CONTEMPORARY CZECH PRONOUNCIATION: A DATABASE STUDY

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ABSTRACT

Recordings of identical texts spoken by young Czech speakers, students of approximately the same age, were auditorily analyzed by experienced listeners. A data structure for storing results of the auditory analyses was handled by appropriate search programs and the results of the searches were then computed transferred into tables and graphs and interpreted. Main results concerning the contemporary Czech pronounciation are presented and discussed.

One of the main tasks of phonetic departments is to describe and to analyse the current state of the vernacular language on the sound level. We have chosen the following methodic approach to evaluate the actual, existing pronunciation of the Czech language:

a) - the speech material to be analysed consisted of two short passages to be read, one easy and the other one difficult both lexically and syntactically, and a section of free narrative speech; the reading material consisted of 1) a short piece of text specially prepared for this purpose and 2) an authentic passage of prose text. The total contents of the text was 462 speech sounds (182 vowels and 280 consonants). Two minutes of free speech, recorded at the same session, were not used for the present database.

b) - several groups of rather explicitely defined speakers were recorded on tape: the first year students of Czech at the Philosophical Faculty of Charles University in Prague. Three groups of speakers reading the same sentences will be reported on here. The choice of students of Czech promised a certain homogeneity in age, previous education, interest in the study of their mother tongue, (partial) knowledge of the orthoepic norm and, last but not least, motivation. The groups of speakers can thus be described as representative of a higher level of pronunciation; as will be seen later, even here the number of deviations from the expected (orthoepic) norm is very high. It is obvious that these findings form a basis for appropriate (in some cases logopedic) measures and, hopefully, even for some changes in the curriculum of the Czech language. The first group of speakers in the first part of our investigation was formed by 33 students; the results are used here for comparison only. The remaining two groups, again students of Czech, consisted of one group of again 33 students, future teachers of Czech, whereas the additional group of 12 students was formed by students studying Czech without any qualification for a teaching job.

c) - an auditory analysis followed, performed (1) by a team of listeners in the first part of the project and (2) by a single listener, co-author of this paper, in the second part of our investigation; these results will form the core of our report. The previous results will be quoted for comparison only; some of them have been reported on at the Acoustic Conference in the High Tatra (October 1989). - The task of the listeners was to transcribe the recorded text: in a preprinted form they had to write down all deviations from the expected orthoepic pronunciation. For the notation a code was used: 21 categories describing the quantitative and qualitative characteristics of speech segments. Some mispronunciations were expressed by a combination of the code "words": 22% of mispronounced vowels were described by more than one of the characteristics.

d) - results of the auditory analysis were then transferred to a database. The database formed then a starting point for a description of the actual pronunciation of our speakers, giving characteristics of speech of the whole group as well as data on individual speakers. Each DB record represented one speech segment (speech sound) deviating in some respect(s) from the norm as pronounced by one particular speaker. By a number of search routines and programs, the stored data were analysed from various point of view. To this end, the main file of deviations and the file containing detailed characteristics of the individual sounds in the text (initial-medial-final, vowel-consonant-syllabic consonant, stressed - unstressed, member of a cluster) were joined, allowing thus a direct access to various categories of segments. The results of the searches were computed, transferred into tables and graphs, and interpreted.

Only some of the results can be presented here, giving information (1) about the performance of the speakers and their interpersonal variability and (2) about the degree of deformation of the individual speech sounds and the most common types of errors.

The attainments of the speakers are characterized by the number of mispronounced sounds (or by the total number of the errors which may be higher); deformations were found to form approx. 11 % of the text (in our previous investigation in 1988: 20%). There are considerable differences between speakers: 8-33 % errors. (1988: 5-33%), 16 % on the average. (In the small group of 12 speakers: range 7 - 21%, average: 16 % again.)

As for the types of mistakes:

1) of the possible 21 types of deformation, six types cover 90 % (1988: 80 %) of all deviations;

2) the most frequent deviation from the orthoepic norm is the extremely open pronunciation of vowels (though the speakers came from various parts of Bohemia and Moravia, not only from Prague and surroundings, where the open pronunciation is rather common);

3) next comes shortening (and reduction) of short vowels and shortening of long vowels, where, in the group of long vowels, it is the most frequent deviation;

4) an excessive nasalisation is the third characteristic deviation. As for consonants, weakening of articulation is here the most common change.

The number of mispronounced vowels is considerably higher than that of consonants: in 75 % of the speakers twice as much vowels are deformed when compared with consonants. The most common deviation is a too open pronunciation, then shortening of long and short vowels, reducing of vowel quality, nasalisation, weakening of consonants, omission and confusion of sounds. Eight speakers in our sample had a speech defect; in two other speakers the nasality was excessive. Regarding the frequency of errors in individual speech sounds: more than 10 % of errors were found in consonants *f, l, č, m, v* (in *f* and *l* more than 15 %), more than 5 % also *š, h, ž, c.*

In all, approx. 32 (1988: 36) % of all vowels were deformed.

In short vowels the most frequent deviation is a too open pronunciation, then comes a reduced timbre and changes in quantity (both shortening and lengthening).

In long vowels an open pronunciation and vowel shortening is very common. The most frequent deviation in consonants is their incomplete (weakened) realisation; the speech defects are found in sibilants and in the -sound.

Perhaps some other findings may be added:

- a fact, which may seem surprising especially to speech therapists, is the high number of mispronounced vowels as compared with the consonants in the text: the V/C ratio is 3:1 on the average, i.e. generally there are three times more mistakes in vowels than in consonants,
- some of the erroneous pronunciations belong to the field of speech therapy (though the number is not high and not significant enough). Anyway, the number (8) of speakers with speech defects may seem too high for future teachers of Czech. A line had to be drawn, of course, between occasional mispronunciations of a "logopedic character" and real speech defects. But even here the occasional mispronunciations may point to a certain instability in pronunciation;
- strangely enough, apart from the clear "logopedic cases", the famous Czech *ř* (*Dvořák*) remains unchanged.

A small table at the end of our paper gives some general results, showing sums and percentages of errors for individual classes of speech sounds. Again, a concentration of deviations in the data for vowels in comparison with those for consonants is apparent here in somewhat more detail. A correlation of these percentages with the results of the previous part of the analyses is high and significant (r = 0.93).

Considerable differences can be seen between the relative stability of the plosives, a stronger tendency to deviations in the group of fricatives and affricates and the group of sonorants. Here again a great difference between vowels and consonants can be found.

These data are given here without respect to the position of the speech sounds within the text; all segments were coded, however, with respect to their occurrence in initial, medial or final syllables, in stressed or unstressed parts of the text and also with respect to their positions within clusters. This, of course, splits the data into numerous minor groups. If we tried to sum up simply some of these results, then, in the first place, the following facts have to pointed out:

- differences in numbers of deviations between initial, medial and final syllables: not only final syllables show, as could be expected, a higher number of deviations, but also the sounds in initital positions;
- no great differences were found in results for stressed vs. unstressed syllables.

In conclusion, two facts perhaps deserve to be mentioned again: firstly, a detailed analysis of our material reveals a picture radically different from the situation with which speech therapists of teachers of foreign students are confronted; secondly, the most common and widely spread are those mistakes originating in careless pronunciation habits, leading then to reduced intelligibility.

Numbers and percentages of mispronunciations in

Speech sounds	N	Err	%
Total:	14 520	2 473	17.0
Vowels (*total*):	5 940	1 899	31.9
Short:	4 686	1 591	33.9
Long:	1 254	308	24.5
Consonants (*total*)	8 580	574	6.6
Plosives:	2 343	90	3.8
Fricatives:	2 442	172	7.0
Affricates:	330	33	12.7
Nasals:	1 551	74	4.7
Sonorants:	1 914	205	8.3

N = number of sounds in a class
Err = number of mispronounced sounds
% = percentage of deviations (Err/N)

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