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## Aviation Culture: a 'Glass Sky' for Women Pilots - Literature Review

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In 1987 Major Sandra Bateman, a pilot in the US Air Force, submitted a paper to satisfy requirements of her Command and Staff College course. In defiance of the historically masculine aviation culture, such as that popularized in Tom Wolfe's 1979 book *The Right Stuff*, Bateman argued "'the right stuff' has no gender" (Bateman, 1987, p. 73). Subsequently, she set about dispelling myths about women pilots' ability to fly aircraft in combat missions. She demonstrated that the reasoning behind the law that excluded women from combat flying was illogical, and outlined the consequences of the exclusion. In contrast to Wolfe (1979) who mythologized the right stuff as heroism, risk taking, rule breaking and flying on "the edge," Bateman (1987) said the right stuff was an "evasive quality" that encompassed skill, cunning and courage (p. 65). She asserted that the continuing restrictions on women were based on "resistance to change for no real reason at all" (p. 73). Resistance to legislation and policies continued until a 2015 order requiring all combat roles in the United States military be opened to women with no exceptions, reflecting similar changes globally (Kamarck, 2016).

The percentage of female commercial pilots globally is approximately five percent (BBC, 2018). Statistics for women helicopter pilots are virtually non-existent, but anecdotal evidence indicates a global average less than women airplane pilots. Our initial intent was to review literature describing the lived experiences of women employed as helicopter pilots, but we found no such specifically focused studies. We, therefore, broadened our scope to all female pilots. This literature review considers why, despite legal reformations, women's employment as pilots remains one of the most gender-segregated occupations, globally.

The literature revealed that an aviation culture resisting female inclusion underpinned most challenges and barriers faced by female pilots. We, therefore, refocused our aim to establish an understanding of the specific impact of aviation culture on the experiences of women pilots.

In order to maximize flight safety, efficiency, and operational integrity, it is widely understood that the aviation industry must attract and develop the very best talent. This requires broadening the pool from which potential pilots are drawn (Germain et al., 2012; Gibbon, 2014a; McCarthy, 2017; Turney, 2000) and progressing diversity throughout instructional, management and leadership roles (Germain et al., 2012; Gibbon, 2014c, 2014d; Turney et al., 2002). Yet, the findings of this review overwhelmingly reveal that women pilots engaged in both military and civil aviation face cultures that are not gender inclusive (Cline, 2017; Davey, 1996; Ferla & Graham, 2019; Gibbon, 2014c, 2014d; Glover, 2000; Henneberry, 2018; McCarthy et al., 2015; Molloy, 2019; Neal-Smith & Cockburn, 2009; Opengart & Ison, 2016; Yanikoğlu et al., 2020; Zirulnik, 2015).

A review of this kind makes a significant contribution to the small but diverse and nascent field of gender issues in aviation. The usefulness of a literature review in furthering research from "disparate and interdisciplinary" fields is through its synthesis of findings (Snyder, 2019). This review brings

together academic research about women pilots from the fields of aviation, employment, management, business, organisation, gender, feminism, sociology, psychology, and communications. It covers civil and military aviation and spans a research period of more than two decades. We adopted a hermeneutic approach to analysis for its emphasis on an iterative nature of understanding. It allowed us to bring together the heterogeneous academic fields through which women pilots have previously been studied. We focused on analyzing attraction, recruitment, selection, training, and retention in relation to the impact of organisational and popular culture on gender equity, diversity and inclusion. We sought to understand the extent and impact of undue gender-based stressors and gender harassment on women pilots and flight safety, and how women pilots adapt to survive in the industry. Finally, we considered the processes of cultural reform within aviation.

Organizational culture became central to our analysis of the literature and is the focus of this paper because the culture of the industry was identified in the literature as the most significant factor in contributing to gender segregation, training and employment challenges, poor work experiences leading to stress, burnout, and attrition for women. Culture is understood to be the values, attitudes, beliefs, language and the behaviours, practices and rituals shared by members of the group. It is at once the shared value system and the “collective social interaction” of the group (Meek, 1988, p. 495). Organisational culture is problematized here, as it can produce and reproduce privilege for some members while producing and reproducing disadvantage for others. Studies focused on women in male-dominated industries consistently report that women experience a range of barriers to their employment and well-being (Bagilhole, 2002; Batty & Burchielli, 2011; Blickenstaff, 2005; Bridges et al., 2021; Bridges et al., 2020; Charlesworth & Robertson, 2012; Hanna-Osborne, 2019; Navarro-Astor et al., 2017; Powell et al., 2009; Prokos & Padavic, 2002; Sang et al., 2014; Whittock, 2000). Barriers are said to arise for a range of reasons, including: sociocultural gender roles, stereotypes and expectations, as well as men’s *natural* suitability versus women’s unsuitability to perform the work. The association between work roles and male gender identity (Bagilhole, 2002; Whittock, 2000) leads to the favoring of normative masculine values and practices in these occupations (Bagilhole, 2002; Blickenstaff, 2005; Bridges et al., 2020; Powell et al., 2009; Sang et al., 2014; Whittock, 2000). Consequently, policy or procedure related to gender equity and diversity are resisted. As such, industries with a long tradition of male-only employment, i.e. various occupations in the STEM sector (Blickenstaff, 2005; Powell et al., 2009) the construction and building industries, forestry and mining (Johansson et al., 2020), architecture (Sang et al., 2014) and particularly those with militaristic traditions such as aviation (Bridges et al., 2014; Mills, 1998; Mills & Mills, 2006), paramedicine (Hanna-Osborne, 2019), firefighting (Batty & Burchielli, 2011), and policing (Charlesworth & Robertson, 2012; Prokos & Padavic, 2002) maintain masculinised cultures that discriminate against women even as percentages grow.

We acknowledge that women pilots are not a homogenous group and come from diverse backgrounds, have differing ethnicities, marital status, sexual orientations, and so on. However, there are shared experiences for women in male-dominated industries that are gender-based, and work to disadvantage and discriminate against women (Bagilhole, 2002, p. 10). These include discrimination related to position and promotion; harassment and sexism; and inflexible work arrangements. Acker (1990) called these systematic power issues “inequality regimes.” For women working within masculine cultures, particularly in male dominated industries, inequality regimes are pronounced.

Members of organisational cultures who contribute to its collective production and maintenance largely embrace the shared values, attitudes, beliefs, language and behaviours and ultimately “fit in.” Those that come from outside the culture or are minorities within the culture, may not as easily embrace the same values, attitudes, beliefs, language, and behaviours. Therefore, they are not always accepted as legitimate members of the group. Bourdieu (1986, 2010 [1984]) describes being aligned with a culture (societal, organisational), and knowledgeable of it, as being in possession of cultural capital. Like economic capital, cultural capital is a resource endowing advantage to the holder. Furthermore, though not his intention, but providing some insight into the marginalisation of women in male dominated industries, Bourdieu postulates that the legitimate physical body forms an *embodied* cultural capital - that is a *body* that equates to an advantage, that fits in (1986).

This bodily “head-start” enables (Bourdieu, 2010 [1984], p. 63) legitimacy within the culture and meets expectations. Within aviation, the identity of pilot assumes a masculine body imbued with the right stuff. Women, without the same embodiment of cultural capital, do not fit easily into an aviation culture where the identity and image of a pilot are stereotypically masculine. Ultimately, women disrupt the homogeneity of the culture (Butler, 2005).

Our findings in relation to organisational culture for women pilots start with the challenges researchers faced in the field; primarily, encounters reflective of the cultural attitudes towards women pilots in the aviation industry. We found the experiences of women pilots, whether in 1996 or 2020, are similarly impacted by the hegemonic masculinity that dominates the aviation culture. From the first notion of pursuing piloting, through recruitment, selection, training and qualifying, the studies in this review reported on culturally based gendered barriers. Studies report that women face undue gender-based stressors, including but not limited to, gender and sexual harassment that is perpetuated by organisational culture.

Gender-based reform has had limited success in the past, particularly when addressing isolated issues. The literature suggests that cultural changes within the industry are needed to affect any real change of the experiences of women pilots. We suggest that cultural change in aviation is more likely if achieved hand-in-hand with broader societal cultural change.

## Methodology

We utilized a hermeneutic methodology specifically designed by Boell and Cecez-Kecmanovic (2014) for conducting literature reviews. The search covered the 25-year period 1996-2020. Initial trial searches tested the usefulness of search parameters and identified key areas of exclusion. Variations on terms from the industry: aviation, aerospace, airline, aeroplane, airplane, aircraft, flying, flight, fixed-wing, rotary-wing, helicopter; the occupation: aviator, aviatrix, airman, airwoman, aircrew, pilot, flyer/flier, flight crew; and gender: woman, women, female, gender - were combined to produce functional Boolean strings.

We chose Scopus® Preview - an abstract and citation database, for its extensive indexing of content to springboard into disparate academic fields (Elsevier, 2021). Combining the 11 industry terms with occupational and gender variables returned 1749 results. We limited our inclusion criteria to: empirical literature focused on gender issues in aviation, the pilot occupation, literature from 1996 onwards, and literature published in English. We excluded: non-empirical literature, literature not concerning sociocultural issues regarding gender in aviation, and literature exclusively about men in aviation.

From the results, we identified journals and tabulated journal meta-data to provide a readily available indication of quality. We searched journals' databases using relevant Boolean strings to further identify material. Finally, we snowballed reference lists for further germane research. We used NVivo 12 (QSR International, 2018) extensively throughout the hermeneutic process to generate metadata and create thematic codes. This simplified categorising and summarising documents (di Gregorio, 2000). Journaling the process within NVivo allowed a simple mechanism to monitor "systematicity and transparency" (Paré et al., 2016).

The hermeneutic process drew our attention to a common theme that appeared to underlie all aspects of the lived experiences of women pilots - that of culture. This led to the refinement of our research questions:

*How does aviation culture impact women pilots' experiences?*

*How does aviation culture affect women as pilots?*

## Discussion of Findings

Scholarly literature reporting on empirical studies that have investigated issues for women in aviation is not prolific. Therefore, we also investigated doctoral dissertations and apposite books. We reviewed 22 journal articles, 14 doctoral theses, and eight chapters from three books. Journal articles were published across 20 disparate journals. Researchers across the timeframe (1996-2020) studied pilots from Australia, Canada, New Zealand, Norway, South Africa, Turkey, USA, UK, and non-specified European countries.

## Challenges Conducting Gender Research in Aviation

The literature recounts challenges, in relation to resistance, that researchers encountered in the field. Davey (1996) found that the airline sponsoring her research wavered when her investigations revealed gender issues. They responded by bringing her study to an "abrupt end" (Davey, 1996,

p. 196). Nearly 10 years later, Wilson (2004) found sampling for her research curtailed when pilot associations declined member participation, citing a reluctance to “get involved in ‘gender issues’” (p. 185). Mitchell et al. (2005, p. 57) received uninvited comments suggesting gender in aviation was “a topic that was best left unexamined.” Neal-Smith and Cockburn (2009) received openly negative responses to their questionnaire. Germain et al. (2012, p. 450) were sent numerous unsolicited emails opining “women do not perform as well as men.” Gibbon (2014c, p. 85) encountered male pilots who were “openly resentful that women pilots were receiving ‘special attention.’” Zirulnik (2015, p. 106) concluded airlines’ “too scared to share” attitude was more indicative of the exclusive culture than the withheld data. Resistance to gender research within the industry was seen to reflect gender inclusion problems experienced by women pilots.

### **Culture of the Aviation Industry**

Work, organisational culture, and occupational identity are recognized in the literature as being sociocultural and gendered constructions; additionally, they are aligned with the wider field of gender and work studies (Acker, 1990; Bagilhole, 2002; Mills, 1998; Whittock, 2000). Furthermore, there is an understanding that in society, domestic and occupational roles are gendered and privilege men. Hegemonic masculinity is raised as a barrier to gender equality, diversity and inclusion in aviation culture globally (Ashcraft, 2005; Ferla & Graham, 2019; Gibbon, 2014c, 2014d; Glover, 2000; McCarthy, 2017; Mitchell et al., 2005; Neal-Smith & Cockburn, 2009; Reynolds et al., 2014; Yanikoğlu et al., 2020).

Although culture was commonly identified as a major barrier to gender inclusion, specific cultural theories were not typically applied. However, in much of the literature the organisational culture of the aviation industry is analysed and critiqued. Culture was seen to both affect and be effected by the attitudes and behaviours of its constituents (McCarthy, 2017; Reynolds et al., 2014; Wilson, 2004) and to be in a constant state of re-examination (McCarthy, 2017; Zirulnik, 2015).

The dominant culture of western aviation was described as masculine, western, white, hegemonic, heterosexual, and largely homogenous (Ashcraft, 2007; Davey, 1996; Gibbon, 2014c, 2014d; Glover, 2000; Henneberry, 2018; McCarthy, 2017; McCarthy et al., 2015; Molloy, 2019; Robertson, 2014; Zirulnik, 2015). It was, therefore, seen to be easily disrupted by the presence of “others” (Zirulnik & Orbe, 2019). Culture was criticised as cultivating masculine discourses on gender stereotypes, perpetuating negative myths regarding women pilots’ skills and *natural* aptitude for flying. Such discourse was seen to result in the exclusion and isolation of women, and the reproduction of a gender-segregated culture (Davey, 1996; Germain et al., 2012; Gibbon, 2014c, 2014d; Neal-Smith, 2014).

Neal-Smith and Cockburn (2009) equated aviation culture to “cultural sexism” and compare it to “cultural colonialism.” Just as in cultural colonialism where “all cultures [are expected to] adapt to the British and American aviation

social systems with no allowance being made for any cultural diversity” (p. 33), cultural sexism expects that women will adapt to aviation social systems without allowances being made for gender diversity.

Militarism and its ideological bedfellow, patriarchy, are offered in the literature as the reasons why aviation maintains a gender segregated culture (Davey, 1996; Ferla & Graham, 2019; Gibbon, 2014a, 2014c, 2014d; Glover, 2000; Molloy, 2019; Neal-Smith & Cockburn, 2009; Wilson, 2004). As Mills (1988) explained, commercial aviation was built on the values and symbols of military aviation and linked “danger, bravery and masculinity” to images of heroism in war (p. 174). Associations with the military drove recruitment policies focused on hiring veterans, uniforms resembling those worn by military pilots and promoted a military *esprit de corps* (Mills, 1998).

While the history of aviation is intertwined with the military, the traditions of military culture also continue to permeate through the high number of pilots transitioning from the former to the latter (Gibbon, 2014c; Neal-Smith & Cockburn, 2009). Furthermore, as Glover (2000) stressed, culture and ideology also transfer back to the military through safety and Crew Resource Management (CRM) initiatives. When Davey (1996) conducted her research nearly two decades ago, fundamental attempts to change the culture of airlines had been implemented for some time, yet she found that a large percentage of aircraft captains had difficulty adapting their autocratic command style to those aligned with CRM principles. Zirulnik (2015) reported a cultural shift to a less militaristic style in aircraft command practices, although he suggests the training and procedures developed to instigate the shift do not adequately lead to a gender or racially diverse flight deck.

### **Cultural Barriers**

Formal national, institutional, and organisational barriers no longer exist to legally support women’s exclusion from pilot employment; however, concerns are raised in the literature that structural barriers have been replaced by cultural barriers (Davey, 1996; Foley et al., 2020; Gibbon, 2014a, 2014b, 2014c, 2014d; Glover, 2000). A significant number of studies in this review identified issues related to culture as responsible for many of the barriers women pilots face. Barriers related to culture include: heightened visibility, performance pressures, negative attitudes toward affirmative action, social exclusion, harassment, and at times assault (see Germain et al., 2012; Gibbon, 2014a, 2014b, 2014c, 2014d; Glover, 2000; McCarthy, 2017; Molloy, 2019; Opengart & Ison, 2016; Reynolds et al., 2014; Sulton, 2008, 2019; Yanikoğlu et al., 2020; Zirulnik & Orbe, 2019).

Masculine hegemony is identified as a significant cultural barrier. The hegemonic masculine stereotype is a strong, heterosexual male who is competitive, confident, independent, risk-taking, physically and sexually dominant, and who takes initiative (Connell & Messerschmidt, 2005). These attributes are associated with stereotypes of an ideal masculinity and are seen as dichotomous to other forms of masculinity and femininity. Hegemonic masculinity is underpinned by attitudes and practices that preserve and

legitimize power held by dominant men and that resist the inclusion of women. Hegemonic practices include the social exclusion of women from both formal and informal networks, bullying and harassment, and discrimination that excludes women from career advancement, leadership and access to prestigious positions (Ashcraft, 2005; Glover, 2000; McCarthy, 2017).

Cultural belief systems that perceive women and men to be dichotomously opposed were also seen to construct caring responsibilities, family commitments and health and wellbeing issues to be feminine concerns peculiar to women pilots and not aligned with industry values.

### **Adaptation to Culture and Gender Management**

Literature in the review concur that women pilots are expected to accept and adapt to the hegemonic masculine culture of aviation, or they are pressured to leave (Davey, 1996; Gibbon, 2014b, 2014c, 2014d; Glover, 2000; McCarthy, 2017; McCarthy et al., 2015; Mitchell et al., 2005; Neal-Smith & Cockburn, 2009; Ramsey & Ramsey, 1996; Zirulnik, 2015).

The literature highlights double binds where attempts to adapt to the culture do not work. Women who chose overt femininity appeased social norms but risked alienation; those who isolated themselves avoided hostility but exposed themselves to claims of uncooperativeness; those who challenged the culture were socially excluded (Gibbon, 2014c, 2014d). Both Neal-Smith (2014) and Zirulnik and Orbe (2019) recounted how women in their studies sought acceptance by allowing the men “to be men” while simultaneously censoring their femininity.

Allowing men to be men requires some participation in sexist and sexual banter as this is one of the most common forms of bonding in aviation (Gibbon, 2014c, 2014d; Glover, 2000). Banter is often deployed as a socialisation test to measure women’s adaptation to the culture (Glover, 2000). Being scored “one of the boys” was a mark of acceptance in Mitchell et al.’s (2005) study, and yet Foley et al. (2020) said that women in their study were unable to become one of the boys. Some studies found that women tend to adopt masculine beliefs and behaviours as a coping mechanism, whether consciously or unconsciously, either before commencing or very early into their careers (Glover, 2000; McCarthy, 2017; Mitchell et al., 2005) and a change of women’s attitudes correlative to their cultural exposure was noticeable for those that survived (Glover, 2000; Neal-Smith, 2014; Turney et al., 2002). However, the resilience and determination required to create and maintain a masculine facade eventually engender resentment and vulnerability, and women pilots’ attrition rates have, in part, been attributed to an inability or unwillingness to continue to fit in (Gibbon, 2014c, 2014d; Glover, 2000; Turney et al., 2002).

### **Attraction, Recruitment, and Selection**

The image of a pilot in the popular imagination as masculine, adventurous figures, coupled with the overwhelming absence of women pilots was seen to perpetuate the sociocultural perception that pilot roles are masculine (Ashcraft, 2007; Ferla & Graham, 2019; Gibbon, 2014a, 2014b, 2014c, 2014d; Glover, 2000; Henneberry, 2018; McCarthy, 2017; McCarthy et al., 2015; Neal-

Smith, 2014). Women were largely absent from fictional renderings in film, television, books, magazines and comics, and in general media such as news and advertising. Additionally, they are not commonly found in recruiting, education and government information; professional association and union material; and organisational publications (Ashcraft, 2007; Gibbon, 2014a, 2014c, 2014d; Glover, 2000). To further exacerbate the situation, women and girls with an interest in flying are often dissuaded by family who follow gendered cultural norms, or by teachers and career advisors (Henneberry, 2018; Neal-Smith, 2014).

According to Zirulnik (2015), airline hiring practices also perpetuate gender segregation in the industry through referral hiring. Those considered a “good fit” for the role are usually male (Gagliardo, 2020; Gibbon, 2014a, 2014c). In the military, where a pilot is also selected for suitability as an officer and for a warrior persona, the recruiting and selection culture is further compounded (Gibbon, 2014c, 2014d; Glover, 2000). Mitchell et al (2005) suggest that in the “closed shop” airline industry only women with the focus and drive normally attributed to men are willing to enter.

Pilot selection criteria generally include minimum education, qualification, experience and physical fitness requirements imposed by the organisation and/or aviation regulator, and psychometric testing (Mitchell et al., 2006). Ostensibly, pilot selection is objective; however, the literature identifies much cultural gender-based subjectivity in selection criteria. According to Neal-Smith (2014), most of the women in her study did not apply for positions they were qualified for because recruitment and selection processes were prohibitive. Unfortunately, equal opportunity measures designed to equalize recruiting result in assumptions that women are being unfairly advantaged by “political correctness” (Mitchell et al., 2005; Wilson, 2004). This is despite an emphasis on equal opportunity over affirmative action. The former aims to achieve diversity through eliminating discrimination in the recruiting and selection process while concurrently providing avenues to address occurrences of discrimination; the latter, through recruiting and selection quotas (Wilson, 2004). McCarthy (2017) and Henneberry (2018) both praised the use of affirmative action by airlines to significantly increase the number of women pilots, believing that the strategy will speed up cultural change. McCarthy (2017) does, however, caution that an over-emphasis on quotas risks the implication that women would otherwise not have been employed. Additionally, she recommends an emphasis on challenging the masculine culture to attract more women applicants in the first place. Other literature suggests increasing the number of women pilots to increase the numbers of role models, mentors, and peer supporters, and to facilitate outreach programs (Depperschmidt, 2008; Depperschmidt & Bliss, 2009; Ferla & Graham, 2019; Germain et al., 2012; Henneberry, 2018; Opengart & Ison, 2016).

### **Training**

The culture of training is identified as problematic in attracting minority individuals to aviation and progressing them through to employment,

particularly in isolated training environments (Davey, 1996; McCarthy, 2017; Molloy, 2019). Competitiveness in the training culture was found to be widely encouraged with survivors generally deemed as adapted to the aviation culture and suitably prepared to cope with the anticipated cultural barriers in their future careers (Davey, 1996; Gibbon, 2014b, 2014c, 2014d; Glover, 2000; McCarthy, 2017).

The review allows some temporal tracking of significant changes in the literature regarding women's adaptation to the training, and the onus of responsibility for successful gender inclusion. For example, Ramsey and Ramsey (1996) note that flight instructors have "a formative influence on the attitudes and behaviours of new pilots" (p. 1), and that the actions of the former "can either reinforce the existing culture" (p. 10) or influence cultural change. Finding that the minority of female instructors tended to conform to aviation culture, they recommended, in line with "many executives in aviation," the need for cultural change in training (p. 1), placing the onus on women instructors to collectively choose to "shift the culture." Sitler (1998) acknowledges the influence of flight instructors, recommending they focus on demonstrating safer flying habits and provide a less militaristic environment that is "safe [and] fear-free" (p. 104). Concurrently, she also implicates women in the need to fit into the culture by becoming more assertive, taking classes to make them aware of their gender difference in speech, and "replace tears with positive responses" (p. 106).

Davey's (1996) work shifted responsibilities from women to men, saying that unless men changed their attitudes and behaviours, the pernicious culture within aviation training establishments would continue. While progressing the discussion beyond the problem of women these statements continue to emphasize the role of the individual as opposed to the role of culture. In this vein, Vermeulen (2009) suggested an understanding of gender-related pilot behaviour be incorporated into instructor training material as a means to shift the burden away from individuals. McCarthy (2017) extended analysis, further arguing that women's disproportionate disadvantage in aviation training comes not specifically from their minority status, but rather from the overall cultural context. Within this context, she contends, women's gender remains irreconcilable with their professional identity.

### **Undue Stressors**

The stress of piloting an aircraft is not unexpected by anyone choosing to follow that career (Glover, 2000). However, the many, varied, and often unnecessary, stressors not directly related to aircraft handling perhaps less so. Women student pilots were led to believe pressures inherent in flying rationalizes its male dominance (McCarthy et al., 2015) and any additional pressure to perform well was self-imposed (Davey, 1996) - but Davey (1996) and Molloy (2019) contended that stress is created and compounded by issues such as high visibility, sexism and isolation in the training environment.

McCarthy (2017) reported that women student pilots recognize stressors inherent in their minority status and may discourage other women's pursuit of

flying based solely on the “emotional stress and trauma” (p. 159). Women in civil training adapted their behaviour in an attempt to manage minority status associated stress. Both Mitchell et al. (2006) and Robertson (2014) link men’s obstructive attitudes to women’s stress levels. Gibbon (2014c) found that men who privately acknowledged and/or apologized for the behaviours of the dominant group still succumbed to the cultural pressure to “publicly side with alpha males” (Gibbon, 2014c, p. 200) thereby missing the opportunity to challenge or change the culture.

Cultural inflexibility is identified in the literature as contributing to stress, and manifests on several levels: perceptions that women’s employment is contingent on affirmative action (Glover, 2000); undue pressure to prove one’s ability and earn the respect of male colleagues (Turney & Bishop, 2004); accusations that women’s accomplishments are not real, but given to meet quotas, or because of favoritism (Gibbon, 2014c, 2014d); or achieved through feminine beguilement (Depperschmidt, 2008); and, lack of flexibility in relation to women’s caring responsibilities (Davey, 1996; Gibbon, 2014a, 2014b, 2014c; Glover, 2000; McCarthy, 2017; Opengart & Germain, 2018; Opengart & Ison, 2016).

Managing a work-life balance is particularly challenging for women in long haul airlines (Opengart & Ison, 2016) and for military pilots (Glover, 2000) because of the negative perceptions linked to women’s caring responsibilities. Opengart and Ison (2016) attributed these system level problems to long established hegemonic operational and organisational structures. Work-life balance, domestic responsibility, and organisational scheduling practices disproportionately heighten pressure felt by women who are more likely to shoulder the burden of caring responsibility and household duties (Davey, 1996; Gibbon, 2014a, 2014b, 2014c; Glover, 2000; McCarthy, 2017; Opengart & Germain, 2018; Opengart & Ison, 2016). Yanıkoğlu et al (2020) found that the difficulties maintaining a work-life balance were increased after women became mothers.

### **Harassment**

While some of the literature in this review includes accounts from women in collegiate aviation programs who praise the support of their professors and the general amiability of most of their male colleagues, and gave examples of men modifying their behaviour to be considerate of women (Kristovics et al., 2006), many reported concerning instances of sexual and gender harassment (Depperschmidt, 2008; Depperschmidt & Bliss, 2009).

The literature concurs that “pranks and humour” and being able to “take a joke” (Davey, 1996) often disguise gender harassment (Foley et al., 2020). Gibbon (2014c) describes a situation where a high performing woman pilot was the subject of a competition to determine “who could last the longest without speaking to her” (p. 199). Although similar in nature to the teasing bounced between male pilots, women are often subjected to more pointed and/or sexual comments (Davey, 1996), deliberate social exclusion strategies (Gibbon, 2014c) and outright hostility and bullying (Mitchell et al., 2005, p. 52). In a

study mentioned by McCarthy et al. (2015), half of the men surveyed had observed a colleague using derogatory language (p. 36) towards a woman pilot, but rationalized it as understood by all to be in jest.

Depperschmidt and Bliss (2009) relayed accounts of women student pilots being faced with offensive and exclusive language which challenged their participation in aviation programs. Throughout Gibbon's (2014c, 2014d) very long list of quite disturbing incidents, it was gender bullying that prevailed over sexual harassment during and post training. Foley et al. (2020) found gender harassment was perpetrated at a near constant rate at all levels of the aviation industry.

Women are more likely to encounter sexual and gender harassment than men and women in male dominated occupations the most of all (Foley et al., 2020). They define gender harassment as a form of harassment resistant to the threat of changing otherwise strong cultural norms that exist in male dominated industries. They found that gender harassment was under-reported. This is likely because of a lack of understanding by women, witnesses and management of behaviours that encapsulate gender harassment. Conversely, the women in Yanikoğlu et al.'s (2020) study understood the nature of gender harassment they endured, but would not report for fear it would impede their career. Depperschmidt (2008), Davey (1996), and Gibbon (2014c) all report that women who did raise concerns found that their grievances were dismissed and/or the women were targeted for further harassment.

For some women, harassment is the "most corrosive aspect of their daily workplace experience" (Foley et al., 2020, p. 9). The impact of harassment on flying has been described as profound, and has been directly attributed to women failing flights and being removed from pilots' courses (Gibbon, 2014c, 2014d). In its extreme form, sexual harassment includes sexual assault. Two studies in this review identified instances of sexual assault (Gibbon, 2014c, Foley et al., 2020). However, more women were found to be exposed to subtle and unspoken forms of discrimination (Opengart & Germain, 2018).

### **Flight Safety**

In the pioneering days of aviation, women pilots were used to promote flight as a safe recreational pursuit - "if a woman could fly a plane then anyone could" (Glover, 2000, p. 91). A century later many male pilots believe women to be less safe (Kristovics et al., 2006; Mitchell et al., 2006; Mitchell et al., 2005; Vermeulen, 2009).

Much of the literature agrees women pilots face gender-based issues on the flight deck. "Males have specific perceptions about women, and bring those perceptions into the cockpit" (Robertson, 2014, p. 94). Men recognize women pilots by gender before profession and hold a belief that gender has a negligible impact on CRM yet "there is no doubt that the cultural environment has an influence on women's ability to fly at their very best" (Gibbon, 2014c, p. 232).

The literature recommends exploring culture further: "Only when a complete and accurate picture of how various subsets of the pilot population

view gender-related pilot behaviour is obtained can the roots of such attitudes be identified and addressed” (Reynolds et al., 2014, p. 109).

The literature also recommends re-evaluating current CRM training from a gender perspective to determine the impact women pilots having to manage their gender has on flight efficiency and safety (Cline, 2018; Mitchell et al., 2006; Robertson, 2014; Turney & Bishop, 2004; Wilson, 2004; Yanıkoğlu et al., 2020). Wilson (2004) asserts it is of “paramount importance” that the effects of gender biases, attitudes, and beliefs are addressed in a “proactive rather than a reactive manner.” She is joined by Neal-Smith and Cockburn (2009), Robertson (2014), Walton and Politano (2014), Yanıkoğlu et al. (2020), and Zirulnik (2015) who all recommend future CRM training includes mitigating against cultural gender bias.

### **Cultural Reform**

The literature concurs that a detailed awareness and understanding of the societal, organisational and occupational context of the factors that impact women is key to initiating cultural change (Gibbon, 2014b, 2014c, 2014d; McCarthy, 2017; Sitler, 2004; Sulton, 2008; Turney et al., 2002; Turney & Bishop, 2004; Yanıkoğlu et al., 2020; Zirulnik, 2015; Zirulnik & Orbe, 2019).

While McCarthy (2017) suggested women pilots currently in the system must initiate change, other literature in the review recommends that a successful cultural shift requires “complete and unequivocal” commitment (Cline, 2017, p. 65) at all levels of leadership across all sectors of aviation organisations (Cline, 2017; Germain et al., 2012; Gibbon, 2014b, 2014c; Robertson, 2014).

Gibbon (2014c) suggested commitment to cultural change will require some affirmative action. While affirmative action has reportedly caused great dissent among men and women pilots (Davey, 1996; Germain et al., 2012; Kristovics et al., 2006; McCarthy, 2017; Walton & Politano, 2014; Wilson, 2004), Gibbon argues resentment generally arises when inequitable tactics are not supported by an overarching diversity protocol.

In 1998, Sitler declared only national and institutional initiation of, and/or buy-in to, aviation diversity programs will weaken resistance to change. Proponents of critical mass theory argue that if women pilots already in the industry are provided opportunities to take up previously withheld operational, training, management and leadership positions, they would become the role models, mentors and decision-makers needed to continue the process (Cline, 2017, 2018; Davey, 1996; Depperschmidt, 2008; Depperschmidt & Bliss, 2009; Ferla & Graham, 2019; Germain et al., 2012; Gibbon, 2014b, 2014c, 2014d; Glover, 2000; McCarthy et al., 2015; Neal-Smith & Cockburn, 2009; Opengart & Germain, 2018; Yanıkoğlu et al., 2020). Yet past initiatives have failed to make a significant difference (Davey, 1996; Gibbon, 2014b, 2014c, 2014d; Neal-Smith & Cockburn, 2009; Sitler, 1998). Assuming cultural barriers will fall away simply by increasing the number of women pilots ignores the considerable influence of organisational, institutional and societal cultural norms (McCarthy, 2017).

### Closing Thoughts

Mills and Mills (2006) argued that, by understanding how culturally gendered practices within aviation are developed and maintained over time, we may also identify avenues for change. After reviewing literature exploring the lived experiences of women pilots over 25 years, it is clear that although there has been some change to the nature of resistance, resistance to the acceptance of women pilots continues. We reviewed 44 pieces of literature and determined that Major Bateman's (1987) battle against the image of the pilot exhibiting the traits of Wolfe's (1979) right stuff, is still being fought.

The literature posits some explanations about the slow rate of cultural change in aviation, arguing that cultural change at an individual level is deeply embedded into occupational identity (Ashcraft, 2005; Davey, 1996; Gibbon, 2014b, 2014c, 2014d; Glover, 2000; Wilson, 2004). Therefore, while social and individual factors influence a pilot's attitude and behaviour, the pressure to uphold a particular occupational identity comes from within the culture of the piloting profession (Mitchell et al., 2006).

While pilot identity has been strongly associated with militarism, Zirulnik and Orbe (2019) argue that the "mythic, cultural, and social construction" of *pilot* arose from the need to sell aviation to the public as a safe means of travel (p. 78). Achieved through the image of a confident white male this gender specific profile is said to be continually reproduced and reinforced by the brotherhood of pilots (Glover, 2000; McCarthy et. al., 2015; McCarthy, 2017; Wilson, 2004; Zirulnik & Orbe, 2019). Glover (2000) argues that identity is performed in the context of local occupational, organisational and societal expectations.

Meek's 1988 influential study on culture determines that while "individuals create and reproduce culture" they do not do so in a vacuum. Therefore, sociocultural change within greater structures of society is required to influence organisational cultures (p. 460). The impact of patriarchy as an ideological social system based on male dominance and power should be included in studies attempting to understand gender segregation in aviation. While some authors have included the concept, and there is some consensus that patriarchy as a social system impacts gender equality, exploring women pilots' experiences through patriarchal theories currently lacks cogency (Davey, 1996; Gibbon, 2014b, 2014c, 2014d; Glover, 2000; McCarthy, 2017).

Typically, patriarchal beliefs include women's unsuitability to masculine ideals, domestic and social subordination, impotence to male sexuality and violence, reliance on male protection, and subjugation to social and economic exploitations. The connections between male dominance and authority are recognisable in Western society's hierarchical power structures, observable in male cognition and discourse and operational in the military and other social institutions. Yet, recognition that aviation culture is a reflection of the temporal patriarchal society in which it exists is not explicitly addressed in the literature. Rather, the literature speaks to the enduring masculinity of the pilot identity and the hegemony that resists change without this

acknowledgement (Ashcraft, 2005; Davey, 1996; Gibbon, 2014c, 2014d; Glover, 2000; McCarthy, 2017).

Reflecting the broader cultural norms of a patriarchal society, the pilot occupation remains designated *masculine*. The myth of pilot right stuff is perpetuated within and reflected back into the industry by society in the form of popular culture. The hegemonic culture of aviation continues to consciously and unconsciously impose barriers to the attraction, recruitment, selection, training, employment, retention, and promotion of women pilots. Women pilots continue to face inordinate gender-based stressors that affect not only their general wellbeing, but their ability to fly at their best. Women pilots succeed in the industry by adapting themselves to the culture. In doing so they inhibit change to the culture. While the easing of some gender challenges was apparent, consensus in the literature is that in the absence of cultural change, women will continue to face structural barriers and cultural disadvantages.

Attempts to rectify the traditionally homogenous work environment have been hindered by gender bias that discourages women from joining the industry in significant numbers. It is problematic that recruitment practices continue to target candidates on the basis of *fit* with the aviation culture. Both men and women are expected to adapt to the extant organisational and occupational cultures and are accordingly socialized, both formally and informally, throughout their careers (Glover, 2000; McCarthy, 2017; Mitchell et al., 2005). This reproduction of culture is also problematic. Indeed, assuming barriers will fall away simply by increasing the number of women pilots (Neal-Smith & Cockburn, 2009) ignores the considerable influence of societal and cultural norms (McCarthy, 2017). In the past, the introduction of women pilots and various management initiatives to accommodate them in both civil and military aviation have failed to negate cultural barriers (Davey, 1996; Gibbon, 2014b, 2014c, 2014d; Sitler, 1998).

The risk of current gender segregation patterns in aviation is that they are likely to perpetuate further gender imbalance. Further research is required that addresses this risk and how it might impact flight safety. Empirical studies that consider how a critical mass of women pilots can be achieved while concurrently addressing the dissolution of barriers specific to organisational cultures is therefore recommended.

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