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Willingness to Fly on Supersonic & Non-Supersonic Aircraft

Jacob Filer, Nicholas DiGrazia, Jae Won Yoon, Vivek Sharma, & Brooke Wheeler

Abstract

A survey conducted on Amazon MTurk found that there is no statistically significant difference between the willingness to fly on a supersonic or non-supersonic aircraft.

Background

Supersonic travel involved flying above the speed of sound and was introduced to shorten travel times. However, the Concorde, the first commercial supersonic jet, went out of service due to efficiency and safety in the early 2000s. The Concorde accident in 2000 led to passenger fear, and the preference for supersonic planes naturally declined (Zhao & Guo, 2012, p. 3). NASA's X-59 project is examining the impact of sonic boom and noise patterns. Noise impacts are less than in the past, and the aircraft is capable of fuel efficiency and long-distance operation (Doebler et al., 2022). The success of the reintroduction of supersonic aircraft will depend on how the public perceives this form of travel.

Purpose

The purpose of this study was to evaluate passengers' willingness to fly (Rice et al., 2020) in two different scenarios: onboard a supersonic aircraft, such as the Concorde or the future Boom Overture, flying at or above the speed of sound, 767 miles per hour, or an aircraft operating under the speed of sound.

Methods

- IRB Exemption was approved (23-027).
- A survey was created using Qualtrics and was posted to Amazon Mechanical Turk (Mturk).
- Data were downloaded from Qualtrics into an Excel spreadsheet.
- Responses were assigned a numerical value with -2 as Strongly Disagree, -1 as Disagree, 0 as Neutral, 1 as Agree, and 2 as Strongly Agree.
- Descriptive statistics were calculated in Excel, and a paired t -test was calculated using R Studio version 4.2.3.

Results

- The 265 participants were evenly split by gender. Their ages ranged from 21 to 70 years old.
- A frequency distribution (Figure 1) illustrates which average willingness to fly responses were most common. The most selected responses were agree and strongly agree (1 and 2).

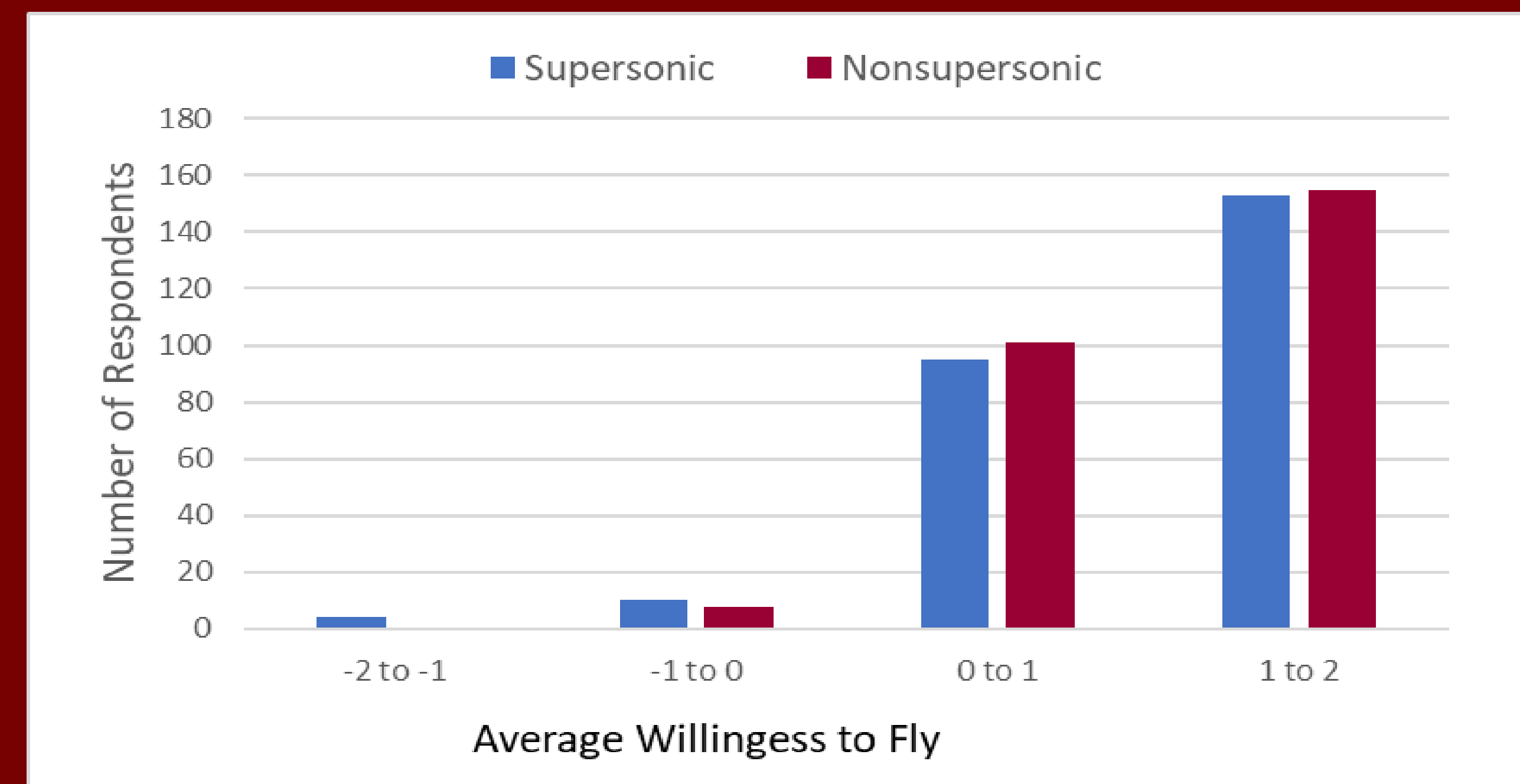


Figure 1. Frequency Distribution for Average Willingness to Fly

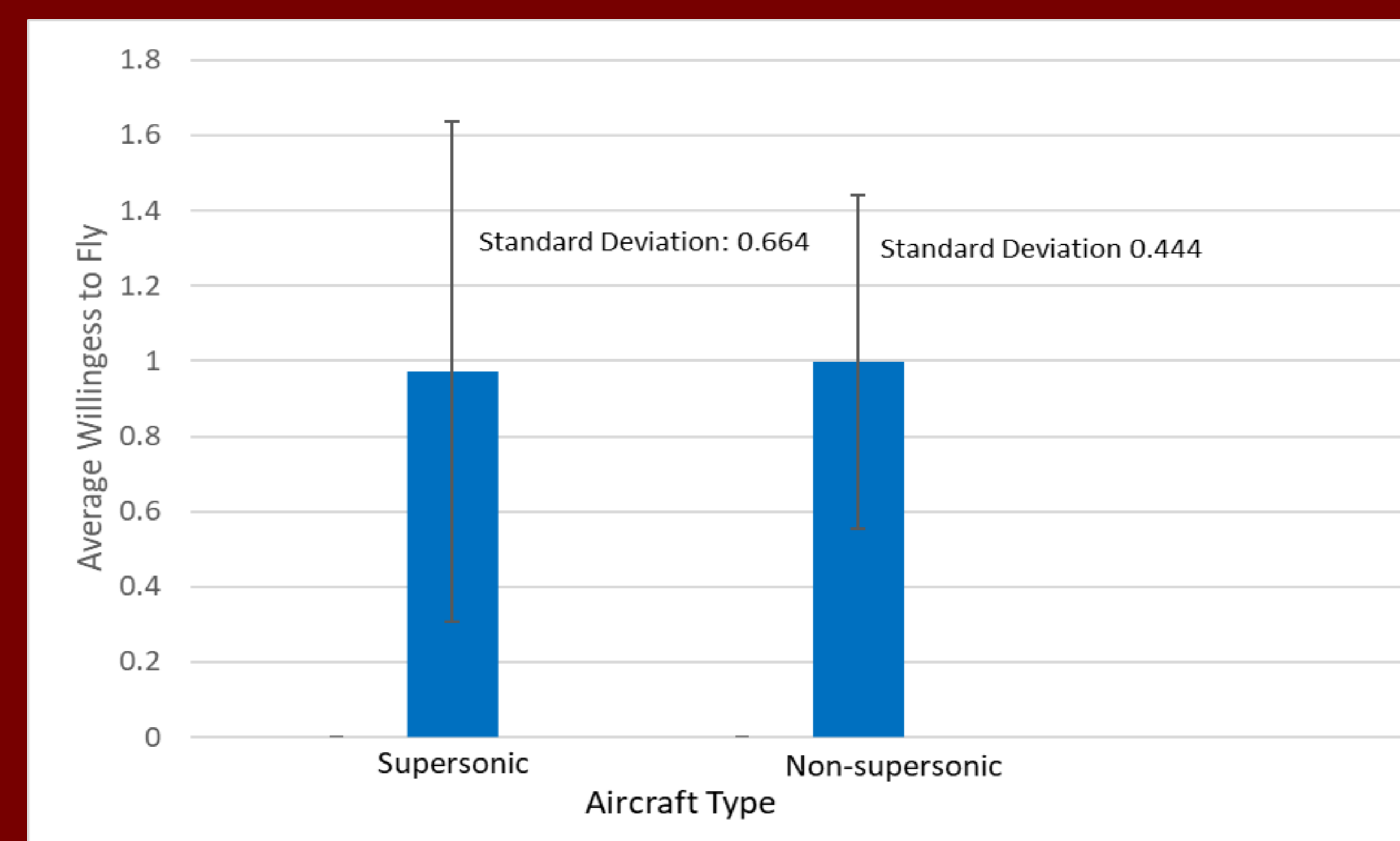


Figure 2. Average Willingness to Fly by Aircraft Type

- Cronbach's alpha was .93 for the non-supersonic scenario and .92 for supersonic, indicating high internal reliability.
- The paired t -test was not significant, $t(263) = -.79$, $p = .43$.
- Cohen's d was 0.05, which is a small effect size.
- The overall average of willingness to fly for supersonic and non-supersonic aircraft was not significantly different from each other. Refer to Figure 2.

Discussion

Data indicates that passengers are equally willing to fly on supersonic aircraft and non-supersonic aircraft. The data we received reached our target population with there being a good variation of Americans participating. These findings contradict our initial hypothesis, which stated that passengers would be less willing to fly on supersonic aircraft. In both conditions, the average willingness to fly is positive.

The average passenger may experience some degree of nervousness when flying, which could potentially impact their responses about supersonic flight. Additionally, if the public is not well-informed about the safety parameters of the aircraft that are currently in use, as well as those of potential supersonic aircraft, this could influence passengers' perspectives on the matter.

Overall, the study produced results that were different from our initial hypothesis, but it provided valuable insight into how passengers feel about the reintroduction of commercial supersonic flights into the industry. The new supersonic aircraft will feature advanced technology and safety measures, and it may take time for the public to recognize and fully appreciate these enhancements.

Future Research

- Similar studies can be conducted to determine if there is a higher willingness to fly with a particular company.
- A study should look at willingness to fly on supersonic aircraft and non-supersonic aircraft for both shorter and longer distance flights.
- Further research is also needed on the effects of supersonic flight on the human body.

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