Jovana Dimitrijević Savić / Danica Jerotijević
Kragujevac, Serbia
j.dimitrijevic.savic@gmail.com / danicajerotijevic@gmail.com

FACTORS INFLUENCING SERBIAN LEARNERS' PRODUCTION ACCURACY OF ENGLISH INTERDENTAL FRICATIVES

Abstract This study investigates the effects of speech style on production accuracy of English interdental fricatives by Serbian L1 learners of English. In this, it continues an established research tradition in SLA focusing on variation in interlanguage (IL) and, in particular, in IL phonology, developed as a response to conventional studies which tend to assume that a single fixed variant will be categorically substituted for a given L2 target variant by an L1 group. A multivariate account of variation patterns in the production of English interdental fricatives by high school students was used to discover which combinations of internal and external factors (e.g. Preston, 2002; Fasold and Preston, 2007) best account for accurate production of the English interdental fricatives by Serbian learners across three different speech styles.

Key words: speech style, English interdental fricatives, SLA, interlanguage phonology

1. Introduction

After a brief account of the most relevant theoretical considerations on which the present study is based, research results are presented and discussed. The paper is conceived as a preliminary study which should lead into a more exhaustive investigation of interlanguage phonology, especially Serbian EFL learners' production of English interdental fricatives /θ/ and /ð/. As such, it represents a continuation of a well established research tradition in SLA, focusing primarily on interlanguage variation.

The idea for the paper derives from a similar study conducted in China, by Rau, Chang & Tarone (2009), which investigated Chinese EFL learners' pronunciation of the English voiceless interdental fricative /θ/. Immediate phonetic environment and speech style proved to be the two factors accounting for accurate production of target [θ], whereas lexical frequency seemed to facilitate target pronunciation only slightly. Learners who pronounced the target sound more accurately tended to rely on monitoring strategies, whereas those whose pronunciation was less precise relied on phonetic salience strategies. As will be demonstrated by the data presented below, our study yielded similar, as well as some divergent results. The paper concludes with a discussion of possible explanations for the results obtained.

2. Background and rationale

Variationist linguistics has much to offer to SLA research, yet only recently has the interconnectedness of the two fields come to be explicitly recognized and explored. Contrary to traditional approaches which explain variation in learners' language through reference to a single contextual factor, the variationist framework tends to assume that interlanguage variation is subject to multiple contextual influences (Bayley & Preston, 1996). Traditional studies focusing on the influence of L1 on interlanguage phonology suppose that speakers frequently substitute each target variant for a single variant in L1. However, numerous studies yielded results that better supported a variationist explanation.

Phonological variation seems to be highly structured and orderly. Although we cannot categorically predict the surface realization of an utterance, it is evident that specific phonological contexts prefer particular realizations (Guy, 2007).English interdental fricatives are acquired late by L1 speakers of English and usually have the following variants [t], [f] and [d], [v] for [θ] and [ð], respectively (Lee, 2006). Plausible factors influencing L1 speakers' tendency to articulate an interdental fricative as either of the variants are markedness, faithfulness, auditory salience and weight (Lombardi, 2003; Brannen, 2002). Of course, the sounds previously mentioned tend to have even more variants in the pronunciation of English L2 speakers, namely [t], [f] and [s] for [θ] and [d], [v] and [z] for [ð] (Rau, Chang & Tarone, 2009). Following results obtained in previous studies, we assumed that Serbian L1 EFL learners' pronunciation of the English interdental fricatives might be realized in the form of several variables: e.g.[t], [f], [ts], [z] or [θ] for target /θ/ (Lee, 2006; Rau, Chang and Tarone, 2009).

Quantitative sociolinguistic studies have identified the influence of both internal and external factors on interlanguage variation. According to the model developed by Fasold & Preston (2007), patterns of linguistic change can be related to both the socio-cultural context, i.e. external factors, such as age, style, geographic region, ethnicity and social status of the speaker, and to various types of internal or linguistic factors, such as transfer of L1 variational constraints (Schmidt, 1987), the interaction between L1 transfer and universal developmental factors (Major, 2001), or the immediate phonetic environment in which a sound occurs (Romaine, 2003) when speaking of interlanguage phonology in particular.

Bearing in mind the theoretical considerations presented above, we attempted to address the following research questions:

a) Which factors affect production accuracy of /θ/, that is, /ð/ by Serbian L1 learners?
    - What is the role of external factors, primarily speech style? What is the role of vocabulary level?

- What is the role of internal factors, i.e. the immediate phonetic environment?

b) Can a constraint hierarchy be identified, and if so, which internal and/or external factor groups impose the greatest effect on variation?

3. Data Collection

The data analyzed for the purposes of this present paper was collected in the period from April to June 2010.

3.1. Participants

The subjects participating in the study were Serbian L1 learners of English at the intermediate to upper-intermediate level, with a vocabulary range from 2000-3000 words (13 students), that is, 3000-5000 words (5 students). The vocabulary range of participants had previously been measured according to the vocabulary size test of controlled productive ability by Laufer & Nation (1999).

3.2. Data Collection

The participants were engaged in two tasks adapted from Rau, Chang & Tarone (2009). The first task the participants were engaged in was the retelling of a well-known children's story, *Three little pigs.* The participants read the story fifteen minutes before elicitation. In order to facilitate their recollection of the story, they were provided with a set of pictures illustrating key segments of the plot. The second task consisted of reading the words provided on a pre-planned list of examples focusing on various contexts for both /ð/ and /θ/ identical to those represented in the story retelling task. Subsequently, the data were recorded and transcribed.

3.3. Data Analysis

In order to investigate interlanguage variationa VarbRul (Sankoff, Tagliamonte & Smith, 2005) analysis was selected as most appropriate to the research design. Tokens for the variables /ð/ and /θ/ were coded for GoldVarb X as dependent variables (accurate, inaccurate).The independent variables were grouped into factor groups, internal and external. A step-up/step-down (multivariate) analysis was performed.

4. Results

The analysis yielded somewhat unexpected results, some of them contrary to previous findings. For the sake of convenience, the obtained results are presented in tables to follow.

4.1. Factors with a significant effect on target pronunciation of /θ/

The VARBRUL analysis identified internal factors only, i.e. the immediate phonetic environment, as having a significant effect on target pronunciation of /θ/, $p < 0.01$.Speech style, however, was not found to have a significant effect on the latter. The statistical significance of the effect of vocabulary level is questionable - what may be at issue is the less-than-well-balanced distribution of participants across vocabulary levels.

TASK	% ACCURATE	% INACCURATE
Word list reading	54.5	45.5
Story retelling	51.2	48.8
% OVERALL	53.2	46.8

Table 1: Accuracy across Tasks

Vocabulary level	% ACCURATE	% INACCURATE
2000-3000	39	61
3000-5000	80.1	19.9
% OVERALL	53.2	46.8

Table 2: Accuracy across Vocabulary Level

Factor group: Vowel following an onset /θ/	Percentage Target	VARBRUL Weight (Pi)	
Low front	70.6	0.82	
Back mid round	58.8	0.58	
Low mid	52.9	0.52	
High front	56.2	0.51	
Mid/rhotacized	44.7	0.45	range = 0.37

Table 3: Factor group – Vowel following an onset /θ/

Factor group: Vowel following onset /θr/	Percentage Target	VARBRUL Weight (Pi)	
High back	71.4	0.69	
High front	60.0	0.63	
Mid front	50.0	0.48	range = 0.21

Table 4: Factor group – Vowel following onset /θr/

Factor group: Vowel preceding a coda /θ/	Percentage Target	VARBRUL Weight (Pi)	
High back	60.7	0.64	
Closing diphthong	59.3	0.62	
High front	51.6	0.53	
Mid front	50.0	0.48	
Mid/rhotacized	19.2	0.06	range = 0.58

Table 5: Factor group – Vowel preceding a coda /θ/

Factor group: Consonant preceding a coda /θ/	Percentage Target	VARBRUL Weight (Pi)	
/l/	68.0	0.71	
/n, ŋ/	45.1	0.41	
/r/	39.4	0.31	range = 0.40

Table 6: Factor group – Consonant preceding a coda /θ/

The ordering of different phonetic contexts in the tables was performed based on the contexts provided in the word list and the retelling task, thus some other possible phonetic environments are excluded from the tables since there were no examples of them either in the word list or in the story retelling task. Furthermore, non-rhotic accents exhibit no occurrence of coda /θ/ preceded by /r/ and the instances pronounced this way by the participants in the present study are examplified in tables by the context "a vowel preceding a coda".

Based on the differences in range between different factor groups we conclude that factor groups facilitating target pronunciation of /θ/ demonstrate a constraint hierarchy: segments preceding a coda /θ/ impose the greatest influence (with range for vowels at 0.58 and range for consonants at 0.40), followed by segments following an onset /θ/ (with range at 0.37 for vowels and range at 0.21 for the consonant cluster /θr/ in onset position).

4.2. Effects on target pronunciation of /ð/

An insufficient amount of variation was found in the corpus, in other words, too many participants consistently replaced the target pronunciation [ð] with [d] in all environments across styles (although this was not the only realization of /ð/ encountered). This resulted in a multitude of knockouts, i.e. too many instances of all tokens being accounted for by one or the other of the application values ('accurate' and 'inaccurate' in this case). Hence, multiple regression analysis could not be performed.

5. Discussion

In the present study considerable variation was attested in learners' pronunciation of the voiceless interdental fricative /θ/, but practically no variation was found in learners' pronunciation of its voiced counterpart /ð/. Furthermore, target /ð/ was realized as [d] in an overwhelming majority of cases, across phonetic environments and across styles. Thus it may be possible that at this stage, target pronunciation of /θ/ is in the process of being acquired, while target pronunciation of /ð/ begins to be acquired at a later stage for the majority of learners. In order to obtain more evidence, further research might engage with a larger number of learners at various proficiency levels.

Contrary to findings reported in the literature, none of which, to the best of our knowledge, address the acquisition of English interdental fricatives by Serbian L1 learners of English, speech style does not have a significant effect on the pronunciation of /θ/ for this particular group of Serbian L1 English learners. Such a situation may have resulted from a methodological issue: the monitoring strategies engaged in by participants during the word list reading task and story retelling task may not have been dissimilar enough. Future research might employ semi-structured interviews instead of story retelling. A potential problem, however, could well be eliciting a sufficient number of target tokens in an interview situation and, moreover, a sufficient number of target tokens in a sufficient range of different phonetic environments.

Vocabulary level was not found to have a significant effect on pronunciation accuracy of /θ/ for this group of learners. Again, this is potentially a methodological concern: future research might do well to engage with learners at more varied proficiency and vocabulary levels and a more balanced sample.

Internal factors have a significant effect on target pronunciation of /θ/: a constraint hierarchy was attested, with segments preceding a coda /θ/ imposing the greatest influence. The results further point to privilege of high vowels and closing diphthongs over other phonetic environments in promoting accurate production of /θ/ as they are closer to the interdental position compared to other vowels. A rhotacized vowel preceding a coda /θ/ and, to a lesser extent, the consonant /r/ preceding a coda /θ/ inhibit the accurate production of /θ/. In this respect, our results are very similar to those reported in Rau et al. (2009). Accurate production of /θ/ is consistent with the implicational typology or markedness principle with ease of articulation as an additional facilitator of accurate production.

6. Conclusion

Following a concise overview of the relevant theoretical framework, the paper presented the results of a study of Serbian EFL learners' production of English interdental fricatives.

Judging by the results, a greater degree of variation can be found in the learners' pronunciation of the voiceless interdental fricative than in their pronunciation of its voiced counterpart, which may be due to some developmental as well as methodological issues, as stated previously. Future studies involving a larger number of participants may provide us with further insights leading to clarification of such an outcome. Moreover, future research may account for the influence, or the lack of influence of speech style which proved to be a significant factor affecting the accurate production of /θ/ in previous studies.

Adhering to the initial presuppositions, internal factors seem to have a significant effect on the target pronunciation of /θ/, yet more elaborate future studies including participants from diverse cultural backgrounds, belonging to different social statuses, age or ethnic groups may lead to novel conclusions, thus enabling powerful insights into the development of theoretical issues regarding interlanguage phonology, especially in the Serbian EFL context.

References

Bayley, R., Preston, D. (Eds.). (1996). *Second language acquisition and linguistic variation.* Amsterdam: Benjamins.

Brannen, K. (2002). "The role of perception in differential substitution". *Canadian Journal of Linguistics, 47*, 1–46.

Guy, G. R. (2007). "The Variation and Phonological Theory". In R. Bayley & C. Lucas (Eds.), *Sociolinguistic variation: Theories, methods, and applications*. Cambridge: Cambridge University Press, 5-23.

Laufer, B., Nation, P. (1999). "A vocabulary size test of controlled productive ability". *Language Testing 16*(1), 33-51.

Lee, J. (2006). Typology of interdental fricatives with reference to loanword adaptation. *Studies in Phonetics, Phonology and Morphology.*v.12, n.1, 127-148.

Lombardi, L. (2003). "Second language data and constraints on manner: Explaining substitutions for the English inter-dentals". *Second Language Research, 19*(3), 225–250.

Major, R. C. (2001). *Foreign accent: The ontology and phylogeny of second language phonology*. Mahwah, NJ: Lawrence Erlbaum.

Preston, D. R. (1989). *Sociolinguistics and second language acquisition.* Oxford: Blackwell.

Preston, D. R. (2002). "A variationist perspective on SLA: Psycholinguistic concerns". In R. Kaplan. (Ed.), *Oxford handbook of applied linguistics*. Oxford: Oxford University Press, 141–159.

Rau, V., Chang H., Tarone E. (2009). "Think or Sink: Chinese Learners' Acquisition of the English Voiceless Interdental Fricative". *Language Learning* 59:3, 581–621.

Romaine, S. (2003). “Variation”. In C.G. Doughty & M.H. Long (Eds.), *The Handbook of Second Language Acquisition*. The UK: Blackwell Publishing Ltd, 409-435.

Sankoff, D., Tagliamonte, S., Smith, E. (2005). “Goldvarb X: A variable rule application for Macintosh and Windows”. Department of Linguistics, University of Toronto.

Schmidt, R. W. (1987). “Sociolinguistic variation and language transfer in phonology”. In G. Ioup & S. H. Weinberger (Eds.), *Interlanguage phonology: The acquisition of a second language sound system*. Cambridge, MA: Newbury House, 365–377.

Tarone, E. (2007). “Sociolinguistic approaches to second language acquisition research, 1997–2007”. *Modern Language Journal,* 91, 835–846.