Public Acceptance of Autonomous Air Carriers

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Introduction

Safety and efficiency have always been the top priorities of commercial aviation, specifically in the major airlines. Ever since the earliest airliners took flight there has been a substantial effort to update and continually improve airplanes to become safer and more efficient. In the past 30 years automation has become more and more prevalent on airlines and today's aircraft can fly almost entirely by themselves. As the quality and effectiveness of computers/flight models are constantly increasing there will almost certainly be a time at which airliners are completely automated, no longer requiring a physical human pilot on board. In a study done, most pilots supported a hybrid system with automation and pilots aboard, instead of full autonomy (Weyer 2016). However more research needs to be done to discover when the general public will feel comfortable enough to fly on fully autonomous aircraft and what levels of automation do they currently support and feel comfortable with.

Aim

This study will attempt to uncover how the average consumers, specifically college students at the University of South Carolina and other nearby colleges, compare to experts in the field of aviation in regards to different levels of automation in airlines. Finding out if single pilot planes would be more assuring than complete autonomy and at what point in time do people think they would be comfortable enough to purchase tickets on airliners with fully automated aircraft. Another one of the major objectives was to compare the differing results based on perceived intelligence and familiarity with aviation. One of the hypotheses is that as perceived expertise with aircraft rises, whether founded or unfounded, the less likely the respondent is to support fully autonomous aircraft. The other hypothesis is that the average respondent, with varying levels of familiarity, will be more likely to be undecided but not fully comfortable with autonomous air carriers. This study will investigate the current levels of comfortability as well as opinions on the future.

Method

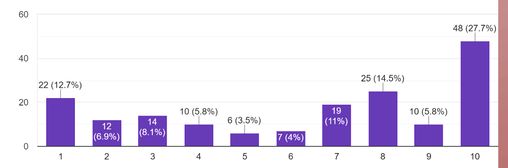
Participants: University of South Carolina students and other similar aged students at NC State and Clemson. Other respondents were pilots and employees in the airline industry found through Facebook and personal connections.

Instrument: Google Forms survey composed of 5 Likert scale questions with options 1-10 and a multiple choice question. The questions rank familiarity with aviation and subsequently comfortability on automated aircraft.

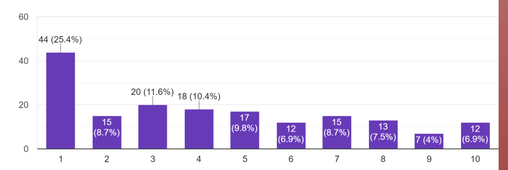
Results

The results for each question are listed below in the order in which they appeared on the survey. 1 is least familiar/comfortable and 10 is the most familiar/comfortable.

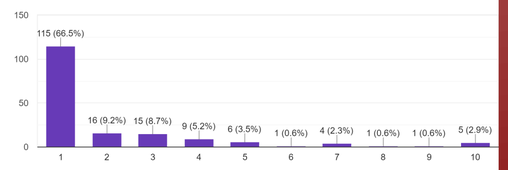
How familiar are you with airplanes and the aviation industry?
173 responses



How comfortable would you feel flying on an airliner with only 1 pilot at the controls?
173 responses

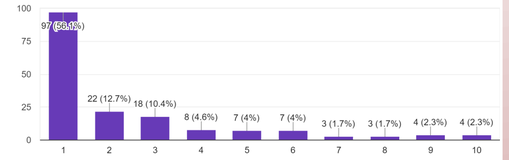


How comfortable would you feel flying on a fully-automated airliner (American Airlines, Delta, etc) without a pilot on board?
173 responses

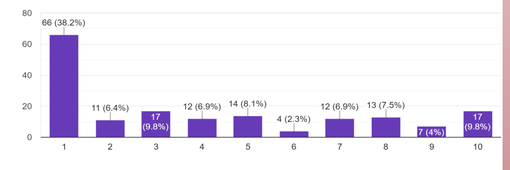


Results Cont.

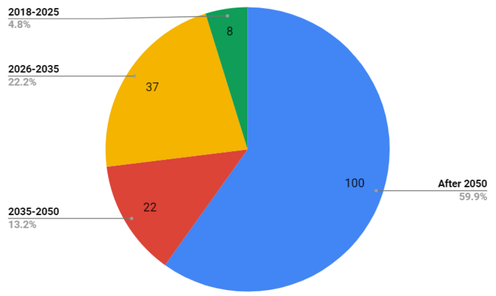
How comfortable would you feel about flying on an airliner controlled by someone on the ground?
173 responses



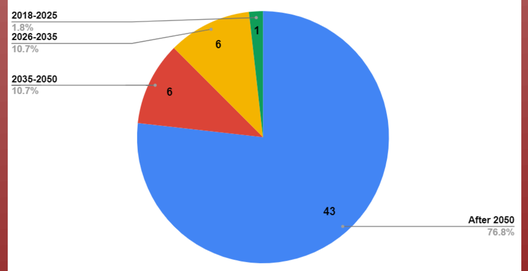
Would you support autonomous cargo planes (FedEx, UPS, etc) flying without pilots on board?
173 responses



At what time period do you think you would feel comfortable flying on an airliner without a pilot on board?



Breakdown of self-perceived expert's (respondents who picked 9 or 10 on the first question) answer to when they would support automation.



The data shows a 17% increase for the year range of after 2050 amongst persons who selected 9 or 10 for familiarity with aviation.

Future Research

The results in the study are similar to those found in numerous other research studies. The mixed results that are generally slightly anti-autonomy replicate the studies of (Wollert 2018) as well as (Tam 2011). While it still appears that American's are not fully against autonomous aircraft, it will be important to conduct similar studies in the future as computers and aircraft safety continue to push technological boundaries.

Since more respondents supported autonomous cargo planes it follows the common theory that cargo operations will be replaced with autonomous aircraft long before commercial air carriers are. This creates a need for more research on the public opinion of automated cargo planes before they are implemented fully.

Conclusions

The research done in this project was an attempt to discover how the public feels about autonomy in aircraft and compare that to how self-perceived experts think. The results were expected in that the respondents did not fully trust automation in aircraft and respondents with self-perceived expertise were less likely to support automation. While the research was limited by a sample of convivence, the results are still valuable and future research in the field is a necessity for the aviation industry as a whole.

References

Tam, A. (2011). Public Perception of Unmanned Aerial Vehicles. *Aviation Technology Graduate Student Publications*.

Weyer, J. (2016). Confidence in hybrid collaboration. An empirical investigation of pilots' attitudes towards advanced automated aircraft. *Safety Science*, *89*, 167-179. doi:10.1016/j.ssci.2016.05.008

Wollert, M. (2018). *Public perception of autonomous aircraft* (Order No.10810632). Available from ProQuest Dissertations & Theses Global. (2071406696).