

THE EFFECT OF PHONETIC TRAINING ON SERBIAN EFL LEARNERS' PERCEPTION AND PRODUCTION ACCURACY

Abstract: The growing interest in SLA research has raised important questions regarding interlanguage phonology and pronunciation instruction in general. Different teaching approaches had divergent views on the importance of pronunciation. The effect of phonetic training on students' perception and production of target language sounds has also been a subject of numerous studies. The present paper aims at determining the effects of phonetic training on perception and production accuracy of English interdental fricatives /θ/ and /ð/. To accomplish the previously stated aim of the study, we conducted the research involving a longitudinal study in 2010/2011 academic year with intermediate level students in a secondary school in Jagodina. After a specifically structured phonetic training, the total of 30 students participating in the study underwent the same procedure including a pre-test and post-test with equal perception and production tasks. The results show positive and beneficial effects of phonetic training on learners' perception and production of English interdental fricatives.

Key words: interlanguage phonology, perception, production, phonetic training.

1. Introduction

With the predominant use of English as a medium of international communication, acquiring the capacity to correctly perceive and produce foreign, i.e. English language sounds has become an essential step towards successful foreign language acquisition. Different approaches in language teaching assumed opposing positions regarding the extent to which pronunciation instruction should be explicit or implicit in EFL curricula (Acton 1984). To date, there has not been a mutual agreement among applied linguists regarding which approach to teaching pronunciation is the most efficient for acquiring foreign language (FL) sounds as well as for eliminating or reducing the phenomenon known as "foreign accent". Practical experience and personal impressions based on classroom behaviour may be authentic and valuable, yet they may have numerous drawbacks since they cannot resolve crucial problems instructors face nor determine for certain which classroom activities are the most productive (Derwing, Munro 2005). Therefore, empirical and replicable research is requisite for diminishing the potential gap between what researchers know in theory and what actual language instructors do in practice.

* danicajerotijevic@gmail.com

The aim of the present study is to establish the effects of phonetic training on accurate perception as well as production of two English sounds considered problematic for Serbian students, interdental fricatives /θ/ and /ð/, to be more precise. After several introductory sections presenting relevant theoretical considerations, the results of the conducted research are presented and discussed.

2. Aims and Effects of Phonetic Training

The initial step in the process of successful mastering a new FL phoneme is learners' perceptual awareness of the distinction between the target phoneme and familiar sounds from their mother tongue, which is followed by understanding how to realize the distinction in their own production resulting in automatic production of the acquired sound without any conscious planning. After a learner becomes aware of the new pronunciation, it can either fit in his/her phonetic map, hence achieving cognitive balance or the process of assimilation, or result in two cases of cognitive imbalance: severe homeostasis, i.e. striking foreign accent, and accommodation, in which the new phonetic sound is learned after perpetual practice (Engwall 2006). It is precisely the aim of phonetic training to stimulate the student to reach the desired automaticity by repetitive constructive exercises, especially regarding accommodation.

If we endorse the assumption that production and perception are interrelated, meaning that advancement in perceptual accuracy leads to production improvement (Flege 1995), we should regard phonetic training as particularly significant and efficient in enhancing L2 learners' performance in both the discrimination and identification as well as eventual production of target language sounds (Iverson, Evans 2007). However, the amount of time a learner is exposed to exhaustive input on L2 sounds is not the only factor influencing the overall effectiveness of phonetic training. Its success likewise depends on learners' attention and the development of L2 sound-processing ability similar to that of native speakers.

The fundamental aim of phonetic training is to provide opportunities for learners to practise pronunciation by receiving relevant information on target language sounds through a diversity of perception and production tasks and appropriate teacher feedback. Furthermore, phonetic training seeks to examine how malleable learners' perceptual systems are when faced with the task of establishing novel phonetic categories and to delineate the alterations that may occur. According to Morley (1991), pronunciation training is guided by a learner's goal to achieve intelligible pronunciation rather than be a flawless pronouncer. It should focus on functional intelligibility, increased self-confidence and speech monitoring and modification strategies employed in and outside the classroom. Namely, pronunciation needs not be perfect and phonetic training should concentrate on enhancing communicability and encouraging students to communicate using the foreign language they are learning.

Various experimental studies argue that phonetic training of segmentals as well as suprasegmentals has positive consequences and thus should be implemented in EFL classrooms (Lively et al. 1994; Bradlow et al. 1999; Silveira 2002; Pruitt et al. 2006; Aliaga-García/ Mora 2008; Nobre-Oliveira 2008 etc.).

Ellis (1994) maintains that phonetic training promotes rapid learning by providing learners with words naturally spoken by multiple speakers and with immediate feedback on correct identification of these words. Moreover, phonetic training proved efficient and helpful in engendering evidence that adults' perceptual system can factually be modified and allow for considerably improved identification of segmental as well as suprasegmental contrasts (Bradlow et al. 1999).

3. Methods and Procedures in Phonetic Training

The results obtained from phonetic training research provide beneficial implications for pronunciation instruction and contribute to L2 speech learning theory in general. Some authors additionally suggest that phonetic training provides a suitable context for testing the effects of quality and quantity of input in L2 pronunciation learning in a controlled way (Aliaga-García, Mora 2008).

Various methods and procedures have been tested for training L2 learners to correctly perceive contrasts not found in their L1 that are particularly difficult, especially the so-called identification and discrimination tests (Halle et al. 2004). In an identification or categorization test, the stimuli are played one by one and the subjects label what they hear. Subjects' identification performance is examined with both trained and untrained items. In a discrimination test, stimuli are grouped, e.g. ABX, where X is either the same as A or the same as B and the subjects are asked whether X is the same as A or B. According to some authors, identification training is preferable because it is thought to direct attention to acoustic details distinguishing particular training tokens and not to the formation of phonetic categories (Pisoni, Lively 1995; Logan, Pruitt 1995). However, others suggest that discrimination training might enhance learners' experience by providing them with a wide variety of tasks and that further investigation is necessary to explore the benefits of this procedure (Handley et al. 2009).

Over the last few decades there has been a growing interest in the use of technology for pronunciation training and a diversity of computer hardware has been introduced. Consequently, numerous researchers tested the outcomes and efficiency of computer-assisted pronunciation training (CAPT) (Ehsani, Knodt 1998; Hincks 2003).

Automatic speech recognition or ASR-based CAPT system is one of the pronunciation training methods to which a considerable amount of research has been devoted recently. This system provides a multitude of advantages for FL speech learners, such as: extra learning time and material, specific feedback on individual errors and the possibility for self-paced practice in a private and stress-free environment (Neri et al. 2006). ASR-based system is gender-specific

since it utilizes different parameter settings for males and females. Nevertheless, the efficiency of the previously described computer system in improving pronunciation quality remains questionable, due to its limitations discovered in the results of empirical research.

High Variability Pronunciation Training (HVPT) proved to be a fairly successful phonetic training paradigm and an alternative to ASR-based system. Not only is it effective in teaching the perception of non-native phonemic contrasts, but also in generalizing this ability to the perception of unfamiliar tokens as well as in retaining it in long-term memory (Bradlow et al. 1999). Learners are presented with high-variability stimuli, consisting of phonemes in isolated words produced by multiple speakers in numerous phonological contexts and word positions containing minimal pairs of target sounds (Lively et al. 1993). Learners' attention is hence directed towards relevant phonetic cues. Even though HVPT is considered beneficial to learning due to the effective feedback it provides, among other features of course, some authors believe that it is not very motivational to learners. Additionally, Jongman and Wade (2007) demonstrated that even with minimal variability, phonetic training might be effective in promoting the acquisition of difficult sound contrasts, as long as it focused on target phonetic prototypes. Their conclusion suggests that phonetic training methods have to be adapted to particular sounds learners' are to acquire, since the overall success of training depends on the relation between learners' L1 and L2 phonetic systems.

Possible variations of training procedures may be (Bettoni-Techio/Koe-rich 2008):

- (a) training of three-sound contrasts
- (b) explicit instruction on the articulation of the to-be-trained sounds
- (c) adaptive training, where learners have to master a structure to proceed to a more difficult one
- (d) use of synthetic stimuli
- (e) fading, where the feature differentiating the sounds is enhanced in the beginning of the training session and gradually fades away; and
- (f) audiovisual training.

4. The Problem with Interdental Fricatives

Non-native speakers of English frequently experience difficulties in pronouncing interdental fricatives, the voiceless /θ/ and the voiced /ð/, which leads to inevitable substitutions of the two even within a single foreign accent. Possible variants of /θ/, as usually encountered in literature, are [t], [s] and [f], whereas /ð/ is substituted with [d], [z] and [v], although it is still uncertain whether these substitutions are phonetically clear instances of the sounds in question. Albeit English interdental fricatives are separate sounds, learners are unable to immediately internalize them probably due to the absence of these sounds from their mother tongue phonological inventory. Furthermore, studies have shown

that interdental fricatives appear rarely in world languages and are acquired late by native speakers (Dubois/Horvath 2004), which additionally hinders successful second language acquisition.

English interdental fricatives are pronounced in the following way (Roach 1990; Ladefoged 2001): the soft palate being raised and the nasal resonator shut off, the tip and rims of the tongue make a light contact with the edge and inner surface of the upper incisors and a firmer contact with the upper side teeth, so that the air escaping between the forward surface of the tongue and the incisors causes friction. For /θ/ the friction is voiceless, whereas for /ð/ there may be some vocal cord vibration.

Interdental fricatives and their substitutional variants are different sounds (which is evident from Giegerich's tables 1 and 2 (Giegerich 1992: 128)), yet the confusion arises because of the similarity in acoustic features (Ladefoged 2001).

Giegerich's Table 1: Feature specifications of [θ] and its frequent replacements

	[θ]	[t]	[s]	[f]
[Consonantal]	+	+	+	+
[Continuant]	+	-	+	+
[Anterior]	+	+	+	+
[Coronal]	+	+	+	-
[Strident]	-	-	+	+
[Tense]	+	+	+	+
[Voice]	-	-	-	+

Giegerich's Table 2: Feature specifications of [ð] and its frequent replacements

	[ð]	[d]	[v]	[z]
[Consonantal]	+	+	+	+
[Continuant]	+	-	+	+
[Anterior]	+	+	+	+
[Coronal]	+	+	-	+
[Strident]	-	-	+	+
[Tense]	-	-	-	-
[Voice]	+	+	+	+

Serbian learners of English likewise encounter problems when pronouncing interdental fricatives since Serbian phonological inventory does not possess the two segments, which is why the two sounds have been chosen for the present investigation regarding the effects of phonetic training. Nevertheless, the phonetic and phonological repertoire of Serbian is familiar with similar sounds that are

often chosen as substitutes for /θ/ and /ð/, such as alveolar dental plosives /t/ and /d/, dental fricatives /s/ and /z/ and labio-dental fricatives /v/ and /f/ (Petrović/Gudurić 2010).

Previous studies have demonstrated that Serbian learners predominantly opt for [t] and [d] as alternatives to /θ/ and /ð/ respectively (Lee 2006), hence our goal is to once again confirm this conclusion or perhaps discover and draw attention to other substitutional variants.

5. Methodology

5.1. The aim of the study

The aim of the second part of the research is to investigate the effects of the six-month long phonetic training on Serbian EFL learners' perception and production of English interdental fricatives. More precisely, the effectiveness of the phonetic training administered to the experimental group is measured in terms of how successful it is in changing learners' perceptual ability to correctly identify English interdental fricatives, and in improving learners' accuracy in the production of the afore mentioned sounds.

5.2. Research questions

Bearing in mind the previously presented theoretical data regarding the efficiency of phonetic training, we formulated the following research questions:

1. Does phonetic training have any impact on Serbian EFL learners' perception and production of interdental fricatives /θ/ and /ð/?
2. If it does, is the impact beneficial or obstructive?

5.3. Participants

A total of thirty participants (18 females, 12 males) at the age of 17 and 18 (mean age 17.5) participated in a pre-test/post-test experiment. All the participants were third year students of a secondary school in Jagodina and were divided into experimental (N=15) and control (N=15) group. Only the experimental group went through a six-month long phonetic training period, after which all groups repeated the same perception and production tasks (post-test). The volunteering learners had been learning English formally for 9 years and had not had any previous phonetic training experience or experience abroad. They were given course credit for their participation. Before the actual phonetic training the participants underwent grammar and vocabulary diagnostic examination (Oxford's diagnostic test 2010) to determine the level of proficiency and the chosen participants were all at intermediate level.

5.4. *Phonetic training*

The phonetic training consisted of diverse perception and production tasks not only regarding interdental fricatives but other phonetic and phonological aspects, as well, since we sought to provide the students with an in-depth analysis of English phonological inventory and thus possibly enhance their performance and expand their knowledge about target language sound system. Students were introduced with fundamental features of English phonetic system, English vowel and consonant properties, and were provided with an opportunity to practise the target language sounds while receiving immediate feedback. A variety of tasks was applied to develop and improve perceptual and productive ability of the participants, as well as to modify their pronunciation regarding diverse phonetic aspects. There was a gradual transition from easily identified and produced sounds to more demanding ones, and at the very beginning the students were familiarized with the symbols of International Phonetic Alphabet. The training sessions were held once a week and each lesson lasted one hour. The phonetic training sessions were structured in the following way: introductory part was devoted to revision and interesting warm-up activities, which was followed by the theoretical part regarding articulatory description of sounds, tips for learning pronunciation, native speaker models, contrastive analysis: Serbian vs. English, and the practical part with exercises aiming at both perception and production. Perception tasks were different from those in pre-test and post-test and consisted of diverse exercises drawing attention to multiple contexts, pair work to encourage peer correction as well as critical listening to native speakers. Production tasks included a variety of reading aloud and repetition tasks. Immediate teacher feedback was provided after each practical session as well as after each pronunciation error. The focus of the training was primarily on segmentals, and interdental fricatives predominantly, however suprasegmental features of English phonetic and phonological system were introduced and discussed on several sessions near the end of the training.

5.5. *Data Collection*

In order to collect the data for the analysis of the effects of phonetic training the participants were asked to do pre-test perception and production tasks and repeated the same tasks after the phonetic training period was finished.

Perception Task. The participants underwent The General Pronunciation Error Perception Test (GPE) (Reis et al. 2008) which measured whether the subjects were able to identify inaccurate production when interdental fricatives were inserted in the context of communication. An excerpt from the text *Three Little Pigs* (Rau et al. 2009) produced by a Serbian EFL speaker with problematic pronunciation was recorded and the participants were given an answer sheet with the original and transcribed text and, after hearing the recording twice, they were

supposed to mark any inaccurate pronunciation they could detect. The recorded speaker was asked to produce the target phonemes differently every time they appeared in the text, substituting them with previously mentioned frequent substitutes /t/, /f/, /s/ and /d/, /v/, /z/. Each target phoneme appeared eighteen times in the text and they were all mispronounced.

Production task. To measure the accuracy of students' production of interdental fricatives, we recorded the participants pronouncing a specially designed word list containing words with interdental fricatives in different phonetic environments. The word list was adapted from Rau et al. (2009) and consisted of 20 /θ/ tokens and 20 /ð/ tokens in various positions. Participants' production was transcribed, the percentage of accurate and inaccurate pronunciation was counted in pre-test/post-test examination and the results were compared to establish the effects of six-month long phonetic training.

5.6. Procedure

The phonetic training occurred during the 2010/2011 academic year, from December to June. Students' performance was measured at the beginning in pre-test activities and later, after the training was over, in post-test activities. The percentage of accurate perception and production in pre-test was measured and later compared to the percentage of post-test.

6. Results

6.1. Perception Task Results

Before the actual phonetic training sessions commenced, we conducted a pre-test examination measuring the accuracy of Serbian EFL intermediate learners' perception of interdental fricatives and we obtained the following results presented in the table below.

Pre-test Results	/ ð /		/ θ /		Total
	Number of Occurrences	Accuracy Count	Number of Occurrences	Accuracy Count	Accuracy Count
Experimental Group	270 (100%)	68 (25.19%)	270 (100%)	81 (30%)	149 (27.59%)
Control Group	270 (100%)	79 (29.26%)	270 (100%)	87 (32.22%)	166 (30.74%)

Judging by the table, the experimental group of participants perceived voiced interdental fricative at 25.19% level of accuracy, whereas the control group had slightly higher results (29.26%). Regarding the voiceless counterpart, the experimental group achieved 30% of accuracy and the control group 32.22 % of accuracy. Consequently, the total level of accuracy for /ð/ and /θ/ was 27.59 % for experimental and 30.74 % for control group.

After six months of phonetic training, the same perception task was repeated for both the experimental and control group and the results are presented in the ensuing table.

Post-test Results	/ ð /		/ θ /		Total
	Number of Occurrences	Accuracy Count	Number of Occurrences	Accuracy Count	Accuracy Count
Experimental Group	270 (100%)	119 (44.07%)	270 (100%)	123 (45.56%)	242 (44.81%)
Control Group	270 (100%)	84 (31.11%)	270 (100%)	85 (31.48%)	169 (31.3%)

The presented results show that the perception accuracy increased for the experimental group, 44.07% for voiced interdental fricative and 45.56% for its voiceless counterpart. When it comes to the control group, the level of accuracy after the renewed examination was 31.11% for voiced, and 31.48% for voiceless interdental fricative. The total accuracy percentage was 44.81% for experimental group and 31.3% for control group.

6.2. Production Task Results

The participants were engaged in a production task before and after the training period which aimed at measuring the level of their production accuracy. They were supposed to read a previously carefully designed word list containing target sounds in various phonetic environments. Along with accuracy percentage of the production of interdental fricatives for each context separately, we sought to determine the most frequent substitution variant for each mispronounced target sounds.

The results of the pre-test are presented in the following two tables for both the experimental and control group for /ð/ and /θ/ successively.

Experimental group / ð /					
Context	Number of occurrences	Accuracy Count	Substitution for Inaccurate Production		
			[d]	[v]	[z]
Intervocalic V+ /ð/+V	15	6 (40%)	9 (100%)	/	/
Interconsonantal C+/ð/+C	15	5 (33.33%)	10 (100%)	/	/
Pre-vocalic Word initial /ð/ +V	60	29 (48.33%)	26 (83.87%)	5 (16.13%)	/
Post-vocalic Word final V+/ð/	75	31 (41.33%)	44 (100%)	/	/
Post-consonantal/ Pre-vocalic C+ /ð/+V	45	15 (33.33%)	30 (100%)	/	/
Post-vocalic/ Pre-consonantal V+/ð/+C	90	48 (53.33%)	39 (92.86%)	3 (7.14%)	/
Total	300 (100%)	134 (44.67%)	158 (95.18%)	8 (4.82%)	/

Control group / ð /					
Context	Number of occurrences	Accuracy Count	Substitution for Inaccurate Production		
			[d]	[v]	[z]
Intervocalic V+ /ð/+V	15	4 (26.67%)	10 (90.91%)	1 (9.09%)	/
Interconsonantal C+/ð/+C	15	7 (46.67%)	8 (100%)	/	/
Pre-vocalic Word initial /ð/ +V	60	25 (41.67%)	28 (80%)	7 (20%)	/
Post-vocalic Word final V+/ð/	75	24 (32%)	49 (94.23%)	2 (3.85%)	/
Post-consonantal/ Pre-vocalic C+ /ð/+V	45	17 (37.78%)	28 (100%)	/	/
Post-vocalic/ Pre-consonantal V+/ð/+C	90	41 (45.56%)	47 (95.92%)	2 (4.08%)	/
Total	300 (100%)	118 (39.33%)	170 (92.9%)	12 (6.56%)	/

The situation is somewhat different with the voiceless interdental fricative.

Experimental group / θ /					
Context	Number of occurrences	Accuracy Count	Substitution for Inaccurate Production		
			[t]	[f]	[s]
Intervocalic V+ /θ/+V	30	14 (46.67%)	16 (100%)	/	/
Interconsonantal C+/θ/+C	30	9 (30%)	21 (100%)	/	/
Pre-vocalic Word initial /θ/ +V	30	16 (53.33%)	9 (64.29%)	5 (35.71%)	/
Pre-consonantal Word initial /θ/+C	45	10 (22.22%)	27 (77.14%)	8 (22.86%)	/
Post-consonantal Word final C+ /θ/	60	17 (28.33%)	43 (100%)	/	/
Post-vocalic Word final V+/θ/	60	19 (31.67%)	34 (82.93%)	7 (17.07%)	/
Post-consonantal/ Pre-vocalic C+/θ/+V	45	11 (24.44%)	32 (94.12%)	2 (5.88%)	/
Total	300 (100%)	96 (32%)	182 (89.22%)	22 (10.78%)	/

Control group / θ /					
Context	Number of occurrences	Accuracy Count	Substitution for Inaccurate Production		
			[t]	[f]	[s]
Intervocalic V+ /θ/+V	30	17 (56.67%)	13 (100%)	/	/
Interconsonantal C+/θ/+C	30	11 (36.67%)	19 (100%)	/	/
Pre-vocalic Word initial /θ/ +V	30	12 (40%)	16 (88.89%)	2 (11.11%)	/
Pre-consonantal Word initial /θ/+C	45	12 (26.67%)	30 (90.91%)	3 (9.09%)	/
Post-consonantal Word final C+ /θ/	60	19 (31.67%)	39 (95.12%)	2 (4.88%)	/
Post-vocalic Word final V+/θ/	60	22 (36.67%)	32 (84.21%)	6 (15.79%)	/
Post-consonantal/ Pre-vocalic C+/θ/+V	45	13 (28.89%)	31 (96.88%)	1 (3.13%)	/
Total	300 (100%)	106 (35.33%)	180 (92.78%)	14 (7.22%)	/

The results of the post-test changed significantly for experimental group, while they remained similar for control group, as can be inferred from the tables below.

Experimental group/ δ /					
Context	Number of occurrences	Accuracy Count	Substitution for Inaccurate Production		
			[d]	[v]	[z]
Intervocalic V+ / δ /+V	15	9 (60%)	5 (83.33%)	1 (16.67%)	/
Interconsonantal C+/ δ /+C	15	10 (66.67%)	5 (100%)	/	/
Pre-vocalic Word initial / δ / +V	60	41 (68.33%)	11 (57.89%)	8 (42.11%)	/
Post-vocalic Word final V+/ δ /	75	45 (60%)	19 (63.33%)	11 (36.67%)	/
Post-consonantal/ Pre-vocalic C+ / δ /+V	45	27 (60%)	18 (100%)	/	/
Post-vocalic/ Pre-consonantal V+/ δ /+C	90	50 (55.56%)	40 (100%)	/	/
Total	300 (100%)	182 (60.67%)	98 (83.05%)	20 (16.95%)	/

Control group/ δ /					
Context	Number of occurrences	Accuracy Count	Substitution for Inaccurate Production		
			[d]	[v]	[z]
Intervocalic V+ / δ /+V	15	6 (40%)	9 (100%)	/	/
Interconsonantal C+/ δ /+C	15	8 (53.33%)	7 (100%)	/	/
Pre-vocalic Word initial / δ / +V	60	28 (46.67%)	25 (78.13%)	7 (21.88%)	/
Post-vocalic Word final V+/ δ /	75	26 (34.67%)	35 (89.74%)	4 (10.26%)	/
Post-consonantal/ Pre-vocalic C+ / δ /+V	45	21 (46.67%)	24 (100%)	/	/
Post-vocalic/ Pre-consonantal V+/ δ /+C	90	38 (42.22%)	47 (90.38%)	5 (9.62%)	/
Total	300 (100%)	127 (42.33%)	147 (84.97%)	16 (9.25%)	/

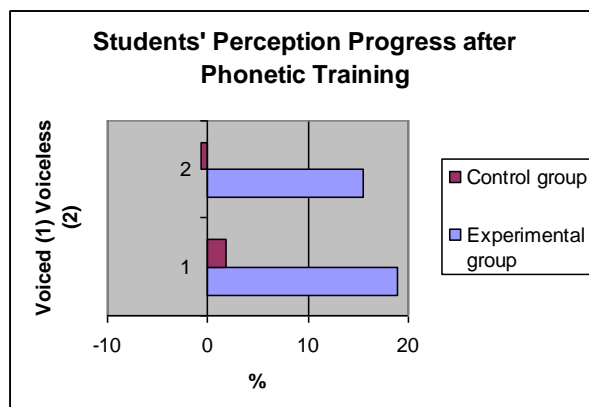
The following two tables display the results of post-test for voiceless interdental fricative.

Experimental group/ θ /					
Context	Number of occurrences	Accuracy Count	Substitution for Inaccurate Production		
			[t]	[f]	[s]
Intervocalic V+ /θ/+V	30	21 (70%)	7 (77.78%)	2 (22.22%)	/
Interconsonantal C+/θ/+C	30	17 (56.67%)	13 (100%)	/	/
Pre-vocalic Word initial /θ/ +V	30	21 (70%)	4 (44.44%)	5 (55.56%)	/
Pre-consonantal Word initial /θ/+C	45	23 (51.11%)	15 (68.18%)	7 (31.82%)	/
Post-consonantal Word final C+ /θ/	60	27 (45%)	29 (87.88%)	4 (12.12%)	/
Post-vocalic Word final V+/θ/	60	31 (51.66%)	21 (72.41%)	8 (27.59%)	/
Post-consonantal/ Pre-vocalic C+/θ/+V	45	23 (51.11%)	22 (100%)	/	/
Total	300 (100%)	163 (54.33%)	111 (81.02%)	26 (18.98%)	/

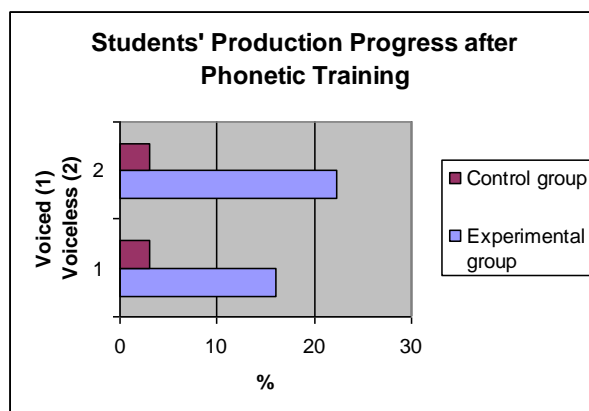
Control group / θ /					
Context	Number of occurrences	Accuracy Count	Substitution for Inaccurate Production		
			[t]	[f]	[s]
Intervocalic V+ /θ/+V	30	15 (50%)	13 (86.67%)	2 (13.33%)	/
Interconsonantal C+/θ/+C	30	12 (40%)	18 (100%)	/	/
Pre-vocalic Word initial /θ/ +V	30	14 (46.67%)	13 (81.25%)	3 (18.75%)	/
Pre-consonantal Word initial /θ/+C	45	15 (33.33%)	26 (86.67%)	4 (13.33%)	/
Post-consonantal Word final C+ /θ/	60	23 (38.33%)	32 (86.49%)	5 (13.51%)	/
Post-vocalic Word final V+/θ/	60	20 (33.33%)	29 (72.5%)	11 (27.5%)	/
Post-consonantal/ Pre-vocalic C+/θ/+V	45	16 (35.56%)	29 (100%)	/	/
Total	300 (100%)	115 (38.33%)	160 (86.49%)	25 (13.51%)	/

For the sake of conciseness and clarity we will present the compared overall results of perception and production tasks in the following bar charts.

Regarding perception, the experimental group showed enhancement 18.88% for voiced, and 15.56 % for voiceless interdental fricative. The control group achieved 1.85% progress in perception accuracy of voiced interdental fricative and scored negatively for its voiceless counterpart (-0.74%).



In the production task, the experimental group produced voiced interdental fricative with 16% of improvement in terms of accuracy and voiceless interdental fricative with 22.33% improvement. The control group enhanced their performance for 3% in both cases.



7. Discussion

7.1. Perception Accuracy

Judging by the results obtained from the pre-test and post-test perception task, the participants in the experimental group improved their general target language sounds perception by 17.22%, more precisely by 18.88% for /ð/ and 15.56 % for /θ/. The perception of the voiced interdental fricative was enhanced to a greater extent than the perception of its voiceless counterpart, which may either indicate that Serbian EFL learners' find the perception of /θ/ more difficult than that of /ð/, or that the amount of exercises during the phonetic training was slightly more focused on /ð/ than /θ/. Perhaps the design of the pre-test and post-

test perception tasks was challenging or unusual for Serbian EFL learners and thus hindered them to achieve even more favourable results. Nevertheless, the improvement is significant especially if we compare the results of the experimental group to the results obtained from the control group which received no training, particularly if we bear in mind that the initial pre-test accomplishment was similar in both groups. The total perception accuracy of the control group remained basically the same, since the results displayed negligible improvement (0.56%), probably due to the repetition of a familiar task or slight advancement in proficiency during the regular school year. The perception accuracy of the voiced interdental fricative increased by 1.85%, whereas the perception of the voiceless counterpart scored negatively even, meaning that the participants were capable of detecting less errors than the first time.

We dare conclude that, although the improvement due to phonetic training was not immense, it was significant, whatsoever, since the group of learners who received the training perceived the target language sounds more accurately than the group attending no training lessons. Furthermore, the control group achieved negative results which points to the lack of consistency and insecurity of learners without the benefits of phonetic training. Additionally, the results of the control group may point to the lack of time devoted to pronunciation practice and insufficient attention paid by school teacher in regular classes.

Perhaps a longer period of training with more frequent training sessions and revised types of tasks would prove even more beneficial for Serbian EFL learners' perception of interdental fricatives. Future research may predominantly concentrate on perception tasks during the phonetic training and consequently measure the outcome in terms of accuracy as well as possibly provide learners with different examination tasks or structure the training sessions differently.

7.2. Production Accuracy

The overall production progress of the experimental group after the phonetic training was considerably different from the progress made by the control group. The control group attained solely 3% of improvement for both the voiced and voiceless interdental fricatives, while the group that underwent the phonetic training achieved 16% for voiced and 22.33% for voiceless. The improvement achieved by the control group may be explained by general advancement in English proficiency during the regular classes at school. The previously explained results suggest that phonetic training may be beneficial and contribute to significant improvement in Serbian EFL learners' production accuracy. Moreover, the negligible percentage of advancement in the control group may suggest regular school teacher's lack of attention paid to pronunciation and the time devoted to practising it. Interestingly, though, the results for the production are somewhat opposing to those of perception, since the participants achieved better results with the perception of /ð/, than with /θ/, while the situation with production is reverse. This may indicate that Serbian learners' find /θ/ easier to produce than to

perceive it, and vice versa with /ð/. However, perhaps differently structured phonetic training and examination tasks would yield divergent results. By enabling longer and more intense training sessions, further research may suggest that phonetic training can have even more successful outcomes.

Regarding the phonetic contexts for /ð/ and /θ/ that displayed the most enhancement in terms of accuracy in the experimental group, we may conclude that the context that achieved the least improvement was post-vocalic/pre-consonantal V+/ð/+C (2.23%), as in *another*, while the most advancement was detected in interconsonantal C+/ð/+C (33.34%), as in *further* (since all the students used American English). Perhaps such a result derives from the fact that phonetic training was prevalingly focused on the phonetic contexts considered to be more difficult for Serbian learners, in this case the latter one. Concerning the voiceless interdental fricative /θ/, the greatest improvement emerged in pre-consonantal word initial /θ/+C, as in *through*, whereas the least enhancement was in pre-vocalic word initial /θ/ +V (16.67%), as in *think*, and post-consonantal word final C+ /θ/ (16.67%), as in *length*. Again, the explanation may be that the phonetic training did not focus sufficiently on the latter two contexts since they were considered more frequent and easier to produce for Serbian EFL learners, than the context that achieved the most success in terms of accuracy improvement.

Considering the most frequent substitute sounds Serbian EFL learners employ to compensate for the inaccurate production of English interdental fricatives, we may say that [t] and [d] are predominant alternatives to /θ/ and /ð/ respectively. Yet we detected random occurrences of [f] and [v], though to a considerably lesser extent. What may be interesting as an outcome of phonetic training is that for certain contexts the use of [f] and [v] increased, probably due to the fact that learners' awareness and necessity for correct production incited them to alter their previous articulatory habits, although not towards the correct ones. However, the aforescribed instances may indicate the gradual malleability of learners' pronunciation towards native-like production. Future research should concentrate on these substitution alternatives and explore how phonetic training may contribute to their reduction and eventual replacement with target language sounds.

Bearing the previously considered results in mind, we may generally conclude that carefully structured and applied phonetic training may be beneficial and fundamental in improving both the perception and production of foreign language sounds.

8. Conclusion

The goal of the current study was to explore how beneficial the phonetic training is for the improvement of Serbian EFL learners' perception and production of English interdental fricatives. After a brief account of the most relevant theoretical considerations, the results of the conducted research were presented and discussed.

Regarding the effects of phonetic training, we presented the results proposing that phonetic training can be highly beneficial for enhancing students' performance both in terms of perception and production. The results of our study showed that phonetic training increased the participants' level of accuracy in perceiving and producing interdental fricatives. Furthermore, the participants displayed consistency in pronunciation, increased self-confidence and awareness of the necessity for correct pronunciation.

Henceforth, a carefully structured and meticulously applied phonetic training may benefit students' awareness of the necessity for accurate pronunciation and contribute to consistency and self-confidence when pronouncing foreign language sounds. Focusing on specific contexts and practising target language phonetic features and patterns, successful phonetic training may lead to gradual reduction of foreign accent and ultimate attainment of native-like pronunciation.

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Danica M. Jerotijević

UTICAJ FONETSKOG TRENINGA NA TAČNOST PERCEPCIJE I PRODUKCIJE SRPSKIH UČENIKA KOJI ENGLESKI UČE KAO STRANI JEZIK

Rezime

S povećanim interesovanjem za istraživanja u oblasti usvajanja drugog jezika postavljaju se važna pitanja u vezi sa međujezičkom fonologijom i podučavanjem izgovora uopšte. Različiti pristupi u nastavi imali su oprečna shvatanja o pitanju važnosti izgovora. Efekat fonetskog treninga na percepciju i produkciju glasova stranog jezika kod učenika takođe predstavlja predmet brojnih studija. Naš rad teži da ustanovi kakav je efekat fonetskog treninga na pravilnu percepciju i produkciju dva za srpske učenike problematična engleska glasa, tačnije, interdentalnih frikativa /θ/ i /ð/. Naše istraživanje predstavlja longitudinalnu studiju sprovedenu školske 2010/2011. godine u srednjoj školi u Jagodini. Nakon specijalno koncipiranog fonetskog treninga, 30 učenika prošlo je kroz identičnu proceduru ispitivanja, kao i pre obuke. Rezultati ukazuju na pozitivne efekte fonetskog treninga na percepciju i produkciju engleskih interdentalnih frikativa.