Intercultural issues in air-ground communication: a case study – triggers for miscommunication

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Outline

- Keywords: "**Intercultural** issues in **air-ground communication**: a **case study – triggers** for **miscommunication**"

- *This workshop → 3 parts*

1. Case-study: video-watching, discussion and presentation

2. Analysis of triggers/ causes: discussion and presentation

3. Training: "Developing language and communication skills for safety" (Link to the title of the session)

1. Case-Study

1.1 EVA Air incidente Flight BR015

- Dec, 2016
- LAX
- From Los Angeles to Taipei
- Boeing 777-35EER
- Time: 01.25 (local time)
- Weather conditions: good
- O fatalities

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- Narrative:
https://aviation-safety.net/wikibase/wiki.php?id=192082

http://www.jacdec.de/2017/05/18/2016-12-16-eva-air-b777-flew-astray-and-close-to-terrain-east-of-los-angeles/

http://www.latimes.com/local/lanow/la-me-ln-faa-investigation-plane-wrong-direction-20161220-story.html

- Still under investigation

- Confusions that turned out into a conflict

- Try to analyse it from a linguist's perspective and offer a contribution

1.2 <u>TASK 1</u>: *Watch the video, read the transcripts and think about the <u>triggers</u> for the <u>miscommunication</u> problems*

▶ Chart

Trigger words/ phrase/sentence	Said by	Problem

→Video: https://www.youtube.com/watch?v=tFdXax7Zh_g

1.3 <u>Discussion</u>

- *In small groups, talk about the triggers you wrote down;*
- *Try to find two in common*
- *Share it with the whole group*

1.4 <u>Chart</u>

Trigger Sentence/ Phrase/	Said by	Problem
1. "confirm heading?"	The pilot	The pilot points at the necessity of clarification of a crucial unit of information: the heading. Too much information?
2. 1.17 - unreadable "... 180, climb and maintain 7,000"	The ATC	The audio does not show what is said at the beginning of the sentence.
3. "left heading 180"	The pilot	A readback, not confirmed / disregarded by the controller - hearback error
4. "copied, right heading 180, EVA 15 heavy" "continue right turn heading"	The pilot	Correct readback, but did not comply with instructions - did not turn right
5. " XXX Correction XXXX" Stop X expedite	The ATC	Confusion (probably she is nervous, aware of a possible negative consequence)

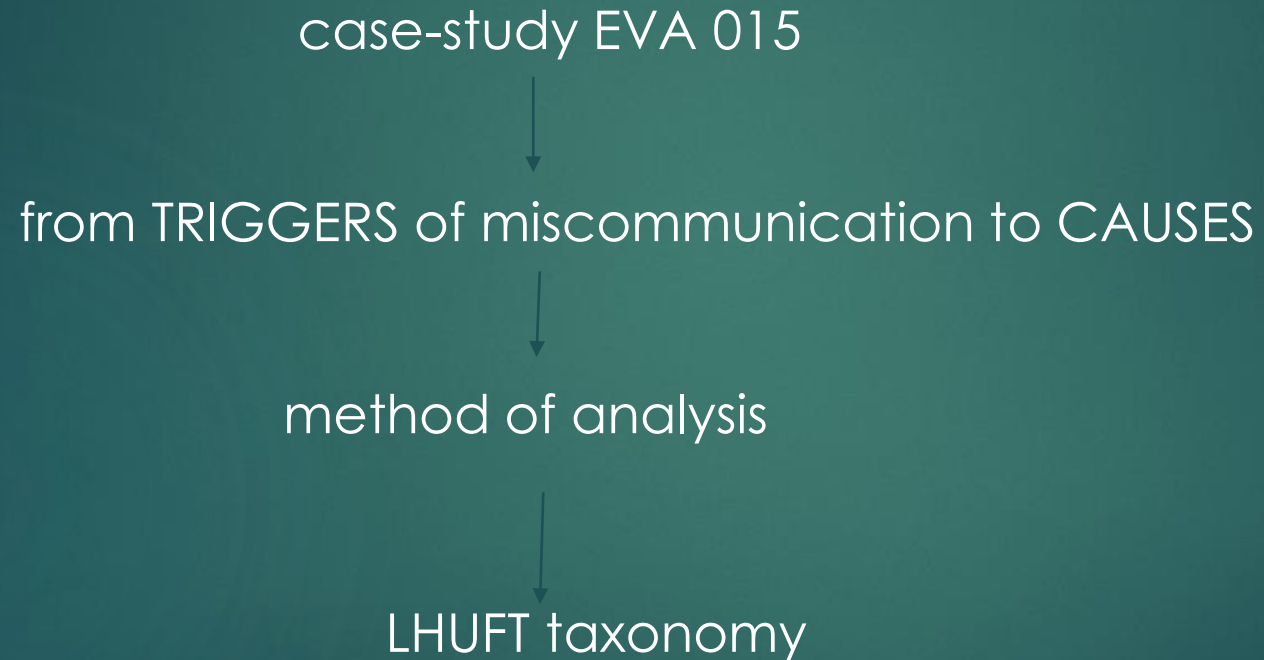| Trigger Sentence/ Phrase/	Said by	Problem
6. "EVA 15 heavy, turn left, left turn to a heading of ah.. 29, ah, 270"	The ATC	Confusion - use of a different direction in the instruction - numbers (maybe, an evidence she is nervous)
7. "EVA 015 heavy, what are you doing? "	The ATC	Use of plain language
8. "Confirm, EVA015 heavy, maintain 5,000, left...right, right heading (uninteligible)"	The pilot	- confirm ? - affirm or a request? - "left… right" - evidence the pilots are confused
9. "turn southbound, southbound now"	The ATC	"southbound": non-standard phraseology
10. "are you southbound now? I see you're going north bound"	The ATC	Use of plain language non-standard phraseology - situational awareness (she seems surprised he is not following)

Trigger Sentence/ Phrase/	Said by	Problem
11. " I see you're going southbound, turn South, ... Cause I see you're going northbound, turn south now, ..."	The ATC	- Confusion (she is probably nervous) - Use of plain language / long sentence
12. "left turn"	The pilot	evidence of confusion in the cockpit
13. "continue right turn, climb to 7,000to heading 1-8-0."	The pilot	- Heading: NOT read back by the controller - ? background noise? terrain awareness alerlt?
14. "American 2552"	The ATC	confusion with numbers, challenged and corrected by the AAL pilot
15. "climb and maintain, maintain 7,000"	The ATC	confusion in the instruction"climb"

Triggers point to:

- confusion of the controller:
  - instructions about directions (right/ left)
  - lack of readback/ hearback
  - use of non-standard phraseology
  - a series of mistakes/ confusions (later corrected) with numbers, verbs, etc.

- limited language proficiency on behalf the pilot: misunderstanding of instructions ?/ confusions that could have been confirmed more immediately

- ATC workload

2. Analysis

2.1 <u>Background</u>

case-study EVA 015

↓

from TRIGGERS of miscommunication to CAUSES

↓

method of analysis

↓

LHUFT taxonomy

LHUFT Taxonomy

- **Communication**
  - **Technical**
    - Equipment failure
    - Noise
  - **Procedural**
    - Blocked transmission
    - Readback/hearback errors
    - Incorrect or omitted call sign
    - Use of two languages in one operating environment
  - **Cultural**
    - **National**
      - Power distance
      - Individualism vs. collectivism
    - **Organizational**
      - Safety culture
      - CRM training
    - **Individual**
      - Lack of situational awareness regarding cultural differences
      - Personal factors

- **Language**
  - **Spoken**
    - **Speaking**
      - Failure to Communicate
      - Pronunciation
      - Structure/Grammar
      - Vocabulary
        - Inaccurate use of ICAO phraseology
        - Inaccurate use of other CAA approved phraseology
        - Use of slang
      - Fluency
        - Numbers
        - Hesitations
        - Tempo
    - **Listening**
      - Comprehension
        - Radio silence
        - Inaccurate readback
  - **Written**
    - **Reading**
      - Manuals
      - MRO
    - **Writing**
      - Text
      - Manuals
      - Graphic information
      - Datalink

2.2 TASK 2: *Try to organize the triggers and problems you observed using the Taxonomy as a method of classification*

- *In small groups, try to come up with two/ three factors*
- *Share it with the group*

LHUFT Taxonomy
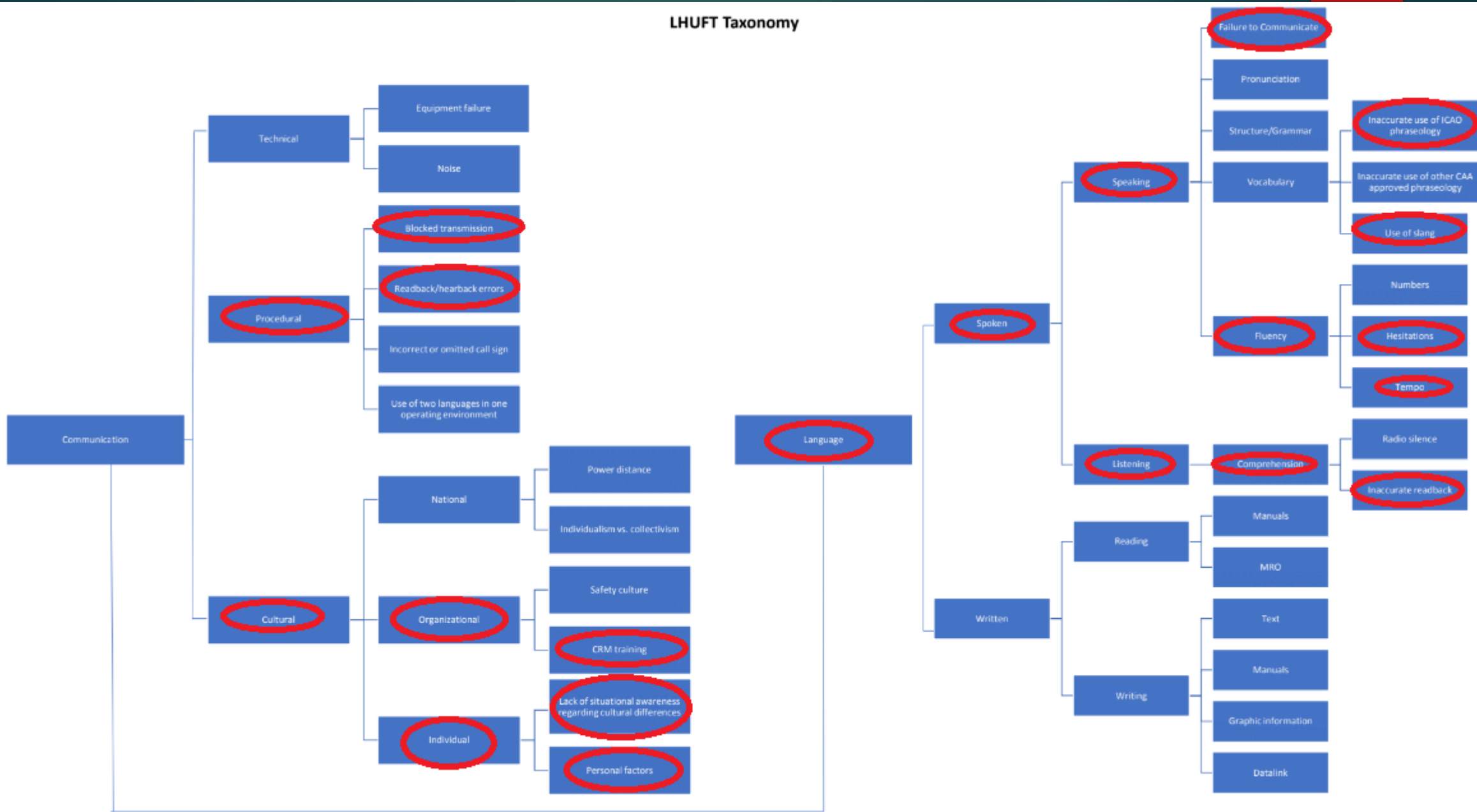
2.3 Discussion: Factors

- Procedural
  - ? blocked transmission
  - readback/ hearback errors
- Cultural
  - organizational: CRM Training
  - Individual: lack of situational awareness and personal factors
- Language
  - Spoken

↖ Speaking

*Failure to communicate

*Vocabulary: inaccurate use of ICAO phraseology and use of slangs

*Fluency: hesitations/ tempo

↖ Listening

* comprehension: innacurate readback

2.4 Inter-cultural Issues in air-ground communication - Theoretical background

Engle (2000)

Barbara Clark (2017)

Estival, Farris & Molesworth (2016)

Prinzo & Campbell(2008)

Merritt and Maurino (2004)

Scholler and Pacheco (2017)

Pereira and Pacheco (2017)

► Engle (2000) – CRM in multicultural crews.

CRM: primary goal → to reduce crew errors by improving interpersonal communications

↖ Power distance

↖ Uncertainty avoidance

↖ Individualism X collectivism

"*CRM is a proven method for enhancing the safety of airline crews, and thus airline operations. However, **CRM does suffer somewhat from a cultural bias toward Western, "low context," cultural values.** When CRM methods are taught to airline crews from other cultures, **the effectiveness of the training could be enhanced by tailoring CRM to the culture of these crews.**" p. 114*

- Prinzo & Campbell (2008)

"As the volume of U.S. and foreign flagship carriers increases, so will the number of transmissions necessary to provide air traffic control (ATC) services. These services include clearances and instructions, as well as traffic and weather advisories, reports, and requests. Given that the present air-ground communications system is reaching pre-9/11 saturation levels during peak traffic periods, it is common for some controllers to **send longer and more complex messages** to reduce the number of times they need to communicate with individual aircraft (Prinzo, Hendrix, & Hendrix, 2006) and **use non-standard phraseology** to decrease the amount of time on frequency (e.g., go fast, good rate), or both. T**he ability to quickly decode, understand, read back, and comply with these messages can be a problem for all pilots, especially those who are unfamiliar with how ATC services are delivered by controllers in a particular region."**

- Merritt and Maurino (2004)

"In sum, **raising awareness of cultural interfaces via training** and analysis is an essential step toward recognizing and managing them. Those who shape the dominant model as well as those who try to adapt it need this awareness"

"tying cultural interfaces to their management in the operating context is the bottom line"

"To that end, **the design of programs** to specifically develop more cultural mediators is proposed as a solution"

"the challenge for safety is not to eliminate cultural interfaces but to **manage the potential threats** they pose. **Systematic research** of the interfaces in different regions around the world will uncover strengths and weaknesses in the global system"

► Farris & Molesworth (2016)

"It is important to take a proactive approach in examining the contexts in which these communications take place, for the purpose of understanding the conditions under which these interactions are most likely to be successful" p. 92

● Contexts – challenges in controller-pilot communications

-One important challenge: "**Controllers are often very busy, and, as a result, particularly during periods when task demands are high, they may issue a number of instructions at a time to a pilot, in the interest of efficiency**". P. 97

↖ High workload and conflicting interests

- Another challenge: "pilots and controllers may not only be strangers, but are often of very different sociolinguistic backgrounds, and cannot see each other, making it **more challenging to achieve mutual understanding and shared situational awareness**" p. 101
- "this can result in controllers trying to convey a lot of information in a single message and possibly not taking the time and attention required to listen carefully to pilots' readbacks, **failing to ensure** that there are no errors contained therein." p. 102
- "**Ever effort** must be made in order to eliminate miscommunications that do occur."

- Study 1: Barshi (1997)

- Analysed speech-rate, workload, message length as variables to readback accuracy

-concluded that message length was a factor " controllers should limit the length of their messages to three commands or information units, in order to ensure accurate pilot comprehension and retention of controller messages". (p. 104)

- Study 2: Barshi and Healy (1998)

- NS

↖ PNNS

↖ LPNNS

Results: all participant groups performed less accurately in response to longer messages.

- The results supported the previous one: " the robust message length effects obtained in this and in previous experiments could be attributed to basic cognitive processes (i.e. working memory constraints) as opposed to processes that are associated specifically with language or with a specific language" p. 106

- The authors recommend that, when communicating with pilots of low EL2 proficiency, controllers should limit the length of their messages to two commands, in the interest of facilitating accurate comprehension.

- Barbara Clark (2017)

- mandatory occurrence reports

- Key problems → ex.: "non-standard phraseology use"

- key recommendations →ex.: "emphasise to pilots and controllers, especially native English speakers, the importance of using ICAO standard phraseology, whenever possible.

- "native speakers play a significant part in language-related miscommunication, most frequently **by not adhering to ICAO standard phraseology and the overuse or over reliance on "plain language"**.

- "Native speakers sometimes show **impatience with non-native speakers, often reflected in increasing speech rate and volume"**

- Recommendations:

  ↖ " Native English-speaking pilots and controllers should train in the use of ICAO phraseology in situations of stress"

  ↖ "language awareness training should incorporate awareness of non-native English listeners in training"

▶ Research results about "issues in air-ground communications" – PUCRS
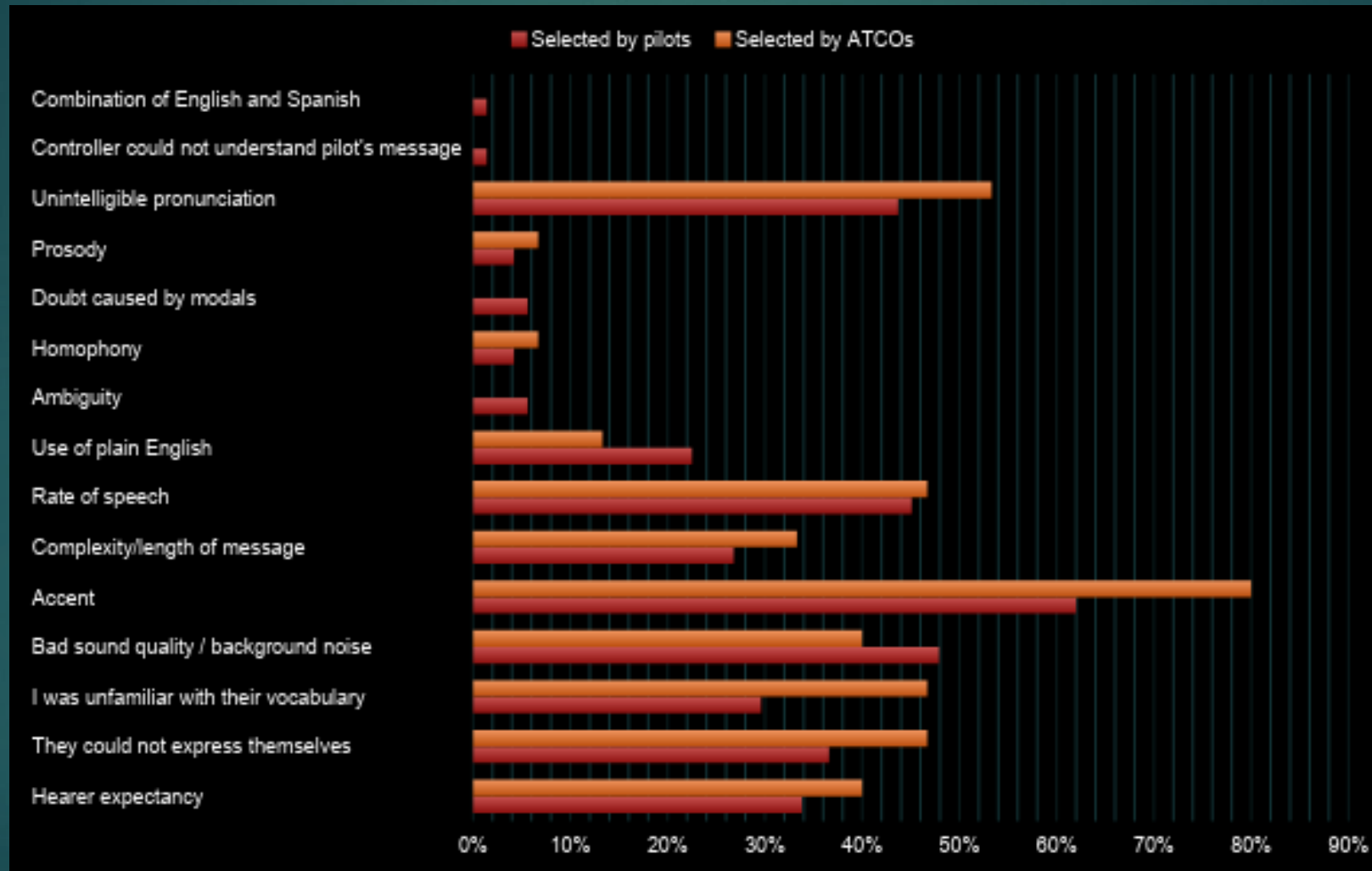
▶ Study 1: SCHOELLER & PACHECO (2017)

- Chart 1: Frequency with which pilots and ATCOs perceive each other using plain English instead of standard phraseology
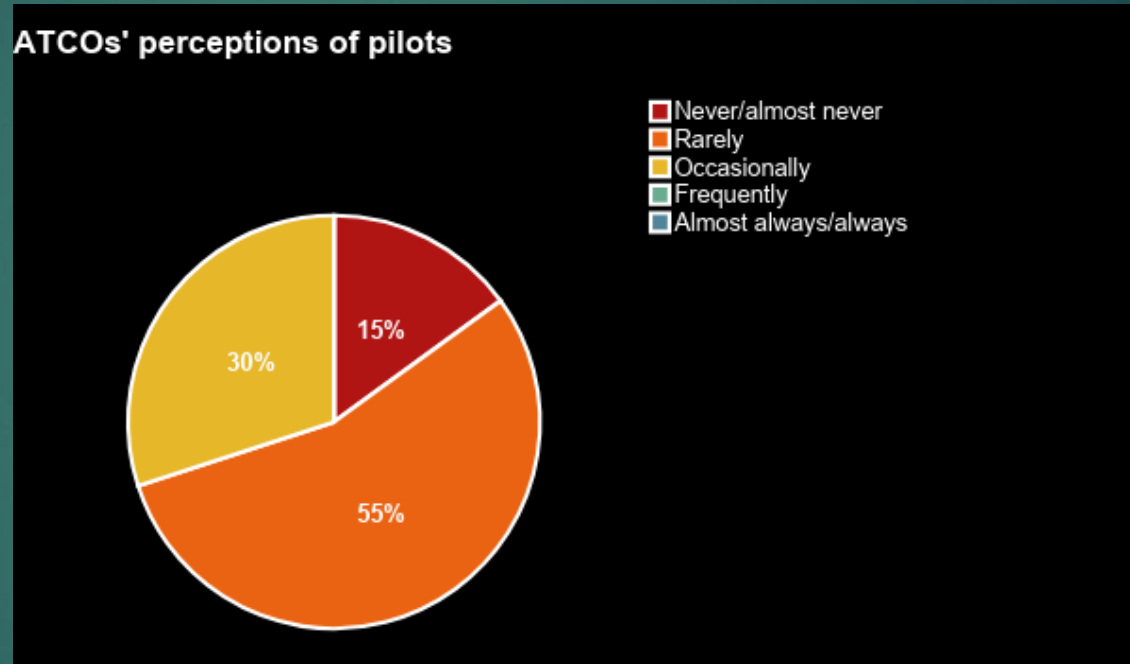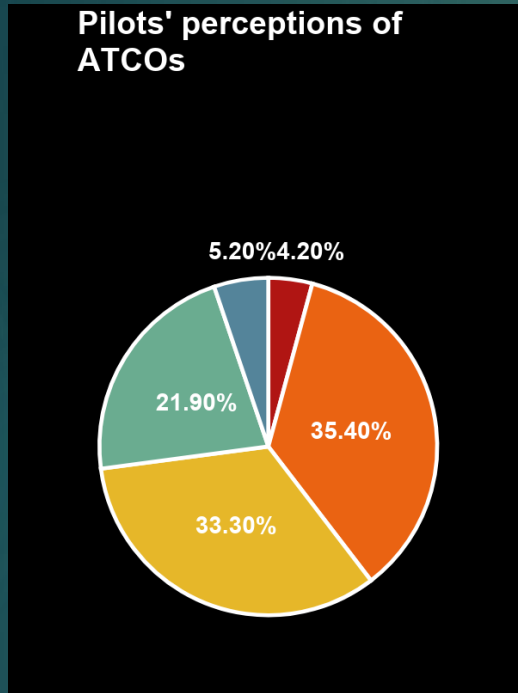
- Chart 2: How much harder pilots and ATCOs consider each other to understand when the other uses plain English – on a scale from 0 to 10
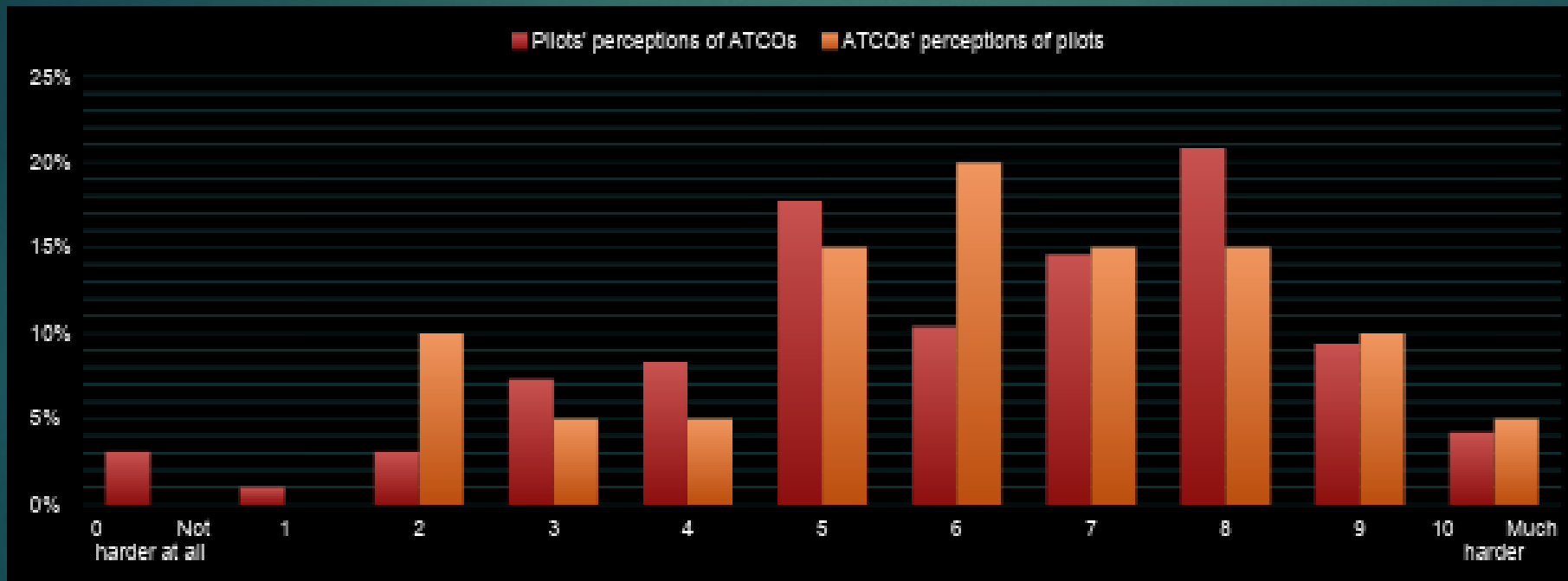
- Chart 3: Main causes reported to have contributed to the understanding problem

- Study 2: Pereira & Pacheco (2017)

- a questionnaire that we made available for Native speakers of the English language pilots. We had answers from pilots of United Airlines, United Express, Delta Airlines, Air Canada and Cathay Pacific, to talk about their flying experiences and difficulties that they had to deal related to communicating with other pilots and air traffic controllers from other cultures.

- Question 5. In your opinion, what is the best way to get around the problems caused by miscommunication?

- Results:

Respondents	Q5
1	Approved phraseology and terminology. Slangs can be confusing.
2	CPDLC.
3	Slow and clear communication using proper phraseology.
4	Standard use of international ATC communication.
5	To avoid miscommunication you need more communication.
6	Listen better and if unsure, ask again.
7	Careful read back and don`t be afraid of asking questions. We are all professionals.

- Study 3: Ferrari (2012)

Issues that can promote miscommunication pointed by Brazilian pilots flying abroad

	Pilot 1	Pilot 2	Pilot 3	Pilot 4	Pilot 5
English language Comprehension	X	X	X	X	
Accent	X	X	X	X	X
Call Sign		X	X		
Confirmation (readbacks)	X		X	X	
SOP	X	X		X	X
Use of standard Phraseology	X	X			
CRM	X	X			X

- DOC 9835

  - Holistic descriptors

"c. Use appropriate communicative strategies to exchange messages .... (eg. To check, confirm or clarify information)

d. Handle successfully and with relative ease the linguistic challenges presented by a complication or unexpected turn of events ..."

  - Communicative functions

1. "Communicative Functions directed towards triggering actions: orders, requests and offers to act,

3. Training: Developing language and Communication skills for safety"

3.1 <u>Discussion: What can we do in class (regular AE classes) in order to " develop language and communication skills for safety"</u> ?

- TASK 3: *Discuss answers to this question having in mind the case of EVA015 and*

outline

- *one activity that could contribute to develop language skills/ awareness*
- *or a suggestion for this purpose.*

3.2 Final (Group) Discussion: Share outlined ideas

- Suggestions:
- Develop awareness –

work with research data, database, accident or incident reports through activities that focus on language as a factor and safety

Ex.:

→ language activities (for all the 6 skills) based on these episodes

→ go back to an accident/ incident and revise the sentences that were inappropriately used. "What should have been said?"

- Corpus studies:

↖ We lack real data

- CORPAC (PUCRS) : "Real Emergency Situations" sentences that are "triggers" for miscommunication problems

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Thank you!

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