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**GREENWASHING IN THE AVIATION INDUSTRY: A GENERATIONAL ANALYSIS OF
SUSTAINABILITY PERCEPTIONS AND WILLINGNESS TO PAY**

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Abstract

This thesis researches the impact of airline greenwashing on consumers' willingness to pay for sustainable air travel in the Italian market, focusing on the distinct purchasing habits of Millennials and Generation Z consumers.

Employing a survey of 120 valid responses, the study highlights the complex relationship between perceived greenwashing and WTP, showing that higher perceptions of greenwashing significantly influence consumer purchasing decisions.

The findings demonstrate the moderating effects of gender, income and educational level variables, emphasizing how demographic and socioeconomic factors influence customers reactions to business sustainability initiatives, underlining the critical need for transparency and authenticity in corporate environmental communication.

Keywords

Greenwashing; Aviation Industry; Willingness to Pay; Sustainability; Consumer Behavior; Generational Attitudes; Consumer Awareness; Environmental Ethics; Airline Industry Marketing.

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1. INTRODUCTION

1.1 Background of the Study

The aviation business is critical to global transportation because it allows people and things to travel long distances quickly. However, it is one of the most monitored sectors in terms of environmental impact, particularly as concerns about climate change grow.

“Aviation has the fastest growth rate of any method of transportation, accounting for 2.5% of global CO₂ emissions” (Ritchie H.,2024), which contributes to a great environmental impact (Whitelegg, 2000). The increasing consumer demand for environmentally friendly products and processes brought to the light the idea of “socially conscious consumers”, which, according to Webster, (1975), examine the long-term public ramifications of their purchasing decisions. Although socially conscious and sustainable consumption are not synonymous, both emphasize the long-term social and environmental consequences of consumer decisions.

At the same time, the phenomenon of greenwashing has emerged as a major concern and reduces consumer trust and calls into doubt the reliability of airlines’, environmental claims. Both Millennials (Ojala, 2019) and Generation Z (Madeira., Rello, 2022) tend to hold companies to high ethical standards, and their purchasing decisions are often influenced by whether they perceive a brand as genuinely sustainable or merely engaging in greenwashing.

1.2 Research Problem and Relevance

Despite the importance of these trends, there is limited research on how greenwashing specifically affects consumer behavior in the aviation industry.

Through the adoption of cost-cutting operational techniques and the provision of lower tickets than traditional airlines, low-cost carriers, or LCCs, have completely transformed the aviation

sector. High aircraft utilization, short turnaround times, and the use of auxiliary airports to cut operating expenses are some of the distinguishing characteristics of low-cost carriers. Furthermore, LCCs frequently use e-ticketing and online booking in addition to charging extra for extras like food, luggage, and seat preference that are normally covered by standard airline ticket pricing and their services are further streamlined by providing only one class of seating and not assigning seats (Doganis, 2001).

On the other hand, full-service or traditional airlines, sometimes referred to as legacy carriers, typically provide a greater array of amenities as part of the basic ticket, such as assigned seating, in-flight meals, entertainment, and several cabin classes (economy, business, and first class). They usually run out of large airports and concentrate on offering a more all-inclusive vacation experience. The difference between the two airline models (full-service and low-cost) illustrates the trade-off that customers must make between service quality and price (Francis et al., 2005).

Airlines' willingness to pay (WTP) is determined by these criteria and customers in the airline market base their decisions not only on pricing but also on the perceived value of the offer, which takes the environment into account. However, when airlines participate in greenwashing, customers can lose faith in them, which is expected to lower their willingness to pay for flights that are advertised as environmentally friendly (Balcombe. et al., 2009).

1.3 Research Aim and Objectives

The study aims to investigate how greenwashing techniques in the airline sector influence Generation Z's willingness to pay (WTP) for flights when compared to Millennials in Italy. The study's goal is to provide insights into how airlines may more effectively and truthfully communicate their sustainability initiatives by evaluating generational differences, which would help airlines fulfil the growing demand for openness and ethical standards, building greater trust among younger customers.

2. LITERATURE REVIEW

2.1 The Concept of Greenwashing

Greenwashing has been a widespread problem in recent years, especially as businesses try to meet the growing demand from customers for ecologically friendly activities. Environmentalist Jay Westerveld coined the phrase “greenwashing” in 1986 to describe the deceptive promotion of towel reuse schemes as environmentally beneficial efforts by the hotel sector and he found that this initiative was more about cutting operational expenses than generating a true environmental benefit (Capaldi et al., 2013). This pioneering case exposed the disparity between businesses’ environmental claims and their real operations, paving the way for greenwashing to become a popular subject in the business and research communities. Fundamentally, spreading false or overstated information about a company’s environmental projects, policies, or effects is known as “greenwashing”. Companies may accomplish this by focusing more on token, superficial gestures than on significant, structural reforms in their company reports, public relations efforts, or marketing communication tactics. It can take many different forms, from faking data on a firm’s environmental performance to overstating the advantages of small sustainability initiatives (Delmas, Burbano, 2011).

As a result, there is a skewed perception of environmental responsibility that emphasizes consumer behavior impact while downplaying the importance of major company initiatives that could have a meaningful influence. Consumers who truly value sustainability may nonetheless be persuaded to support businesses that do not completely perform on their environmental claims, diverting resources away from companies that are really committed to sustainable innovation (TerraChoice Environmental Marketing Inc., 2007).

2.2. Greenwashing in the Aviation Industry and Regulatory Responses

The aviation industry, noted for being one of the most energy-intensive sectors, has come under increased criticism for its environmental impact (Guzman, et al., 2024). As consumer awareness of climate change has grown, airlines have implemented a variety of green marketing tactics to promote their sustainability initiatives. This tendency has captured the interest of regulators, particularly in Europe, where new legislation has been passed to ensure transparency and accuracy in environmental claims (European Parliament, 2024).

On April 30, 2024, the European Commission and EU consumer authorities took considerable measures to combat alleged greenwashing tactics across 20 airlines (Barrow, Broadhurst, 2024). This decision followed the European Parliament's adoption of the Green Claims Directive, a legal framework requiring corporations, including airlines, to back up their environmental claims with verifiable facts, which tries to ensure that consumers are not misled by false or exaggerated claims about sustainability (ESG news, 2024).

Enterprises must give accurate and clear information backed up by third-party verification to support their green claims, according to the Green Claims Directive (ESG news, 2024). This directive specifically targets three major aspects of greenwashing in aviation: among them are carbon offset programs, which frequently deceive consumers the assumption that paying an additional price will totally offset their flight's CO₂ emissions (Barrow, Broadhurst, 2024). For example, the Netherlands Authority for Consumers and Markets (ACM) investigated KLM's "Fly Responsibly" campaign (DW, 2024), which pushed carbon offset services as a means of compensating for flight emissions. However, the ACM discovered that these programs frequently lacked openness and scientific correctness, causing consumers to believe they were participating in truly sustainable practices (DW, 2024).

Claims of "sustainable aviation fuels" (SAFs) have also received attention. SAFs are marketed

as a low-carbon alternative to standard jet fuel, however their environmental benefits are strongly reliant on their manufacturing processes and lifecycle emissions. Some airlines have been accused of exaggerating the role of SAFs in reducing emissions, despite scant data to back up their assertions (ESG today, 2024).

Furthermore, airlines routinely employ ambiguous and broad phrases like “green” or “responsible” without offering specific explanations or solid facts to back up their assertions, which hinders genuine sustainability efforts (Stay Grounded, 2023). Ryanair’s claim to be “Europe’s lowest emissions airline” exemplifies false advertising in this context (Politico, 2024). The UK Advertising Standards Authority (ASA) banned this remark, which appeared in a 2020 advertising campaign, since it was unfounded and potentially misleading, considering that Ryanair’s emissions computation was based on chosen and biased data and lacked clarity when comparing it to other airlines, failing to present a clear picture of the company’s environmental impact (Politico, 2024).

The UK has also responded to greenwashing concerns via the Green Claims Code, which is enforced by the Competition and Markets Authority (CMA). The UK's Advertising Standards Authority (ASA) banned commercials by airlines such as Air France and Etihad in December 2023 due to unfounded environmental claims, highlighting the increasing regulatory pressure on airlines (Barrow D., Broadhurst, 2024). Similar to the EU's approach, the UK's regulatory framework strives to hold businesses accountable for their environmental pledges by forcing them to make accurate, proven claims. Fines for greenwashing can be severe; under the Green Claims Directive, penalties can reach up to 4% of yearly sales, while in the United Kingdom, fines can reach up to 10% of total income (European Parliament, 2024). These financial penalties, together with the reputational damage, provide a significant incentive for airlines to ensure the accuracy and transparency of their environmental marketing.

However, the problem of greenwashing in the aviation industry is not exclusive to Europe, because as climate litigation gets traction around the world, the aviation industry has emerged as a target for legal challenges due to its substantial energy use and contribution to global CO₂ emissions. In 2017, air transport accounted for 2% of total worldwide anthropogenic CO₂ emissions, a proportion that is predicted to rise unless significant efforts are made to decouple aviation expansion from emissions (Balounová, 2023). This figure becomes more stunning when considering that just 2-4% of the global population flies abroad every year, with the wealthiest 1% of travelers accounting for approximately half of aviation's CO₂ emissions (Department of Service Studies, 2020).

Critics have pointed out flaws in international efforts to reduce aircraft emissions, such as the Carbon Offsetting and Reduction Scheme for International aircraft (CORSIA). CORSIA, which attempts to offset CO₂ emissions through compensation mechanisms, has been chastised for lacking ambition and effective implementation, failing to deliver meaningful reductions in aviation emissions (Balounová, 2023).

These restrictions seek to guarantee that airlines back up their environmental claims with verifiable information and climate litigation is gaining popularity as a means of combating misleading environmental claims.

2.3. Consumer behavior in environmental marketing

Promoting sustainability and environmentally conscious consumption requires an understanding of consumer behavior in the context of environmental marketing. These efforts frequently seek to capitalize on customers' growing environmental consciousness while falling short of actual sustainable measures (Delmas and Burbano, 2011; Zahid et al., 2023). Companies employ green marketing as a ruse, turning what should be a tool for consumer knowledge and empowerment into a technique for deception and misdirection (Majláth, 2018).

Fostering ethical buying habits is crucial for both ecological preservation and improving societal well-being as the effects of climate change and environmental degradation become more pressing (Trudel, 2021).

2.4 Theoretical Framework

To understand sustainable consumer behavior, it is required to explore the cognitive systems that drive decision-making processes. Dual-process theories distinguish between two systems that guide consumer choices: System 1, which is instinctive and emotional and frequently prioritizes immediate gratification and convenience, and System 2, which is more deliberative and rational and considers long-term outcomes and consequences (Morewedge and Kahneman, 2010). This approach is especially useful for studying the contradiction between short-term preferences and long-term sustainable conduct. For example, a consumer may automatically prefer the convenience of driving (System 1), but a more critical review may notice the environmental benefits of public transit. However, cognitive biases such as myopia, in which consumers overestimate short-term costs and advantages, frequently impede long-term decision-making (Gillingham et al. 2009).

The Theory of Reasoned Action (TRA) shows up as a particularly appropriate paradigm for investigating the ways in which attitudes and societal norms impact consumer actions. According to TRA, first proposed by Fishbein and Ajzen (1975), individuals' intentions are influenced by their attitudes toward the way of acting and the perceived social pressures (subjective norms) that surround it. This makes it a useful lens for assessing customer responses to greenwashing techniques in the aviation sector since it considers both personal views and external societal forces. For example, negative views about false marketing promises, paired with societal expectations of sustainable conduct, are expected to have a considerable impact on a consumer's willingness to pay (WTP) for ecologically friendly flights. TRA's combined

focus on internal and external factors makes it particularly suitable for examining the interplay between marketing techniques and customer decision-making in sustainability contexts.

Other theoretical models, while interesting, are less relevant to the current study. The Norm Activation Theory (NAT), which emphasizes personal norms and a sense of moral responsibility, provides useful insights into intrinsic motivations for pro-environmental habits, but it fails to adequately address the external factors that are critical in marketing-driven industries such as aviation. Similarly, the Value-Belief-Norm (VBN) paradigm examines strongly held human values and their impact on environmentally conscious acts. While VBN effectively describes long-term ecological commitments, it fails to capture the effects of marketing efforts or peer practices that greatly influence consumer decisions in dynamic circumstances such as greenwashing (Stern et al., 1999).

Additional study on environmentally conscious consumer behavior (ECCB) identifies demographic and psychological characteristics that predisposition people to make sustainable choices (Ito, 2015). For example, environmentally conscious consumers are more likely to commit to eco-friendly habits and are less susceptible to deceptive marketing methods (Kautish and Sharma, 2020). Offering discounts for energy-efficient options, for example, has been shown to encourage environmentally responsible conduct (Ito, 2015) and setting green energy as the default option has been demonstrated to significantly improve uptake (Ebeling, Lotz, 2015). Although understanding these aspects is critical for businesses seeking to promote green products and services, it does not provide a prediction framework for greenwashing-influenced intentions.

As a result, while other frameworks and methodologies offer significant views, the Theory of Reasoned Action serves as the most thorough foundation for this research. Its ability to incorporate attitudes, subjective standards, and behavioral intents makes it ideal for

investigating how greenwashing in the aviation industry affects WTP for sustainable flights.

2.5. Behavioral Differences between Millennials and Generation Z

According to socialization theory (Hurrelmann, Bauer, 2015), generational cohorts are influenced by their distinct formative experiences, which in this case include increased environmental concerns and internet access to information.

In this case, both Millennials (born between the early 1980s and the mid-1990s) and Generation Z (born between the late 1990s and the early 2010s) are commonly referred to as digital natives since they grew up at a period of fast technological advancement, which has influenced their travel habits and preferences.

Millennials place a high value on the ethical and sustainable credentials of the brands they connect with by setting a premium on openness and corporate responsibility since they grew up in an era of greater environmental awareness. According to Gurău, (2012), Millennials are more inclined to engage in socially conscious purchasing behavior's, supporting firms that share their beliefs, particularly those related to environmental sustainability. This generation has also been instrumental in demanding corporate accountability and propelling the growth of socially responsible firms (Kumar, 2008).

On the other side, Generation Z, a generation that grew up with unprecedented access to digital information, is quickly developing as a significant demographic in the travel industry. Their economic impact is expected to exceed \$400 billion by 2020, demonstrating their expanding significance on global marketplaces (Francis, Hoefel, 2018). However, unlike their predecessor, "Gen Z" values unique experiences over specific destinations, viewing travel as a complete effort rather than just visiting new areas (Francis, Hoefel, 2018). According to market research, 56% of this generation favor sustainable travel options, indicating a high preference for

responsible consumption and environmentally friendly accommodations (Francis, Hoefel, 2018).

Social media shapes the travel experiences of both Millennials and Generation Z, but each cohort has specific preferences for the platforms they use and the methods they participate in. Generation Z gravitates towards highly visual platforms like “Instagram” and “TikTok”, where they can share real-time experiences and connect with content that matches their values, notably those of sustainability and authenticity (Francis, Hoefel 2018). These platforms enable them to prioritize meaningful material, while rejecting overly manicured or commercialized trip pieces. For this generation, social media is an essential tool for not only sharing travel experiences, but also organizing travels: they rely extensively on peer evaluations, influencer recommendations, and visual information that offers true insights into places and accommodations (Jiang, Ngien, 2020).

In contrast, Millennials prefer sites such as “Facebook” and “Twitter”, which were popular during their early years and continue to provide value for longer-form content and community participation. While they value visual platforms, they utilize social media to curate their experiences, frequently seeking validation and approval from their networks (Gurău, 2012). Even if platforms like Instagram remain important to them, this demographic may choose aspirational images over real-time interactions and likes to highlight events that improve their social image, making travel a useful tool for personal branding on social media (Bolton et al., 2013).

2.6. Willingness to Pay (WTP) for Sustainable Products

Willingness to Pay (WTP) refers to the “maximum amount of money a consumer is willing to pay on a product or service” (Kotchen and Moore, 2008), and it is critical in promoting sustainable consumption behaviors. As environmental concerns rise owing to climate change

and resource depletion, the importance of WTP for the marketing of sustainable products grows. These eco-friendly, recyclable, and resource-conserving products have major environmental benefits but are frequently marketed at a premium.

Perceptual characteristics or factors (PF) have a significant impact on consumers' willingness to pay for ecological items, which include personal convictions, environmental concern, and a sense of duty for sustainability. People who are more environmentally conscious place a higher value on the ecological benefits of sustainable items and are hence willing to pay a higher price (Harms, Linton, 2015). This arises from their notion that their purchase choices can help to solve environmental concerns: according to Biswas and Roy (2015), people who believe they have a personal responsibility to protect the environment are more likely to accept the price premium associated with eco-friendly items because they see it as a method to promote environmental preservation (Biswas, Roy, 2015).

Contextual factors (CF) also play an important role in determining WTP for sustainable products, which include the perceived quality of the product, its market availability, and government incentives to encourage green consumption. Consumers are more likely to pay a premium for sustainable items that they believe meet or exceed the quality of their conventional counterparts. The presence of eco-certifications is a particularly crucial feature, as they serve as a solid indicator of a product's environmental credentials and can dramatically increase WTP by informing customers that the product has a lower environmental impact (Harms R., Linton J. D., 2015).

Corporate Environmental Performance (CEP), which refers to a "company's ability to lessen its environmental impact and run its operations sustainably" (Harms, Linton, 2015), additionally serves as an important factor in determining WTP for sustainable products. Consumers are more inclined to trust and remain loyal to businesses that exhibit a strong

commitment to environmental sustainability, which frequently results in greater WTP for their products (Harms, Linton, 2015). However, poor environmental performance can harm a company’s brand and limit consumers’ willingness to pay. Companies that receive eco-certifications can improve their CEP since these certifications demonstrate to customers that the company is committed to decreasing its environmental effect, which, not only improves the company’s image, but also boosts the perceived value of its products (Harms, Linton, 2015).

3. METHODOLOGY

Based on existing research, the model shown in Figure 1: Conceptual Model demonstrates how numerous variables, largely related to consumers’ views of greenwashing in the aviation industry, interact to influence their willingness to pay (WTP) for sustainable flights.

This model suggests that the *dependent variable*, “Willingness to Pay (WTP)”, is influenced by the *independent variable*, “Perceived Greenwashing”, with generational cohort (Millennials and Generation Z), Income Level, Gender and Environmental awareness acting as moderators.

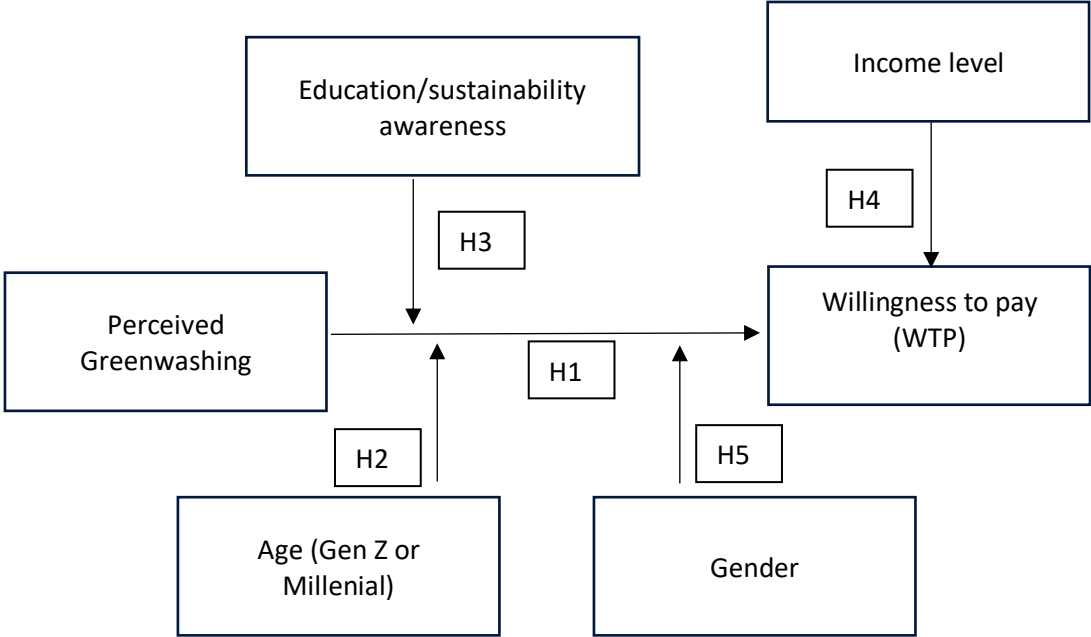


Figure 1: Conceptual Model

3.1 Research Model and Hypothesis Development

The suggested research model fills an empty spot in the literature while simultaneously investigating numerous hypotheses aimed at understanding how these factors interact and influence customer behavior about sustainable flying.

With growing consumer knowledge of environmental sustainability, greenwashing can have a direct influence on customer trust, especially among environmentally sensitive generations such as Millennials and Generation Z (Do Paco and Reis, 2012). Pro-environmental behavior is frequently associated with a critical perspective of greenwashing, as consumers become less tolerant of fraudulent environmental claims (Rotaris et al., 2020). This study seeks to explore how greenwashing affects willingness to pay (WTP) for sustainable aviation solutions, with a specific emphasis on generational, educational, income-based, and gender-based differences.

Therefore, it could be concluded that customers are less inclined to acquire offers by companies that make false or fake environmental promises (Delmas & Burbano, 2011).

H1: Greenwashing practices in the aviation industry lead to a lower willingness to pay for flights by Italian costumers.

Generation Z has been proven to be more aware of social and environmental issues than Millennials, owing to their early exposure to climate change issues. Considering the socialization theory mentioned before, this awareness suggests that Generation Z is more sensitive to sustainability promises and may be more suspicious of greenwashing efforts than Millennials.

H2: Generation Z consumers in Italy exhibit a higher sensitivity to greenwashing practices, resulting in a significantly lower willingness to pay for flights marketed with greenwashing

compared to Millennials ones.

Previous investigations on pro-environmental behavior discovered that when consumers' environmental awareness grows, they are less likely to accept or ignore greenwashing (Lyon & Montgomery, 2015). Consumers who are well-informed (particularly about environmental issues) are more likely to challenge claims, making them wary of companies that fail to provide relevant evidence for their green initiatives (Do Paco, Reis, 2012).

H3: Higher levels of education and sustainability awareness are associated with a lower impact of greenwashing practices on WTP in the aviation industry among both Generation Z and Millennials in Italy.

Higher-income consumers are more likely to pay a premium for sustainable items, which reflects both their financial capabilities and a desire to promote environmental principles through their purchasing decisions (Zahid et al., 2023). Lower-income consumers prefer affordability over sustainability due to budget constraints (García de Frutos et al., 2019).

H4: Higher income levels are associated with a greater willingness to pay for environmentally friendly flights

Lastly, women tend to be more ecologically conscious than men, typically prioritizing ethical and sustainable items (Zahid et al., 2023). Because of their higher environmental focus, women are more likely to feel upset, if not disillusioned, when corporations engage in greenwashing, seeing it as a betrayal of their trust and ideals.

H5: Gender differences influence the relationship between greenwashing practices and willingness to pay for flights, with women exhibiting a stronger negative response to greenwashing compared to men across both generations in Italy.

3.2 Research Design and Methodology

The investigation adopts a quantitative research approach to investigate how greenwashing strategies within the airline sector influence customer choices, with a special focus on the willingness to pay (WTP) for sustainable flights among Generation Z and Millennials in Italy.

The research project's methodology combines survey-based questionnaire for data collection with statistical analysis to investigate the correlations between the variables outlined in the conceptual model. Moreover, with the cross-sectional methodology, data are collected at a particular point in time to provide a picture of current perceptions and actions.

3.3 Sampling and Data Collection

The primary collection instrument in this study was an online survey created and disseminated by Qualtrics, a popular and dependable platform for survey-based research. Qualtrics was chosen due to its strong features, which include ease of modification, a user-friendly interface, and the capacity to efficiently reach varied participant pools. Furthermore, its widespread use in academic research improves the precision and trustworthiness of data collecting processes (Hair et al., 2019).

The questionnaires (Appendix) were divided into several components, including an informed consent portion, demographic questions, questions about environmental awareness, perceptions of airline sustainability claims, and questions about respondents' WTP. It featured both closed-ended questions with multiple-choice alternatives, as well as a 5-point Likert scale to measure respondents' opinions and impressions, ranging from "not at all" to "extremely". The Likert scales were used to assess the strength of respondents' opinions on a variety of topics, including the clarity of airline sustainability claims, the perceived frequency of greenwashing, and the impact of these characteristics on willingness to pay (WTP).

To guarantee a representative sample, the study focused on two significant demographic cohorts: Millennials (born 1981–1996) and Generation Z (born 1997–2012) living in Italy with online access that were urged to share the poll with individuals in their networks who met these criteria. This snowball sampling strategy provided a greater reach while remaining focused on the target populations.

A total of 120 replies were obtained, with no data eliminated: demographic questions on age, gender, education level, and annual income were included to collect the variables present in the conceptual model (Figure 1: Conceptual Model). The sample size is compatible with accepted research criteria, which state that a minimum of 100-200 responses are required for statistically meaningful results in investigations using correlation or regression analysis (Hair et al., 2019; Tabachnick and Fidell, 2013). Furthermore, several social science study standards propose obtaining at least 10-20 responses per variable under consideration to improve analytical reliability (Field, 2018; Kline, 2016; Pallant, 2020).

The survey was offered in both English and Italian to accommodate participants in Italy, ensuring that language hurdles would not prevent participation. All replies were anonymous, and data were treated discreetly in accordance with ethical research principles (Flick, 2018).

To ensure content validity and construct reliability, survey questions were adapted from existing literature and pre-tested with a smaller sample of 30 respondents via Google Forms. This initial trial sought to uncover difficulties with question clarity, response formatting, and platform usability and significant improvements were made in response to this criticism. Originally prepared in English, the survey was translated into Italian to better reach the target audience. The questions were rephrased to be more brief and contextually relevant, ensuring that they accurately captured respondents' environmental beliefs and the response scales were improved to increase the data's interpretation.

4. FINDINGS AND ANALYSIS

The data, acquired from a quantitative survey questionnaire (Appendix), includes 120 responses from a sample of Italian millennials and Generation Z. Given the number of variables under consideration, this sample size is deemed acceptable for robust statistical analysis (Hair et al., 2019; Tabachnick and Fidell, 2013). The study was carried out using R Studio (R Core Team, 2023), a sophisticated and widely utilized statistical computing environment, considering R's versatility and the availability of a diverse set of packages suitable for advanced statistical modelling.

4.1 Descriptive Statistics

The data from the completed online surveys were examined, including 73 Generation Z respondents (60.4%) and 47 Millennials (39.6%), with the majority of respondents identified as female (55.2%), a 39.6% identifying as male and a tiny proportion of individuals (3.1%) choosing not to declare their gender, while others classified as genderfluid (1%) or genderqueer (1%), with all of them with a minimum age of 18 years old.

Educational attainment varied, with 50 participants possessing a bachelor's degree (41.7%), 21 holding a high school diploma or less (17.7%), and 49 holding a master's degree or higher (40.6%). The income distribution indicated that most respondents (53.1%) earned less than €20,000 per year, 30.2% earned between €20,000 and €40,000, and 16.7% earned more than €40,000.

In terms of their understanding of the airline industry's environmental impact, a significant proportion of respondents (43.8%) reported being only slightly informed, while others described themselves as moderately informed (38.5%), not at all informed (11.5%), extremely informed (1%), or very informed (5.2%).

When looking at how frequently respondents evaluated the environmental impact of their travel decisions, a significant number did so infrequently (30.2%) or occasionally (27.1%), followed by often (21.9%) and never (17.7%), but only a small fraction (3.1%) said they always considered the environmental impact. Respondents' perceptions of a company's environmental impact varied, with 35.4% suggesting it is relatively important, 27.1% classifying it as slightly important, and 17.7% calling it very important with a smaller fraction (13.5%) said it was unimportant, while 6.2% said it was extremely important.

Regarding willingness to pay for an environmentally friendly flight, 40.6% of respondents said they would be willing to pay a little bit more, while a sizable percentage (26%) said they would not pay any more. A smaller proportion (32.3%) chose a moderate sum, while only 1% were willing to spend significantly more. According to majority respondents, the most important consideration in picking a flight was price (70.8%). Other considerations mentioned include brand reputation (13.5%), flight duration (11.5%), and environmental impact (2.1%).

When asked how being aware of an airline's involvement in greenwashing affects their desire to pay for flights, 38.5% reported being slightly less eager to pay. Other replies show that other individuals are considerably less willing (25%), much less willing (20.8%), would avoid flying with such an airline (1%), or believe greenwashing has no effect (14.6%).

Finally, most respondents (51%) believe that tougher restrictions are required to prevent greenwashing in the aviation industry, with 36.5% strongly and only a small fraction (2.1%) believed stronger rules were probably or certainly unnecessary.

4.2 Results of Hypothesis Testing

The *first hypothesis* investigated whether consumers' willingness to pay (WTP) for flights is adversely affected by greenwashing efforts in the airline sector. To test this, an ordinal logistic

regression model was used, with WTP as the outcome variable. The predictor variable, “Greenwashing Frequency”, represented respondents’ judgments of how frequently airlines exaggerate their environmental efforts (measured as a factor with four levels: never, rarely, sometimes, and often). The model converged well, and the likelihood ratio test showed a statistically significant overall model fit ($p < 0.001$), indicating that the data is suitable for testing the association. However, the precise results of the regression analysis revealed that none of the categories of “Greenwashing Frequency” were statistically significant in predicting WTP: respondents who saw airlines as “Never” participating in greenwashing showed no statistically significant difference in WTP from those who perceived airlines as “Sometimes” or “Often” inflating their environmental claims.

Similarly, there was no statistically significant difference in WTP between respondents who evaluated airlines as “Never” versus “Rarely” participating in greenwashing.

These findings provide no statistically significant evidence to support the assumption that perceived greenwashing frequency influences WTP for flights: as a result, the null hypothesis (no association between Greenwashing Frequency and WTP) cannot be discarded.

Hypothesis 2 predicted that Generation Z will be more sensitive to greenwashing than Millennials, resulting in a reduced willingness to pay (WTP) for flights. To test this hypothesis, a stacked bar chart was created to show the proportion of WTP responses (Nothing, A little, A moderate amount, A lot) across generational groups (Generation Z and Millennials) at different levels of perceived greenwashing frequency (Always, Never, Rarely, Sometimes, Often).

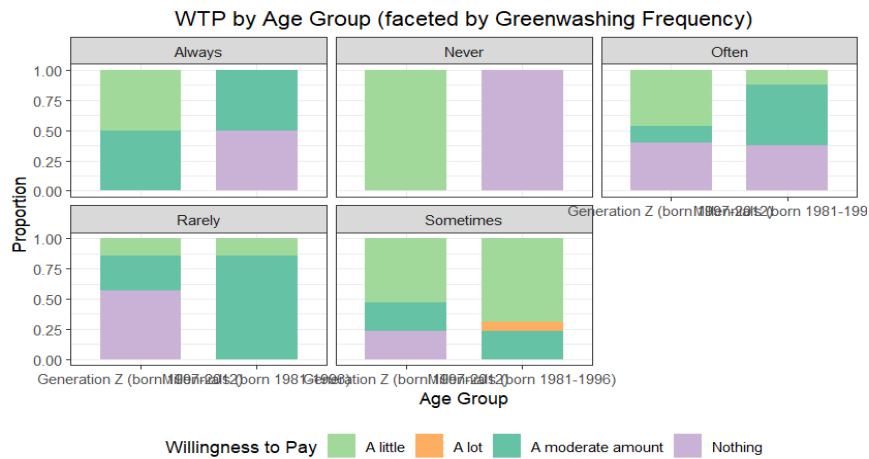


Figure 2: Willingness to Pay (WTP) by Age Group

The graph (Figure 2: Willingness to Pay (WTP) by Age Group) provides qualitative insights into the interaction of age group, greenwashing perceptions, and WTP:

“Never” Greenwashing: When respondents perceive no greenwashing, the distribution of WTP responses between Generation Z and Millennials is nearly identical. Both groups have a strong preference for spending "a little" extra, demonstrating similar behaviour in the absence of perceived greenwashing.

“Rarely” Greenwashing: Generation Z has a somewhat larger proportion of respondents who are hesitant to pay more (“nothing”) than Millennials. This tendency suggests that Generation Z is slightly more sensitive to greenwashing, even when it is thought to be infrequent.

“Sometimes” Greenwashing: As greenwashing perceptions grow, Generation Z exhibits a more obvious change, with a higher proportion selecting “nothing” and a lower proportion selecting “a little” than Millennials. This lends credence to the hypothesis that Generation Z is more dubious of sustainability promises when greenwashing is suspected to occur on occasion, with “Frequently” Greenwashing, as the level of greenwashing perception rises, the distinctions across generations become more apparent. A greater proportion of Generation Z prefers “nothing” and “a little”, but Millennials are more ready to spend “a moderate amount”. This

suggests that Generation Z may be more critical of greenwashing efforts and less likely to financially support airlines when these practices are common.

“Always” Greenwashing: At the greatest level of perceived greenwashing, both groups have a comparable proportion of “nothing” responses. This implies that skepticism or reluctance to pay for flights is widespread at this point, reducing generational disparities reported at lower levels of greenwashing perception.

In general, the visual study reveals some variations in the sensitivity of different generations to greenwashing. Generation Z seems less inclined to pay more for flights when perceived greenwashing is at moderate to high levels (Sometimes and Often), indicating heightened sensitivity or scepticism about such activities.

According to *hypothesis 3*, the association between consumer willingness to pay (WTP) for flights and perceptions of greenwashing is moderated by education level, with highly educated people being less impacted by greenwashing.

The most typical response, across all educational levels and greenwashing frequencies, was that they would be ready to pay “a little”. Nonetheless, a sizable percentage of respondents chose “nothing”, indicating a strong reluctance to pay a premium, irrespective of educational attainment.

When the effect of the perceived frequency of greenwashing increased, the percentage of respondents who were willing to pay “nothing” tended to rise as well. This lends credence to the idea that, regardless of educational background, regular greenwashing lowers consumer WTP.

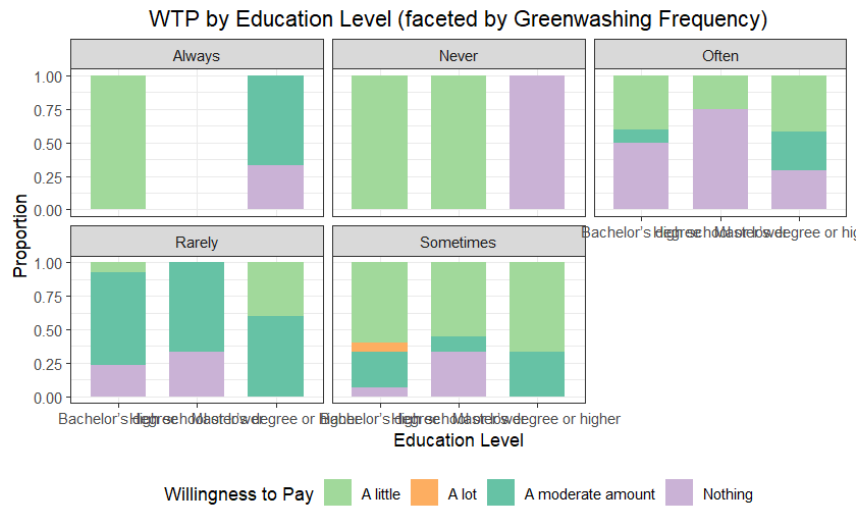


Figure 3: Willingness to Pay (WTP) by Education Level

Figure 3: Willingness to Pay (WTP) by Education Level shows how education may have a moderating influence on the association between WTP and the prevalence of greenwashing. Higher educated people (master's degree or above) seem a little more inclined to pay, while the variations are not very noticeable, especially when greenwashing is seen as modest or rare.

As for *hypothesis 4*, Income Level and Willingness to Pay (WTP) for environmentally friendly flights are positively correlated. Descriptive statistics were employed to examine the link between income levels and views of airline clarity regarding sustainability claims, stratified by the frequency of perceived greenwashing. These trends can be shown in a stacked bar chart (Figure 4: Willingness to Pay for Sustainable Flights by Income Level) that shows the frequency of greenwashing and income levels:

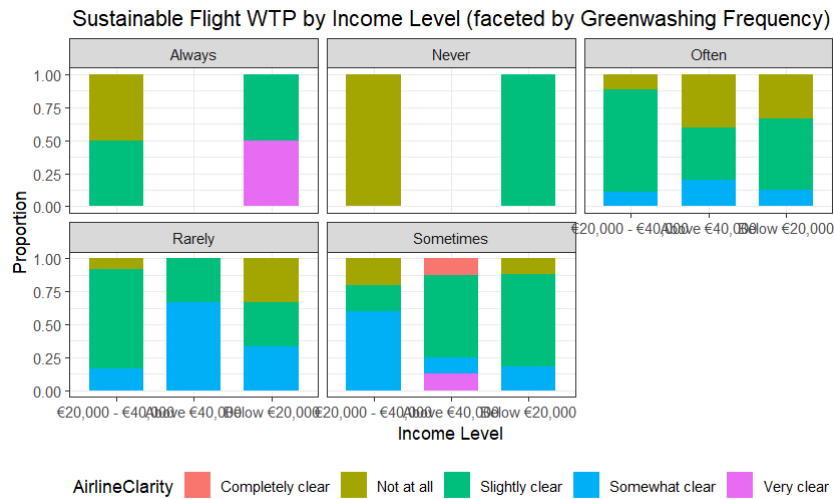


Figure 4: Willingness to Pay for Sustainable Flights by Income Level

People in higher income brackets (over €40,000) are more likely to choose, considering Q8 of the Survey (Appendix) “To what extent do you believe that airlines are clear in their environmental claims?”, the answer “Slightly clear”, suggesting that they may have a more sophisticated or knowledgeable view of airline sustainability messaging. “Not at all” and “Somewhat clear”, on the other hand, indicate a greater level of doubt among those in the Below €20,000 income group.

People of all socioeconomic levels now perceive airline communications as “Slightly clear”: this consistent response implies that the frequency of greenwashing reduces income-related disparities, maybe because of general scepticism or misunderstanding regarding airline claims.

However, Figure 4: Willingness to Pay for Sustainable Flights by Income Level suggest that WTP is influenced by income level, especially in situations with low levels of greenwashing. Higher income groups may be more inclined to pay for ecologically friendly flights because they are more likely to view airline sustainability initiatives as legitimate and transparent. However, opinions across income levels converge as the incidence of greenwashing increases, potentially negating the positive impact of income on WTP.

Frequent greenwashing, on the other hand, appears to undermine these distinctions, underscoring the widespread effect of greenwashing on consumer confidence across all economic brackets.

Hypothesis 5 looks at the relationship between gender, perceived greenwashing frequency, and willingness to pay (WTP) for environmentally friendly flights. The picture below (Figure 5: Willingness to Pay by Gender) provides insight into behavioural variations between men, women, and other gender identities.

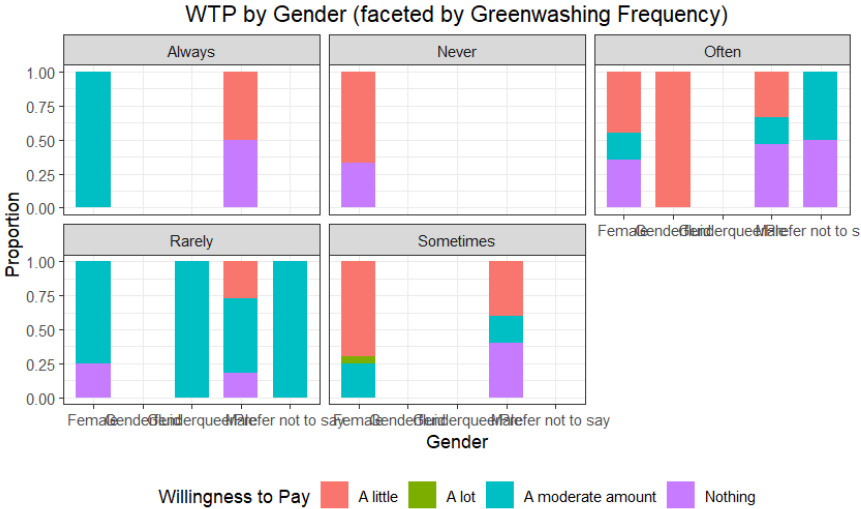


Figure 5: Willingness to Pay by Gender

Regardless of gender or greenwashing frequency, the most common Willingness to Pay replies are “a little” or “a moderate amount”. However, a large proportion of respondents chose “nothing”, indicating a high level of price sensitivity or cynicism about paying more for sustainability claims. This unwillingness to pay is especially noticeable when greenwashing is viewed as common.

When greenwashing occurs frequently, as in the “Often” or “Sometimes” categories, gender inequalities in WTP become more prominent. Women have a higher proportion of "nothing" responses than men, indicating that they may be more sensitive to or sceptical of greenwashing

claims. Men, on the other hand, are slightly more likely to select "a little" or "a moderate amount," implying a higher willingness to pay despite concerns about greenwashing, which could indicate varying levels of faith in sustainability promises or attitudes toward environmental stewardship.

Gender disparities are less noticeable at lower levels of greenwashing perception, such as "Rarely" or "Never". Both men and women (the sample size for other genders was too small for statistical significance) are more likely to choose "a little" or "a moderate amount", whereas fewer people choose "nothing": when greenwashing is judged to be limited, gender has less influence on WTP, and people are more ready to support ecologically friendly behaviours.

In conclusion, the data demonstrate that while both men and women have lower WTP as perceived greenwashing frequency increases, women appear to be more dubious, especially at greater levels of greenwashing, while men are slightly more resilient in their WTP, even in the face of perceived dishonesty.

4.3 Mediation and Moderation Effects

Individual differences exist in the association between consumer willingness to pay (WTP) for sustainable flights and perceived greenwashing. Rather, it is influenced by important demographic variables like gender, economic level, education, and generational cohort. The following part evaluates how these factors influence customers' willingness to pay for environmentally friendly aircraft projects by interacting with their opinions of greenwashing.

Significant disparities in sensitivity to greenwashing are highlighted by generational variances. With a steep decline in WTP as perceived greenwashing increases, Generation Z exhibits a more critical approach. Their early experiences, which were marked by increased exposure to climate activism and easy access to environmental information, can be linked to this increased sensitivity (Do Paco and Reis, 2012). On the other hand, although they are also impacted,

Millennials show a less noticeable drop in WTP, which could indicate a more realistic method of assessing greenwashing or a readiness to weigh moral considerations against pragmatic elements like cost and ease of use. (L. Larson et al., 2022)

The degree of education has a significant impact on how people react to greenwashing. People with higher levels of education are more likely to be discerning and award transparent businesses with higher WTP. However, when dishonest marketing tactics become more common, their tolerance for greenwashing drastically decreases, leading to a precipitous decline in WTP. Customers with less education, on the other hand, exhibit a comparatively constant WTP over a range of greenwashing frequency levels (Paudel P., 2024).

Moreover, customers with higher incomes and more financial flexibility are typically more prepared to pay for environmentally friendly flights, especially when greenwashing is thought to be rare. However, when the perceived frequency of greenwashing increases, their WTP significantly declines, indicating that their purchase decisions are heavily influenced by their level of faith in corporate statements. Regardless of the frequency of greenwashing, lower-income consumers' behavior is dominated by financial constraints, which leads to a constantly low Willingness to Pay (Salo H., 2020).

Furthermore, greenwashing is particularly sensitive to female consumers and repeated occurrences result in a sharp drop in WTP, because they are less tolerant of what they perceive to be dishonest sustainability promises, which is probably a result of their stronger ecological ideals and ethical considerations. Although they are similarly affected, male customers show a more consistent WTP pattern over a range of greenwashing degrees, which may indicate different priorities when assessing business practices (Faleiro, 2022).

4.4 Comparative Analysis: Millennials vs. Generation Z

Willingness to pay (WTP) for sustainable flights is significantly influenced by the generational divide between Millennials and Generation Z, especially when it comes to perceived greenwashing.

When it comes to greenwashing, Generation Z is consistently more critical: considering the open-ended question of the Survey (Appendix), authenticity and transparency are found to be important factors in determining Gen Z's readiness to contribute financially to green projects. Conversely, although Millennials are similarly impacted by false sustainability promises, their WTP decrease is not as severe as Gen Z's: worries about business greenwashing may be subordinated to the older generation, by preferring Comfortability, Flight Duration or Brand Reputation (Q11, Appendix).

5. DISCUSSION

5.1 Main Findings

The findings provide valuable insights into how customers react to sustainability promises in the aviation industry, as well as how greenwashing affects their willingness to pay for environmentally responsible flights.

Generational disparities appeared as a significant influence, with younger customers molded by greater environmental consciousness and digital access to information (Ojala, 2019), may have instilled cynicism toward ambiguous or inflated sustainability claims (L. Larson et al., 2022).

Education and environmental understanding greatly influence the relationship between greenwashing and WTP: higher levels of education and environmental awareness are related with a more critical approach to sustainability promises. When greenwashing is present, these

more knowledgeable consumers have a lower tolerance for unfounded or misleading marketing, as well as a lower willingness to pay (Do Paco and Reis, 2012; Lyon and Montgomery, 2015).

In contrast, less informed consumers exhibit a more constant WTP across varied amounts of perceived greenwashing. Income, despite initially showing a favourable correlation with WTP for sustainable travel, loses predictive value when greenwashing is suspected. Even high-income consumers, who may be more prepared to pay a premium for sustainable solutions, express strong doubts and lower their expenditure when they perceive false environmental marketing, which supports the impact of corporate social responsibility (CSR) and brand reputation in shaping consumer behaviour (Harms and Linton, 2015; Zahid et al., 2023).

5.2 Theoretical Contributions

The investigation adds to various current theoretical frameworks in the fields of consumer conduct and sustainability advertising.

First, it applies on the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) to a sample of 120 people, showing that the perceived presence of greenwashing has a negative impact on consumers' positive attitudes toward sustainable aviation, reduces the perceived social acceptability of sustainable travel options, and, ultimately, reduces their willingness to pay (WTP) for eco-friendly flights. The implicit use of TRA contributes to the previous research by demonstrating how false sustainability marketing techniques can impede the success of well-intended corporate sustainability initiatives (Delmas & Burbano, 2011; Lyon and Montgomery, 2015).

Furthermore, the research of generational variations adds significantly to socialization theory (Hurrelmann and Bauer, 2015), presenting empirical evidence of how formative experiences and different socio-cultural contexts create environmentally conscious consumerism.

Beginning with Generation Z, which has grown up in an era of increased environmental consciousness and publicly available information and debate on sustainability issues, findings reveal that it has a lower tolerance for greenwashing. Millennials, on the other hand, exhibit a less marked negative response, which confirms past research and indicate a different balance between ethical considerations and pragmatic issues such as cost and convenience (Gurău, 2012; Kumar, 2008).

5.3 Implications for the Aviation Industry

Building consumer trust and loyalty among environmentally concerned travelers is critical to the aviation industry's long-term viability, requiring evident results and independent third-party verification, in line with the increased regulatory pressure for accuracy and openness in environmental claims (Barrow and Broadhurst, 2024; European Commission, 2024). A customized approach is required to address the various sensitivities of different consumer segments. To develop trust, airlines should prioritize demonstrably verifiable environmental benefits, particularly among Generation Z, a group that is highly sensitive to greenwashing (Ojala, 2019; Madeira and Rello, 2022), while higher-income clients looking for ecologically responsible travel may be drawn to premium sustainable offerings that are clearly and honestly communicated. Furthermore, gender-sensitive marketing techniques, such as ethical campaigns emphasizing the airline's commitment to sustainability, can effectively attract female travellers, who frequently value sustainability and ethical concerns (Zahid et al., 2023).

Furthermore, effective educational programs can dramatically improve consumer knowledge while mitigating the negative effects of greenwashing, encouraging educated decision-making and increases trust (Do Paco and Reis, 2012).

Finally, working with legislators to set industry-wide standards for sustainability claims is critical for reducing consumer mistrust, increasing accountability, and creating a more

transparent and trustworthy aviation industry (European Commission, 2024).

5.4 Limitations of the Study

While the study contains useful insights, some limitations must be addressed. Even if the sample size is acceptable for exploratory analysis, the findings' generalizability is limited: a larger and more diversified sample may provide more statistical power and broader applicability. The dependence on self-reported data raises the possibility of biases, such as social desirability bias, which could have influenced responses. Furthermore, the study's emphasis on the Italian market limits the findings' application to other cultural and economic contexts. The cross-sectional methodology measures consumer thinking at a particular point in time, making it difficult to examine trends over time. Therefore, a longitudinal approach may provide more detailed insights into the evolution of customer attitudes and behaviors. Finally, while the study looked at moderating factors like education and gender, other variables like cultural values or political orientation could add to the analysis.

5.5 Suggestions for Future Research

Building on the study's limitations and conclusions, future research should use longitudinal designs to capture the temporal dynamics of consumer behaviour in response to greenwashing. Cross-cultural studies could reveal differences in responses across economic and cultural contexts, providing a more complete picture of the phenomenon.

Experimental research might isolate the causal impacts of specific greenwashing scenarios on customer trust and willingness to pay, giving strong evidence to support this study's correlational conclusions.

Expanding the scope to include other industries with major environmental consequences, such as fashion or food, may show sector-specific patterns and influence larger sustainability efforts. By addressing these issues, future study can improve understanding of greenwashing's

multifaceted effects and aid in the creation of effective solutions to promote true sustainability and customer trust.

6. CONCLUSION

Based on quantitative survey data, the findings showed a complex association between greenwashing frequency and lower WTP that goes beyond a straightforward correlation. A strong trend showed that growing perceptions of greenwashing have a major impact on consumer behavior, especially among Generation Z, even though a direct, statistically significant relationship could not be shown. This result is consistent with earlier studies showing that younger generations are becoming more sceptical and environmentally conscious (Ojala, 2019; Madeira and Rello, 2022).

Significant moderating impacts of a number of important socioeconomic and attitudinal variables were also identified by the investigation. Although a stronger willingness to pay more for sustainable travel options was originally linked to higher income and education levels, this favorable relationship was significantly weakened, or even reversed, in the face of perceived greenwashing. This implies that customers' mistrust of greenwashing claims considerably reduces their desire to pay for ecologically friendly goods and services, even though financial ability and educational achievement can have an impact, showing that knowledgeable consumers are more inclined to question unsupported marketing strategies and carefully examine environmental claims (Do Paco & Reis, 2012; Lyon and Montgomery, 2015).

In addition, gender was found to be a significant moderating factor, with female respondents reacting to greenwashing significantly more negatively than male respondents. Given that female consumers are often linked to higher environmental values and heightened awareness of corporate social performance, this finding emphasizes the significance of ethical considerations and corporate social responsibility in shaping consumer behaviour (Zahid et al.,

2023; Harms and Linton, 2015).

Building and retaining customer trust requires real sustainability initiatives that are marked by open communication, verifiable outcomes, and a clear dedication to minimizing environmental effect (Stay Grounded, 2023). Incorporating theoretical viewpoints outside of the Theory of Reasoned Action (TRA), such as social identity theory, value-belief-norm theory (VBN), and norm activation theory (NAT), (Kautish and Sharma, 2020) could also lead to a more thorough understanding by clarifying the intricate interactions between variables that affect consumer choices in the context of sustainable consumption (Stern et al., 1999; Schmuck et al., 2018).

Although it also identifies areas for further investigation, this study offers a useful basis for comprehending how customers react to greenwashing in the aviation sector. In order to monitor how customer views and actions change over time, especially in reaction to shifting degrees of greenwashing and developments in sustainability activities within the aviation sector, longitudinal studies are essential. Second, in order to determine if the patterns found are unique to the Italian market or reflect more broadly applicable trends in consumer behavior with regard to environmentally conscious purchase decisions, cross-cultural comparisons are required. Lastly, expanding the study to include other industries with large environmental impacts (such as fashion and food manufacturing) may provide important new information on how broadly applicable these findings are and may also highlight unique understatements to a given industry in how consumers react to greenwashing.

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8. APPENDIX

Survey:

Sustainability in the Airline Industry

Start of Block: Informed consent

By participating in this survey, you confirm that you understand the purpose of the research and consent to the anonymous use of your responses for academic purposes. The data collected will be handled confidentially and used solely for research purposes. You may stop participating at any time without providing a reason.

Yes (1)

No (2)

End of Block: Informed consent

Start of Block: Introduction to the survey

Thank you for taking the time to participate in this survey! This research project aims to study how greenwashing practices (when a company or organization promotes itself as environmentally friendly, often through misleading or deceptive marketing tactics, while its actual practices do not reflect a genuine commitment to sustainability) adopted by airlines influence consumer choices in Italy, particularly the willingness to pay for flights among Generation Z and Millennials.

Have you heard of the term "greenwashing" before?

- Yes (1)
- Maybe (2)
- No (3)

End of Block: Introduction to the survey

Start of Block: Demographic Information

By participating in this survey, you confirm that you understand the purpose of the research and consent to the anonymous use of your responses for academic purposes. The data collected will be handled confidentially and used only for research.

Q1 Age Group

- Millennials (born 1981-1996) (1)
- Generation Z (born 1997-2012) (2)

Q2 Gender

- Male (1)
 - Female (2)
 - Non-binary (3)
 - Genderqueer (4)
 - Genderfluid (5)
 - Prefer _____ to _____ self-describe: (6)
-
- Prefer not to say (7)

Q3 Education Level

- High school or lower (1)
- Bachelor's degree (2)
- Master's degree or higher (3)

Q4 Annual Income Level

- Below €20,000 (1)
- €20,000 - €40,000 (2)
- Above €40,000 (3)

End of Block: Demographic Information

Start of Block: Environmental Awareness

Q5 How well-informed do you feel about the environmental impact of the airline industry?

- Not at all (1)
- Slightly informed (2)
- Moderately informed (3)
- Very informed (4)
- Extremely informed (5)

Q6 How often do you consider the environmental impact of your travel choices (e.g., flights,

accommodations, etc.)?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Always (5)

Q7 How important is a company's environmental impact when making purchasing decisions?

- Not at all important (1)
- Slightly important (2)
- Moderately important (3)
- Very important (4)
- Extremely important (5)

End of Block: Environmental Awareness

Start of Block: Perceptions of Airline Sustainability Claims

Q8 To what extent do you believe that airlines are clear in their environmental claims?

- Not at all (1)
- Slightly clear (2)
- Somewhat clear (3)
- Very clear (4)
- Completely clear (5)

Q9 How often do you think airlines exaggerate their environmental efforts (greenwashing)?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Always (5)

End of Block: Perceptions of Airline Sustainability Claims

Start of Block: Willingness to Pay for Sustainable Options

Q10 If a flight is marketed as “environmentally friendly,” how much more would you be willing

to pay?

- Nothing (1)
- A little (2)
- A moderate amount (3)
- A lot (4)

Q11 Which factor is most important when choosing a flight?

- Price (1)
- Flight duration (2)
- Brand reputation (3)
- Environmental impact (4)
- Other: (5) _____

Q12 Does knowing that an airline has engaged in greenwashing affect your willingness to pay

for its flights?

- No effect (1)
- Slightly less willing (2)
- Moderately less willing (3)
- Much less willing (4)
- I would avoid flying with such an airline (5)

End of Block: Willingness to Pay for Sustainable Options

Start of Block: General Attitudes Toward Greenwashing

Q13 To what extent do you feel disappointed or frustrated when you find out a company has engaged in greenwashing?

- Not at all (1)
- Slightly (2)
- Somewhat (3)
- Very (4)
- Extremely (5)

Q14 Do you think stricter regulations are needed to prevent greenwashing in the airline industry?

Definitely not (1)

Probably not (2)

Might or might not (3)

Probably yes (4)

Definitely yes (5)

End of Block: General Attitudes Toward Greenwashing

Start of Block: Open-ended question

Q15 In your opinion, how could airlines improve their sustainability efforts to build trust with consumers?

End of Block: Open-ended question

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