Speaking of Clearances

U.S. pilots preferred speaking to writing when responding to non-U.S. controllers, but were divided about speech versus datalink in receiving ATC messages.

BY RICK DARBY

Concern about substandard English language use in aviation is often raised in terms of pilots whose native language is other than English. That was, for example, a critical factor in the 1990 accident involving Avianca Flight 52, which crashed because of fuel exhaustion on its third approach to New York's John F. Kennedy International Airport after being placed in a holding pattern for more than an hour. The pilots had been unable to make clear to controllers the nature of their emergency.

But U.S. pilots who have a native's command of English encounter problems at non-U.S. locations where they must communicate with controllers whose English is limited. Also, in some cases, being unable to understand non-English communication on the radio frequency reduces their situational awareness.

In the first of several reports on pilots' non-U.S. flying experience and practices by the U.S. Federal Aviation Administration,[1] researchers found that, based on small-group interviews with U.S. pilots experienced on international routes, "English language proficiency is often deficient in non-native-English countries and hampers effective communication. English language deficiency below a certain level hampers air traffic control [ATC] communication. Language proficiency includes pronunciation, structure, vocabulary, fluency, comprehension and interaction." The researchers also asked general questions about ATC differences in international operations and how they affected the pilots' procedures and performance.

Twelve airline transport pilots from each of four major U.S. air carriers, for a total of 48, were interviewed about their experiences. These pilots had an average of 15 years of international flight experience, with an average of five international flights in the 30 days before the interviews. All listed English as their first language. About 60 percent of the pilots said that they knew no languages other than English, and among the others, the majority spoke and understood some French and Spanish.

Responses were categorized into 10 sections. This report concerns their responses to the first two sections, "Background Information" and "Preflight Preparation." The pilots' answers to questions and discussions during the interviews "provide a wealth of ideas related to the international flight experiences," as well as "their perception of the situations they encountered," the report says.

Although the pilots' responses were partly anecdotal, they answered questionnaires that enabled the researchers

Countries Flown Through by U.S. Pilots In the Three Months Preceding the Interview

Number of Pilots	Countries
1–5	Argentina, Aruba, Antilles, Belgium, Belize, Bermuda, Bolivia, Cambodia, Chile, Colombia, Costa Rica, Crete, Cypress, Denmark, Ecuador, El Salvador, Fiji, Grand Cayman, Greece, Greenland, Guatemala, Haiti, Honduras, Iceland, Iraq, Israel, Jamaica, Kuwait, Laos, Luxembourg, Mongolia, The Netherlands, New Zealand, Nicaragua, Panama, Peru, Poland, Puerto Rico, Republic of the Philippines, Scotland, South Korea, Spain, St. Martin, Switzerland, Tahiti, Thailand, Trinidad, Turkey, Vietnam, United Arab Emirates
6–10	Brazil, China, Dominican Republic, Ireland, Italy, Japan, Russia, Venezuela
11–15	Cuba, France, Germany
16–24	Canada, England, Mexico

Source: U.S. Federal Aviation Administration

Table 1

U.S. Pilot Preferences for Modality of Receiving ATC Messages

Strongly prefer to hear
6 (12.5%)

Strongly prefer to read
11 (22.9%)

Prefer to hear
10 (20.8%)

Prefer to read
15 (31.3%)

No preference
6 (12.5%)

ATC = air traffic control

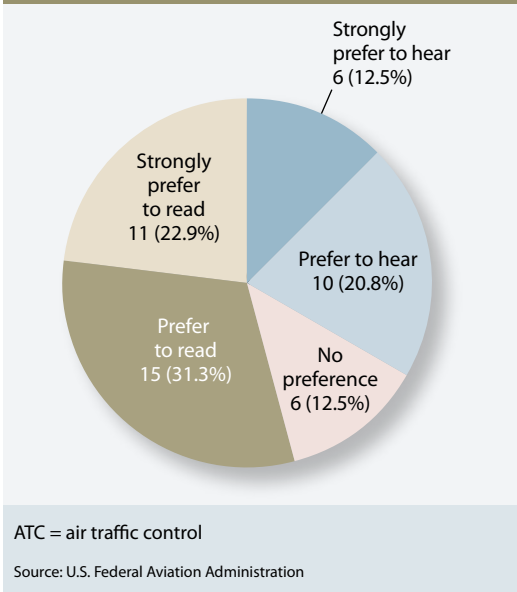Source: U.S. Federal Aviation Administration

Figure 1

preferred to hear ATC communications, 54 percent preferred to read them and 13 percent had no preference (Figure 1).

One comment explaining a preference for hearing ATC messages was: "Information is rapidly conveyed; it can be questioned and clarified quickly." Another was: "Reading messages is a 'heads down' activity not suitable for many phases of flight."

The opposite viewpoint was expressed as: "When talking to some foreign controllers, their English is so bad, or radios are so scratchy, that you are simply listening for what you think they are going to tell you."

When *responding* to ATC, the majority preferred speech to typing (Figure 2). This was elaborated as: "Speaking … is less time-consuming and it takes less effort. It is easier to correct a misunderstanding. It is also easy to make non-standard requests. Speaking is faster, and I can listen to the inflection and cadence in speech."

Pilots who preferred to type their messages to ATC believe "it minimizes hearback/readback problems significantly. Written communication greatly reduces confusion. For non-English[-speaking] controllers, datalink would be easier for them to understand."

The next section of the questionnaire and interview concerned preparation for international flights.

Pilots were asked what language problems they expect, or have experienced, when flying in non-U.S. airspace. They listed 109 examples of language-based difficulties, which the researchers categorized into themes (Table 2). "English language comprehension and production" plus "controllers' inability to communicate in plain language" accounted for 56 percent of anticipated problems.

"At times, when you ask a basic question dealing with weather, runway conditions or something that is not standard, the controllers cannot answer that question if it's not something that they would expect to parrot back," was one example given of the "controllers' inability to communicate in plain language" category.

to quantify the results. The report includes quotes, which amalgamated the words of various pilots for the sake of creating a single coherent narrative for each topic.

The 48 U.S. pilots listed 64 geographical areas they had flown through in the three months preceding the interviews (Table 1). Canada, England and Mexico were transited by at least 33 percent of the pilots. "They landed their aircraft in 47 different countries or regions during that time period," the report says. "Within the 30 days preceding the interviews, 83 percent of the pilots flew an average of five international flights, including multiple flights to Costa Rica, Guatemala and Venezuela."

Pilots were asked if they would prefer written communications, such as datalink, to voice communications from ATC. About 33 percent

Another pilot said, "Sometimes there's difficulty conveying our wishes due to a controller's comprehension skills. When there is a large thunderstorm between my airplane and the airport … and I want to get across to the controller that I cannot do what was just asked of me, I'll say, 'Unable' and you can see a big question mark out there over his head. It is as though he is thinking, 'What do you mean, unable? I gave you a command.' Well, it's not the way we operate at our company. He can arrest me when we land if he wants."

Controllers' pronunciation of fixes, intersections, waypoints and numbers was accounted a major problem.

"Due to the accents and the speed that they're speaking, I personally have to ask them sometimes to repeat themselves more slowly or spell fixes phonetically to get the understanding correct," was one comment. "I have to make sure all of us are hearing the same thing. I've had it happen where we're all listening, but can't decide what fix he's trying to give us. We've been up for 18 hours, so give us a break and spell it for us because we can't understand the pronunciation."

Another comment was: "Again, because of the accent, we never really did come up with exactly what he was saying. We came up with a pretty good consensus of what we thought he meant, but I don't think any one of us was 100 percent certain what the clearance was."

During the small group interviews, "oral responses were embellished and discussions expanded to include cultural differences [in various countries]," the report said.

Asked about the effect of the difference in ATC "procedural complexities" from country to country on the pilots' flight experiences, about 10 percent reported a positive effect, about 40 percent said it was neutral, and half said it was negative. Among the choices offered, none said the effect was "very positive" or "very negative." Those who found the experience positive said it kept them on their toes, improved situational awareness and encouraged flexibility — "Aviation is a dynamic environment."

Pilots were asked how much differences in ATC "procedural complexities" had influenced their flight experiences. About 54 percent reported either a moderate or considerable influence, and the remainder reported a limited influence (Table 3, p. 52).

A comment from a pilot who answered "to a considerable extent" was: "One of the biggest problems is transition levels. There are some places we fly into where we don't know the transition level until it's reported on the ATIS [automatic terminal information service]. When we get close enough to where we can hear the ATIS, it will tell us — if we can understand it — what the transition level is. It may vary by 1,000 ft. One day it might be 6,000, one day it might be 7,000."

A pilot said, "I feel that we should have standardization anywhere we fly. I should expect that service, and pilots from other countries flying here [in the
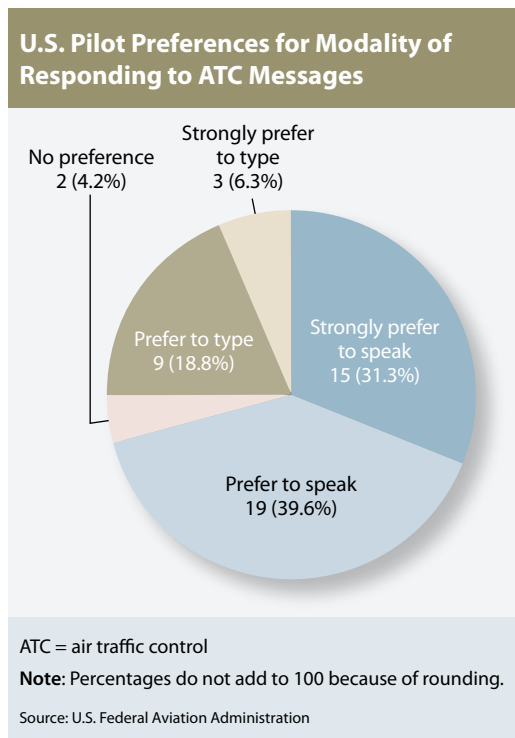

U.S. Pilot Preferences for Modality of Responding to ATC Messages

No preference 2 (4.2%)
Strongly prefer to type 3 (6.3%)
Prefer to type 9 (18.8%)
Strongly prefer to speak 15 (31.3%)
Prefer to speak 19 (39.6%)

ATC = air traffic control
Note: Percentages do not add to 100 because of rounding.

Source: U.S. Federal Aviation Administration

Figure 2

Anticipated Language Problems for International Flights

Survey Pilots' Response	Frequency	Percent
Controllers' inability to communicate in plain language	27	24.8
Controller voice quality and speech rate	10	9.2
English language comprehension and production	34	31.2
Frequency congestion*	3	1.8
Multiple languages on frequency	18	16.5
Non-standard terms for standard questions	14	12.8
Poor radio equipment, coverage, quality	3	2.7

*Frequency congestion was mentioned only in connection with "multiple languages on frequency."

Source: U.S. Federal Aviation Administration

Table 2

Influence of Differences in ATC Procedural Complexities on Pilot Flight Experiences

Survey Pilots' Response	Number of Pilots	Percent
To a great extent	0	0.00
To a considerable extent	7	14.58
To a moderate extent	19	39.58
To a limited extent	22	45.84
Not at all	0	0.00

ATC = air traffic control

Source: U.S. Federal Aviation Administration

Table 3

Extent to Which Pilot Performance Is Affected by Different ATC Procedures

Survey Pilots' Response	Number of Pilots	Percent
To a great extent	1	2.08
To a considerable extent	2	4.16
To a moderate extent	15	31.25
To a limited extent	25	52.08
To a very limited extent	1	2.08
It depends	1	2.08
Not at all	3	6.25

ATC = air traffic control

Note: Percentages do not add to 100 because of rounding.

Source: U.S. Federal Aviation Administration

Table 4

U.S.] should expect that same service. In other words, we are all best served by a single global standard."

The issue of cultural norms was mentioned under the subject of procedural complexities. A pilot said, "In South America, a lot of controllers have the opinion that 'el capitán' is always right. There is the hierarchy where the pilot knows what he is asking, and the controller should not try to interpret anything other than what he's asking. If a pilot asks to do something, they approve it because the pilot knows what he wants to ask, even if it's dangerous. So if 'el capitán' says he wants to go down to 6,000 ft and there is a 12,000-ft mountain in front of the aircraft, 'el capitán' will get permission to go down to 6,000 ft."

Forty of the 48 pilots reported that different ATC procedures affected their performance to a moderate or to a limited extent (Table 4).

"In Japan's, China's and Russia's airspace, ATC doesn't have the ability to cope with fast-moving situations like weather deviations or turbulence, and I think they have to stop and think of how to talk to us in English," said a pilot. "Things start falling apart and the communication stops."

Another comment was: "In the U.S., there are a lot more approaches or arrival routes, followed by a radar vector into the pattern behind some other aircraft, whereas with radar vectoring in other places, you'll either continue on your route, or if they need to adjust your position in line they'll say, 'After this point, instead of going to Lucia, you're now going to go straight to Mateo.' But once you get onto the approach, the routing leads you into the airport instead of the controller vectoring you all the way in, and the altitude restrictions have to be kept up with all the way around. The difference is, in the U.S., it's radar vectors and with controllers in other countries, you fly the complete approach."

The interviewed pilots were asked, "Is there any incongruence between what you would normally understand is written on a procedure and what the controller instructs or expects you to do during a flight?" Comments were received from 42 pilots, with the rest either seeing no examples of incongruities between written procedures and controller instructions or expectations, or providing no examples.

"I have had several occasions of being cleared for a standard terminal arrival, and it becomes ambiguous whether you are cleared to descend via the arrival altitude restrictions or not," a pilot said. "Foreign controllers — especially non-native English-speaking controllers — are unsure how to differentiate that specific thing. On the standard departure, you'll have an altitude restriction and they'll clear you directly to an altitude; they don't always mean that you are cleared to disregard the crossing restriction on the climb. So, I've made it a habit when this happens to read back and make sure I understand the clearance is to climb unrestricted to this altitude. A good percentage of the time, they'll come back and say, 'No, cross at the altitude that's listed' or 'comply with the restriction,' even though the altitude assignment should have removed the restrictions." 🥨

Note

1. Prinzo, O. Veronika; Campbell, Alan. *U.S. Airline Transport Pilot International Flight Language Experiences, Report 1: Background Information and General/Pre-Flight Preparation.* Report DOT/FAA/AM-08/19. September 2008. Available via the Internet at <www.faa.gov/library/reports/medical/oamtechreports/2000s/media/200819.pdf>.