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"You'll Never Really Be One of Us": Women's Underrepresentation in the Aviation Workforce

Rebecca K. Lutte Ph.D.
University of Nebraska at Omaha, rlutte@unomaha.edu

Shannon M. Morrison Ph.D.
The Ohio State University, morrison.413@osu.edu

Introduction

A broad representation of workforce brings many benefits to the aviation industry, including increased profitability, enhanced safety and innovation, and increased ability to meet workforce demand. Despite these benefits and need for additional workforce, women remain significantly underrepresented in many aviation occupations. Boeing projects over half a million jobs for aviation personnel globally as pilots, technicians, and cabin crew by 2040 (Boeing, 2021). Morrison (2020) notes that an aging workforce, an increase in air travel, and mandatory retirements are all factors in the growing need for pilots. Yet, the number of women pursuing careers in aviation is lagging. In the United States, women hold just 4.7% of Airline Transport Pilot Certificates, the certification required to fly for a major airline (Federal Aviation Administration [FAA], 2021). According to Lutte (2021), these numbers hold true across many professions in the aviation industry with women representing less than 20% of the workforce. Yet, data from the U.S. Bureau of Labor Statistics showed women were, for the first time, a majority of the U.S. college-educated labor force in 2019 (Fry, 2019), and, between 1970-2018, the number of women ages 25-64 with a college degree in the workforce quadrupled (U.S. Bureau of Labor Statistics, 2019). While not every career in aviation necessitates a college degree, this contrast between women with college degrees and those who are employed in aviation suggests that there continue to be barriers that preclude women's participation. Building on prior work, this study aims to further understand what specific factors influence a woman's aviation career decision-making and her retention to the field and offers recommendations on how to recruit and retain more women in aviation.

Literature Review

Review of previous literature reveals potential factors that can impact women's participation in aviation. Workplace bias, discrimination and harassment, the struggle to maintain a work and family life balance, the lack of women in leadership positions, and the need for additional targeted outreach are all factors that contribute to the continued underrepresentation of women (FAA, 2022; Gorlin & Bridges, 2021; Korn Ferry, 2020; Oliver Wyman & International Aviation Womens Association [IAWA], 2021; United States Air Force, 2021; Węziak-Białowolska et al., 2020; Stevenson et al., 2021). A 2003 study (Anderson & Pucel) explored positive influences on men and women in their pursuit of a professional flight career. Factors influential for women included exposure to aviation at a young age, opposite gender mentors and role models, desire for challenging work, and overall passion for aviation (Anderson & Pucel, 2003). The primary negative factor identified for both men and women was cost of flight training (Anderson & Pucel, 2003). While this study was limited to examining recruitment in a single occupation area (professional flight), it suggests that further exploration across the aviation industry is necessary to understand the lack of women.

Aviation has historically been a male dominated industry in most occupation areas. As such, the likelihood of the individual persisting in a field that is coded in a gender that differs from the one they identify with, grows smaller. This is in part due to the socialization that occurs in these "coded" professions (Carli et al. 2016; Seron et al., 2016; Yanıkoğlu et al., 2020). In other words, women pursuing aviation careers are more likely to experience a professional culture that supports a network of men, ultimately weeding them out. Experiencing negative attitudes in the workplace reinforces the belief that women do not belong and therefore are less likely to be recruited or retained.

The research on the lack of women in STEM-based fields is well documented. Many of the findings of this research articulate a need to consider how to encourage more women to pursue STEM-based fields. One of the most frequently cited solutions is to consider the role of outreach and engagement, whether this is through youth outreach programming, or mentorship designed specifically for women (Halleran, 2019; Stevenson et al., 2021; Yanıkoğlu et al., 2020). This suggests the importance of outreach and the positive impact of women connecting with other women in the field.

Purpose of the Research

This study expands on previous research by examining the current factors that influence the recruitment and retention of women in a broad array of aviation occupations. This project proposes the following research question: *What factors influence a woman's decision to a) pursue a career in aviation and b) remain in the industry*? The purpose of this research is to identify the specific factors that: 1) recruit women, and 2) enable them to persist. Understanding these factors will allow for existing strategies to be further developed that will continue to enable the industry to attract and retain more women in aviation.

Methodology

A mixed methods approach was used in which the authors utilized both quantitative (closed-ended) and qualitative (open-ended) survey data to integrate both sources and better address the research questions (Creswell, 2015). The advantage of the qualitative data was to provide a more comprehensive view using stories and personal experiences to better understand the overall results (Creswell, 2015). The survey was developed based on the review of the literature and prior research. Key factors identified in the Anderson and Pucel (2003) article were included and expanded upon to update the data and capture retention in addition to recruitment.

A pretest was conducted with a small group of Women in Aviation International (WAI) members and their feedback resulted in minor changes to survey questions. The survey targeted a purposive sample. The research was conducted in collaboration and cooperation with WAI, and the online survey was distributed via email amongst its membership. This group was selected because it allowed access to the targeted demographic and those who work in a wide range of aviation career fields. The survey received IRB review and approval (IRB# 116-19-EX).

Questions fell into three basic categories: demographics, recruitment, and retention. The recruitment questions were designed to better understand what draws women into aviation, the role of outreach, and the impact of influencers. Retention questions focused on what keeps women in the field of aviation. Barriers to recruitment and retention were also explored. For the recruitment and retention section, Likert scale questions explored the positive or negative impact of a variety of factors on women's decisions to pursue and remain in aviation. To test internal consistency, Cronbach's alpha was calculated for data sets on recruitment and retention. The scores were .818 and .849 respectively, indicating high reliability (Hinton et al., 2014). Open-ended questions were included to better understand challenges and barriers facing this underrepresented group. NVivo software was used for coding and analysis of open-ended responses. Coding allows researchers to condense large amounts of data by categorizing that data into identified, meaningful themes (Miles et al., 2020). Themes were identified through an initial review of open-ended responses and coded through a focused coding of all responses (Denzin & Lincoln, 2018).

Results

A total of 1,323 survey responses were submitted by women, a 14% response rate. There were respondents in all 22 categories of occupations listed in the survey. The occupation with the

highest response rate was airline pilot (21%) followed by student (16%). The occupation with the lowest response rate was board of directors (.3%). Just over 1/4 of respondents (26%) indicated they have over 20 years of experience in the aviation industry.

Recruitment: Factors That Affect Aviation Career Decision-Making

Women were asked to what degree do you think the following factors influence your decision to pursue a career in the aviation industry? Using a Likert scale provided the opportunity to examine the 29 factors on a scale of negative influences to positive influences on the decision to pursue a career in aviation. The top three positive factors included 1) passion for aviation, 2) perceived as an adventurous profession, and 3) perceived as a fun profession. A total of four factors were identified as negative influences. They included 1) cost, 2) perceived existence of good ole boy network, 3) perceived family life impact, and 4) high school counselor. The full results are presented in Appendix A.

Retention: **Factors That Influence a Decision to Remain in a Career in Aviation**

The survey questions were designed to reveal information about retention, including a question regarding whether one had considered leaving the aviation industry. The results of this question revealed 38.2% of women replied that they have "somewhat" (26.4%) or "strongly" (11.8%) considered leaving the aviation industry (n=1,089). In addition, a Likert scale question was again used to gauge factors that influence women's decisions to remain in careers in aviation. This allowed for the ability to explore 24 identified factors that negatively influence or positively influence the decision to remain in aviation. The full results are summarized in Appendix B. The top 3 factors for choosing to pursue a career in aviation and to remain in the industry were the same. Similarly, the top three negative factors held constant for both career decision-making and retention to the profession. Notably, the perception that aviation functioned

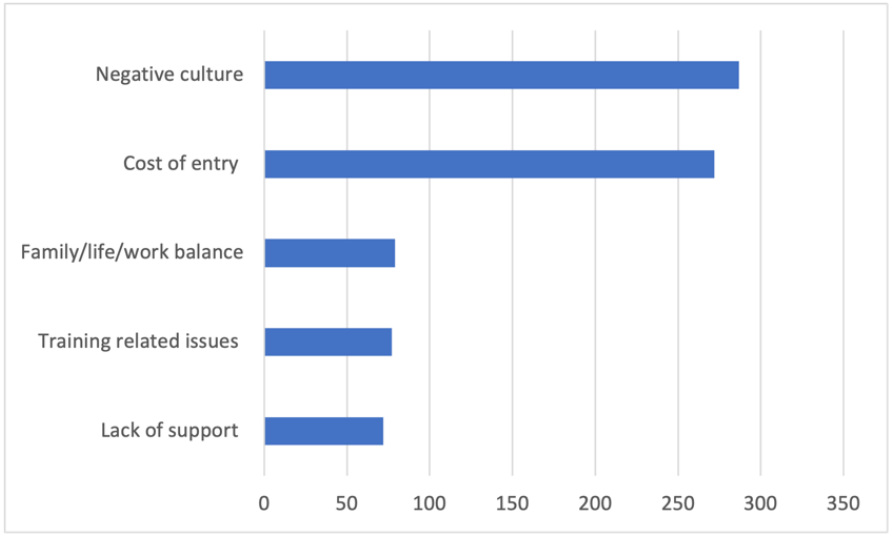
on a 'good ole boy network,' moved from the number two ranking in the recruitment question, to the number one position as the highest ranked negative factor on retention.

Greatest Challenges/Barriers

An open-ended question was asked about the greatest challenge experienced in the pursuit of an aviation career. The results supported the Likert responses by providing the opportunity to gain a better understanding of the influencing factors. A total of 996 women were willing to share their experiences and responded to this question. The authors view the high response rate to this key question as an indication that women clearly want to be heard on these issues. The most common themes are summarized in Figure 1 with the top five greatest challenges or barriers to persisting in the aviation industry. Numbers indicate the total responses in that category.

Figure 1

Top 5 Greatest Challenges/Barriers to Women in Aviation Careers



A key result from this question was the ability to connect the negative culture to how women perceive the 'good ole boy network.' Since this topic rates highly as a negative factor both in the

quantitative and qualitative questions, it is important to examine these responses to gain a better understanding of this important factor. Listed below are example comments from the responses:

- “Sexism isn’t blatantly obvious, but it wears you out over a long period of time.”
- "You'll never really be one of us."
- “A big part of this is learning how to be heard and respected.”

Additional themes that emerged, but generally had fewer responses, included training related issues, lack of support, and confidence. Within training related issues, topics raised included inability to find a good flight instructor or school, and isolation experienced during training. Lack of support comments included topics such as not having a women support system, not having women teachers or mentors, and again the feeling of being the “only one” and isolation. There were also comments that identified lack of confidence in skills and abilities as a barrier. Some example comments from these categories are included below.

- “Not knowing/seeing any women in prestigious commercial aviation positions. Feeling very “alone.”
- “Not having a woman support system up front or a mentor. I think this is very important.”
- “As with most women, I stand in my own way far too often. Believing in myself and taking risks are two areas where personal growth has led to increased success. The faster or earlier we can get younger women there, the more diverse and inclusive those leadership teams will become.”

Discussion

Negative Workplace Culture Impairs Recruitment and Retention of Women in Aviation

While the existence of the ‘good ole boy network’ or male dominated culture has been established throughout the history of aviation, the results reveal it remains the primary deterrent to the recruitment and retention of women in aviation. Culture was the most frequently raised

topic in response to greatest challenge/barrier experienced in pursuit of an aviation career. It is also the top ranked negative factor for retention. Direct comments from women ranged from experiences of sexist comments, discrimination, sexual harassment, and even to sexual assault. Inability to address the negative workplace culture will result in continued underrepresentation of women. To address this issue requires an "all-in industry approach." An emphasis on awareness training including bias and allyship training, accountability to include zero tolerance practices, and increasing the number of women in leadership positions are necessary steps to start to address this issue.

Identifying and Engaging Influencers

Another topic explored from the survey data was information about those who act as influencers or potential gatekeepers to pursuing an aviation career. Influencers are individuals who may have an impact on one's decision to pursue aviation as a career or remain in the field. Survey results showed that 55% of women indicated parents were a positive influence. However, when it came to choosing an aviation career, having a family member in aviation was not a factor (62% indicated no influence). Being introduced to aviation as a child was a positive influencing factor on the decision to pursue an aviation career by 54% of women. High school counselors yielded interesting results. A total of 84% of women reported that high school counselors did not have an influence on the decision to pursue a career in aviation. When counselors did play a role, it was more often negative than positive. Given the responses about the role of counselors and parents, it is essential that outreach be conducted to better inform those who play an influencing role. Mentors were not identified as having a large influence on the decision to pursue a career. When women were asked about the influence of both male and female mentors, 75% reported female mentors had no influence on the decision to pursue an aviation career, and 62% reported

male mentors had no influence. However, mentors do play a slightly larger role in retention. Only 23% reported that female mentors positively influenced the decision to pursue a career but that increased to 35% who reported female mentors positively influenced the decision to stay. Male mentors played a larger role than female mentors in both recruitment and retention (37% positively influenced for both categories).

Engaging Young Women Works: Industry Needs to Reimagine Outreach and Engagement

The survey results revealed that exposure to aviation as a young person works. Fifty-four percent of women reported that early exposure to aviation as a child positively influenced their decision to pursue an aviation career. Industry needs to ensure that the outreach programs are aligned with the factors that draw women into aviation. The factors that draw women into aviation were dominated by feelings such as passion for aviation and the desire for an adventurous and fun career. Additionally, women indicated they are drawn to aviation because they want to be challenged and to prove their personal abilities. Often in aviation we see that outreach and recruitment begin with an emphasis on STEM. With this approach we run the risk of sending the message that "if you are not interested in STEM, aviation is not interested in you" (Penney, 2020). What this data shows is the need for continued emphasis on youth outreach that focuses on the excitement, fun, and adventure to draw more women to aviation.

Cost of Entry is a Barrier

It comes as no surprise that cost of entry, particularly for flight training, is identified as a barrier to entry to aviation. Scholarships can assist in addressing this barrier. For example, Women in Aviation International awarded $473,000 in 2022 and the total amount of scholarships awarded by the organization is $14.5 million (WAI, 2022). Increasing awareness of scholarship availability for women is recommended. Additionally, given the added expense of flight training

for those pursuing a collegiate professional pilot program, increased access to financial aid is essential. Given that current financial aid limits do not even cover the costs of tuition and fees for most, the added expense of flight training puts the career goal out of reach for many. Expanding Pell Grant funding (current Pell Grant maximum is $6,495 for academic year) and increasing other financial aid options would assist to address this barrier.

Retention is Crucial

It is clear from the data that we also need to do a better job of retention. The response of 38% having considered leaving the industry should raise concerns. While we can invest in outreach and recruitment, it is equally—if not more critical—to ensure that we address the barriers to retention. We need to be able to provide an environment where women who have already invested in their careers in aviation, and developed skills and experience, work in an environment that is inclusive, that offers opportunities for advancement, and enhances their desire to remain. The challenges of balancing work and family disproportionally impact women in the workplace (McKinsey & Company, 2020). A continued focus on policies to address these challenges, such as paid family leave (maternity and paternity) and flexible schedules, should be implemented. Additional efforts include providing access to mentors. Women often feel isolated in this male-dominated industry. Although mentors were not cited as playing an influential role, the responses to open-ended questions revealed a desire for increased support from women, indicating that the problem is a lack of opportunity to connect with women mentors.

Further Research

While this project reinforced and gave new insight to the barriers to recruitment and retention of women in aviation careers, there are still areas of further research that need to be conducted to continue to address the problem of why women remain underrepresented in the

aviation industry. First, to further our understanding of the experiences of women, a larger sample size must be collected. Second, because this project used one organization for its sample, it did not account for the intersectional experiences of women of color, trans women, gender non-conforming, or women with disabilities (list not exhaustive). Understanding intersectional experiences is crucial to attracting *all* women to the field of aviation. The authors consider these two points to be limitations to the study. Finally, this survey provides a snapshot of the experiences of women pursuing a career in a predominantly male industry. Findings revealed the factors that influence women pursuing and persisting. The next step would be to design an intervention to both address negative factors and support the positive factors.

Conclusions

It is essential for the future success of the industry that aviation attracts a broad representation within the workforce. Attracting women into aviation is a necessity not only to address workforce demand but also to achieve the benefits that diversity of thought brings.

> Until aviation addresses the full range of barriers that are keeping women from succeeding, the industry not only will be at a disadvantage in the battle for talent, but its ability to survive, thrive, and manage risk will be in jeopardy. (Oliver Wyman and International Aviation Women's Association, 2021, p.3)

The results of this study identified factors that positively and negatively influence the ability to recruit and retain women in aviation. These factors should be used to inform strategies to increase the numbers of women in aviation for the overall benefit of the industry. Key results indicate the importance of youth outreach and the need for outreach to influencers such as parents and high school counselors. Outreach should capture the characteristics of the industry that draw women in such as the adventure, passion for aviation, and desire to prove abilities. In

addition to recruitment, we must focus on retention. A high priority is to address the negative workplace culture, adopt policies to address work-family balance, and create communities of support. By tailoring strategies for the recruitment and retention of women to the very factors that influence their career decisions, we can better use resources to build representation in the industry.

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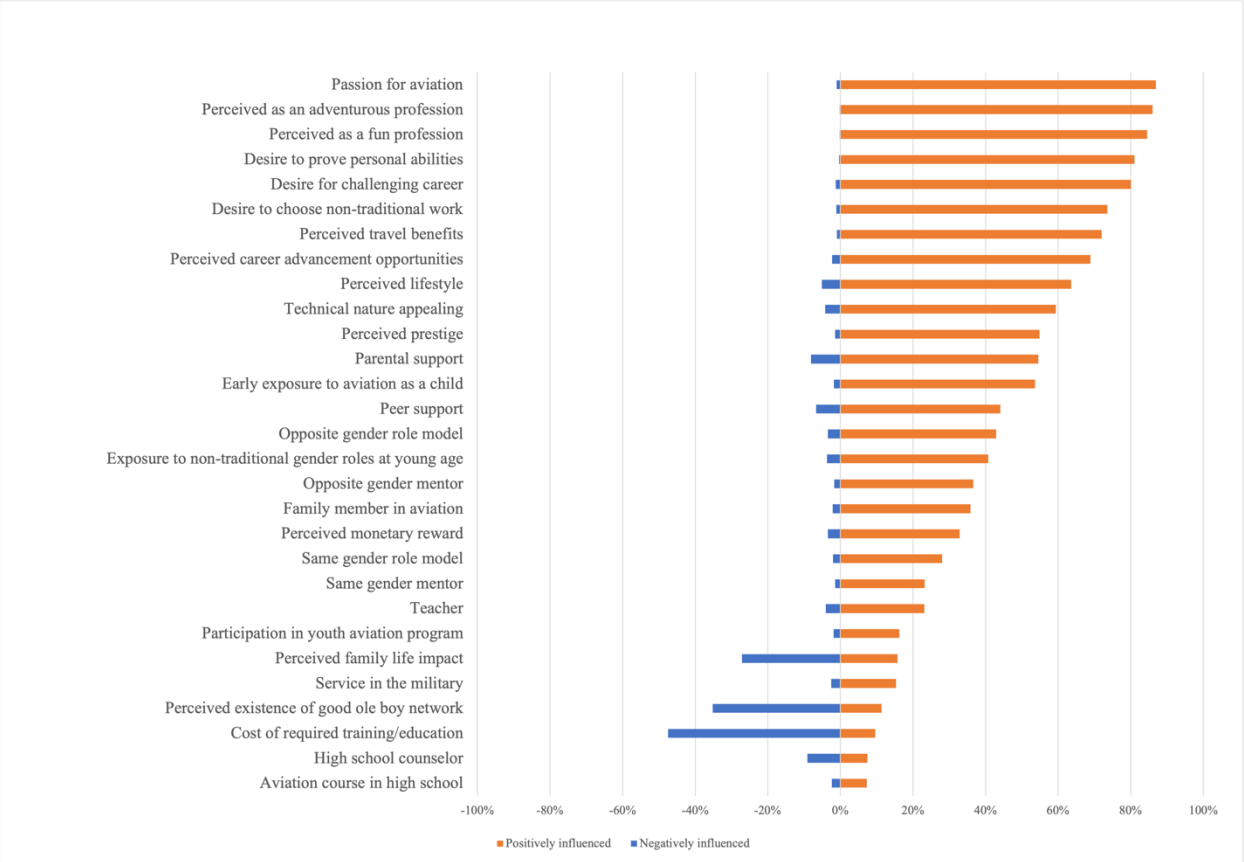
Appendix A

Influencing Factors on Recruitment of Women in Aviation



Appendix B

Influencing Factors on Retention of Women in Aviation