

PHONEMIC PERCEPTION TRAINING IN TEACHING ENGLISH TO PILOTS

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ABSTRACT

A new speech perception training programme for teaching English to Russian pilots and controllers has been introduced based on a thorough phonetic-phonemic investigation of perceptual mistakes in English made by Russian learners of English and on a linguistic analysis of lexical units to be frequently used (both spoken and auditorily perceived) in their everyday professional communication on international airlines. Special attention is paid to the training of the phonemes which have no equivalents in the Russian language. Two major difficulties in perceiving English speech by native speakers of Russian are tense/lax distinctions in vowels and fortis/lenis distinctions in consonants.

1. INTRODUCTION

Teachers of foreign languages are familiar with a considerable speech perception deficit in their students even at stages when their own speech in this language may be considered quite adequate if not completely devoid of phonetic mistakes. The necessity of adequate testing, teaching and researching listening skills is shared by most of us, especially those who teach English, the language of global communication in many spheres of life[1, 2].

Our previous studies of phonetic perception skills in university students of the English department have shown that their phonemic hearing, as well as general listening comprehension skills were insufficiently developed[3]. In order to improve the situation, a new discipline, namely, listening comprehension, was introduced into the curriculum of the English Department of St Petersburg State University.

When asked to write down exactly what they heard students demonstrated certain inadequacies in grammatical and semantic interpretation of texts which

may have been brought about by phonetic mistakes involving incorrect identification of such features as voiced/devoiced (fortis-lenis) consonants, short/long (lax/tense) vowels and omission/insertion of phonemes, etc. Although phonemic hearing deficit in a foreign language, or perceptual accent, is very difficult to overcome in adults it can be reduced by specific perception training.

In teaching English for specific purposes, that is to students of science and technology it is often taken for granted that their professional knowledge of relevant lexis is a solid foundation for efficient communication with native speakers of English. However, realities of international communication clearly demonstrate how naive this point of view is. Specialists in various fields are becoming increasingly aware of the necessity of mastering receptive as well as productive speech fluency.

In some professions perfect perceptual skills are of paramount importance. Aviation is one of them.

In accordance with the requirements of the International Civil Aviation Organisation (ICAO) flight crews, air traffic controllers and aeronautical station operators have to demonstrate the ability to speak and understand the language normally used for radiotelephony communications which is based on the English language. Three levels of proficiency are distinguished: expert, extended and operational levels. These are defined on the basis of four main speech characteristics, i.e., pronunciation, stress, rhythm and intonation. Operational level presupposes that these are influenced by the first language or regional variation, but only sometimes do they interfere with understanding. The next level, extended, is one on which the above-mentioned speech parameters though influenced by the first language or regional variation, only rarely interfere with understanding. Speech characteristics of those on the highest, expert, level, although possibly influenced by the first language or regional variation almost never interfere with understanding. It is worth mentioning that these criteria apply only to speech understanding by the others and there no special requirements as to the quality of speech

perception of the air controllers and flight crews themselves. It is understood that appropriate speech presupposes appropriate speech comprehension, although, as we have pointed out, these two skills do not necessarily run parallel.

2. MATERIAL AND PROCEDURE

In working out a course in English for pilots and controllers in Russia and CIS we paid attention to maintaining a sensible balance between speech production and comprehension skills, so that our students could adequately conduct and comprehend radiotelephony communications and in compliance with the ICAO requirements demonstrate competence with standard phraseology as well as general proficiency in the English language used for radiotelephony communications.

Our task was to integrate into the English language curriculum a special-purpose phonetics course whose aim was to develop listening and speaking skills enabling aviators to communicate efficiently.

Being a cross-disciplinary research group, we have found it mandatory that our trainees be exposed to various perceptual stimuli, both related and unrelated to their speciality in order to make their speech and speech perception performance as close to that of native speakers. Thus the linguistic material used included two types of stimuli: general English and aviation English words and texts. We called them General English Stimuli (GES) and Aviation English Stimuli (AES), the former being additional and the latter forming the main stock. It is worth mentioning that GES were selected on the basis of the phonetic/phonemic analysis of the AES.

Let us first consider the actual AES, namely, radiotelephony communications messages, reports and instructions, which are used by pilots and ATC controllers to confirm or acknowledge obtained information and report on procedures completed or being carried out.

Controller:	Vacate the runway as soon as possible and report vacated.
Pilot:	Vacating the runway, will report vacated. / Runway vacated.

It is clear that the communicative meaning of these utterances depends on the correct phonetic realisation and perception of the final morphemes -ing and -ed. We selected the most frequent verbs used in Air - Ground communications and presented them for oral reproduction (drills) and auditory perception.

Verb forms used by controllers in instructions.	Verb forms used by pilots to answer that the action is performed.
a. Vacate	vacated
Start	started
Complete	completed [id]
Descend	descended
b.turn	turned
use	used [d]
c.stop	stopped
cross	crossed
reach	reached [t]

As post-stress reduction in Russian is much more prominent than in English we consistently draw our students' attention to the three different realisations of the -ed element of the participle and train the students to perceive and pronounce them correctly. At the same time it is explained that these participles are elliptical forms of the predicate in the passive voice.

Full grammatical form. The form used by flight crews.

ILS is established.	ILS established.
RVSM is approved.	RVSM approved.
Procedure turn is completed.	Procedure turn completed.

Similarly, utterances containing -ing forms were trained.

Controller:	Flight crew:
Hold short of runway.	Holding /Holding short
Caution taxi slower.	Slowing down.

As in the case of past participle, it was made clear that the -ing form is the elliptical realisation of the Present Progressive Tense form:

<u>Full grammatical form.</u> We are turning final..	<u>Flight crew phraseology</u> Turning final.
I am maintaining the Maintaining present flight level	resent flight level.
Station is calling Flight 611	Station calling Flight 611

As the phoneme [ng] is absent in Russian, it needs special training both on the receptive and reproductive level. This is done using, for instance, degrees of comparison.

Runway 11 is long. Runway 25 is longer. The longest taxiway,

Surface wind is strong Cross wind is stronger. The strongest wind.

Another phonetic feature which needs special training is differentiation between [v] and [w], the latter non-existent in Russian. Fortunately, there a lot of words containing these phonemes in standard radiotelephony phraseology and we concentrate a great deal on speech perception and production of words with [v] and [w]. For example,

Vet –wet

Vest-west

Vent-went

Wait on taxiway W1(whiskey one)

Reason- vortex wake.

Runway visibility is one thousand meters;vertical visibility is 55 (five five)meters.

Other examples of high probability lexical contexts were selected both for identification and production.

Another problem for Russian speakers of English is perception and production of the voiced and voiceless 'th' phonemes, which do not occur in Russian. Here we train function words first in most frequent combinations and then focus on relevant terminology.

In addition to AES training we used a series of GES to test both perceptual and productive abilities of our trainees. The procedure involved multiple choice tasks for speech perception and reading aloud lists of words. The auditory stimuli were separate words with tense/lax vowels and fortis/lenis consonants in word final positions. Our previous studies of auditory perception of such words have demonstrated that Russian learners of English have difficulty identifying words containing lax vowels followed by lenis consonants, for example, 'mills' was perceived as 'meals', etc [3] A corpus of 200 minimal pairs was made and the stimuli were presented in randomized order to students for identification.

For example, words like 'greed' and 'greet', 'starred' and 'start', differing in one distinctive feature only, along with words differing in two phonemic features, like, 'feed' and 'fit', or 'hard' and 'hut' were presented for auditory identification.

The listeners were 36 students of the Civil Aviation Academy and 36 students of the English Department of St Petersburg State University (the control group).

The students were tested and trained in groups of 12 in a language laboratory (Prisma Auditek). Training sessions

were organised in such a way as to elicit high-percentage correct identification from each trainee. When reliable perception data were obtained we recorded each student's oral realisations of the stimuli. Predictably, speech quality improved considerably. Differences between the two groups in their knowledge of general English were quite perceptible, especially in the sphere of active vocabulary. As to their perception skills , these differences were not so significant at the very start of experimental work and tended to become even less in the course of training.

Our results have confirmed the data previously obtained for students of the English Department that irrespective of the level of English language mastery, Russians make numerous perceptual mistakes in identification of lenis stop consonants when they are preceded by a tense vowel.

The number of two-feature substitutions was much smaller than one-feature ones and mistakes of this type were typical of the initial stage of training.

The next stage included perception of short texts containing words from the list of quasihomophones. The context was made suitable to evoke either member of the pair. The texts were read by native speakers of English, both male and female, at three speech rates, slow, normal and fast. There were 4 speakers, 2 British and 2 American. The listeners were instructed to identify the key word in the written version of the text.

At the third stage of training our subjects were presented with short samples of radio programmes and other authentic materials which had some of our key words. In this case there were also rate variations, some extracts spoken slower and the others faster. When listening to these 'fast' speech materials the students were allowed to slow down them at the beginning of training. Special attention was paid to explaining to the listeners which parts of utterances were usually pronounced faster than the others, thus enabling them to predict speech tempo alterations and foresee possible perceptive complexities.

It should be mentioned that the consequent stage of perceptual training was introduced as soon as the previous one for a set number of phonemes was completed. Namely, first perception of the phonemes [i:] – [i] was trained in words, short texts and then in fragments of natural texts. After that we trained other phonemes in contexts of increasing complexity. Finally, all the phonemes were presented in random order to make sure that adequate perception skills had been achieved for the whole phonemic system.

It is interesting that most of our trainees reported subjectively better feelings towards listening comprehension in general after the course of phonemic perception training. They mentioned not only improvement of their listening , which correlated with their scores in the tests, but also that the 'listening barrier' disappeared and they felt much more self-confident both

in performing tasks involving their professional language both at the level of speech comprehension and speech production.

3. CONCLUSIONS

In conclusion, we would like to say that specific phonemic perception training in teaching English to pilots and flight controllers has proved to be highly efficient. Integrated as it was in the conventional language training based on the professional approach, it allowed us to diagnose perceptual difficulties in our students at the initial stage of language learning and conduct further listening comprehension activities with the consideration of the individual skill development rate.

Comparing results obtained from the two categories of students investigated, namely, future aviators and specialists in English, we have found similar patterns of perceptual confusions, there being merely quantitative differences in test scores.

Further work will be directed to the development of more individualised speech perception programmes and new efficient diagnostic test.

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