

# Are there two pilots in the cockpit?

April 12 2018, by Eve Fabre

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Credit: Wikimedia, CC BY

Ever since the early days of commercial aviation, flight safety has steadily improved. Considering the number of flights, accidents are now extremely rare, and 70% of them are attributable to human factors. This has led to research in psychology, cognitive science and, more recently, in [neuroergonomics](#). Researchers have been investigating factors such as drowsiness, stress, attention, workload, communication, and cognitive

biases. One that has been surprisingly overlooked is that of social relations within the cockpit.

Commercial-airline crews are made up of one or two first officers and a designated leader, the captain. While all the pilots have the necessary skills to fly the aircraft, the captain is legally responsible for the [flight](#). They are more experienced, better paid and often significantly older than first officers. Before takeoff, the captain decides who will pilot the aircraft and who will monitor the instruments, checklists and communication. The power imbalance between the two creates a hierarchical system. Depending on the situation and the pilots' personalities, this imbalance can sometimes compromise communication and adversely influence decision making.

## **Power and cognitive bias**

Being in a position of power increases the risk of [cognitive bias](#). The halo effect – i.e., the tendency to judge people on the basis of their characteristics (such as ethnicity, age, cast, religion, etc.) or past events unrelated to the situation at hand – can severely affect captains. This happened in 2011 during the approach of [First Air flight 6560](#), when the relatively inexperienced first officer noticed that the aircraft was veering slightly off-course. The captain – who, unlike the first officer, had flown many times over the Arctic region – believed the instruments were simply adversely impacted by the proximity of the north magnetic pole. Blinded by his first officer's relative lack of experience, the captain ignored the latter's repeated warnings and suggestions to go around. The mistake proved fatal to the captain, the first officer and 10 passengers.

Captains can also be affected by the false-consensus bias – the tendency to believe that those around us approve of our ideas and actions to a far greater extent than is actually the case. Also, the higher a person's position in the hierarchy, the less negative feedback he or she will openly

receive from subordinates. Therefore, the greater the power imbalance between the captain and the first officer, the higher the risk of false-consensus bias in the cockpit.

## **First officers or passive observers?**

Captains aren't the only ones to be affected by this power imbalance. In the 1970s, a [study](#) carried out in a flight simulator showed that when the captains pretended to lose consciousness during a landing, nearly one in four first officers failed to take over the controls. Given the changes that have taken place in cockpit organisation since that time, it is unlikely that a new study would produce such worrying results. However, it demonstrates that under certain conditions first officers can feel less engaged, responsible or legitimate than the captain, and fail to react appropriately.

An overly authoritarian captain can severely exacerbate this tendency and even paralyse the first officers to the point that they become mere bystanders. This occurred during the crash of [Korean Air cargo flight 8509](#). The captain, a domineering former military pilot, made a catastrophic error. The first officer noticed but did nothing for fear of reprisal. The aircraft hit the ground less than 60 seconds after take off, killing everyone on board.



US Airways flight 1549 in the Hudson River, New York, on January 15, 2009. After the aircraft's engines failed and no airport was sufficiently close for an emergency landing, Captain Chesley Sullenberger, assisted by co-pilot Jeffrey Skiles, chose to set down in the Hudson. He kept the landing gear up, to allow the plane to land relatively smoothly. All 150 passengers and 5 crew members were brought to safety. Credit: Greg L./Wikipedia, CC BY

Finally, the halo bias can also affect first officers, who sometimes see the [captain](#) as all-knowing and infallible. They are less inclined to challenge the captains and more likely to bow to their decisions (conformity bias), which can have a negative effect on safety.

## What next?

So why not simply abolish hierarchy among pilots? There are sound reasons not to. First of all, the hierarchical structure has demonstrated, time and again, its effectiveness in cases of emergency. Take, for

example, the January 2009 landing of [US Airways flight 1549](#) on the Hudson River, or the management of 55 failures brought on by the explosion of an engine on [Qantas flight 32](#) in November 2010. Moreover, a lack of hierarchy can prove just as disastrous, as it was for the two first officers at the controls of the [Rio-Paris flight](#).

Eliminating pilot hierarchy is therefore not an appropriate solution. Instead, it would be more effective to focus on pilot training. The first priority is to better educate pilots about the issues associated with hierarchy. Secondly, more research is necessary to better understand and deal with these complex phenomena. In the medium to long term, this should allow us to come up with innovative solutions to these problems.

Above all, it is vital to develop procedures that would allow:

- Optimal communication between pilots. It can be adversely affected by the hierarchical power imbalance.
- First-officer assertiveness. Problems arise when they are passive or when their work has been undermined or neglected.

This is particularly relevant as the boom in air traffic has led passengers to fly with airlines from countries where the culture of hierarchy is strong and therefore the risks higher. Furthermore, societies are evolving and the aviation industry is opening up to previously excluded groups such as women and people from lower casts, which may in some cases heighten problems linked to hierarchy. A detailed study of the impact of social factors on the way crews operate would be a boon to aviation safety.

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