



Exploring intercultural factors in international pilot-air traffic controller communications:

Validating a taxonomy using mixed methods research

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Research gaps:

- the impact of cultural background on interactions between pilots and ATCOs in English is still underestimated;
- the industry lacks a categorization of factors confirmed by aviation stakeholders that can be used as a tool to improve intercultural communications within the aviation community.

Workshop purpose:

- present results from an exploratory research that investigates culturally influenced factors arising from international radiotelephony communications;
- engage participants in discussions based on research subjects' (pilots and ATCOs) perceptions of those factors and their threat to aviation safety.



Theoretical Framework

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➤ **Discourse and Pragmatics:**

Speech Acts Theory (Austin, 1962)

Facework and politeness strategies (Brown & Levinson, 1987)

Impoliteness theories (Culpeper, 1996)

➤ **National cultural dimensions (Hofstede, 1991)**

Individualism-collectivism, power distance, masculinity-femininity, uncertainty avoidance

➤ **Theories of cross-cultural communications:**

Face-negotiation theory (Ting-Toomey, 2005)

Conversational constraints theory (Kim, 2005)

Communication accommodation theory (Gallois, Ogay & Giles, 2005)

Expectancy violations theory (Burgoon & Hubbard, 2005)

Anxiety/uncertainty management theory (Gudykunst, 2005)

➤ **Intercultural communication:**

Intercultural communicative competence (Byram, 1997; Lussier, 2007)

English as a lingua franca (Jenkins, 2000; Seildhofer, 2001)

Intercultural communication: A discourse approach (Scollon & Scollon, 2001)

Interculturality (Kesckes, 2014)

Intercultural awareness (Baker, 2011, 2016)



A model of intercultural RT communications

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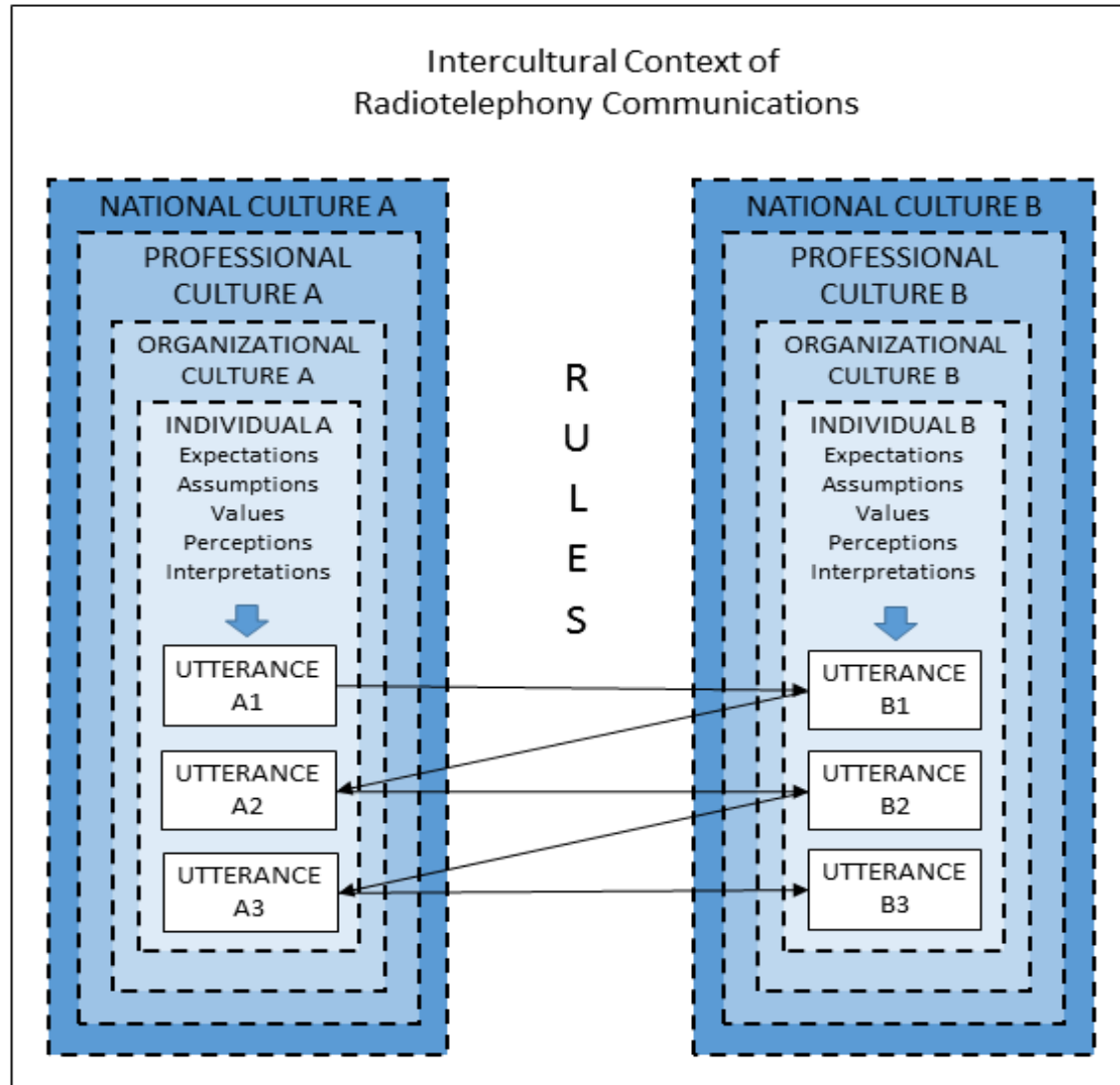


Figure 1. Model of radiotelephony communications in intercultural contexts (Monteiro, 2016)

Research questions

Question 1

- What intercultural factors arise from international pilot-ATCO communications that can affect the way they interact in the English language?

Question 2

- To what extent do experienced pilots and ATCOs perceive the potential threats of intercultural factors to the safety of radiotelephony communications?

Methods – Study design

A two-phase, exploratory sequential mixed-methods design.

Phase 1 – Qualitative (QUAL)

- Data collection: Six transcripts of RT communications publicly available on aviation-related websites (a mix of types of interaction);
- Data analysis: Coding (Saldaña, 2009)
Categorizing and Connecting (Maxwell & Miller, 2008)
- Inter-coder reliability – Cronbach's Alpha = 0.921

Phase 1 - Findings

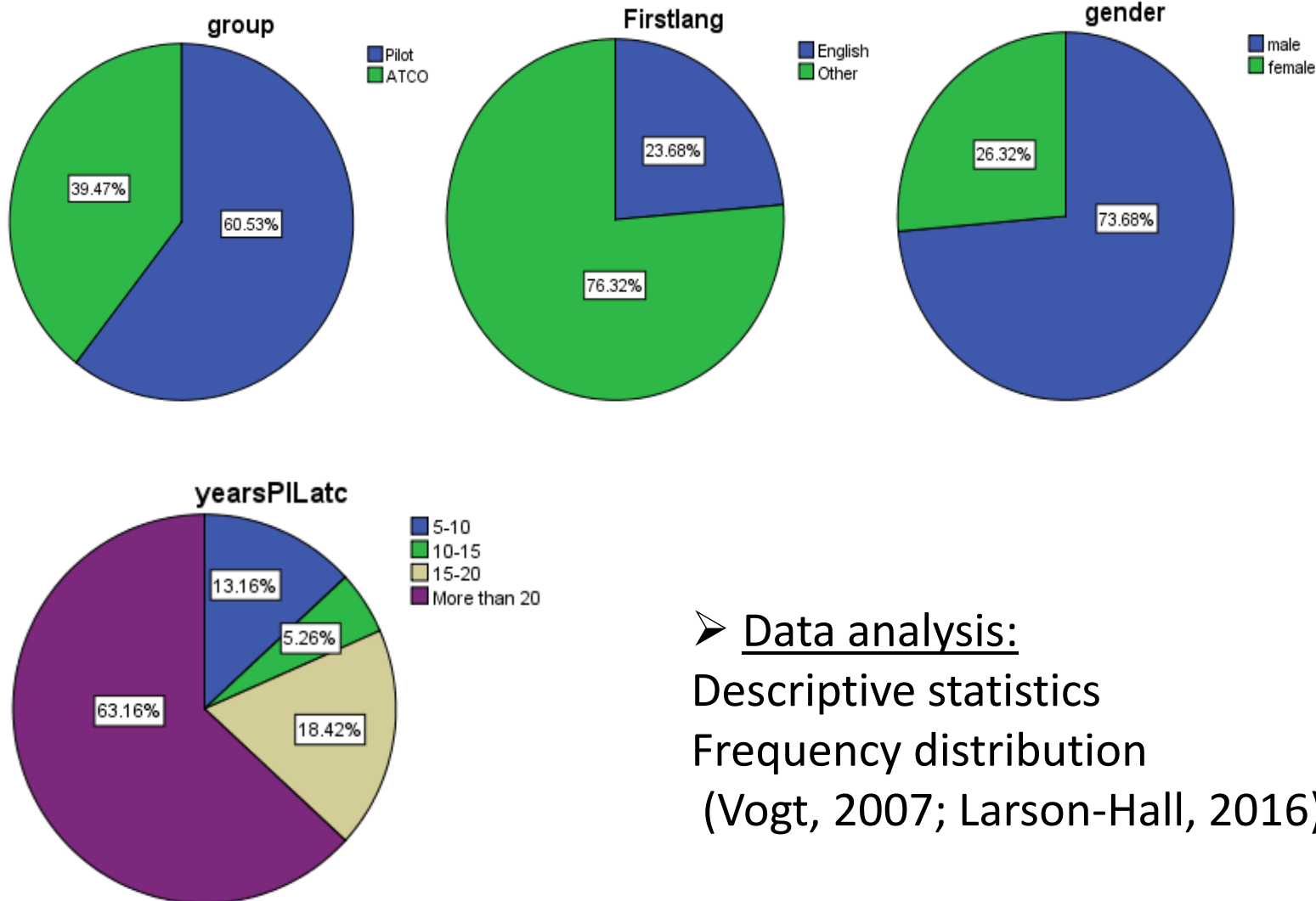
Table 1: Outcome of Phase 1(draft taxonomy) and data mixing with Phase 2 (questionnaire development)

THEME	CATEGORIES	SUB-CATEGORIES	OPERATIONAL DEFINITIONS IN THE QUESTIONNAIRE
Intercultural factors in international pilot-ATC communications	Power Distance	Power relations	Q18, Q19
		Deferential role	Q20, Q21
	Face-work strategies	Self-face concern	Q22
		Mutual-face concern	Q12
	Conflict management	Conflictual direction	Q23, Q 24
		Neutral direction	Q10, Q11
		Expectancy violations	Q25
	Communication styles	Directness	Q13
		Indirectness	Q26, Q27
	Non-collaborative behavior	Unprofessional tone	Q28, Q29
		Unprofessional attitude	Q30, Q31, Q32
		Non-compliance with rules	Q33, Q34
	Collaborative behavior	Professional attitude	Q14, Q15, Q16
		Supportiveness	Q17

Phase 2 – Quantitative (quan)

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- Online survey Participants: 38 key stakeholders (pilots and ATCOs)



- Data analysis:
Descriptive statistics
Frequency distribution
(Vogt, 2007; Larson-Hall, 2016)

Phase 2 – Findings

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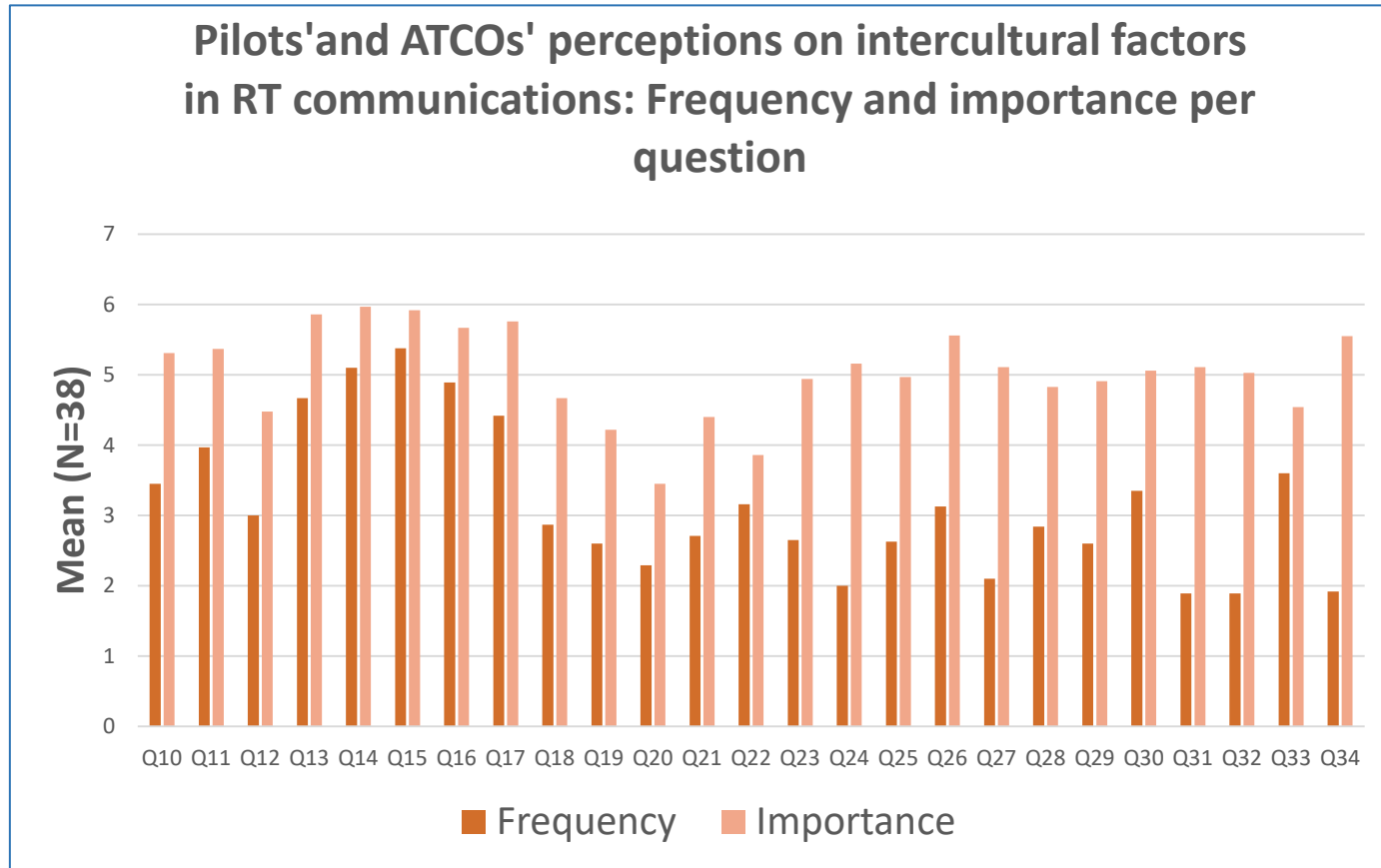


Figure 2: Comparing and contrasting frequency and importance per question

Results and discussions

➤ **Research question 1:**

Evidence to answer this question was collected mainly from the qualitative phase of the study; however, findings from the quantitative phase and from the analysis of survey open-ended responses also substantiate my discussions.

Responses to the questions '**How often do you encounter pilots/ATCOs who.....?**' revealed the situations that were considered the least and most frequent in RT communications, according to the sample analyzed, for both the expected practices (Section 2) and the potential threats to safety (Section 3).

Table 2: All respondents' perceptions per section – Frequency of occurrence

All respondents	Least frequent	Most frequent
Section 2 – 10.1 to 17.1	Q 12.1 ($M = 3.00$, $SD = 1.41$)	Q 15.1 ($M = 5.38$, $SD = 0.79$)
Section 3 – 18.1 to 34.1	Q 32.1 ($M = 1.89$, $SD = 1.06$)	Q 33.1 ($M = 3.60$, $SD = 1.35$)

Results and discussions

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➤ Research question 1 - Comparing perceptions:

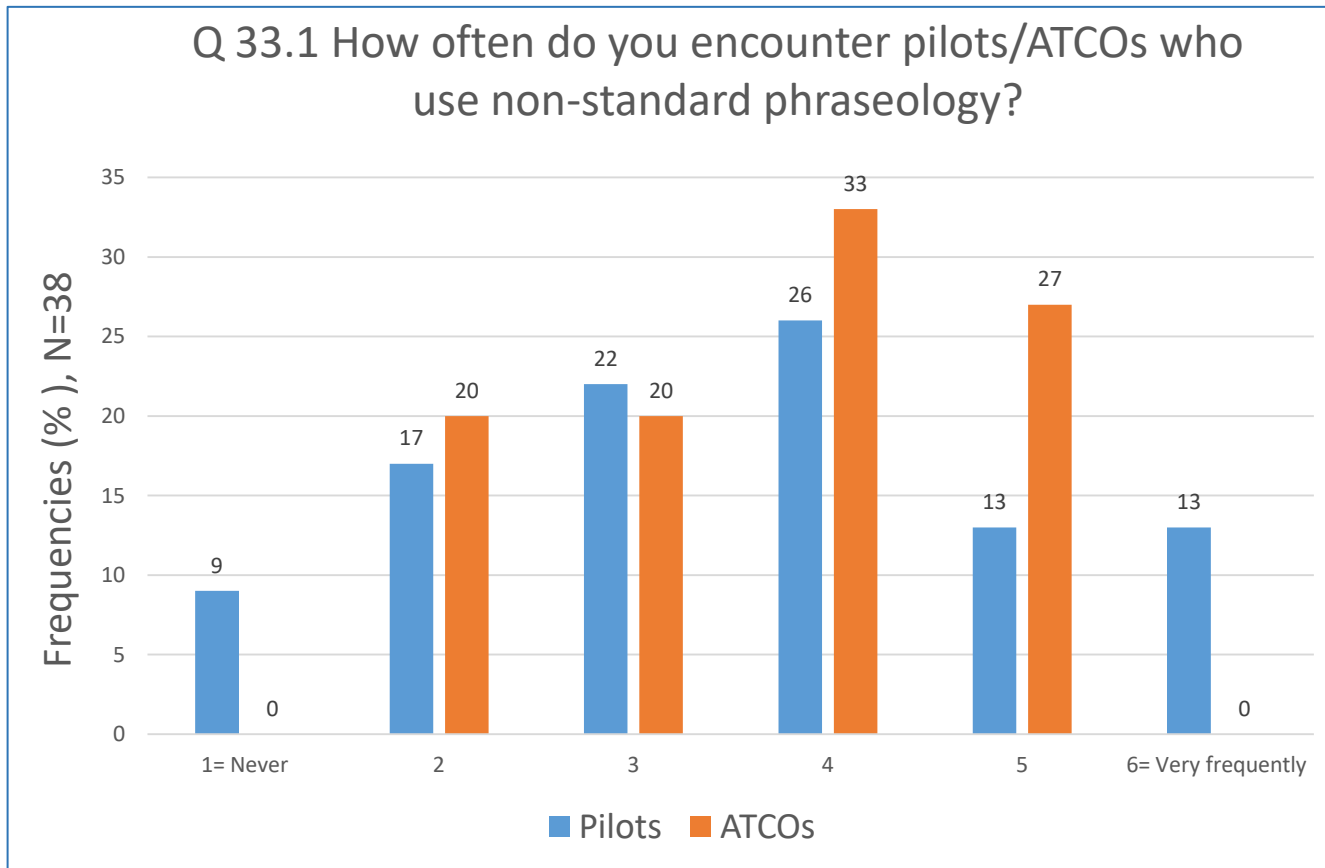


Figure 3: Pilots' X ATCOs' perceptions (Q33.1)

Results and discussions

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➤ Research question 1 - Comparing perceptions:

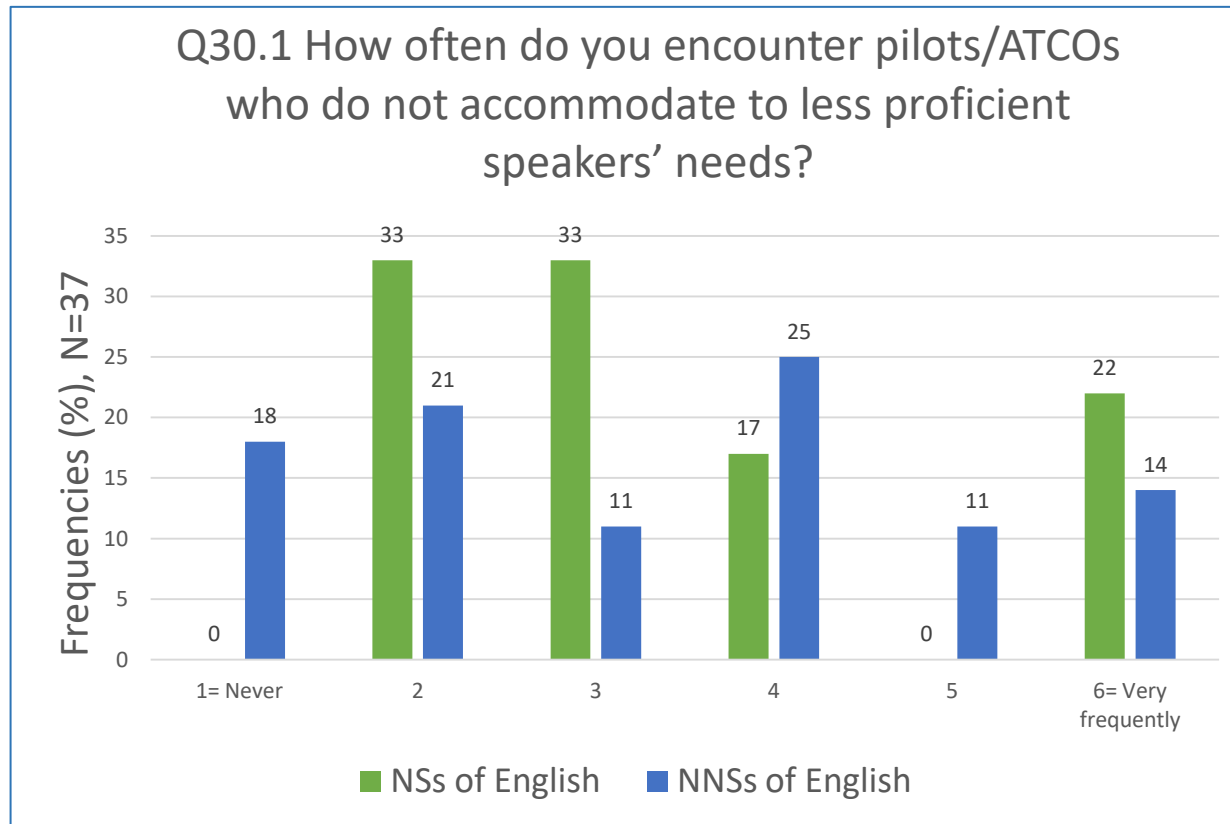


Figure 4: NSs' x NNSs' perceptions (Q30.1)

Results and discussions

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➤ Research question 1 - Comparing perceptions:

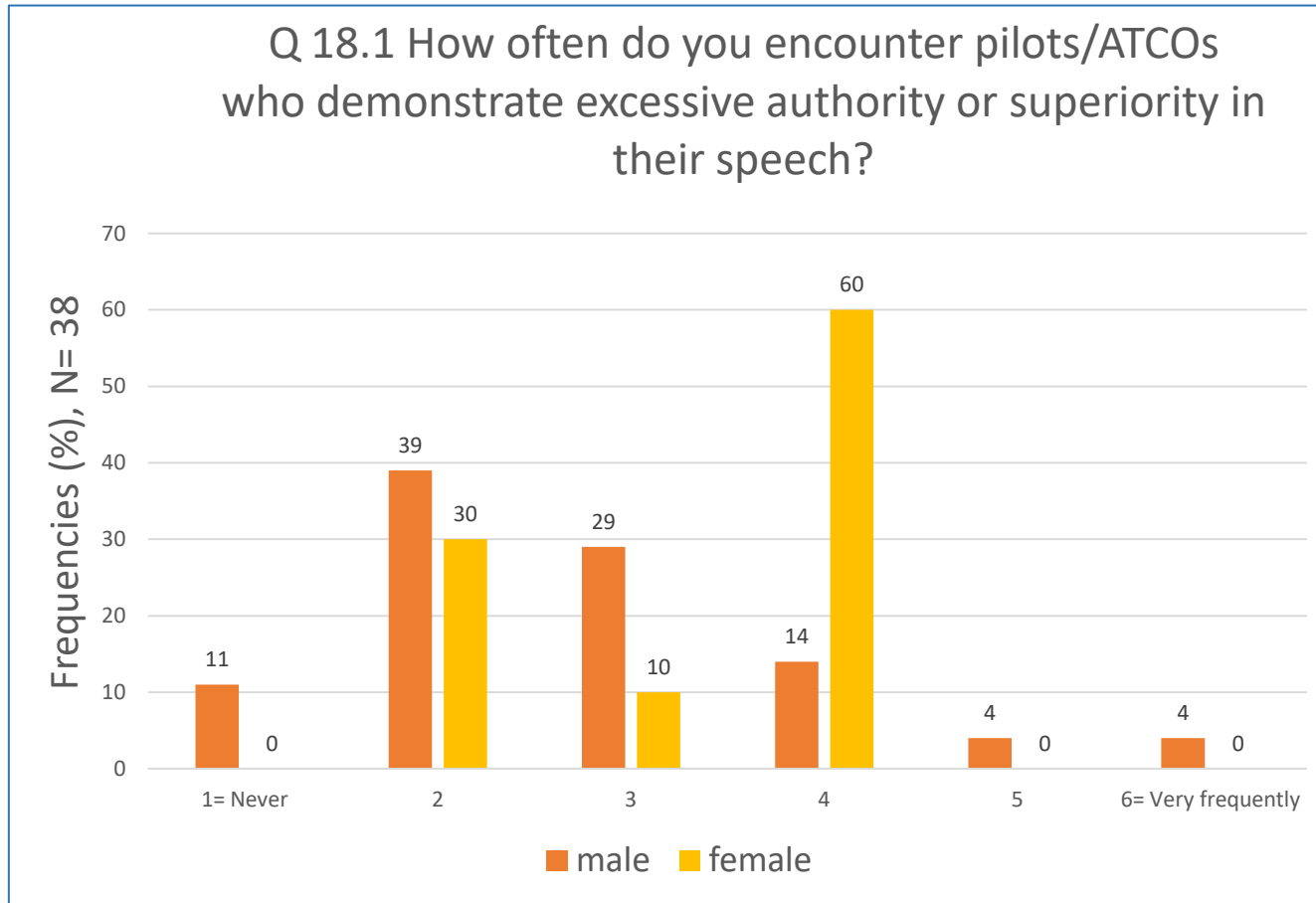


Figure 5: Males' x females' perceptions (Q18.1)

➤ **Research question 2:**

Responses to the questions '**How important is this.....?**', in Section 2, and '**How important were these events as potential threats to safety?**', in Section 3, revealed the situations that were considered the least and most important in the participants' opinion.

Table 3: All respondents' perceptions per section – Importance to safety

All respondents	Least important	Most important
Section 2 – 10.2 to 17.2	Q 12.2 ($M = 4.48$, $SD = 1.29$)	Q 14.2 ($M = 5.97$, $SD = 0.16$)
Section 3 – 18.2 to 34.2	Q 20.2 ($M = 3.45$, $SD = 1.54$)	Q 26.2 ($M = 5.56$, $SD = 0.82$)

Results and discussions

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➤ Research question 2 - Comparing perceptions:

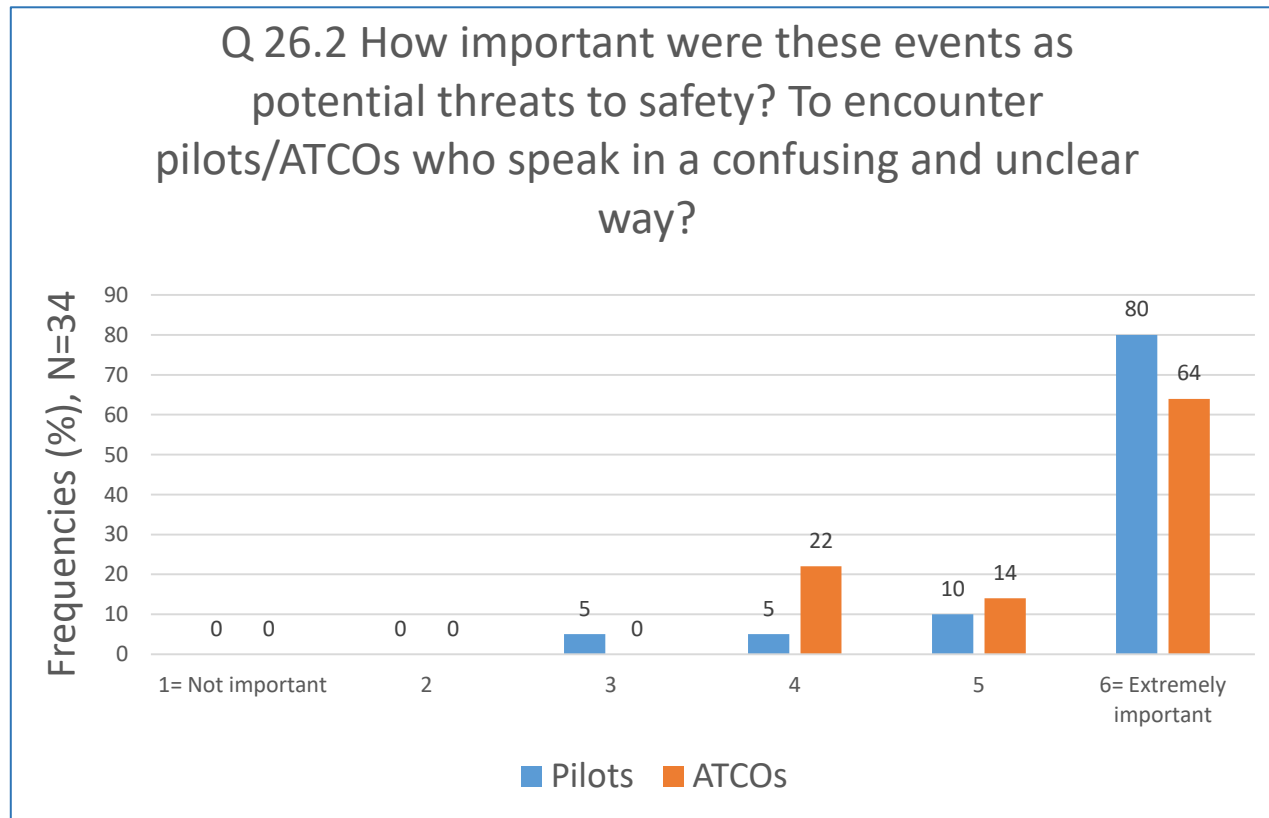


Figure 6: Pilots' X ATCOs' perceptions (Q26.2)

Results and discussions

➤ Research question 2 - Comparing perceptions:

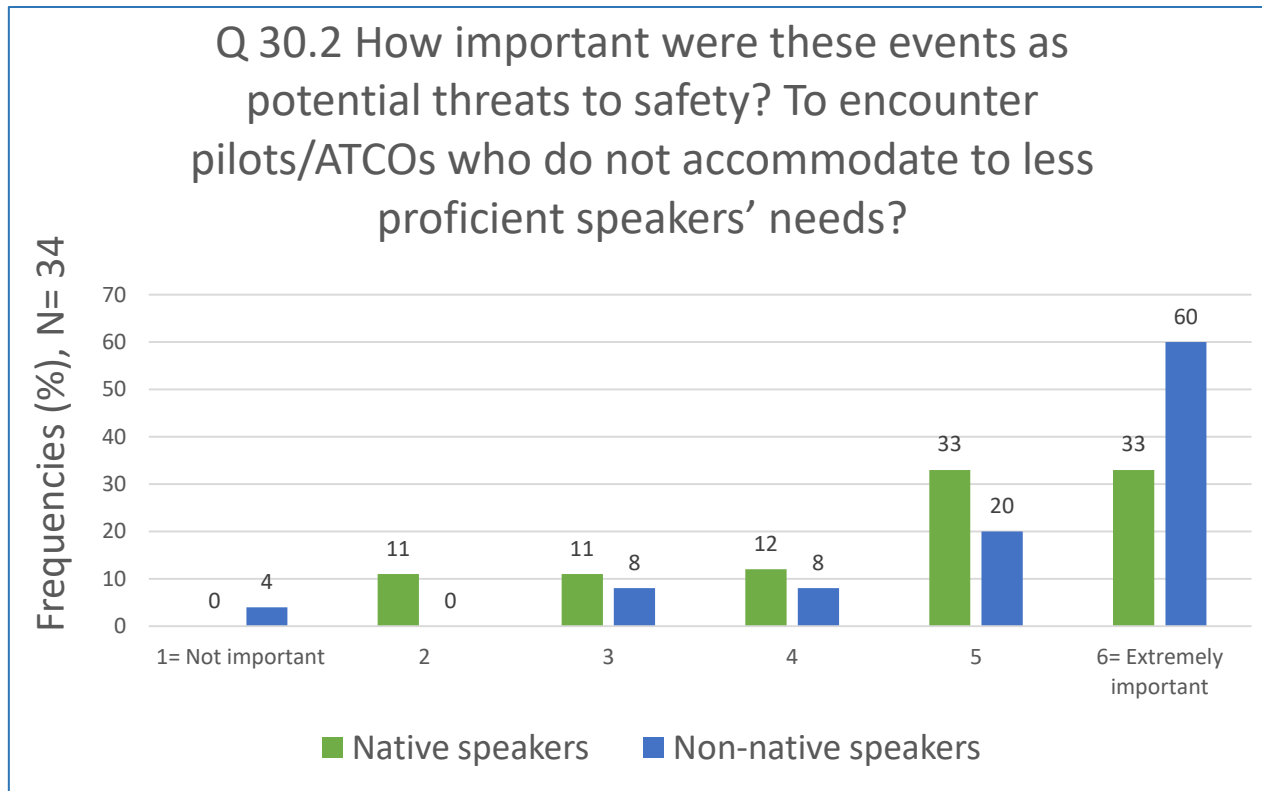


Figure 7: NSs' x NNSs' perceptions (Q30.2)

Results and discussions

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➤ Research question 2 - Comparing perceptions:

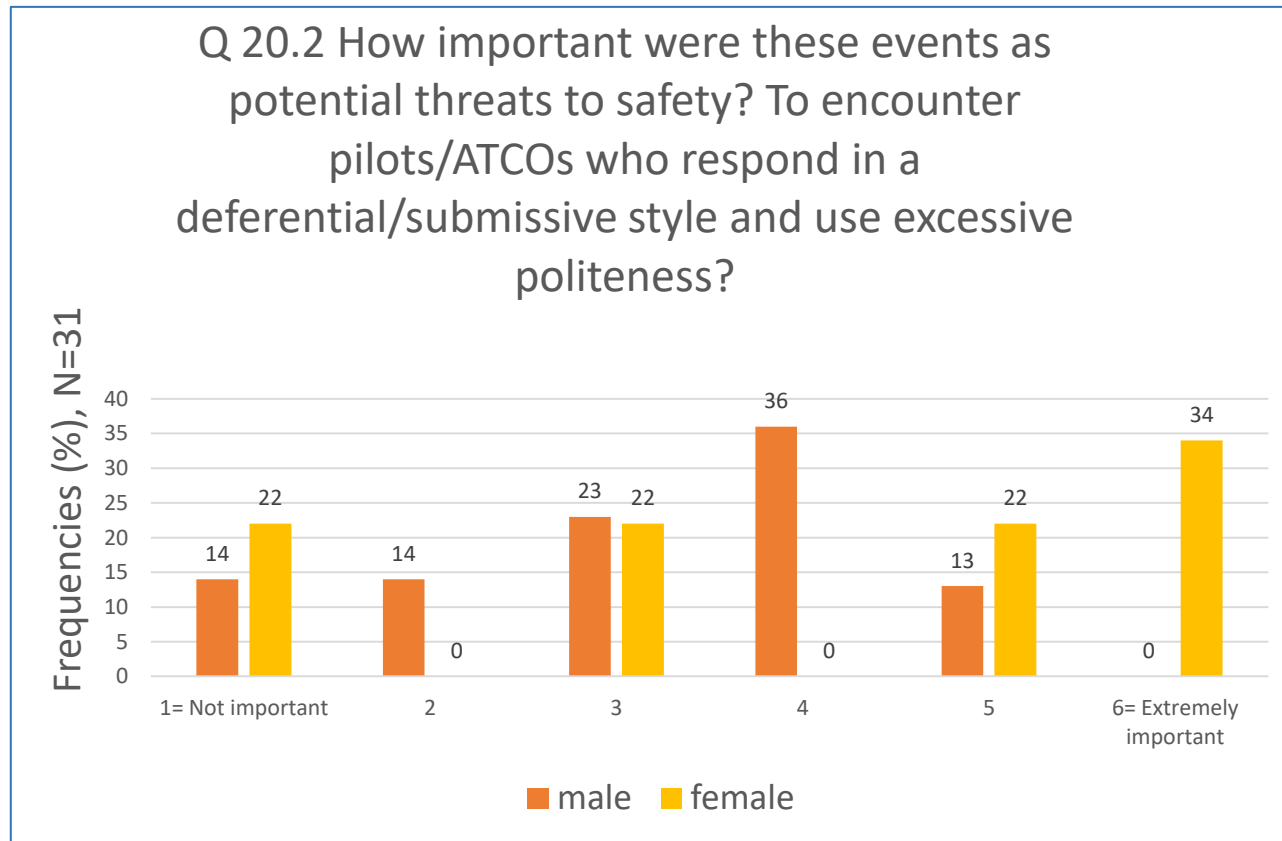


Figure 7. Males' x females' perceptions (Q20.2)

Results and discussions

➤ Triangulating findings:

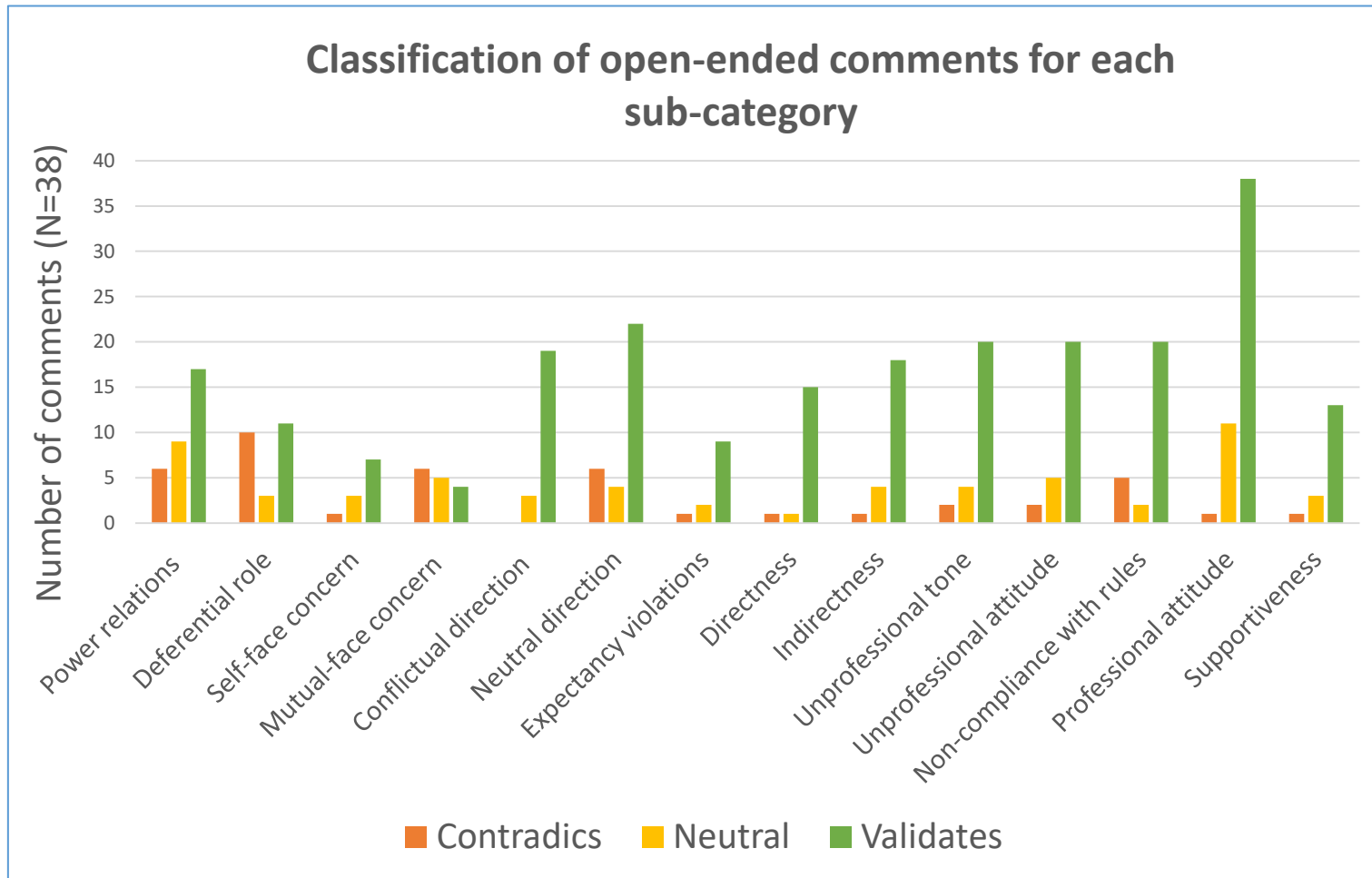


Figure 8: Summary of open-ended comments classification (Contradicts, Neutral, Validates)

Conclusions

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- Complex connections and relationships among sub-categories were noticed;
- The frequency of occurrence of intercultural factors that can affect pilot-ATCOs communications was generally lower than their perceived importance as a potential threat to safety.
- Questionnaire responses suggest that the constructs identified for each sub-category of intercultural factors refer to situations or events that do happen in international RT communications, which are also considered relevant to safety by the pilots and ATCOs sampled in this study;
- Some similarities but also some differences in perception across groups of participants were observed;
- Survey open-ended comments corroborated quantitative findings for each question and also substantiated other sub-categories;
- Despite sample size (N=38), validation of the draft taxonomy was possible using mixed methods research. A sequential qualitative study with aviation stakeholders (N=129) is now under way, and initial analysis of data suggests, so far, confirmation of findings presented here.



Workshop activity

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- Based on research subjects' open-ended comments, workshop participants will:
 - ✓ identify the main themes that emerge from the comments and rate their importance/significance to aviation safety;
 - ✓ consider possibilities to incorporate them into training activities;
 - ✓ discuss strategies to address these issues in terms of testing, policy change, regulations, etc.

Your participation is very much appreciated!!!

