

Cillie (Cäcilia) Rentmeister ©

“This is Your Captain Speaking – The Gender Factor in Aviation”

1. 2017: Breaking the six-percent Barrier

Voice from the cockpit: “Welcome aboard, ladies and gentlemen. This is your captain Andrea Amberge speaking...”

In the passenger cabin, actress Maria Furtwängler exclaims: “Shit, can I still get off this plane?”

Furtwängler quickly continues, explaining her reaction to a female pilot, “I wasn’t being misogynous in saying that. But my imprinted inner image of what a pilot should look like got the better of me.” In the interview she describes this airplane scene as an eye-opener about “unconscious bias” – conditioned prejudices, entrenched stereotypes also fostered by women against women.¹

Andrea Amberge welcomed her passengers on board that way almost 2,000 times, between 2000 and mid-2017. She became the first female captain to fly a Lufthansa Airbus A320 in 2004, and she was the first female captain on Airbus A340 long-distance flights (fig. 1).



*Fig. 1 Lufthansa's female pilots: Captain Andrea Amberge on Airbus.
(Photo English version only; courtesy of © Andrea Amberge)*

¹ Maria Furtwängler, interview by Deike Diening, “Slut Shaming habe ich ganz früh gelernt,” *Tagesspiegel* (March 21, 2017), <http://www.tagesspiegel.de/weltspiegel/sonntag/maria-furtwaengler-im-interview-slut-shaming-habe-ich-ganz-frueh-gelernt/19532912.html> (accessed March 21, 2017).

Lufthansa even sought the approval of the *Gesellschaft für Deutsche Sprache* (Germany's government-sponsored organization for language usage) to introduce the neologism *Kapitänin* (female captain).

However, even in 2017, neither women nor men have much opportunity to enjoy – or be alarmed – by a woman's voice coming from the cockpit. Captain Amberge is one of only about three percent of female commercial pilots worldwide, of six percent employed by Lufthansa, and of only six percent of aviatrixes all over the world.²

The division between "crew" and "cabin," between male and female domains, is virtually nowhere as evident as in a commercial airliner.³ In 2017, 3.8 billion passengers experienced this "gender gap."⁴ The door between the cockpit and passenger compartment separates these two worlds, with a gender pay gap along as a silent passenger; the gap divides both wages and status, with men's jobs being predominantly technical and prestigious, and women's focused on looking after people.

Women have been piloting motorized airplanes since 1908.⁵ So we must ask why the average percentage of women pilots has not exceeded six percent in 110 years, especially given the fact that women have fought for equality and theoretically, at least, have access to all the classic "men's professions."

Pilot Andrea Amberge believes that the gender divide takes hold very early on in the game.

"Girls often don't even consider pursuing a technical career. They generally don't get much information about the many job opportunities in aviation. I am frequently invited to events as a role model, such as to two 'Girls' Technology Camps' at Siemens. The girls see for themselves that a woman pilot is a viable option—and a person just like you and me! Role models are extremely important, including in everyday life. For example, young women can talk to me personally, if they're search of a career and are at all "airminded." People in my neighborhood ask me if I'd talk to their daughters. Recently a girl approached me who, aged just 14, asked me some extremely focused questions about a career as a pilot."⁶

Furtwängler too believes in the power of role models for girls, and names a few gutsy movie heroines: "We are able to see examples, and suddenly things are possible! The slogan of the Geena Davis Institute puts it in a nutshell: "If she can see it, she can be it."⁷

² According to ISA statistics, cited in Hugh Morris, "Why are there so few female pilots?" *The Telegraph* (October 27, 2015), <http://www.telegraph.co.uk/travel/news/Why-are-there-so-few-female-pilots/>. Further statistics can be found, for example, at The Gender Gap Grader, <http://gendergapgrader.com/studies/airline-pilots/> (accessed June 25, 2017).

³ Donna Bridges and others, eds., *Absent Aviators: Gender Issues in Aviation* (Farnham/UK: Routledge, 2014), 165-167.

⁴ Statista: Statistik Portal, <https://de.statista.com/statistik/daten/studie/374860/umfrage/flugverkehr-entwicklung-passagiere-weltweit/>. The worldwide turnover for 2017 was estimated at 527 billion US dollars just for passenger flights.

⁵ In 1927 there were the exceptions, such as Lufthansa pilot Marga von Etzdorf and three American Airlines women pilots, <https://www.welt.de/reise/article161880530/Are-you-a-Madam-Sir-das-ist-der-Klassiker.html>. Further statistics are available at Gender Gap Grader, <http://gendergapgrader.com/studies/airline-pilots/>; and at Women of Aviation Worldwide Week, <https://www.womenofaviationweek.org/five-decades-of-women-pilots-in-the-united-states-how-did-we-do/> (accessed April 21, 2017).

⁶ Andrea Amberge, interview by Cillie Rentmeister, June 15, 2017, authorized transcript.

⁷ Cited in Rentmeister, transcript; Geena-Davis-Institute on Gender in Media, <https://seejane.org/>.

In the same interview, Furtwängler recalls how she used to tell blonde jokes and distance herself from other women, the “stupid ones,” by resorting to slut shaming, sort of along the lines of “there is me and then there are the other women.” She notes that Americans call this “internalized misogyny,” unconscious discrimination against women.

She thinks that doubting one’s performance is a typically female characteristic, and supports quotas for women as a “crutch.” She has often encountered women in leadership positions “who say that nothing has changed. The statistics for the last ten years speak for themselves.”⁸

Amberge’s and Furtwängler’s comments and attitudes are in keeping with actual research.

2. Destination Self-Confidence — Last Flight “the Eleventh Hour”

The example of female pilots provides ample evidence for anyone looking at how social gender identity is constructed, and what or whose interests it serves; or at how the masculine desire for hegemony (R. W. Connell’s hegemonic masculinities) is entwined with prestigious, innovative technology; how the gender order is forcefully perpetuated, mainly in the manifold ways in which girls and women are discouraged; how stereotypes, and conscious and unconscious prejudices, wield power in both(!) genders. In aviation, an international industry, gender segregation is extreme, and even today, it is one of the most prestigious male domains.

2.1 „Absent Aviators”

Absent Aviators is the title of a 2014 volume and probably the first comprehensive scholarly publication on the question of “why so few?” - “why so few women pilots?”

For the publication, the twenty-five authors, all women, viewed hundreds of studies from the United States, Britain, Canada, South Africa, Norway, and Austria.⁹

The details reveal remarkable differences from country to country. As far as flying skills go, however, men and women score equally well, albeit sometimes in different ways. Men and women are equally safe pilots. The differences lie in the details. Aviation accidents in the case of male pilots are frequently linked to over-confidence in their own ability, or to being more easily distracted and inattentiveness. The cause of accidents in the case of women pilots tend to lie more in operating errors. While women pilots have slightly more accidents, the consequences are not as severe. There are more deaths in accidents when males pilot the planes.

The bottom line to the study is that still today “aviation is a dominant masculine occupational culture supported in the context of gendered organizations and

⁸ Cited in Rentmeister; cf. the *IAB-Kurzbericht* from 2011 to underscore the truth of these findings, <http://doku.iab.de/kurzber/2011/kb0311.pdf> (March 16, 2017).

⁹ Bridges, and others (eds.): *Absent Aviators: Gender Issues in Aviation* (Farnham/UK: Routledge, 2014).

continues to keep many jobs segregated on the same gender lines as was common in the early post-Second World War period.”¹⁰

The profession of female pilots most strongly impacted—and most prominently visible.¹¹

These two key “barriers in the sky” have been identified: girls and women continue to suffer from a gender-specific “confidence gap,” owing to the persistence of damaging gender stereotypes and frequently unconscious prejudices in both sexes about women and technology.¹² And secondly, there is an absence of role models to build confidence in both history and the present.

There has been research on these barriers since the 1970s. Girls lose the confidence in becoming anything they want early; between seventh and ninth grade it decreases by three-and-a-half times as much as in boys.¹³ Until the age of twelve, their dreams are still as ambitious as those of boys; they too want to become engineers or pilots. After that, however, most girls restrict their ideas about careers, especially in Germany, by the way. Here “more than half the girls within the dual education system choose only ten different vocations, none of which are related science or technology.”¹⁴

The conclusion is that girls must be encouraged and receive support before they reach the age of twelve, because that is “the eleventh hour.”

Talent and ability have no gender. The 2012 PISA study confirmed this in “The ABC of Gender Equality,” with A, B, and C standing for aptitude, behavior, and confidence. Culture and the education system make the crucial difference. In Asian countries “girls perform on a par with their male classmates in mathematics and attain higher scores than all boys in most other countries and economies in the world.”¹⁵ However, in the West, where girls likewise increasingly achieve excellent STEM results at school, they still do not dare to pursue a technical career.¹⁶ The number of women in Germany pursuing a

¹⁰ Bridges, *Absent Aviators* 2014, 2.

¹¹ With about 8 percent, women engineers are midrange. By comparison, women air traffic controllers will soon be over 30 percent. In Germany 27 percent of air traffic controllers are women, see DFS Deutsch Flugsicherung, https://www.dfs.de/dfs_homepage/de/Unternehmen/Zahlen%20und%20Daten/Mitarbeiterstruktur/, (accessed April 4, 2017).

¹² The terms used in the context are “confidence gap,” “stereotype threat,” “implicit bias,” “unconscious bias.” Psychological experiments show that in tests taking place after negative input on the abilities of one’s own gender lead to significantly poorer results, while positive prior input produces equal results for both boys and girls, having the impact of self-fulfilling prophesy.

¹³ American Association of University Women (AAUW), *Shortchanging Girls, Shortchanging America*, Washington 1991 and 1994, 2nd Executive Summary, p. 7, <http://www.aauw.org/files/2013/02/shortchanging-girls-shortchanging-america-executive-summary.pdf> (accessed March 9, 2017).

¹⁴ See Lilly Beerman, Kurt A. Heller, Pauline Menacher, *Mathe: nichts für Mädchen? Begabung und Geschlecht am Beispiel von Mathematik, Naturwissenschaft und Technik* (Bern: Huber, 1992), 24ff. Cited in https://www.girls-day.de/Ueber_den_Girls_Day/Daten_und_Fakten/Statistiken_zur_Studien-_und_Berufswahl/Eingeschraenktes_Berufswahlspektrum (accessed June 25, 2017).

¹⁵ *PISA in Focus* 49 (September 2015) 4, OECD iLibrary, www.oecd-ilibrary.org/docserver/5js4xfhhc30-en.pdf?expires=1536655004&id=id&accname=guest&checksum=5890A4248D9E18306D204E68CEA5EF62 (accessed Sep. 11, 2018)

¹⁶ STEM: science, technology, engineering, math.

technical vocation has been stagnating at twelve percent for twenty(!) years.¹⁷ Only twelve percent of engineers are female in the United States. And the number of women working in the computer sciences there has even decreased, from thirty-five percent in 1990 to twenty-six percent in 2013.¹⁸

2.2 Why Should Girls Pursue STEM Careers?

But why should we entice gifted girls and women into pursuing STEM careers—apart from reasons of non-discrimination or equal opportunity? Because for corporations, gender diversity expands capability, improves production, and increases profits—as has been verified by Kinsey reports, studies carried out by Credit Suisse, and the research group working with Marcus Noland.¹⁹ Studies by the American Association of University Women (AAUW) indicate that women boost creativity, productivity, and innovation in business.²⁰ And because, in the face of international competition, countries like Germany and the United States cannot afford to do without the talents of women.²¹ On top of that, the aviation industry has a bright future ahead of it, with predictions of high growth rates; by 2027 there will be a demand for 255,000 new pilots.²² Correspondingly, the demand for a skilled workforce is growing in more than 30 other technical professions in aviation.²³ And ultimately, because choosing STEM professions would drastically reduce the gender pay gap for women.

On the second aspect, that of role models, we do perhaps know of Ada Lovelace, the first computer programmer. But who has heard of Margaret Hamilton, the young mathematician who developed the software for the first moon landing? For forty years, no one spoke of her. “Only now is she being celebrated on the Internet—with her, computer programmers began their march to conquest, the big bang of the digital era.”²⁴ Girls should learn about the following five role models while still in school. They represent countless others.

¹⁷ The BIBB (Bundesinstitut für Berufsbildung—Federal Institute for Vocational Training) observed in 2017 that the number of women choosing technical professions in the last twenty years has stagnated at 12 percent despite numerous subsidy and supporting programs. See Stephan Kroll (BIBB), “Technikberufe: Nicht immer nur reine Männersache,” *BWP*, February 2017, <https://www.bibb.de/veroeffentlichungen/de/bwp/show/828Z>, (accessed May 17, 2017).

¹⁸ Christiane Corbett, Catherine Hill, *Solving the Equation: The Variables for Women’s Success in Engineering and Computing* (Washington: AAUW, 2015) 13.

¹⁹ Kinsey Report October 2007: “Gender diversity, a corporate performance driver,” and “Women Matter: Gender diversity, a corporate performance driver” <http://www.mckinsey.com/business-functions/organization/our-insights/gender-diversity-a-corporate-performance-driver>; see additionally Kinsey Report December 2016, “Women Matter: Reinventing the workplace to unlock the potential of gender diversity;” and Credit Suisse Research Institute (eds.): *The Credit Suisse Gender 3000, “Women in Senior Management”* (authors Julia Dawson, Richard Kersley, Stefano Natella), September 2014; Marcus Noland, Tyler Moran, Barbara Kotschwar, *Is Gender Diversity Profitable? Evidence from a Global Survey*. Working Paper Series 16-3, February 2016, <https://piie.com/publications/wp/wp16-3.pdf> (last accessed June 14, 2017).

²⁰ AAUW, *Solving the Equation*, 2015, IX.

²¹ AAUW, *Solving the Equation*, 2015, IX. STEM stands for Science, Technology, Engineering, Mathematics.

²² *Flugrevue* (June 21, 2017), <http://www.flugrevue.de/zivilluftfahrt/airlines/pilotenausbildung-studie-zum-personalbedarf-in-der-luftfahrt/726630> (accessed June 21, 2017).

²³ Comprehensive information on professions and wages, <https://www.career.aero/ausbildung/de/luftfahrt-berufe> (accessed March 1, 2017).

²⁴ DER SPIEGEL, no. 30 (2016): 100 ff.

3. 1911: Melli Beese, Berlin

On September 13, 1911, at Johannisthal Airport in Berlin, Melli Beese from Dresden was the first German woman to pass the test for piloting a motorized airplane.

She set records in flying and was celebrated by spectators as well as the press. At her flight training school, she also taught women, and her own firm constructed the "Melli Beese Taube" (dove).

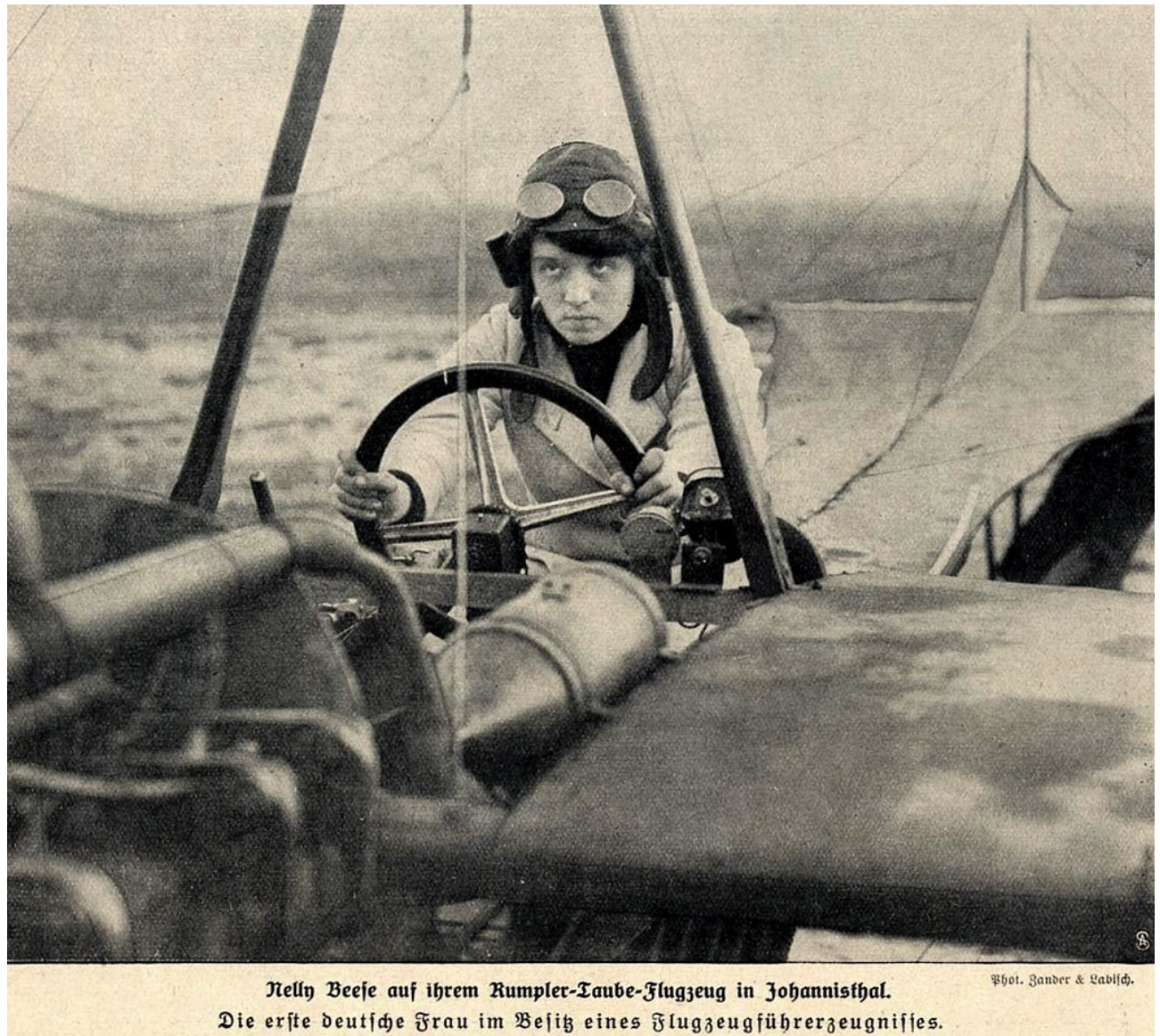


Fig. 2 The first German woman pilot of a motorized plane: Melli Beese on her Rumpler Dove 1911.

(Photo English version only; © Zander & Labisch, Public domain/Wikimedia Commons)

She registered her own patents, among other things for a folding and an amphibian aircraft (fig. 2 a, in German Print Version only). Even while she was learning to fly, Melli Beese was made to realize that women were not welcome. Initially she couldn't find anyone who was prepared to teach her, and then male trainee pilots were known to sabotage her aircraft, putting her in mortal danger. They jammed the steering mechanism, or secretly drained her fuel tank, so that

she had to make risky emergency landings. Her flying instructor told her that this was only logical, after all, as a woman pilot she was robbing men of their glory.²⁵

Gender order is also threatened in other ways. In numbers inconceivable for us today, millions of women's rights campaigners in the industrial nations from across the political spectrum organized and took to the streets of the cities, demonstrating in the hundreds of thousands. In Berlin alone, the capital of Germany, 45,000 women rallied for the first International Women's Day on March 8, 1911. Throughout Western Europe it was over a million people.

Middle-class girls shelved their embroidery frames, went outdoors, strapped roller skates onto their feet, and played loud games in full public view together with boys, games that demanded a lot of space and mobility (fig. 3). Else Ury's heroine in the girls' novel *Nesthäkchen* (Baby of the family) is, in 1913 Berlin, "a veritable tomboy," and she and her girlfriend Amanda roller-skated around "making as much noise as an express train."



Fig. 3 Roller skating woman and girl - probably in Berlin, ca. 1910.
(Photo English version only; © ullstein bild - Conrad Huenich/Timeline Images)

In the rapidly expanding city, girls discovered mobility on roller-skates, and skated in public alongside boys, "making as much noise as an express train."

²⁵ Günter Schmitt, *Die Ladys [sic] in den fliegenden Kisten* (Berlin: Brandenburgisches Verlagshaus, 1993), 59. For the probably most comprehensive evaluation of the situation of women in aviation in the German language see Wolfgang Meighörner, ed., *Die Schwestern des Ikarus: Frau und Flug* (Marburg: Jonas, 2004) [published for the 2004 exhibition with the same title at the Zeppelin-Museum Friedrichshafen]. A richly illustrated classic is Valerie Moolman, *Frauen in der Luft* (Amsterdam: Time-Life, 1982).

It is said of many women pilots that they loved sport as girls - such as Beese who was a sailor - and that they enjoyed playing wild games, were "risk takers" and "sensation seekers."

For a good number of hegemony-guarding men this was too much; too much was changing in the traditional roles of man and woman. In 1912, philosopher Oskar Schmitz lauded the "cultural value of war," claiming only a large-scale war could reestablish the old gender order, which had gone awry:

"In my opinion only a war can again raise the value of masculinity. A war would, in one fell swoop, dredge all these cultural swamps, and the men, who have left behind an addled home (these days, nearly all homes are addled owing to the demands of the women and the daughters) will deliver from the battlefield a convincing reply to all those issues that [these women] currently discuss at meetings and in books. Practical necessity and adversity will again demand that women return to their real nature, and all this public debate (...) will come to an end."²⁶

Schmitz was wrong. The sheer necessities of World War I dissolved the boundaries of traditional gender roles to a hitherto unimaginable degree. The wives of those millions of men dressed in field-gray uniforms had to do the technical work formerly carried out by men; they drove military hospital trucks and trams, screwed together military aircraft. And many of them found they liked it, discovering new sides to themselves in boiler suits and overalls, achieving an unusual freedom of movement, for which they had long yearned.

For the time being this put an end to women pilots in civil aviation, while the "ace pilots" now also imbued the pilot nimbus with a distinctly martial flavor - in all nations fighting in the war.

Melli Beese was certainly keen to make a patriotic contribution to the First World War with her aircraft construction projects. But then her French husband Charles Boutard was imprisoned by the Germans and she was also arrested. This began a tragedy that ended with her suicide in 1925. Beese's career was also doomed because aviation had become the domain of the military, and was thus finally made utterly "masculine."

4. Between the Wars: The Woman Pilot as the New Woman and Token

4.1

Not long after World War I, the international CINA resolution in 1924, male pilots — often surviving military pilots - reserved the cockpits for themselves in the lucrative emerging industry of civil aviation. All that remained for female pilots were competition flying and air shows - unreliable sources of income. This was paradoxical because women pilots simultaneously embodied internationally the ideal of the liberated, modern "new woman." They enjoyed the wide-scale acclaim of the press for risky long-distance and round-the-world flights.

²⁶ See Cillie Rentmeister, *Frauenwelten—Männerwelten* (Opladen: Springer, 1985), 178-179 and 214 ff., chap. 6 "Körper, Kleider und Geschlechterkampf." (Bodies, dress, and the gender struggle).

The situation was especially paradoxical in Nazi Germany. There, women were pressured to go back to "the heroic vocation of motherhood as predestined by nature." Yet at the same time, those dashing young German girls (*schneidige Deutsche Mädel*) and their long-distance flights were officially celebrated for enhancing Germany's international importance in aviation.²⁷

4.2 1937: Amelia Earhart

Networking and solidarity among women pilots in the United States grew in the period between the two World Wars instead of being quashed as in Nazi Germany. The pilot Amelia Earhart was, at the beginning of the 1930s, the only person who had flown across the Atlantic twice. She became a role model for women, and a heroine in the eyes of both men and women worldwide for her courageous achievements, her modesty, her photogenic quality, skilled handling of the media, her eloquence, and the clever publicity strategies of her husband Charles Putnam. Throughout her life, she took to heart the issue of encouraging girls and women to become free and self-confident, which she perceived as the deeper meaning of her flights.

In 1929 she flew in the legendary Powderpuff Derby, a transcontinental air race between twenty-nine women pilots. She also founded the first international organization for women pilots — The Ninety-Nines — which today, with 5,000 members, is the largest organization of women pilots in the world.



Fig. 4 American aviator Amelia Earhart (1897-1937) standing by her Lockheed Electra dressed in overalls, with Fred Noonan getting into the plane in the background. Parnamerim airfield, Natal, Brazil, 1937
(Photo English version only; © Unknown author, via Wikimedia Commons)

²⁷ Evelyn Zegenhagen, "Schneidige deutsche Mädel": Fliegerinnen zwischen 1918 und 1945 (Göttingen: Wallstein, 2007).

She was always aware of her “token” status, of being an exception and a symbolic figure.²⁸ When she flew she was, so to speak, on show for all to see. Each of her achievements was closely scrutinized. If all went well, she benefited from that status, just like other women pilots; she had easier access to broad press coverage and was able to accomplish more “firsts.” The disadvantages soon became apparent, however, when something went wrong. A failure by one female pilot was immediately generalized as evidence that women were incompetent as pilots. What Earhart had to say about this was that “[women] must pay for everything (...). They do get more glory than men for comparable feats. But, also, women get more notoriety when they crash.”²⁹

In 1937, she noted in her diary how women should cope with failure, shortly before she started out to circumnavigate the globe, and disappeared somewhere over the Atlantic.

“Women, like men, should try to do the impossible. When they fail, their failure must be but a challenge to others.”³⁰

Almost eighty years later, another woman took to the stage to encourage other women and girls with a postscript from the twenty-first century. What she says seems to echo Amelia Earhart:

“We can reignite the revolution by internalizing the revolution. The shift to a more equal world will happen person by person. We move closer to the larger goal of true equality with each woman who leans in.”³¹

Sheryl Sandberg is also a token, as Facebook’s CEO and seventh in Forbes’ 2016 ranking of World’s 100 Most Powerful Women. She calls her best seller *Lean In* a “feminist manifesto.”³² On tokenism, she comments in an interview how “it is interesting to observe that within groups that have historically been seen as minorities that - as soon as this minority arrives at the center of power - it initially adopts the characteristics of the majority and, by doing so, discriminates against its own minority group.”³³

Amelia Earhart and Sheryl Sandberg have no need to disassociate themselves from other women in this way.

²⁸ Rosabeth Moss Kanter, in *Men and Women in the Corporation* (New York: Basic Books, 1977), evolved the concept of tokenism for the behavior of minorities toward the majority in groups. Members of a group who differ from the rest by a key characteristic (such as gender) are seen as “tokens” if they are, in numbers, under the critical mass of 20 percent. They stand out much more than the others in every situation, are constantly scrutinized closely, and their achievements as individuals are understood to represent the entire minority group.

²⁹ Amelia Earhart quotes, <http://ameliaearhart.com/quotes/>, <http://collections.lib.purdue.edu/aeearhart/>, <http://www.purdue.edu/uns/x/2009b/091019CordovaEarhart.html> (accessed May 10, 2017).

³⁰ See Gertrud Pfister: *Fliegen—ihr Leben: Die ersten Pilotinnen* (Berlin: Orlanda Frauenverlag, 1989), 198.

³¹ Sheryl Sandberg, *Lean In: Women, Work, and the Will to Lead* (Random House, NY, 2013), 11-12.

³² *ibid*, 10.

³³ Cited in Miriam Stein: “Wir müssen zuerst die Stereotypen verändern” (First we must change the stereotypes), interview with Sheryl Sandberg, *Süddeutsche Zeitung* April 23, 2013), <http://www.sueddeutsche.de/karriere/sheryl-sandberg-ueber-frauen-und-karriere-wir-muessen-zuerst-die-stereotypen-veraendern-1.1656285> (accessed June, 2017).

5. 1942: Unsung Heroines

Joan Hughes is pictured here in England standing in front of the Stirling Bomber she has just landed (fig. 5). She stands for so much more - for almost 1,250 women pilots of two women's organizations in the United States and Great Britain who can boast of having made a significant contribution toward fighting the war. That should have, once and for all, done away with the stereotypes and prejudices about the "weaker sex." However, it was only a few years ago that the achievements of these women were duly acknowledged so they will finally go down in the annals of history.



Fig. 5 Woman Airforce Service Pilots (WASPS) after training with B-17 Flying Fortress around 1944.

(Photo English version only; © U.S. Air Force photo, Public domain, via Wikimedia Commons)

While 166 women pilots flew for the British ATA (Air Transport Auxiliary), a civilian unit, 1074 women piloted for WASP (Women Airforce Service Pilots) in the United States.³⁴ Behind the front lines, these women undertook extremely dangerous transport flights. On average they flew a wider variety of aircraft types than men - everything from single-seat fighter aircraft to four-engine bomber aircraft. Fifty-three women pilots were killed.

³⁴ Information page with documentary film, Aviation America, "Women Airforce Service Pilots: Fighting for America and Against Discrimination," <https://sites.google.com/site/aviationinamerica/home/wasp-women-airforce-service-pilots> (accessed May 5, 2017).

On the Soviet side, women with the status of military pilots flew in their own night-bombing squadrons, including combat operations on the front. German soldiers feared them, decrying them as "night witches."

"Too weak, too unstable." Women pilots were yet again disproving the biases protecting male interests. The ergonomic argument, which still prevents access for women to certain cockpits today, also proved to be a fallacy - that they were "too small." In Nazi Germany Hanna Reitsch, who was just 1.55 meters tall, was a test pilot for rocket-powered aircraft, and participated in barrage balloon defense operations, among other achievements. Her services and propaganda impact were seemingly so important to the war effort that Hitler appointed her the world's first female airline captain. (Reitsch is mentioned here only in the context of her height. In no way is she to be referred to as a "heroine"). ATA pilot Joan Hughes became an aviation instructor when she was only 24 years old and flew all types of aircraft; she too hardly reached 1.55 meters.³⁵

In the 1920s and 30s, aircraft companies were glad to have women pilots demonstrate their new machines. They wanted it to look like "even a woman could fly it," effectively communicating that the aircraft must be very safe and easy to operate.

The instructor Paul Tibbets utilized the psychology of traditional gender patterns to challenge the male ego in an attempt to boost the courage of male pilots. In June 1944, he had the task of training pilots for the new four-engine long-range bomber aircraft B-29 Superfortress. At the time, this was the largest and heaviest bomber aircraft in the world. However, the men refused to fly the machine when it turned out that the engines of the plane were prone to catch fire.

Tibbets therefore recruited two WASP aviatrixes, Dora Dougherty and Dede Moorman, to fly demos of the Superfortress at several air force bases - alone. Another WASP pilot described the rationale behind this:

"(...) The men would see them land the plane and get out. That would give them second thoughts, when they saw a woman flying the plane!"

It worked and the men got back into the B-29 cockpit. But the successful flight demonstrations were halted after just a few days. Tibbets' boss, General Barney Giles, told him that it would not do - his women were "putting the big football players to shame!"³⁶

At the end of World War II, the women pilots of the Allied Powers, like other women, were banished back to traditional female roles. "Pilot jobs in a rapidly expanding commercial aviation were made available to returning airmen. (...)

³⁵ <http://afleeetingpeace.org/the-ata/index.php/2-uncategorised/31-w011-joan-hughes> (accessed May 4, 2017; no longer available). The original stipulation for the WASPs of having to be at least 1.60 meters tall was further lowered as early as 1943. Those who were too small had already found ways of being accepted anyway. With a grin on her face, WASP veteran Margaret Phelan Taylor confesses that she stood on her toes. When she arrived at Avenger Field in Texas where most of the WASP aviatrixes were being trained, she saw to her surprise that many of them were not taller than her, and they laughed together about how they managed to sneak in anyway. Susan Stamberg, "Female WWII Pilots: The Original Fly Girls," March 9, 2010, <http://www.npr.org/2010/03/09/123773525/female-wwii-pilots-the-original-fly-girls>, (accessed May 2, 2017). Important note: Reitsch is mentioned here only in connection with height. Under no circumstances should she here be referred to as a "heroine".

³⁶ Cited from <http://cotteyphile.com/dora/> and <http://www.pbs.org/wgbh/amex/flygirls/sfeature/waspsb29.html> (accessed May 2, 2017).

Women (...) were denied authority over men. Men retained their 'monopoly of the handling of technical objects and machines' (Bourdieu)" - in the lucrative jobs within the aviation industry.³⁷

The WASP pilots were denied military status even during the war. The women pilots had to collect money among themselves to transport home the coffins of comrades who were killed and, when the WASP and ATA organizations were disbanded after the war, they had to pay for their own tickets home. After the war was over women, pilots received neither the honor nor the benefits of war veterans. Their achievements were doomed to be forgotten immediately. It was not until 1977 that they were granted the status of veterans, after a long fight. Indeed, it was not until March 2010 that the 200 WASPs still alive, mostly in their nineties, were awarded the Congressional Gold Medal in Washington. The House Speaker Nancy Pelosi said, "Women Airforce Service Pilots, we are all your daughters; you taught us how to fly."³⁸

The fact that the WASPs are now included in the history books as role models is owing to women pilot organizations such as the Ninety-Nines. Many of the WASPs were and are members. It is also thanks to the unabated strength, assurance, and sense of tradition of women's organizations in the United States. The AAUW, founded in 1881, has already been cited. The National Women's History Project - Writing Women back into History (NWHP) is one of the organizations that is working on raising historical awareness:³⁹ "History helps us learn who we are, but when we don't know our own history, our power and dreams are immediately diminished."⁴⁰ Each year in March, the NWHP organizes National Women's History Month, with programs and ceremonies at schools and universities, in businesses and for the general public. In 1980, Jimmy Carter underscored the significance of this annual event by quoting the historian Gerda Lerner: "Women's history is women's right."

Germany and Europe could well use such a month. It would provide some answers to the questions of what part women have played in Europe's achievements and what the cultural legacy of women is. It would also help in dismantling stereotypes and prejudice against women.

6. 1977-2017: Threshold Barrier Unbroken

6.1

When in 1977 a British two-women-crew piloted their airliner to "a perfect landing" (*Berliner Zeitung*) in Dusseldorf, Lufthansa commented that "in German

³⁷ Bridges, *Absent Aviators* 2014, 3.

³⁸ WWII Female Pilots Honored with Gold Medal NPR story, March 10, 2010, <http://www.npr.org/templates/story/story.php?storyId=124533914>; the same late tribute was paid to the ATA aviatrixes, see *Daily Mail* article "Britain's Spitfire Pilots," <http://www.dailymail.co.uk/news/article-516816/Britains-FEMALE-Spitfire-pilots-receive-badge-courage-last.html> (accessed May 4, 2017).

³⁹ National Women's History Project: Writing Women Back into History, <http://www.nwhp.org/2018-theme-nominations/> (accessed May 28, 2017).

⁴⁰ <http://www.nwhp.org/> (accessed May 12, 2017).

airliners there will be no only female crews in future" because "women are somehow more delicate."⁴¹

At Lufthansa it took an especially long time - until 1988 - before two women pilots climbed into the cockpit. "The German Trade Union Confederation called the German parliament in 1987 because of Lufthansa's open discrimination against women, whereupon the airline, as a state-owned company, took immediate action (...)."⁴²

In 2017, legal barriers to careers for women were dismantled in many countries. The percentage of women airline pilots has nevertheless stagnated at around three percent worldwide, with Lufthansa at six percent.

Why?

In *Absent Aviators*, almost ten percent of the female pilots reported that they experienced bullying, sexual harassment, and open hostility.⁴³ Virtually all of them found the implicit prejudice oppressive. They are under intense scrutiny and must be equally good or even better than their male colleagues—they must constantly prove themselves in order to find total acceptance. Many had to learn that "they must choose to be respected but not liked, or liked but not respected."⁴⁴ Male pilots - mostly the older ones - bother the 'tokens' with their sexist remarks, or the wisecracks typical for a misogynistic, masculine culture like: "if women were meant to fly, the sky would be pink."⁴⁵

Women astronauts also have to deal with cyber bullying and the eternal "special questions for women," things which men would never be asked, such as questions about their partners, their family, if they want children, making babies in outer space, menstruation, and hygiene, along the lines of, "women should be rejected for space flight (...) If your tampon burst while you were in space, the entire spacecraft will be spoilt."⁴⁶

Eurofighter pilot Nicola Baumann was chosen in 2017 to become the first German female astronaut. She was asked by the head of the business news section of the German weekly newspaper *ZEIT* about her "long-distance jet relationships," and twice about wanting to have children in the future because, the interviewer said, she was working in a field "(...) in which I can imagine that being a mother is pretty difficult. For example, when I think of space travel there are probably serious hurdles (...)."⁴⁷

⁴¹ *BZ Berlin* (November 1, 1977). As if women pilots had not just evidenced the very opposite, and then, in the early 1960s, the "two Jacquelines," Auriol and Cochran, broke the sound barrier, and, in 1963, the Russian woman cosmonaut Valentina Tereshkova orbited the world solo for three days.

⁴² Evelyn Zegenhagen, *"Schneidige deutsche Mädel": Fliegerinnen zwischen 1918 und 1945* (Göttingen: Wallstein, 2007), 445.

⁴³ In anonymous interviews, see Mitchell/Kristovics/Vermeulen in Bridges, *Absent Aviators* 2014, 181.

⁴⁴ Mitchell/Kristovics/Vermeulen in Bridges, *Absent Aviators* 2014, 182, 178.

⁴⁵ Bridges, *Absent Aviators* 2014, 2.

⁴⁶ MS Magazine Blog, September 25, 2013, <http://msmagazine.com/blog/2013/09/25/malaysian-woman-triumphs-over-cyber-bullies-in-race-to-space/> (accessed May 28, 2017).

⁴⁷ Dr. Uwe Jean Heuser, head of the *ZEIT* business news section, interview by Nicola Baumann, "Chefsache-Konferenz 2017 (Management conference)," June 22, 2017, <https://www.youtube.com/watch?v=rMvayzL924M>, transcript C.R.; translation R.S.

It is not uncommon for professional women pilots to react by either consciously or unconsciously adopting male beliefs and behavior on the job, so they are considered 'one of the boys' and left alone.⁴⁸

But how can we break the token threshold of six percent? One general conclusion in *Absent Aviators* is the importance of updating laws and corporate policies, as well as improving career opportunities for female pilots. And military aviatrixes have a positive impact on the image of what women can achieve. But tokenism is and remains a key problem. Not until the female cohort in aviation reaches critical mass will women be better accepted as professional pilots.⁴⁹

6.2 Make Girls Realize: "No Dream is Too Big!"

At this point, role models that empower women enjoy broad exposure on the Internet and social media. On YouTube videos featuring women pilots, ramp agents, and air traffic controllers are multiplying. Self-confident millennials film their first solo flight and all kinds of "firsts" with action cams, airlines advertise with their chic women pilots, and you can even fly with African, Arab, Japanese, and South American aviatrixes in cockpit view – it's encouragement in every language, because the female captains want to inspire girls and other women.

Fig. 6 (Photo omitted, in German print version only: The Air India all women crew of the world-record global circumnavigation with a Boeing 777-200 for International Women's Day on March 8, 2017.)

Every year, the airlines strive to outdo each other for International Women's Day on March 8.⁵⁰ In 2017, Air India won the publicity race with its world-record "all women crew" circumnavigation of the globe, with a stopover in San Francisco. Captain Kshamta Bajpai explained that men and women perform equally well as a team in the cockpit. After all, they are equally well trained and all hold the same license: "But yes, it puts a smile on your face when you fly with a group of women!"⁵¹ Air India holds another world record - 15 percent of its pilots are female.⁵²

⁴⁸ Mitchell/Kristovics/Vermeulen in Bridges, *Absent Aviators* 2014, 180.

⁴⁹ Mitchell/Kristovics/Vermeulen in Bridges, *Absent Aviators* 2014, 184.

⁵⁰ Crews comprising only women strengthen the message of solo flights by women. They are the ultimate proof that they can do it. For this reason, already in 1929, the aviatrixes competing in the Powderpuff Derby flying across the United States refused the offer made by the organizer that a pilot accompany each woman pilot for safety reasons.

⁵¹ "Air India felicitates all women flight crew," ETV Andhra Pradesh, <https://www.youtube.com/watch?v=boaat4OTOkY>, from min 0:56 (accessed May 13, 2017). Harpreet A. de Singh, Air India's head of security, managed the whole project. See *The Ninety-Nines Magazine* (May/June 2017): 24.

⁵² Recently Air India introduced rows exclusively for women on domestic flights to tackle harassment. <https://www.theguardian.com/world/2017/jan/17/air-india-introduces-female-only-rows-to-tackle-harassment>. Addition (English version only): gender-segregated public transport is practised in a number of countries, on the reasons and positive effects see Nato Kurshitashvili, Karla Dominguez Gonzalez, Muneeza Mehmood Alam: "Inclusive transport will be critical to women's empowerment - and to development as a whole", World Bank Blogs, May 11, 2018, <https://blogs.worldbank.org/transport/inclusive-transport-will-be-critical-women-s-empowerment-and-development-whole>, retrieved April 07, 2023.

Note June 2023: Typo from the German version corrected to 15 percent <https://www.outlookindia.com/business/air-india-says-15-of-its-total-1-825-pilots-are-female-pilots-news-268243>, retrieved April 07, 2023

Encouraging calls to girls also come from far above us – from women astronauts. They also present themselves and their missions on YouTube, garnering millions of clicks with their practical insights. These range from how to file your nails or brush your hair in outer space, to the inner workings of the International Space Station.⁵³



Fig. 7 European Space Agency astronaut Samantha Cristoforetti, attired in her blue flight suit, 2013.

(Photo English version only; source: <https://www.flickr.com/photos/nasa2explore/12778323323/>. NASA public domain /wikimedia)

Italian astronaut Samantha Cristoforetti sent a live message to all girls from the International Space Station (ISS).⁵⁴ She speaks to actress Susan Sarandon while letting a tablet showing a scene from *Thelma & Louise* glide past the camera.

"Susan, it was awesome to chat with you here from space! And it was great to learn how interested you are in girls and STEM, and how committed you are to help more and more girls find their way to science, technology, engineering, and math! And maybe in the future we can work together (snaps her fingers) and sparkle that passion and interest for STEM and show that no dream is too big!"

⁵³ Video with Suneeta Williams gets almost 10 million views, <https://www.youtube.com/watch?v=SGP6Y0Pnhe4> (accessed June 17, 2017).

⁵⁴ "A Space Shout Out from Samantha Cristoforetti," <https://www.youtube.com/watch?v=uC24qTZz7so> (accessed March 10, 2017).

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