of government regulation.

Lastly, a review was completed of open-ended responses provided by participants as to the advantages and disadvantages of government regulation of commercial airline seat pitch. Common answers in favor of government regulation were more comfort (additional legroom), increased safety, and better government oversight. The most commonly stated disadvantage was concern over ticket costs and increased airfares as a result of government intervention. The answers to opened-ended questions roughly matched the distribution of the quantitative question regarding support of government regulation of seat pitch as numerous participants also expressed their views that the government should not get involved or set a regulatory minimum.

Study 1 – Discussion

The findings from study 1 provide both quantitative and qualitative insights into passengers’ perceptions on whether the government should regulate seat pitch on commercial airliners. Approximately 60% of passengers agreed or strongly agreed with government regulatory intervention for commercial airline seat pitch. However, this number is not as high as may have been expected, and it highlights that while a majority of passengers favor regulated seat pitch, there is still a group of passengers who are either neutral or against government involvement. In qualitative responses,

participants indicated that while they felt comfort and safety would be two main advantages of the government regulating commercial airline seat pitch, the major disadvantage was their concern that these regulations would result in higher ticket prices and airfares.

Study 2 – Introduction

In Study 1, participants provided both quantitative and qualitative responses regarding their support for or against government regulation of commercial airline seat pitch. Given that not all passengers were in favor of government regulation, the purpose of Study 2 was to develop a valid model to identify factors that predict a passenger's support of government regulation of commercial airline seat pitch. Study 2 was conducted in two stages, first to develop a regression model and second to validate the model.

Study 2 - Methods – Stage 1

Participants

Two hundred and twenty-three (91 females) participants were used in the development of the regression equation in Stage 1. Participants reported an average age of 34.97 ($SD = 10.04$) years old, and the participants were recruited from Amazon's ® Mechanical Turk ® (MTurk) using the same worker requirements as in Study 1.

Materials and Stimuli

Participants were first provided with an electronic consent form that they digitally acknowledged to participate in the study. After verifying they were at least 18 years old, they were presented with instructions and the following information regarding commercial airline seat pitch:

Seat pitch refers to the space between a point on one seat and the same point on the seat in front of it. For many carriers, the pitch in Economy class is 29 to 32 inches (74 to 81 cm). More seat pitch can mean more legroom, but legroom is also affected by the thickness of the seat back. Airlines have claimed that a reduction of seat pitch can be compensated for by a thinner seat-back design. (https://en.wikipedia.org/wiki/Airline_seat).

Following this description, participants were given the following statement: *“Imagine a situation where the government is planning to regulate seat pitch on commercial aircraft.”* Participants were then asked to complete three scales relating to their perceptions on the familiarity, complexity, and value of government regulation of seat pitch. Next participants provided their ratings of comfort, safety, and ticket cost, and they were provided a 10-point rating scale that ranges from (1) *“I am NOT concerned with comfort/safety/ticket cost”* to (10) *“I AM concerned with comfort/safety/ticket cost”*. Following this, participants responded to affect questions using the six universal facial expressions from Ekman and Friesen (1971). The images can be found in Figure 4, and the 10-point rating scale ranged from (1) *“I do not feel this way at all”* to (10) *“Extremely feel this way”*. Participants then rated how strongly they felt the government should or should not regulate airline seat pitch using the statements *“The government should NOT regulate airline seat pitch”* (1) to *“The government SHOULD regulate airline seat pitch”* (10). Participants were then asked demographic questions related to their gender, age, ethnicity, the frequency of paying for airline seat upgrades, political affiliation, the highest level of education, number of roundtrip airline flights per year, and annual income. Lastly, participants were debriefed, compensated, and dismissed.

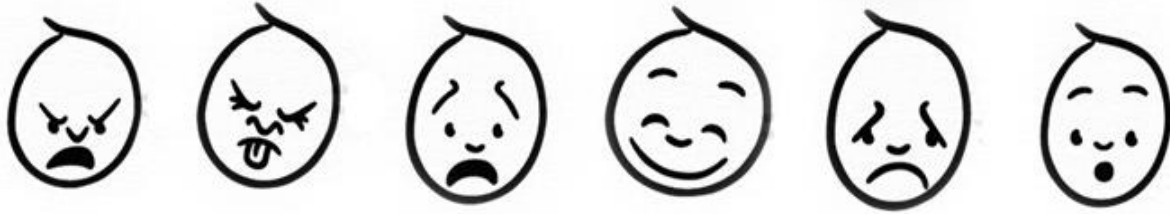


Figure 4. The six facial expressions of Ekman and Friesen (1971). The images represented, from left to right, are anger, disgust, fear, happiness, sadness, and surprise.

Design and Ethics

This study used a quantitative non-experimental design to identify which factors predict a participant's support of government seat pitch regulation. As in Study 1, the IRB of the subject university reviewed the study and all associated materials before any data was collected.

Study 2 - Results – Stage 1

The purpose of Stage 1 was to develop a regression equation that would predict a participant's support of government regulation of commercial airline seat pitch. The study used 20 possible predictors:

- regulation complexity, regulation familiarity, regulation value, comfort, safety, ticket cost;
- six universal facial expressions of anger, disgust, fear, happiness, sadness, and surprise;
- gender, ethnicity, number of roundtrip flights per year, percentage of flight completed with a paid seat upgrade, age, highest level of education, annual income, and political affiliation.

G*Power software was used to determine the necessary sample size for each stage. Using an alpha level of .05, power .95, and 20 predictors a required sample size of 222 participants were needed.

Initial Data Analysis

The data was assessed to verify the assumptions of regression were completed. Independence of residuals was examined using the Durban-Watson statistic yielding a value of 2.273. Since the value is close to 2, the data can be assumed not to violate the independence of residuals. All leverage values were determined to be less than .2, indicating that no cases had excessive leverage on the model, and all Cook's distances were above 1. Thus there were no influential cases within the data. A check of Mahalanobis' distance values demonstrated that all observed values were less than the critical value of 45.31 (highest observed 34.73) which indicates there were no outliers in the data. Tolerance values were all above .1 suggesting there were no issues with multicollinearity in the model. Finally, normality and homoscedasticity were assumed as met through an assessment of a residual histogram plot, P-P plots, and standardized residual vs. standardized predicted value plots.

Regression Equation Development

A backward stepwise regression was completed using 223 participants recruited via Amazon's Mechanical Turk to eliminate statistically insignificant predictors. The results produced a model with seven significant predictors of support for government regulation of commercial airline seat pitch: regulation value, disgust, happiness, Republican affiliation, Hispanic ethnicity, Asian ethnicity, and high school level of education. The resulting regression equation produced was:

$$Y = 4.954 + 1.499X_1 - 0.095X_2 + 0.250X_3 - 0.417X_4 - 1.571X_5 - 0.916X_6 - 0.572X_7$$

Where Y is the predicted support of government regulation of commercial airline seat pitch, and regulation value (X_1), disgust (X_2), happiness (X_3), Republican affiliation (X_4), Hispanic ethnicity (X_5), Asian ethnicity (X_6), and high school level of education (X_7). These predictors suggest that participants who found *greater value* in government regulation and who expressed *happiness toward government regulation* were *more supportive* of the government regulating commercial airline seat pitch. Participants who were *disgusted* by government regulation, Republican affiliation, Hispanic ethnicity, Asian ethnicity, and high school level of education were *less supportive* of government regulation of commercial airline seat pitch. The model accounted for 53.7% (52.2% adjusted) of the variance in the dependent variable, and it was significant, $F(7, 222) = 35.64, p < 0.001$.

Study 2 - Methods – Stage 2

Participants

An independent sample of 247 (112 female) participants was used to examine the model fit in stage 2. The average age of participants was 35.23 ($SD = 11.40$) years old. All participants were recruited from MTurk using the same selection parameters as described in Stage 1.

Materials and Stimuli

Participants completed the same instrument and followed the same procedure as in stage 1.

Design

Stage 2 also used a quantitative non-experimental design to identify which factors predict a participant's support of government seat pitch regulation and conduct a model fit assessment of the regression equation developed in Stage 1.

Study 2 - Results – Stage 2

Stage 2 – Model Fit

The regression equation developed in Stage 1 was tested for model fit and validity in stage 2 using an independent sample of 247 participants from MTurk. Model fit and validity was examined using three analyzes. First, a t -test was completed between the predicted score for government regulation of seat pitch with the actual score of participants. Second, a Pearson's correlation was conducted between the predicted and actual values, and finally, the cross-validated R^2 was calculated.

Model fit was first examined by using a t -test of the predicted government regulation of seat pitch scores and the actual scores reported in Stage 2. The regression equation developed in stage 1 was used to calculate the predicted value of the Stage 2 data. An independent samples t -test found no significant difference between the predicted stage 2 scores ($M = 6.72, SD = 1.58$) and the actual Stage 2 scores ($M = 6.60, SD = 2.50$), $t(492) = .787, p = .431$. Since the predicted scores of government regulation of seat pitch do not significantly differ from the actual scores, this suggests the original regression equation is a valid model to predict government support of regulating seat pitch.

Next, a Pearson's correlation was conducted between the predicted government regulation of seat pitch score and the actual score from Stage 2. The data suggest a statistically significant relationship

exists, $r(245) = .541, p < .001$. This cross-validity correlation coefficient suggests further evidence of model fit.

Last, the model fit was examined using the cross-validated R^2 . Cross-validated $R^2 = 1 - (1 - R^2)[(n + k) / (n - k)]$, where R^2 is the overall R^2 from the Stage 1 model, n is the sample size of the stage 1 sample, and k is the degrees of freedom. The calculation revealed $R^2 = .509$, and this indicates how well the preliminary model would apply to other samples from the population. Due to the low difference between the overall R^2 and the cross-validated R^2 , the presence of model fit can be suggested. The model fit summaries are presented in Table 1.

Table 1

Model Fit using Actual Vs Predicted Scores for Study 2 Stage 2

t-Test		Correlation		Cross-Validated R^2
<i>t</i>	df	<i>r</i>	Sig.	
0.787	492	.541	<.001	.509

Study 2 – Discussion

Study 2 created and validated a statistical model to predict a passenger’s likelihood to support government regulation of seat pitch. Seven factors were found to be significant: regulation value, disgust, happiness, Republican affiliation, Hispanic ethnicity, Asian ethnicity, and high school level of education. These factors provide some insight into the types of individuals who may or may not favor government regulatory involvement in commercial airline seat pitch.

General Discussion

The findings from these two studies provide some insight into passengers’ feelings on government regulation of seat pitch. The results from Study 1 indicate that while approximately 60% of passengers agreed or strongly agreed with government regulation of seat pitch, there were also participants who felt strongly against government involvement. Study 2 provided insights into the factors which would predict a passenger’s likelihood of supporting government regulation of commercial airline seat pitch.

The main advantage highlighted by participants in support of government regulation was the increased comfort that would result from having an increased seat pitch. Participants indicated that their ideal value was around 30-31 inches, and approximately 65% felt airlines should be forced to increase the seat pitch of their aircraft if the government imposed a minimum that was greater than that currently installed on aircraft. This value indicated by participants was still less than the ideal amount of seat pitch for overall passenger health of 34-40 inches (Kremser et al., 2012). Along with comfort comes safety and health concerns, which are the leading arguments in favor of government intervention (Elliott, 2018; Glusac, 2018), especially with reduced seat pitch being considered in both the short- and long-haul markets (Daft & Albers, 2012; Francis, Dennis, Ison, & Humphreys, 2007; Pels, 2008; Wensveen & Leick, 2009).

The main disadvantage attributed to government involvement is the possible resulting airfare increase, which was a commonly cited concern in the open-ended responses of participants from study 1. The airlines suggest government regulation would result in increased airfares, and participants also

expressed this concern. Airlines highlight reductions in seat pitch as necessary to compete with low-cost and ultra-low-cost carriers, and they say they provide products with greater seat pitch for customers who are willing to pay (McCartney, 2018). Lee and Luengo-Prado (2004) found that airlines which offered a premium economy upgrade section were more profitable than an airline that offered greater seat pitch throughout the entire cabin. It may be possible that consumers, at least the ones opposed to government regulation, are willing to accept reduced seat pitch to secure the lowest ticket cost. Kurtulmusoglu, Can, and Tolon (2016) found that in their sample, ticket cost was the primary concern of participants. For those passengers who are against government regulation, it is possible that they most value low ticket costs and prefer to have the choice to purchase upgrades if they desire. This finding was supported in prior research by Kuo and Jou (2017) who found that while most passengers were unwilling to pay for upgrades, the *price-sensitive business traveler* and *comfort seeking leisure* passengers may be a target audience for these upsell products.

The statistical model revealed some further insights into the types of factors that predict a passenger's level of support for government regulation of seat pitch. As the perception of regulatory value and happiness toward government regulation increases, so does support of government regulation. For these individuals, it is possible that they view the regulation to be a benefit to passengers and thus are more supportive of it. However, individuals who felt disgusted by the government regulatory involvement were less likely to support the regulation of seat pitch, and those participants who identified as Republican, Hispanic, Asian, and who had a high school level of education were generally more opposed to government regulation. It is possible that these individuals prefer the ability to make their own choices when it comes to the type of seat pitch they are willing to accept for the amount they have to pay. While consumers have been shown in principle to be willing to pay more to upgrade (Balcombe, Fraser, & Harris, 2009), most do not purchase upgrades to sections such as premium economy (Kuo & Jou, 2017). It is possible that some passengers recognize the tradeoffs between comfort and cost, and they have indicated that they would instead make these decisions for themselves instead of having a regulated minimum.

Practical Applications and Future Research Recommendations

The findings from the study offer some practical applications and recommendations for future research. The main issues seem to concern ticket cost, safety, and health concerns. First, while a majority of participants favor government regulation of seat pitch, it is not an overwhelming majority, which identifies some mixed perspectives on this issue. Passengers identified one of their main concerns as ticket cost, and further research should investigate anticipated increases in airfare, if any, which would be the result from a minimum seat pitch being established. Second, concerns identified over safety and the ability to evacuate the aircraft in the required minimum amount of time should be further researched to ensure aircraft can safely and efficiently be evacuated with current and proposed seat pitch distanced. Lastly, concerns over passenger health along with health concerns for flights over longer periods in seats with reduced pitch should be addressed. These health issues are primarily of concern on long-haul flights with reduced seat pitch, and health-related significant problems may be of interest to passengers and the government. Additional data from the investigation of these three areas may help provide further and valuable information which could help inform passengers and the government as to whether regulation of seat pitch is necessary.

Limitations

A few limitations bound the current studies. First, the studies used participants from Amazon's Mechanical Turk. While this population has been shown to be as valid as traditional laboratory data (Buhrmester, Kwang, & Gosling, 2011; Germine, et al., 2012; Rice et al., 2017), the results cannot be generalized beyond those types of individuals who completed online human intelligence tasks for

monetary compensation. Second, participants were presented with hypothetical scenarios in both studies. Participant behavior may be different from their attitudes or in a dynamic environment, such as one where they have to purchase a ticket, and the ticket cost is changing as a result of any regulatory effect. The studies were also limited to how much information to provide or not provide to participants. It is possible that providing this information to participants before the study may have influenced some of their responses (Furnham & Boo, 2011; Green, Jacowitz, Kahneman, McFadden, 1998). Neutral descriptions of seat pitch were presented to try and prevent biasing the participant's perspectives and to compliment this limitation. A participant eligibility requirement was to have completed a commercial airline flight within the preceding 12 months so that participants would have recently experienced a flight and be able to reflect on their experience accurately.

Conclusions

A current issue within the aviation industry is whether seat pitch should remain determined by the airlines or if the government should set a regulatory minimum. Passenger groups and airlines have offered differing views on the issue with a focus on ticket cost, safety, and passenger health concerns. This study provides an analysis of passenger perceptions, and the findings indicate that approximately 60% of passenger agree or strongly agree with the government regulating commercial airline seat pitch. Furthermore, 65% felt airlines should be required to increase the seat pitch on their aircraft if the regulated minimum was higher than their current seating configuration. The study also produced a valid model to help predict a person's likelihood to support government regulation of seat pitch. Rating of regulation value, disgust, happiness, Republican affiliation, Hispanic ethnicity, Asian ethnicity, and high school level of education were all significant predictors in the model.

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