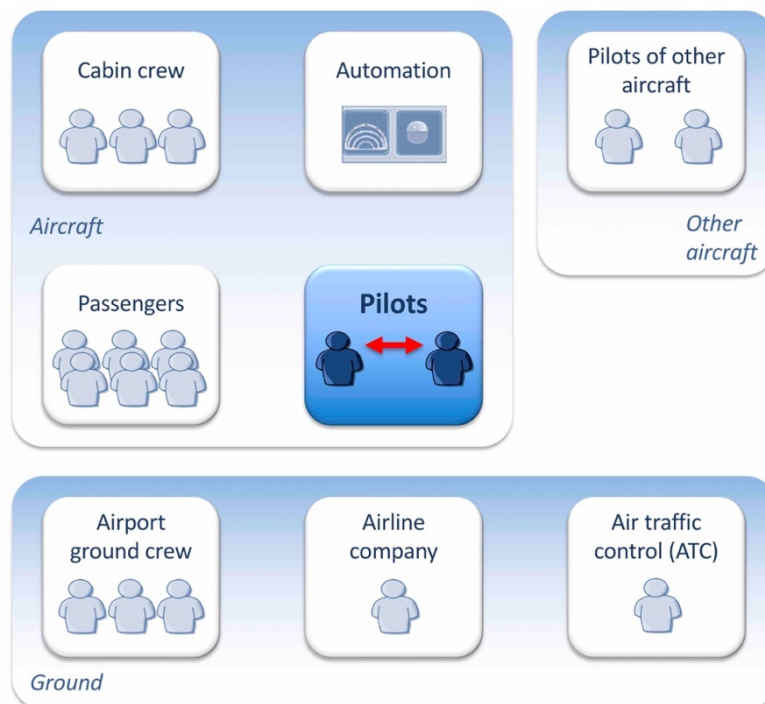




Intra-Cockpit Communication

In the 1950s, at the start of the jet age, a flight crew of four or five members was required to deal with all the tasks involved in flying an aircraft: handling flight controls, controlling the engines, operating the radio and navigating. Advances in technology since that time, especially in cockpit automation, have seen successive reductions in flight crew size. In the 1980s, many airliners had a flight crew consisting of three people: a captain, a first officer and a flight engineer. Nowadays passenger aircraft are usually operated by just two pilots, a captain and first officer, as shown in Figure 1. The pilots sit side by side, facing forward, with domains of attention that overlap but are significantly different. This seating configuration allows some use of non-verbal gestures such as pointing, but makes it difficult for them to see each other's facial expressions clearly.

Figure 1: Pilot interactions within the cockpit.



Speech plays an important role in enabling pilots to coordinate actions inside the cockpit. The language used depends on the airline and crew composition. For airlines based in English-speaking countries, intra-cockpit communication is naturally in English, as it is for multicultural airlines with a high proportion of native English speaker (NES) pilots, such as Emirates. In other airlines, a national or regional language may be used, or a mixture of languages. Hutchins, Nomura and Holder (2006, p. 3) reported on the speech of Japanese flight crews:

In Japanese airlines, most utterances in the flight deck (revenue flights) are produced in Japanese. English is used only for communication with ATC, reading text that arrives in the flight deck in English (for example, the text of electronic checklists displays, ACARS messages, and dispatch paperwork),



and some technical call-outs such as 'V one,' 'Flaps five,' and 'Push Autopilot'. All other utterances, for example conversations about how to fly an approach, where traffic or weather are located, how the airplane is performing, as well as informal conversations, public address messages to the cabin (on domestic routes), communication with cabin crew, and communications with company personnel, are conducted in Japanese.

The working hypothesis developed by these researchers is that constraints in the environment (e.g., linguistic representations in the cockpit, such as labels, or ATC communications in English) affect the choice of language for non-native speakers (NNS) of English. When not constrained, NNS pilots revert to their native language (L1) since it is cognitively easier than communicating in English, which is for them a second language (L2). This is especially true for tasks that involve complex processing.

Considering whether NNS pilots should be required to use English for flight deck communication, the German linguist Rainer Dietrich (2004, p. 193) noted that "even very professional speakers of a foreign language have a slower word recognition in the non-native language, showing that understanding, and certainly speaking, in a foreign language takes it toll on the speaker." He recommended against mandating the use of English for pilots sharing a common L1, reasoning that its use would involve an extra cognitive burden that could be critical in high workload flight phases, such as final approach and landing.

Intra-cockpit communication does not feature prescribed language to the extent that pilot-ATC communication does, but some tasks – notably the reading of checklists – must be carried out in a particular way. Pilots otherwise have more freedom to communicate using **plain language**. One significant constraint, though, is the **sterile cockpit rule**, which prohibits non-essential speech in operations below 10,000 feet. This rule was introduced by the Federal Aviation Administration (FAA) in the United States following accidents such as the 1974 crash of Eastern Airlines Flight 212 in North Carolina. In that accident, the pilots were distracted by "conversations not pertinent to the operation of the aircraft" (NTSB, 1975, p. 15; for further details see Sumwalt, 1993, 1994).

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