CHINESE L1- CROATIAN L2 – DIFFICULTIES AND SUCCESS

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ABSTRACT

This pilot study presents the results of speech training exercises (phonetic correction) in 5 (4F and 1M) Chinese students of Croatian. The effects of training were assessed through listening evaluation tests and acoustic analysis of vowels. Twenty students of phonetics, native speakers of Croatian evaluated the pronunciation skills of Chinese students. The acoustic analysis of vowel formants in terms of F1 and F2 frequency was performed for female speakers only and compared to native speaker values. Both methods revealed some improvement in the quality of pronunciation in general, and provided guidelines for further course of phonetic speech training for Chinese students.

Keywords: FLL, speech training, vowel space, Chinese language, Croatian language

1. INTRODUCTION

It is well known that L2 pronunciation is influenced by the language that the learner already knows. The phenomenon is called foreign accent and it is defined as 'pronunciation that bears traces of the phonology of their first language' [9]. It also seems that foreign accent is becoming an integral part of the language learning process due to biological factors (critical periods) and language learning settings (group courses and learning material focusing more on developing language than on speech competence), therefore individual pronunciation problems and specific errors are frequently ignored. Previous studies [8] have shown that individual phonetic speech training (phonetic correction) yields very good results since it concentrates on individual problems and needs.

Phonetic correction was introduced by Guberina [12] within the Verbotonal method which is based on the idea of restricted bands of frequencies characteristic of individual sounds that are necessary and sufficient for these sounds to be recognized and distinguished from other (particularly closely related) sounds. Other factors facilitating successful speech training are, among others, sound context, intonation, position within the word/sentence and movement and are described in more details in previous work [4, 6]. Another important aspect of phonetic correction is the notion of the *system of errors*, i.e characteristic and systematic errors that can be expected in the speech of students sharing a common language background when learning a foreign language.

In order to understand the system of errors expected among Chinese students of Croatian, we should focus on some phonological characteristics of the two languages, especially in terms of sound inventories and tones. Although there are many descriptions of Chinese sound inventory [2, 10, 11], and they all differ, it can be said that there are 22 (23) consonants in Standard (Mandarin) Chinese (SC), including 6 stops /p/, /pʰ/, /t/, /tʰ/, /k/, /kʰ/, 6 (7) fricatives /f/, /s/, /ʂ/, /ʐ/, /ɕ/, /x/ and (/v/ occurring in some Chinese dialects and loan words), 6 affricates, /ʦ/, /ʦʰ/, /ʨ/, /ʨʰ/, /ʈʂ/, /ʈʂʰ/, 3 nasals /m/, /n/ and /ŋ/ (last occurring only in syllable coda), and 1 lateral /l/. Some authors put /r/ in phonological inventory of SC for /ʐ/ emphasizing that there are no trills in the system [3]. Voiced sounds occur as realizations of unaspirated stops and affricates in unstressed syllables. There are 25 consonants in Croatian, 6 stops, /p/, /b/, /t/, /d/, /k/ and /g/, 6 fricatives /f/, /s/, /z/, /ʒ/, /ʃ/, and /x/, 5 affricates /ʦ/, /ʧ/, /ʤ/, /ʨ/, /ʥ/, 3 nasals /m/, /n/, and /ɲ/, 4 approximants /ʋ/, /j/, /l/ and /ʎ/ and 1 trill /r/. Both languages have 5-vowel systems [2, 5], but the vowel distribution is somewhat different. SC has 3 high vowels /i/, /y/ and /u/, 1 mid /ə/ and 1 low vowel /a/. Descriptions of vowels differ even more, due to five possible realizations of each vowel depending on the surrounding consonants [2]. Croatian has 2 high vowels /i/ and /u/, 2 mid vowels /e/ and /o/ and 1 low /a/. Third, Chinese is typologically classified as a tone language with four lexical tones, while Croatian is a pitch-accent language with 4 accents [5] It is evident that Chinese students will have most difficulties on the prosodic level causing pronunciation difficulties and lower speech intelligibility among native Croatian speakers.

Their inability to perceive the difference between trill /r/ and lateral approximant /l/ will be the most prominent error on segmental level.

The aim of this work was to evaluate the success of phonetic correction by assessing the students' pronunciation of sentences and isolated words BEFORE and AFTER correction. It was expected that speech training would have positive effect on Chinese students' pronunciation of Croatian, resulting in higher listening evaluation scores. It was also expected that although vowels were not the primary focus of speech training exercises, the formant values would change resulting in more native-like vowel space, since previous studies have shown positive correlation between its shape (in terms of F1 and F2) and L2 proficiency [7]. Therefore, the improvement of vowels can indicate general improvement, as shown in previous studies [8].

2. MATERIAL AND METHOD

2.1. Speakers

Five native speakers of Chinese participated in this study (1 male, aged 18 and 4 females, mean age 21.2 years). They had been learning Croatian at the Faculty of Humanities and Social Sciences, University of Zagreb. The course consisted of daily 90-minute group classes at different levels defined within *Common European Framework of Reference for Languages* (CEFR) [1]: A1, A2, B1, B2, C1, C2; A being the lowest and C the highest level, and individual speech-training sessions. Three female participants, *F1, F2* and *F3* (speaker's code expressed in italics) were at level B2, 1 female (*F4*) was at A2 level and the male participant (*M1*) was B1. Duration of their stay in Croatia ranged from 8 to 24 months (mean 15.8 months). The recordings of participants (pre-correction and post-correction) were done approximately 2 months apart, with 10-15 individual sessions between recordings.

2.2. Listeners

Twenty native speakers of Croatian, graduate students of phonetics at the Faculty of Humanities and Social Sciences in Zagreb (18 female and 2 male; age range 18 to 24 (mean 22.1) participated in the study.

2.3. Listening evaluation test

The test material consisted of 10 words and 10 sentences for each speaker, recorded at the start of individual sessions (BEFORE) and after 2 months (AFTER).

Table 1: Test material.

Sentences / English	Words / English
Jedem rižu. / I eat rice.	Hrenovka / Frankfurter
Grad je siv. / The city is gray.	Uraniti / To be early
Kruno je tu. / Kruno is here.	Darovnica / Gift certificate
Ovaj brod je moj. / This ship is mine.	Nakriviti / Tilt
Moj urednik je žena. / My editor is a woman.	Kariran / Checkered
Moja sreća je iznimna. / I'm truly happy.	Operirati / To operate
Ne smiješ nakriviti čašu. / You mustn't tilt the glass.	Lakirati / To laquer
Ovaj preokret je nagao. / This is a sudden turnaround.	Marelica / Apricot
Sviram glasovir. / I play piano.	Paralelogram / Parallelogram
Recikliram papir. / I recycle the paper.	Ruralan / Rural

The total number of tokens was 200 (100 words and 100 sentences). Test words and sentences were selected from the material used in speech training sessions. The material was recorded in studio conditions with professional equipment.

2.4. Acoustic analysis

Words with five Croatian vowels were analyzed: *kip*, *kec*, *kap*, *kos*, *kup*. Four tokens of each word recorded at the start of individual sessions (BEFORE) and four recorded after 2 months (AFTER) were used. The recordings were made in the same way as the recordings for the listening test. Only female speakers were included in acoustic analysis since no comparison could be done for the single male speaker. For each speaker formant values were hand-tracked and averaged from 4 tokens of each word BEFORE and AFTER (total of 160 tokens for the 4 female speakers).

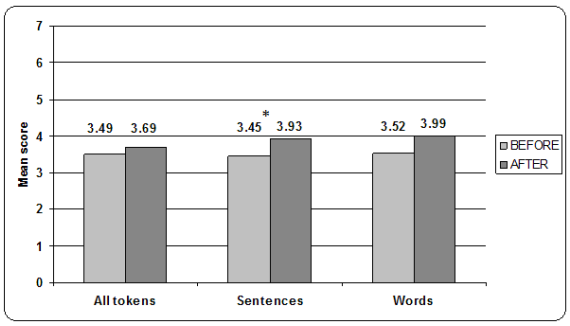
2.5. Procedure

The instructions given to listeners were to grade the pronunciation of each stimulus on the 1-7 scale, 7 being the best, i.e. closest to native Croatian pronunciation. The 200 tokens were presented in 5 blocks with 2-minute pauses between the blocks. Listeners were not familiar with the number of speakers or the speech training process. Listening tests were run from a notebook computer and presented via loudspeakers in a classroom (ambient noise approximately 40 dB). The test lasted 50 minutes.

3. RESULTS AND DISCUSSION

The scores averaged for recordings BEFORE and AFTER and are presented in Fig. 1. Significance (p) is marked with one (.05) or two (.01) asterisks.

Figure 1: Mean evaluation score for BEFORE and AFTER (all tokens, sentences and words).



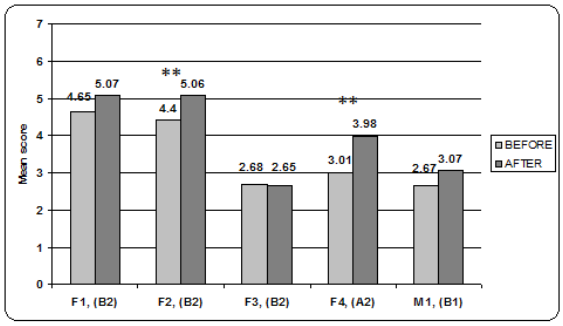
The AFTER stimuli were scored higher, but the difference in scores is generally lower than in similar studies [8] and it is statistically significant only for sentences (p=0.03). These results can be explained primarily by prosodic differences of the L1 and L2 resulting in foreign accent that the listeners are not familiar with and which they therefore score lower.

The results for sentences and isolated words show that words had slightly higher BEFORE scores (3.52 as opposed to 3.45 for sentences), but sentences showed statistically significant improvement. This indicates that in the AFTER stimuli, stress and intonation were closer to native speakers showing improvement in overall students' speaking skills. In general, the sentences that were scored higher were those in which prosodic features are more native-like regardless of possible segmental errors.

One of the premises of Verbotonal method is that the system of errors provides information about difficulties appearing in interlanguage, but that speech training sessions should address the individual realizations of possible systematic errors. In other words, it is expected that all L2 learners have systematic errors but also that they exhibit individual progress dynamics and that training sessions should be tailored to match individual needs. Accordingly, individual results should provide better understanding of pronunciation difficulties and improvement.

Speakers' individual scores showing the relationship between foreign language proficiency level and listeners' assessment are shown in Fig. 2. Fig. 2 shows higher scores for the AFTER stimuli correlated with the language proficiency level for all speakers except *F3*. This can be explained by any of the numerous factors affecting the language learning process: age, sex, motivation, previous learning environment and conditions, attitude towards language learning etc. This speaker is the oldest in the group (26), her stay in Croatia is the longest, but her speaking skills are in general below that expected for the B2 level. When looking at her results in particular, listeners assessed her sentences AFTER slightly better (2.82 as opposed to 2.67 for BEFORE sentences). On the other hand, the words were scored lower probably due to the fact that trill /r/ was still developing. It was no longer substituted with the lateral approximant /l/, but it was retroflex approximant /ɻ/ and therefore not acceptable to the listeners. Speakers *F2* and *F4* demonstrated greatest progress which was statistically significant (p=0.01 and p=0.00, respectively) because they were highly motivated which was evident through their regular attendance and enthusiasm. Speaker *F4* demonstrated the greatest progress compared to the beginning of sessions and produced little or no segmental errors. The highest average score was around 5 and the two speakers (*F1* and *F2*) with that average score showed the ability to make even the most difficult distinctions, i.e. between phonemes /r/ and /l/ in the same word /marelica/ (*apricot*) or and /paralelogram/ (*parallelogram*). It is interesting to note that individual speech training sessions yield results regardless of language learning level and the fact that more advanced students have more fixed interlanguage. Finally, the male speaker (*M1*/B1 level) for whom it was expected to be scored between *F1*, *F2*, *F3* and *F4* (being at A2 level, the lowest one among the speakers) was initially scored lower that *F4* but showed greater progress than *F3* which we again attribute to strong motivation.

Figure 2: Speakers' individual mean evaluation score for BEFORE and AFTER (A2 being the lowest and B2 the highest level within CEFR).



The results of acoustic analysis are in agreement with the scores provided by the listeners. When averaged across female speakers, formant values did not show any improvement, since the change occurred at different vowels in different speakers. As a result, we examined the formant values individually and compared them to listeners' scores and language proficiency level. Speaker *F3/*B2 (lowest results at listening evaluation test) did not demonstrate any change in formant values and front vowels remained more open (with higher values of F1 when compared to Croatian). Formant values of the two speakers with the highest evaluation scores (*F1/*B2 and *F2/*B2) were close to values of native speakers when measured from the tokens recorded BEFORE individual training sessions. These results are correlated with language proficiency level. Finally, speaker *F4/A2*, who demonstrated the greatest progress, showed the highest variability of formant frequencies in repetitions of the same tokens at the same recording session indicating still unstable Croatian vowel system.

Although this study included a small number of speakers with high individual variability, the results support the finding from similar studies [8] and it can be said that the speakers familiar with target language vowels having similar formant values (in case of SC the vowels occur either as phonemes or allophones), show slower progress in bringing production of vowels closer to those of native speakers.

4. CONCLUSION

This pilot study of phonetic correction of Chinese speakers learning Croatian indicated that the method yields good results in the quality of foreign language pronunciation, but it also revealed that students whose L1 and L2 are typologically different require more training sessions in general and also training sessions focused exclusively on listening skills, which would then enhance better overall pronunciation. As expected, greater improvement in listeners' scores was found in the speakers who were highly motivated, while the acoustic analysis was in agreement with language proficiency level.

5. ACKNOWLEDGMENTS

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6. REFERENCES

[1] Common European Framework of Reference for Languages.2011. *http://www.coe.int/t/dg4/linguistic/Source/Framework_EN.pdf.* Retrieved by February 2, 2011.

[2] Duanmu, S. 2005. Chinese (Mandarin), Phonology. In Brown, K. (ed.), *Encyclopedia of Language and Linguistics* (2nd ed.). Elsevier Publishing House, 2, 351-355.

[3] Duanmu, S. 2007. *The Phonology of Standard Chinese*. Oxford; New York: Oxford University Press.

[4] Guberina, P. 1972. *Restricted Bands of Frequencies in Auditory Rehabilitation of the Deaf*. Zagreb: Institute of Phonetics.

[5] Landau, E., Lončarić, M., Horga, D., Škarić, I. 1999. Croatian. *Handbook of the International Phonetic Association. A Guide to the Use of the International Phonetics Alphabet.* Cambridge. Cambridge University Press, 66-69.

[6] Mildner, V., Bakran, J. 2001. Acoustic correlates of phonetic correction. *Clinical Linguistics & Phonetics* 15(1&2), 151-155.

[7] Mildner, V., Horga, D. 1999. Relations between second language proficiency and formant-defined vowel space. *Proc. 14th ICPhS* San Francisco 2, 1455-1458.

[8] Mildner, V., Tomić, D. 2007. Effects of phonetic speech training on the pronunciation of vowels in a foreign language. *Proc. 16th ICPhS* Saarbrücken, 1665-1668.

[9] Mitchel, R., Myles, F. 2004. *Second Language Learning Theories* (2nd ed.). London: Hodder Arnold.

[10] Norman, J. 1988 *Chinese*. Cambridge: Cambridge University Press.

[11] Ou, S. 2007. Linguistic factors in L2 word stress acquisition: A comparison of Chinese and Vietnamese EFL learners' development. *Proc. 16th ICPhS* Saarbrücken, 1681-1684.

[12] Pansini, M. 1995. Univerzalnost verbotonalnih zasada. *Govor* 12, 125-134.