Flight shaming consumers into aviation sustainability: which factors moderate?

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Abstract: Flight shaming has evolved from recent environmental activism efforts to curb air transportation use because of its adverse environmental impacts. This research aimed to determine if there was a significant effect of flight shaming on willingness to fly and identify what factors moderated this effect. Through the use of three studies and a total of 847 participants, results indicated participants were significantly less willing to fly when exposed to the flight shaming condition. Two of the four proposed moderators, value with sustainability and willingness to pay for sustainability, had a significant moderating effect where participants with high levels of these moderating variables were significantly less willing to fly than those with lower values. This research highlights the impact of flight shaming and demonstrates the need for airlines to curb the effects of flight shaming by promoting climate sustainment within their operations.

Keywords: flight shaming; consumer perceptions; willingness to fly; moderation; sustainability.

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1   Introduction

Flight shaming, as a concept, is relatively new to the aviation industry. It appears to have gained traction over the summer of 2019, particularly within and around Europe, but the implications have stretched worldwide. Coined in Sweden, *flygskam* – flight shame has evolved as a byproduct of environmental activists (Martin, 2020; The Guardian, 2020). Climate change-conscious travellers are becoming more selective about their transportation options, preferring more environmentally friendly modalities (Martin, 2020). In some cases, individuals will even forgo travel, leveraging alternative options such as telephonic meetings or Skype (Baron, 2019). While perhaps not the norm, some companies are seemingly joining the movement. Swedish Klarna Bank AB reportedly curtailed regional business flights and discouraged long-distance flights (Berton, 2019). The downturn of flyers in some markets has many airline executives concerned this movement may be more than just a short-term trend.

1.1   Background and definition of shaming

Shaming has been demonstrated to be an effective and powerful social instrument: to feel shame is a deeply personal experience. It is upsetting, unpleasant, and has been described as the worst of the social emotions (Elster, 1999; Williams, 1993; Wolheim, 1999). A severe reaction to shame has even led to suicide (Nussbaum, 2004). The Merriam-Webster Dictionary (2020) defines shaming as: "the act or activity of subjecting someone to shame, disgrace, humiliation, or disrepute especially by public exposure or criticism".

Shaming is used to uphold moral beliefs and social standards, as a direct form of punishment for committing a crime or social non-conformance to cultural norms. Shaming is also used in demonstrations to protest for social justice by highlighting 'shameful' behaviour by those in power (Courpasson and Vallas, 2016). Scholarly literature reveals shaming is also a complex phenomenon embedded and related to frameworks and constructs of neoliberal globalisation and the politics of social 'resistance' (Amoore, 2005; Gills, 2000; Johansson and Vinthagen, 2016).

Shaming can be conducted in numerous ways. Typical instruments of shaming include: imposing marks on or tattooing the skin to indicate a traitor, prisoner, or member of a group; imprisoning in iron masks (in medieval times); or public restraining or imprisonment using stocks or cages (Adkins, 2019). To understand how this deeply-personal feeling can influence, affect and transform countries, cultures, and societies, one must consider two elements:

1   the moral reasoning behind the intent to shame (e.g., to show the injustice of slavery)

2   the desired outcome of the shame (e.g., to invoke civil rights legislation and protection).

For this paper, the authors evaluated shame in the context of social resistance, public or private protests, and social movements (Courpasson and Vallas, 2016; Seidman, 2016). Shaming has taken both violent and non-violent forms and ranges from wide-spread public movements to smaller covert targeting forms of shaming. In 2020, when climate change is receiving more attention, a new type of shaming is rising, *flight shaming*.

1.2 Shaming within aviation 'flygskam' – flight shaming

Flygskam is Swedish for 'flight shame' aimed to evoke emotional feelings of shame for using air travel (Dyer, 2019). The reason for this shaming: aviation contributes to carbon emissions and, therefore, global climate change. Subsequently, flight shaming is directed at individuals and organisations who choose to travel or encourage others to travel by air.

The reality is that aviation only contributes a relatively small amount of global carbon emissions than other transportation modalities (Fleming, 2019). Despite this, flight shaming has recently gained international prominence. The objective of flight shaming is to shame organisations, individuals, and governments into reconsidering their contribution to adverse climate-related changes (Dyer, 2019). The quickly emerging 'flight shaming' phenomenon has affected Europe, putting governments and industry leaders on alert for what is showing to be a significant impact on the global aviation industry (de Juniac, 2019; Topham, 2019). Flight shaming first began in 2018 with a small group of environmentalists encouraging people to *stay on the ground* rather than fly. The movement quickly gained momentum throughout 2019, as activists increased their calls for climate change action.

A Swiss Bank, UBS survey of 6,000 people from the USA, Germany, France, and the UK, indicated 21% of participants chose to reduce airline flights in the preceding 12 months (Reed, 2019). Further research suggests there is potential that flight shaming will cut the demand for air travel in Europe and the USA by half (Reed, 2019). UBS's research projects that the annual growth rates in aviation will drop from 4.5% to 1.5% through 2035 due to the growing flight shaming movement (Reed, 2019).

Several recent examples highlight the intersection of large consumer group movements and the aviation/airline industry. One notable example related to a band who was travelling for a concert. The airline broke one of the musician's guitars, which was observed by them from the window of the aircraft. After the airline refused to provide compensation for the damaged equipment, the band released a video song of the experience on YouTube, which has now been viewed over 20 million times (Dave Carroll Music, 2021). In 2015, protesters against the expansion of Heathrow airport in London, blocked the tunnel leading to the main airport entrance (Reuters, 2015), and in 2019, airline caterers protested around the Thanksgiving holiday over wages and benefits (Josephs, 2019). Also, in 2019, flights at Hong Kong were forced to be cancelled as protesters occupied the airport to protest new government restrictions (BBC, 2019). In all these cases, the high visibility and critical nature of the aviation industry helped to increase the visibility of the protests surrounding these causes.

1.3 Aviation and the global environmental impact

The Director-General and CEO of the International Air Transport Association (IATA) recently stated that the United States has the world's largest aviation market. Aviation in the US currently supports 6.5 million jobs and contributes $779 billion to GDP. Industry growth is forecasted to increase to 8 million jobs and $1.26 trillion in GDP in the next 20 years (de Juniac, 2019).

IATA and the International Civil Aviation Organization (ICAO) have been working on setting aggressive climate change goals. Aviation activities generated 895 million tons of carbon dioxide (CO_2) in 2018, representing approximately 2% of the 42 billion total tons of CO_2 generated by human activities every year. Even though air travel demand

grows at around 5% annually, the aviation industry has managed to limit its annual emissions increase to approximately 2.4% (IATA, 2020).

ICAO introduced a carbon offset program in 2016; and, 192 member states and governments agreed to comply voluntarily. The implementation of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) will encourage mandatory participation by 2027 for most United Nations member states. By 2050, the goal of CORSIA is to reduce CO_2 emissions by 50%, based on 2005 levels. A flight today produces only half the CO_2 it did in 1990, and aviation CO_2 production is comparable to servers and internet cables (IATA, 2020).

KLM Royal Dutch Airlines launched a high-profile advertising campaign called 'Fly Responsibly' to inform passengers and stakeholders about what the airline is doing to minimise CO_2 emissions and educate passengers and other organisations to make sound environmental choices about air travel (KLM, 2020). These choices include; packing lighter, travelling less, contributing to carbon offsetting programs, and investing heavily in sustainable aviation fuel (Moores, 2019).

Interestingly, the impacts of COVID-19 on the reduction in overall flying has not diminished the concept of flight shaming, and in some cases has intensified the focus on climate change and now, any un-necessary air travel. At a recent national infrastructure summit held in Sydney Australia, the CEO of Virgin Australia defended the aviation industries reduction of emissions plans, however, these measures don't appear to be changing consumer perceptions or subduing the flight shaming movement (NZHerald, 2020). Some airlines are now flying empty flights or 'ghost flights' to maintain airport slots (Bliss, 2020). Criticisms have now been raised of this practice as being bad for the environment and unnecessary. ICAO (2020) estimates by the mid-2030s, at least 200,000 daily departures worldwide. As the industry continues to grow at this quick pace, it will be necessary to consider the environmental impacts, especially due to the flight shaming awareness of climate change caused by the aviation industry.

1.4   Gender differences and shame

The use of shaming to highlight gender inequality has increased recently in the USA, mainly centring on shaming senior male executives for the sexual harassment and exploitation of women in the workplace. This shaming movement is known as the 'Me Too' and 'Times Up' movements (Lee, 2018). Gender inequality in organisations has been a long-enduring issue. Along with many other inequality regimes, gender inequality remains prevalent in today's society (Acker, 2006). Research into gender differences and shaming indicated that females are more sensitive to shame than men and more readily acknowledge when they have shamed others (Fitch and Nazaretian, 2019). Males and females of almost all ages and cultures either engage in shaming activity or have been shamed. Parents use shaming to teach their children who grow and learn the effects of shame (Fitch and Nazaretian, 2019; Nussbaum, 2004), and shaming appears to be a normal part of life. The circumstances and situations determine the shaming activity's type and intensity (Courpasson and Vallas, 2016; Nussbaum, 2004).

However, no studies to date examine gender differences in those who engage in flight shaming or those being shamed. Previous research on passenger gender differences within the aviation industry has shown that gender significantly differs in many aviation activities, whether these findings are based on the type of aircraft, new technology, or even the type of pilots who are flying the aircraft (Rice et al., 2017b, 2018; Winter et al.,

2014). A prior study has shown the ability to influence consumers' willingness to ride in driverless vehicles based on the influence of positive or negative presentation of information (Anania et al., 2018a).

1.5 The concept of willingness

Willingness is defined in the Merriam-Webster dictionary (2020) as; "inclined or favorably disposed of in mind, eager to help, prompt to act or respond, done, borne, or accepted by choice or without reluctance or relating to the power of choosing". Willingness represents the predisposition to a choice and generally follows a decision about the 'thing' being considered. The 'willingness' to participate in an activity is based on complex and multi-faceted contributors, including experience, knowledge, capabilities, cultural and social norms, attitudes, and in no small degree, emotions (Elster, 1999; Endsley and Jones, 2011; Esses and Dovidio, 2002; Norman, 2013; Seo and Barrett, 2007). Emotions play a significant role in human willingness; for example, research indicates that feelings towards individual animals drive a willingness to protect them (Prokop and Fančovičová. 2013). Emotions were found to significantly affect the willingness of stockbrokers to buy and sell securities on Wall Street (Seo and Barrett, 2007).

Previous research indicates that high consumer willingness levels are a vital factor in advancing innovations (Seo and Barrett, 2007). This finding is especially important within the realms of green energy and new technologies such as riding in autonomous vehicles and flying in newer types of aircraft (Anania et al., 2018a, 2018b; Kowalska-Pyzalska, 2017; Rice and Winter, 2019; Rice et al., 2019). Emotions such as shame, embarrassment, and guilt may have a considerable effect on the willingness and the decision to fly or stay on the ground.

1.6 Instruments used in these studies

1.6.1 Willingness to fly

For this study, the willingness to fly scale was used in the context of willingness to fly in commercial aircraft. The willingness to fly (WTF) scale was initially developed by Rice et al. (2015a) and has been re-validated in subsequent studies that have shown it useful in demonstrating effects on the consumers' willingness to fly in various scenarios (Mehta et al., 2017; Rice et al., 2015b; Winter et al., 2017). The scale consists of seven items and uses a 5-point Likert response, ranging from strongly disagree (–2) to strongly agree (2) with a neutral option (0) (Rice et al., 2020). The WTF scale is located in Appendix A.

1.6.2 Familiarity with sustainability scale

Rice and Winter (2015) initially developed the familiarity scale, and it has been validated in a previous study used to measure participants' familiarity with driverless vehicles (Rice and Winter, 2019). This study instrument uses five statements that have been adapted to assess participant familiarity with sustainability. A five-point Likert response scale was used, and the scale is located in Appendix A. The psychometrics are reported in the results section.

1.6.3   Value with sustainability scale

The value scale was initially developed and validated by Rice and Winter (2019) to measure how much participants value the new technology of driverless vehicles. It has been adapted for ongoing research into assessing the perceived value of sustainability in various aviation scenarios. Five statements were presented to the participants, with a 5-point Likert response scale. The value with sustainability scale (VOS) is shown in Appendix A. The psychometrics are reported in the results section.

1.6.4   Willingness to pay for sustainability scale

Willingness to pay has been used in previous studies to assess how willing consumers would be to pay for goods or services in various industries, including green energy and sustainability associated with the aviation industry (Kowalska-Pyzalska, 2017; Rains et al., 2017). When the willingness to pay is high, consumers assess the value and importance of the goods, services, or benefit on offer. The willingness to pay scale consists of 5-point Likert response anchors from strongly disagree to strongly agree. The WTP scale is presented in Appendix A.

1.6.5   Environment commitment scale

The environment commitment scale is a four-item scale used to measure a participant's commitment to the environment (Ling-Yee, 1997). The scale consists of seven-point Likert-type response anchors from strongly disagree to strongly agree.

1.7   Current study

The purpose of these studies is to examine the influence of a newspaper article designed to replicate the feelings related to flight shaming to assess participants' willingness to fly. While prior studies have investigated willingness to pay pertaining to aviation sustainability (Rains et al., 2017; Ragbir et al., 2021; Walters et al., 2018) and others willingness to support aviation sustainably (Milner et al., 2019; Winter et al., 2019), no prior study has investigated the novel concept of flight shaming on willingness to fly. The moderators are grounded in a previous study investigating various types of sustainable aviation propulsion systems (Winter et al., 2020).

2   Study 1 – introduction

The purpose of study 1 was to determine if there would be a significant difference in willingness to fly based on whether or not participants read a simulated newspaper article that highlighted lobbyist groups either supporting or protesting commercial aviation on the grounds of being either sustainable or unsustainable, respectively, to simulate flight shaming. Study 1 predicted the following hypothesis:

H$_1$ Flight shaming would significantly lower the willingness to fly rating for the group that received the negatively framed news article compared to the positive one.

2.1 Study 1 – methods

2.1.1 Design

The study used an experimental between-participants design with the type of article condition as the independent variable and willingness to fly as the dependent variable. The university's institutional review board approved the study.

2.1.2 Participants

One hundred and sixty-four participants (66 males, 96 females, 1 non-binary, 1 non-reporting) from the USA were recruited for the study using Amazon's® Mechanical Turk® (MTurk) platform. The average age of participants was 38.20 (SD = 11.75) years. Participants reported the following ethnicities: 77% Caucasian (white, non-Hispanic), 8% Latino/Hispanic descent, 7% Asian descent, 6% African descent, and 2% Other. MTurk provides a means to administer electronic instruments to participants who complete online human intelligence tasks (HITs) in exchange for monetary compensation. Participant requirements were established to help ensure quality data was received. Participants needed to have completed at least 100 prior tasks and held approval ratings of 98% or higher to participate in the study. Previous studies have shown that MTurk provides data as valid as traditional laboratory data (Buhrmester et al., 2011; Germine et al., 2012), and the advantages and disadvantages of using this and similar platforms to research aviation have been identified (Rice et al., 2017a).

2.1.3 Materials and stimuli

The instrument used in the study was created and deployed via Google Forms®. The link to the survey was included in the recruitment announcement posted on MTurk. After clicking on the link, participants were taken to a digital consent form. After accepting the study's terms, participants read brief instructions and were randomised into one of two conditions. At the start of both conditions, participants read, "for the following questions, imagine a situation where you are planning to purchase a ticket on a commercial airline flight between two major cities and you see the following headline in the newspaper". In condition 1, participants were presented with a newspaper article that said that lobbyist groups were supporting air travel as a sustainable means of transportation; while in the second condition, the newspaper article indicated that lobbyist groups were protesting the use of air travel due to it being unsustainable. A copy of the two conditions is shown in Figures 1 and 2. Participants then responded to the seven-items on willingness to fly scale. Lastly, participants were asked questions on demographic factors, debriefed, compensated, and dismissed.

2.2 Study 1 – results

An initial data screening found less than 1/2% of the data missing. For missing items on the reflective willingness to fly scale, known value replacement was used to impute missing values (Hair et al., 2018). The willingness to fly scale demonstrated strong convergent validity with all items loading above .88. A Cronbach's alpha of the 7-items on the willingness to fly scale was .967, and thus, the average score for this scale was

used in the data analysis. Normality was assessed through skewness (all values less than +/–1) and kurtosis values (all values less than +/–1.1). The data were analysed using an independent samples t-test. The findings indicated that participants exposed to the article protesting aviation (or the flight shaming condition) ($M = 0.47$, $SD = 1.12$) were significantly less willing to fly compared to those in the non-flight shaming condition ($M = 1.01$, $SD = 0.76$), $t(162) = 3.54$, $p = .001$, $d = 0.56$. The data from study 1 is shown in Figure 3.

Figure 1   The newspaper displayed to participants demonstrating support of continued air travel (see online version for colours)

THE DAILY NEWS

THE WORLD'S FAVOURITE NEWSPAPER

Lobbyist Groups Support Air Travel

Support growing for continued air travel

Lobbyist groups demonstrate worldwide to continue their support of the use of air travel as a sustainable means of transportation.

Figure 2   The newspaper displayed to participants in the flight shaming condition, which demonstrated protests against the use of air travel (see online version for colours)

THE DAILY NEWS

THE WORLD'S FAVOURITE NEWSPAPER

Lobbyist Groups Protest Air Travel

Support growing for reduced air travel

Lobbyist groups demonstrate worldwide to continue their protests of the use of air travel as an unsustainable means of transportation.

2.3   Study 1 – discussion

The findings from study 1 demonstrated that there appears to be a significant decrease in willingness to fly based on the presence of flight shaming. These results suggest that the concept of flight shaming significantly affects the willingness to fly, and these results demonstrate the need to conduct further investigation into the idea of flight shaming.

Figure 3 Data from study 1 showing the significant decrease in willingness to fly in the flight shaming condition (standard error bars are depicted) (see online version for colours)
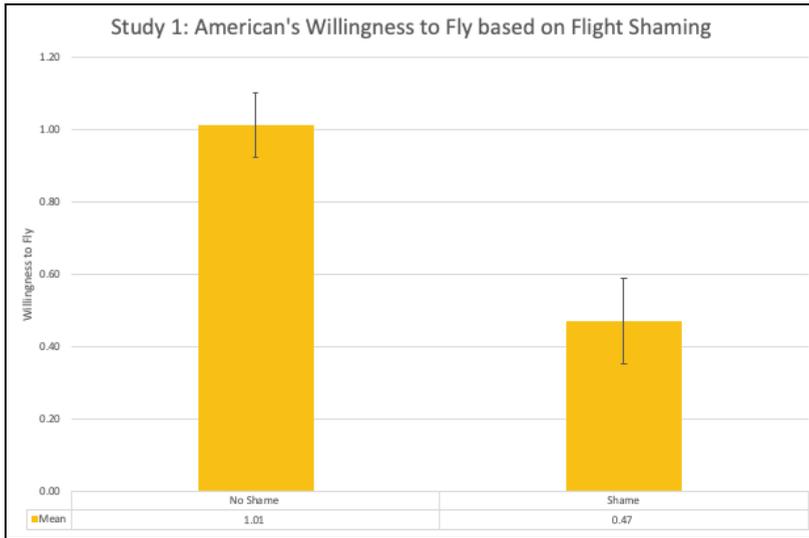
3 Study 2 – introduction

The purpose of study 2 was to replicate the findings of study 1. Additionally, the authors wanted to examine if there would be any differences based on the gender of the participant. The following hypotheses were used in this study:

H_1 Flight shaming would significantly lower the willingness to fly rating for the group that received the negatively framed news article compared to the positive one.

H_2 There would be no significant main effect of gender.

H_3 There would be a significant interaction, although this hypothesis was non-directional.

3.1 Study 2 – methods

3.1.1 Design

The study used an experimental between-participants design. Type of article was the first independent variable, and participant gender was the second independent variable. Willingness to fly was the dependent variable. The university's institutional review board approved the study.
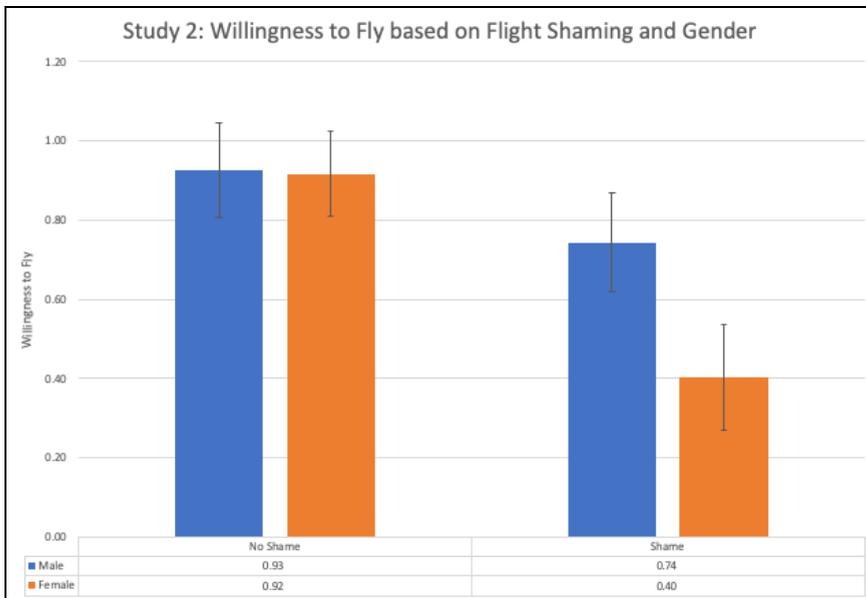
3.1.2 Participants

Two hundred and fifty-three participants (110 males, 142 females, 1 non-binary) were recruited in study 2 from MTurk. The participants reported a mean age of 38.57 ($SD = 12.42$) years. Participants reported the following ethnicities: 78% Caucasian

(white, non-Hispanic), 5% Latino/Hispanic descent, 9% Asian descent, 8% African descent, and <1% other. As in study 1, participants had to have been residents of the United States, at least 18 years old, completed at least 100 prior tasks on MTurk, and held an approval rating of at least 98% or higher. Participants who completed study 1 were excluded from participating in study 2 using a user-defined selection requirement on MTurk.

3.1.3 Materials and stimuli

The instrument, scenarios, newspaper articles, and scale used in study 2 were the same as study 1.

Figure 4   Decrease in willingness to fly based on flight shaming in study 2 as a function of the condition and participant gender (standard error bars are depicted) (see online version for colours)

3.2 Study 2 – results

An initial data screening found only one item missing for one participant on the reflective willingness to fly scale. For this item, known value replacement was used to impute missing values (Hair et al., 2018). The willingness to fly scale demonstrated strong convergent validity with all items loading above .88. A Cronbach's alpha of the 7-items on the willingness to fly scale was .965, and thus, the average score for this scale was used in the data analysis. Normality was assessed through skewness (all values less than +/–1.2) and kurtosis values (all values less than +/–2.3). The data were analysed using a 2×2 between-participants ANOVA. The results indicated a significant main effect for the type of article between the no flight shaming group and the flight shaming group, $F(1, 248) = 8.06$, $p = .005$, *partial eta squared* = .031. However, there was no significant main effect based on participant gender, $F(1, 248) = 2.03$, $p = .156$, *partial eta squared* =

.008, nor a significant interaction between the type of article and gender, $F(1, 248) = 1.82$, $p = .178$, *partial eta squared* = .007. The findings from study 2 are depicted in Figure 4.

3.3 Study 2 – discussion

Study 2 sought to replicate study 1 based on the presence of flight shaming and examined any effects of participant gender. In a replication of the findings from study 1, there was a significant decrease in willingness to fly when flight shaming was presented to participants. However, there were no significant differences based on the participant's gender or interaction between the two independent variables. In general, the findings suggest that flight shaming does result in a decreased willingness to fly, and these effects occur in both males and females.

4 Study 3 – introduction

The purpose of study 3 was to attempt and replicate the findings from studies 1 and 2. Additionally, in study 3, four added variables were assessed to evaluate their possible impacts on a moderating effect between the type of article and willingness to fly. These variables included familiarity with sustainability, value with sustainability, willingness to pay for sustainability, and an environment commitment score. In study 3, the following hypotheses were proposed:

H_1 Flight shaming would significantly lower the willingness to fly rating for the group that received the negatively framed news article compared to the positive one.

H_2 There would be no significant main effect of participant gender.

H_3 There would be no significant interaction between the type of article and gender.

H_4 At least one of the moderators would significantly influence the type of article on willingness to fly, where the moderating effect would result in a more significant decrease in willingness to fly.

4.1 Study 3 – methods

4.1.1 Design

Study 3 used an experimental between-participants design. The type of article and gender were the two independent variables. The willingness to fly was the dependent variable, and familiarity with sustainability, value with sustainability, willingness to pay for sustainability, and environment commitment score were the possible moderating variables. The university's institutional review board approved the study.

4.1.2 Participants

Four hundred and thirty-two participants completed the study. An initial assessment of the data found 430 eligible responses for data analysis, with two cases being removed due to missing or incomplete data. The study consisted of 206 males, 222 females, and

two participants who failed to report their gender. The average age of participants was 40.44 (SD = 14.17) years. Participants reported the following ethnicities: 73% Caucasian (white, non-Hispanic), 4% Latino/Hispanic descent, 10% Asian descent, 10% African descent, and 3% other. As in studies 1 and 2, participants were recruited from MTurk using the same eligibility requirements; and participants who completed either studies 1 or 2 were excluded from conducting study 3 using a user-defined selection requirement on MTurk.

4.1.3   Materials and stimuli

The procedure and instrument used in study 3 were similar to that of studies 1 and 2, with the addition of four scales evaluating familiarity with sustainability, value with sustainability, willingness to pay for sustainability, and environmental commitment (which were included as possible moderating factors). These scales are depicted in Appendix A. Participants first agreed to the terms of the consent form, which were the same as the prior two studies. They were then provided with instructions and randomly assigned to one of the two experimental conditions related to the article type. Participants completed the four scales described earlier as the possible moderating variables. These scales were presented in a randomised fashion to prevent order effects. After completing these scales, participants were given the newspaper article and asked to rate their willingness to fly. Lastly, after collecting demographic data, participants were debriefed, dismissed, and compensated.

4.2   Study 3 – results

An initial data screening found less than 1/2% of the data missing. For missing items on the reflective scales, known value replacement was used to impute missing values (Hair et al., 2018). Normality was assessed through skewness (all values less than +/–1.6) and kurtosis values (all values less than +/–3.1).

4.2.1   Factor analysis

First, the data were assessed regarding the validity of the scales used in the study. A maximum likelihood analysis with a promax rotation assessed the scales' factor structure to ensure they could be used for inferential statistics. On the initial assessment of the scales, a 5-factor pattern was found, which yield a Kaiser-Myer-Olkin (KMO) measure of sampling adequacy (MSA) of .929. This value is considered 'meritorious' (Hair et al., 2018), while Bartlett's test of sphericity was statistically significant (p < .001), which indicates the data were appropriate for factor analysis. Convergent validity was demonstrated by the scales, as all had average factor loadings of .7 or higher. Discriminant validity was also established, as no factors had any substantial cross-loadings, nor was any inter-factor correlations greater than 0.7. Finally, Cronbach's Alpha values for the five scales ranged from .853–.964, indicating high internal consistency. Therefore, the scales were deemed appropriate for use with the inferential statistics, and the scores from each scale were averaged for use in the data analysis. The final pattern matrix can be found in Appendix B and the scree plot in Appendix C.

4.2.2 *Inferential statistics*

A 2×2 between-participants ANOVA was used to examine differences in willingness to fly. The data indicated a significant main effect based on the type of article, $F(1, 424) = 11.69$, $p = .001$, *partial eta squared = .027*, and a significant main effect of gender, $F(1, 424) = 7.94$, $p = .005$, *partial eta squared = .018*. The interaction between the type of article and gender was not significant, $F(1, 424) = 0.846$, $p = .358$, *partial eta squared = .002*. These findings reveal that participants were again less willing to fly in the flight shaming condition than in the non-flight shaming condition. Additionally, females were less willing to fly in both conditions than male participants. The findings from study 3 are shown in Figure 5.

4.2.3 *Moderation analysis*

The PROCESS version 3.4 plugin for IBM SPSS Statistics Version 26 was used to assess the moderating effect of familiarity with sustainability, value with sustainability, willingness to pay for sustainability, and environment commitment score. Hayes (2018) created the PROCESS plugin to conduct mediation, moderation, and conditional process analysis. When installed, the plugin works through the Regression menu of SPSS. The plugin has several pre-defined models, with the basic moderation model being model 1. Using a guided user interface menu, the independent, moderator, and dependent variables are assigned to their respective locations, and the plugin completes the analyses. The analyses were conducted using 5,000 bootstrapped samples (Hayes, 2018).

Figure 5 Data from study 3 showing the significant main effects of flight shaming and gender (standard error bars are depicted) (see online version for colours)
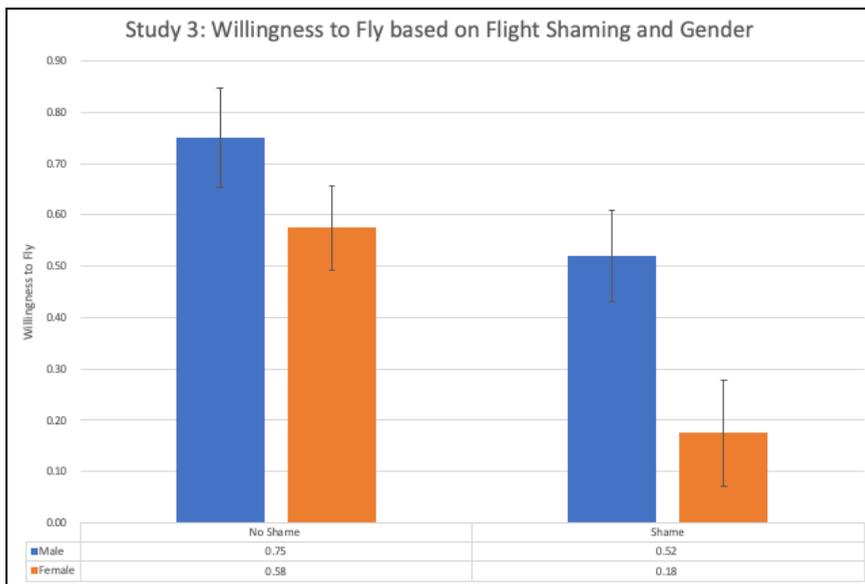
4.2.3.1   Familiarity with sustainability

The familiarity with sustainability and type of article did not produce a significant interaction, $F(1, 426) = 3.00$, $p = .08$, and as a result, there was no significant moderating effect of familiarity with sustainability.

Figure 6   A visual depiction of the moderating effect of value with sustainability and type of article on willingness to fly (see online version for colours)

	Low	Middle	High
No Shame	0.61	0.64	0.67
Shame	0.5	0.34	0.17
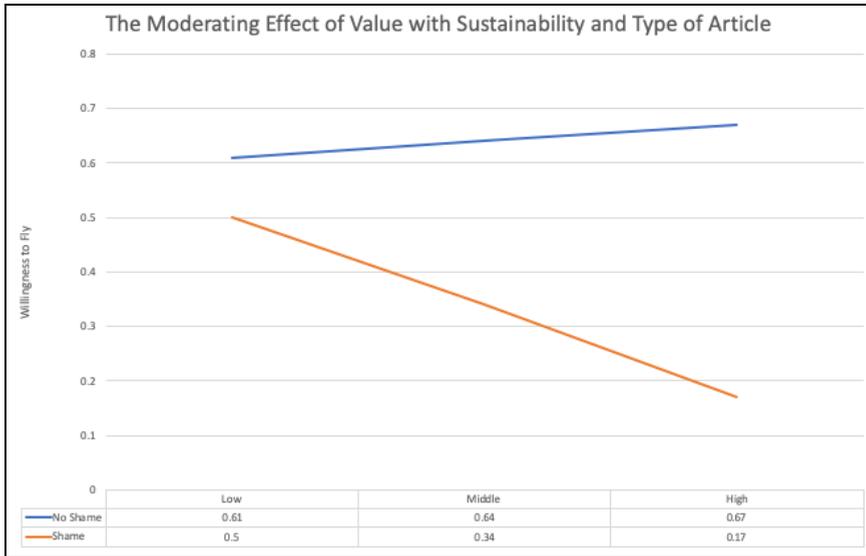
4.2.3.2   Value with sustainability

Value with sustainability significantly interacted with the type of article, $F(1, 426) = 4.07$, $p = .04$. A visual representation is shown in Figure 6, and the model summary statistics are presented in Table 1a. The interaction was probed at three levels of value with sustainability, one standard deviation below the mean, at the mean, and one standard deviation above the mean. Table 1b highlights that as value with sustainability increases, there is a greater difference in willingness to fly scores based on the type of article. In general, the willingness to fly is significantly less when flight shaming is present for those with middle and high ratings of value with sustainability.

Table 1a   Value with sustainability as a moderator of willingness to fly

	b [95% CI]	*SE B*	*t*	*p*
Constant	.60 [.31, .88]	0.146	4.103	<.001
Type of article	.02 [–.35, .38]	0.187	0.110	.912
Value	.04 [–.17, .25]	0.105	0.365	.715
Value × Type of article*	–.27 [–.53, –.01]	0.134	–2.018	.044

Note: $R^2 = .04$; *$p < .05$.

Table 1b Three regression models estimating willingness to fly based on the value with sustainability and the type of article with centring of the moderator at low, middle, and high values (the mean and +/–1 SD)

	b [95% CI]	SE B	t	p
Low = .4910	–.11 [–.38, .15]	0.134	–0.840	.401
Middle = 1.201*	–.30 [–.49, –.12]	0.093	–3.283	.001
High = 1.910*	–.50 [–.76, –.23]	0.132	–3.758	<.001

Note: *p < .05.

4.2.3.3 Willingness to pay for sustainability

Willingness to pay for sustainability significantly interacted with the type of article, $F(1, 426) = 4.59$, $p = .03$. A visual representation is shown in Figure 7, and the model summary statistics are presented in Table 2a. The interaction was probed at three levels of willingness to pay for sustainability, one standard deviation below the mean, at the mean, and one standard deviation above the mean. Table 2b highlights that as the willingness to pay for sustainability increases, there is a greater difference in willingness to fly scores based on the type of article. In general, willingness to fly is significantly less when flight shaming is present for those with middle and high ratings of willingness to pay for sustainability.

Figure 7 A visual depiction of the moderating effect of willingness to pay for sustainability and type of article on willingness to fly (see online version for colours)

	Low	Middle	High
No Shame	0.73	0.64	0.55
Shame	0.64	0.36	0.08
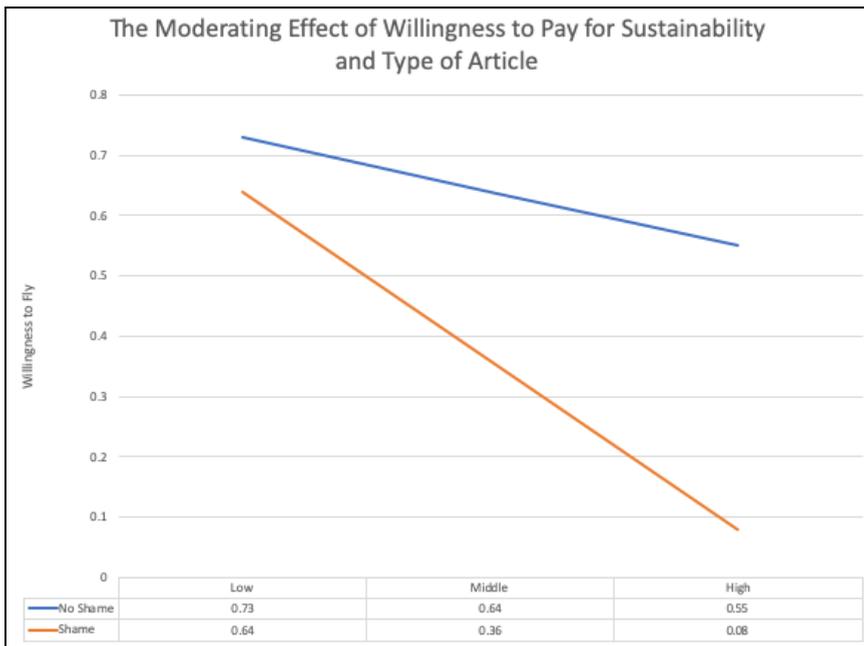
4.2.3.4   Environment commitment

The environment commitment score and the type of article did not produce a significant interaction, $F(1, 426) = 0.64$, $p = .42$, and as a result, there was no significant moderating effect of environmental commitment.

4.3   Study 3 – discussion

Study 3 replicated the findings from studies 1 and 2 in that there was a significant decrease in willingness to fly when flight shaming was present. However, study 3 also demonstrated that, overall, females were less willing to fly in both conditions than male participants. Value with sustainability and willingness to pay for sustainability were found to be significant moderators. In both cases, as ratings in the two moderators increased, significant decreases were found to exist in willingness to fly in the flight shaming condition when compared to the non-flight shaming condition. This data suggests that individuals who perceive sustainability to have more value and are more willing to pay for it may be more influenced by flight shaming.

5   General discussion

The purpose of these studies was to investigate the possible effects that flight shaming may have on consumer's willingness to fly. The studies also examined possible differences based on participant gender, significant interactions, and possible moderating effects. Willingness to fly appeared to be affected by the presence of flight shaming, and two significant moderating variables were identified. A discussion of the findings from the three studies follows.

   Across the three current studies, there was consistent support for the hypotheses, and a significant decrease in willingness to fly based on flight shaming was demonstrated. The data provide some insights into the effects of flight shaming on consumers and why this effect may occur. In general, shaming is an effective strategy to change an individual's behaviour (Courpasson and Vallas, 2016). In the case related to aviation and the current studies, worldwide climate protests may be causing participants to experience negative feelings, thus resulting in a lower willingness to fly ratings. Shame may also be causing participants to consider the trip's necessity and whether alternate transportation modes would be viable (de Juniac, 2019; Topham, 2019). Additionally, it is possible, for example, in business, that a face-to-face meeting is not necessary, and a video conference may be a sufficient alternative to travel. Therefore, the effects of shame may cause participants to reconsider viable alternative forms of travel.

   The current studies also examined the possible differences based on participant gender or any interactions. The data did indicate some conflicting findings as it relates to the main effect of participant gender. In study 2, there were no gender effects on willingness to fly, while in study 3, there was a significant main effect of gender, where females were less willing to fly overall than males. This difference requires further investigation to explain; however, the literature related to gender is somewhat mixed as to whether or not there are differences related to shame (Fitch and Nazaretian, 2019). Perhaps more interesting from these studies' findings was the lack of the interaction between the type of article and gender, which was consistent across both of the studies

that examined for this effect. This finding demonstrates that the impact of flight shaming appears universally across genders, and males and females are equally affected by shaming efforts.

The final hypothesis under investigation was the possible moderating effect with the type of article on willingness to fly. Two significant moderators, value with sustainability, and willingness to pay for sustainability, were identified in the study. These moderators both follow similar patterns. Those who have middle to high levels of value and willingness to pay for sustainability are more significantly affected by flight shaming than those who were not shamed. For those participants who value and are willing to pay for sustainability, they may want to see their additional financial investment used as intended. As a result, they appear more likely to be influenced by a shaming effort. Prior research indicated that consumers are willing to pay for sustainable efforts (Rains et al., 2017; Walters et al., 2018), but as would be expected, they likely want to see that additional investment resulting in more sustainable outcomes. The industry should consider these types of individuals as those who could be the most affected by shaming efforts.

5.1   Practical implications

The findings from the current studies provide some novel contributions to the aviation industry. First, while flight shaming is a relatively new concept to influence aviation passengers, there has been very little scholarly research on the topic. These studies' findings demonstrate that there appears to be consumer influence based on the messages and framing of air travel on sustainability. Second, the data also show that while flight shaming was most prevalent in Europe, the effects may be noticed in the USA as well. This research suggests that flight shaming may not be a regional phenomenon, but the consequences could be experienced globally. Third, those who appear to care the most for sustainable practices – defined explicitly as demonstrating value and a willingness to pay for sustainability – may be the most influenced by flight shaming efforts.

As a result of these findings, those in industry can provide information that may prevent or limit the decrease in willingness to fly due to flight shaming. There appears to be a strong influence on how the message is communicated. If environmental groups wish to convey the effects of air travel as harmful to sustainability, the aviation industry must also be ready to respond with factual information. Additionally, the aviation industry may want to promote the advances being made to incorporate sustainable solutions proactively. Examples include renovating airports to be more sustainable or airlines working to integrate biofuels into their operations. These proactive practices can help frame the message, and they may demonstrate that substantive efforts are being made to enhance the aviation industry's sustainability.

5.2   Limitations and recommendations for future research

The use of MTurk is one of a convenience sample, limiting the generalisability of the results. While some studies have found that the sample collected from MTurk is likely to be more diverse, this does not necessarily mean it is always representative of the specific population. Additionally, this study was limited to American participants. Studies have found that the MTurk's population tends to be more tech-savvy, younger, less politically

diverse, more highly educated, and less religious than the US population (Berinsky et al., 2012; Shapiro et al., 2013). Therefore, future studies should seek to expand the sample and replicate the research to verify the findings and apparent effects of flight shaming.

This study was conducted in a cross-sectional administration; therefore, the findings only represent the point in time when the study was conducted. Future studies should analyse the trend of these results over time to see how the impacts of the flight shaming trend. This research was also limited to one newspaper headline and did not analyse other possible headlines' response. Additionally, there was an assumption that the newspaper article would invoke a shame-related response in participants, especially in the negative condition. It is acknowledged that shame is a personal experience, and it may be difficult to invoke this response. However, the newspaper article allowed a way to investigate this phenomenon while also avoiding any possible harm to participants. Future work should investigate how different aspects of communication may influence flight shaming on willingness to fly or what other factors may invoke a shame response within participants.

With the current study design, two groups were compared against one another, a positive and negative. A limitation of this design structure was no strict control group from which to compare a baseline rating. The rationale for this design decision was that it would be unlikely that a newspaper article would be written with a neutral position on sustainability. Thus, a more realistic example would be an article framed positively or negatively. However, it is acknowledged that the findings compare two groups over a baseline or control condition.

In future iterations of this research, the authors recommend completing a statistical model of the different relationships to identify what predicts or influences a consumer's likelihood to experience flight shaming. Additionally, the type of communication should be evaluated. The use of more sustainable forms of propulsion or related technologies may offset some of the effects of flight shaming, and their influence should also be investigated.

6   Conclusions

Flight shaming has become a more prevalent phenomenon within the last few years. Impacts were felt, particularly in Europe, in the summer of 2019, resulting in a decrease in travelling passengers. However, the effects of flight shaming are being experienced worldwide. The purpose of these studies was to examine the possible impacts of flight shaming on willingness to fly, along with possible moderating variables. Through the use of three studies, the data indicate that flight shaming does result in a significant decrease in willingness to fly. Additionally, a participant's value with sustainability and willingness to pay for sustainability were significant moderators of flight shaming's effects on willingness to fly. In general, as ratings of value and willingness to pay for sustainability increased, there was a significant decrease in willingness to fly ratings when flight shaming was present. These results suggest that flight shaming may affect passengers' willingness to fly, and the industry should consider promoting their efforts to reduce environmentally harmful effects of air travel and their initiatives for improving the sustainability of air travel.

Author's note

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Appendix A

Scales used in these studies

Participants responded to each scale using a 5-point strongly disagree to strongly agree option.

Willingness to fly

1   I would be willing to fly in this situation.

2   I would be comfortable flying in this situation.

3   I would have no problem flying in this situation.

4   I would be happy to fly in this situation.

5   I would feel safe flying in this situation.

6   I have no fear of flying in this situation.

7   I feel confident flying in this situation.

Familiarity with sustainability

1   I am familiar with sustainability.

2   I have a lot of knowledge about sustainability.

3   I have read a lot about sustainability.

4   Sustainability has been of interest to me for awhile.

5   I know more about sustainability than the average person.

Value with sustainability

1   Sustainability is something that would be beneficial to me.

2   Sustainability would be something valuable for me to understand.

3   I think sustainability is useful.

4   There would be value in being sustainable.

5   If sustainability were available, I think it would be beneficial to utilize.

Willingness to pay for sustainability

1   I would be willing to pay more for sustainability.

2   I would be comfortable paying more for sustainability.

3   I would have no problem paying more for sustainability.

4   I would be happy to pay more for sustainability.

Appendix B

Pattern matrix from study 3

Cronbach's alpha values	0.964	0.938	0.946	0.892	0.863
Factors	1	2	3	4	5
Fam1				0.586	
Fam2				0.822	
Fam3				0.949	
Fam4				0.829	
Fam5				0.642	
Val1		0.900			
Val2		0.797			
Val3		0.827			
Val4		0.876			
Val5		0.911			
WTP1			0.960		
WTP2			0.875		
WTP3			0.875		
WTP4			0.850		
ECS1					0.921
ECS2					0.603
ECS3					0.668
ECS4					0.847
WTF1	0.859				
WTF2	0.887				
WTF3	0.870				
WTF4	0.925				
WTF5	0.933				
WTF6	0.889				
WTF7	0.892				

Appendix C

Scree plot from the study 3 factor analysis