

ACQUISITION OF L2 PHONETIC FEATURES

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1. Introduction

The claim that the learner's native language (NL) influences second language acquisition (SLA) is unquestionable in light of available evidence. L1 plays a particularly important role in the phonetic/phonological domain, which is clearly manifested in various accents displayed by learners. The claim, as formulated currently, does not reflect the early views of classical Contrastive Analysis Hypothesis (CAH) which regarded the role of L1 as inhibitive; it has become axiomatic now to see L1 as facilitating SLA in a number of ways, too. Learners make use of some L1 features in shaping their own peculiar linguistic systems, i.e. interlanguages (ILs); this is not, simplistically, negative transfer but rather a strategy that learners employ, whereby they reduce the learning burden. This, however, raises a serious danger of permanent incorporating the features in the given IL, i.e. of fossilizing them.

On the other hand, as is well known, the difficulties which various learners experience in articulating some target sounds do not necessarily concern acquisition of new or similar sounds encountered in the TL system; learners also (and probably more often) have problems with those sounds which have corresponding (quasi-equivalent) counterparts in L1. The main obstacles for learners to utilise familiar L1 sounds in the new system are due to their different distributions in the two languages in question. The learning problem, then, is to extend prior knowledge to new phonetic contexts in such a way that new, automatized articulatory routines are developed. The problem can be overcome with teachers' intervention, so that the seemingly inhibitive features are utilised so as to become facilitative. This is evidenced in the case of Polish learners of English as illustrated in the present paper.

Unless learners receive adequate phonetic training they, as a rule, are unaware of the allophonic distinctions, nor of the contrastive differences, or of the potential similarities between L1 and L2 systems. By and large language teachers do not pay sufficient attention (at least, in learners' opinion) to this important linguistic

area in language pedagogy. This last observation refers not only to general English courses taught at schools or elsewhere, but also to university practical phonetics courses on which teachers seem to be primarily concerned with phonemic distinctions and suprasegmentals rather than with the subphonemic level of the L2 taught. The phenomena referred to in this paper (and similar phenomena) have often been experienced by a great number of colleagues teaching English on various proficiency levels.

Evidence presented below seems to justify the claim that teachers could relatively easily prevent fossilization of some errors and successfully help their learners acquire those L2 forms which, at least potentially, might be rendered by their L1 counterparts; in other words non-transferable features should be encouraged to become transferable; this process could be fostered by raising learners' phonetic consciousness. Their success in acquiring appropriate features is feasible provided teachers pay proper attention (and at the right time!) to the sounds in question (for the purpose of the argument the question of school teachers' competence in teaching phonetics will be disregarded). This assertion is based on the findings from a research on the acquisition of selected English sounds by Polish learners of English. To focus just on the claim itself the argument is confined to illustrating the case with data obtained for the acquisition of only two sounds: one vowel and one consonant.

The English sounds in question are:

- (1) [e] = the main variant of /e/ (front mid unrounded)
e.g.: [let] 'let', [bed] 'bed', [ren] 'wren'
- (2) [n] = alveolar nasal followed by:
 - a. vowel /i/ (front half-close unrounded),
e.g.: [nit] 'knit', [nik] 'Nick', and
 - b. glides beginning with [i] or [j],
e.g.: [niə] 'near', [nijd] 'need', [njuw] 'new'.

The following Polish sounds are regarded as close qualitative counterparts of the English ones:

- (3) [e[^]] = raised variant (mid) of /e/ (front half-open unrounded)
e.g.: [še[^]č] 'sieć', [če[^]ń] 'cień', [že[^]m'a] 'ziemia'
- (4) [n] = dental nasal
e.g.: [noga] 'noga', [nerka] 'nerka'

These Polish sounds would be desired in the learners' realizations of the corresponding English ones. If Polish learners were taught to use them in place of their English counterparts their pronunciation would certainly be less marked for a foreign accent. However, in spite of their crosslinguistic similarities, Polish learners are not taught to use them in their spoken English and thus retain a foreign accent.

An experiment was carried out to verify the following hypotheses:

Hypothesis 1

Most learners do not discriminate between the corresponding P and E vowels, thus do not distinguish E words from P words.

Hypothesis 2

Most learners, irrespective of their proficiency level, do not produce the E sounds properly (the vowel and the consonant).

Hypothesis 3

Most learners are capable of producing the E sounds properly when aided (being explicitly illuminated by the investigator).

Hypothesis 4

Mere exposure to L2, or interaction in it, does not improve learners' perception of phonetic qualities nor their articulation of the investigated E sounds in any significant degree.

Hypothesis 5

Conscious attention to crosslinguistic similarities improves both learners' perception and pronunciation significantly.

In the case of E[n] followed by [i] or by the diphthongal glides [njuw], [ij], [jə], etc., the substitution is phonemic, i.e. it is realized as a palatal nasal, non-existent in English, e.g.: E 'knit' [nit] is pronounced [ñit], as in P 'nit' [ñit]; 'new' [njuw] = [ñuw], as in 'niunia' [ñuña]; 'knee' [nij] = [ñij], as in 'padnij' [padñij]; 'onion' [ʌnjən] = [añjon], as in 'kanion' [kañjon], etc.

It is argued below that, with regard to the two English sounds in question, training Polish learners to articulate them properly involves developing automatic use of the familiar L1 sounds in new L2 phonetic contexts (the sounds having approximately the same phonetic value). Moreover, it is hypothesised that this can be achieved by raising the learners' phonetic awareness, i.e. with their conscious contribution to the learning process (not just through traditional drilling) and that, furthermore, success is expected with most learners irrespective of the differences in their age or current level of L2 proficiency.

To check that the allegations made above are correct an experiment was conducted. Data were collected from the tests administered to subjects before and after the experiment for comparison.

As regards E[e], Polish learners habitually and indiscriminately substitute for it their L1 main variant, i.e. front half-open unrounded [e], e.g. [meva] 'mewa', [era] 'era', etc. This substitution of vowels not only contributes to the accent, but may also disturb communication; its open quality results in phonemic reinterpretation if context does not disambiguate the lexical meaning: native (RP) speakers of English take the Polish vowel for their /æ/, so that attempted 'met', 'set', 'bet', etc. are understood as 'mat', 'sat', 'bat' (cf. Zybert 1983).

2. Subjects

Initially 237 Polish learners of English were investigated; 28 either dropped out in the course of the experiment or were unavailable for the final recordings. The remaining 209 subjects, divided into six categories, were investigated in different groups:

beginners

- [1] children (age: 6-7): 22 (2 groups)
- [2] children age: 9-10): 12 (1 group)
- [3] adults (age: 19-42): 9 (1 group)

intermediate

- [4] adolescents & young adults (age: 15-22): 41 (4 groups)
- [5] adults: (age: 23- 55): 52 (6 groups)

advanced

- [6] young adults (age: 19- 21): 73 (6 groups)

- [1] Category 1 learners were kindergarten children; they had two thirty minute lessons per week and at the time of the experiment they had been learning English for 7 months.
- [2] Category 2 subjects were primary school pupils who had been taught English twice a week in regular 45 minute lessons for 8 months; some of them had earlier contact with English in the kindergarten.
- [3] Category 3 subjects were beginners and false beginners taught on alternate residential week-end courses (Friday through Sunday) over 8 months, each session comprising 18 hours, the whole course 288 hours.
- [4] Category 4 included secondary-school and university students who attended courses preparing for the FCE examination. They were enrolled on the basis of the results they achieved in a placement test, which guaranteed they were all on a sufficient and approximately equal level. The courses amounted to 120 hours in classes taught twice a week in 100 minute lessons over eight months. Of the 41 subjects only 2 failed the examination later.
- [5] These subjects were taught on intensive ESP (banking and finance) residential courses. They were grouped in accordance with their proficiency levels and were assessed on the basis of a placement test administered on entry; the investigated groups represented similar levels. They were taught 9 hours daily in six two-week sessions over a period of 9 months, each session consisting of 91 hours, and whole course amounting to 546 hours.
- [6] The advanced groups consisted of second year university students, all English majors, who had English classes every day throughout the school year.

Categories 1-4 subjects were all taught by Polish teachers only, while categories 5-6 were taught by both Polish and native English teachers. Categories 1-5 subjects did not receive any special training in English phonetics (were only instructed on how to pronounce English sounds), while English majors (category 6 subjects) had had special theoretical and practical phonetics classes.

The following subjects were randomly selected for the experiment (altogether 58 subjects participated):

- category 3 – one group (9 subjects),
- category 4 – two groups (17 subjects)
- category 5 – two groups (19 subjects)
- category 6 – one group (13 subjects)

3. Aims and objectives

All subjects were investigated before the experiment with the following objectives:

1. to see if Polish learners are able to discriminate between the corresponding E and P vowels (to see if word origin was identifiable through the vowel quality),
2. to assess their current pronunciation of the investigated E vowel,
3. to evaluate their articulatory potential to produce the E sounds.

To verify objective 1 a listening test was given; for objective 2 all subjects were recorded in an imitation test, and categories 3-6 subjects, additionally in a reading test; for objective 3 impressionistic judgements were made by the researcher in direct contact with each subject.

Categories 1 and 2 subjects were included in the initial testing on both perception (listening) and production to see if children differ from older learners.

The subjects who did not reproduce the E sounds correctly after one hearing of each item were explicitly illuminated on the differences between the corresponding sounds in English and Polish by providing examples (e.g. E 'set' /P 'set'; E 'nicked' /P 'nikt'); [they were simply asked to listen to the sounds in question in such pairs as e.g. E 'set' /P 'set'; E 'nicked' /P 'nikt'); if they could not hear any difference, more examples were provided orally on the spot (to illustrate) by the investigator in an attempt to elicit data. All subjects were able to articulate the desired E sounds (no assessments were necessary to be made).

The after-experiment objectives of the investigation were:

4. to see if/how the subjects' listening ability to discriminate between the investigated P and E vowels has improved,
5. to assess production of the E sounds by subjects in the experimental groups (have they improved their articulation or not?),
6. to ensure that correct realizations of the E sounds have been integrated in their IL system.

For objective 4 the listening test was replicated for all 209 subjects; as regards the last two objectives the subjects were recorded both at individual recording sessions and in the classroom during regular language classes, of which they had not been informed. At the individual sessions they were fully aware of being tested for accuracy; this raised the investigator's suspicion that they could still be monitoring their productions; therefore, in order to arrive at objective data, the final assessments were also made on the basis of the recordings conducted without the subjects' knowledge. A comparison of the articulations recorded at sessions and in spontaneous speech of the subjects in non-experimenting groups did not indicate any qualitative differences. For this reason the data obtained at sessions quoted in the tables should be treated as representative for these groups. With the experimental groups, however, samples of language recorded in class were analysed by judges. This was a hard and highly laborious work: for this reason the number of spontaneous tokens analysed is somewhat smaller than those obtained from the tests. The results of the assessments are given in separate tables below.

4. The experiment

After all the initial recordings had been completed the subjects in the experimental groups were informed that one of the teaching objectives was to improve their pronunciation. The students expressed their will to eliminate the features that contributed to the foreign accent in their English as much as possible. They were explicitly, though briefly, illuminated on the qualitative differences between various sounds in Polish and English, in particular between the sounds dealt with in this paper (category 6 subjects having been trained in English phonetics were evidently advantaged over all the others). Once the teacher had become convinced the learners unmistakably discriminated between the corresponding E and P sounds (both in and out of context /in words and as individual sounds) they started to practice them on their own. In fact, very little practice was done in the classroom; instead learners were frequently told to remember the phonetic quality of the two English sounds – they were reminded to constantly monitor themselves. As regards the vowel, learners were constantly reminded to keep in mind a number of Polish words such as: 'sieć', 'śnieg', 'cień', 'pień', 'ziemia' etc. These key words contain /e/ articulated in a palatal context which automatically enforces articulation of the close variant [e[^]]. This was insisted on in the belief that a mental image of the sound quality would always be 'at hand', ready to be consciously used, when speaking English. Learners were instructed to use this P vowel sound in E words that contained the corresponding vowel. The Polish key words were meant to serve as reference or orientation points for articulating the E vowel.

As for /n/ they were constantly reminded that /ŋ/ does not occur in English. They had to remember of the required sounds also outside the classroom: at home or elsewhere – they practised using these sounds individually (this is what they claimed doing) thus setting new articulatory habits! Results of this are presented in the tables given in the Results section.

5. Tests and procedures

I. The vowel

a. The listening test

The following words were played to all 209 subjects to identify as English or Polish:

E sense, ten, pet, set, leg, deck, zed, fez, Ben, less;
P sens, ten, pet, set, lek, dek, zet, fez, Ben, les;

The words were randomized to make List 1:

1. E set, 2. P dek, 3. P Ben, 4. E zed, 5. E fez, 6. P sens, 7. E pet,
8. P lek, 9. E ten, 10. P les, 11. E deck, 12. P sense, 13. P zet,
14. E men, 15. P ten, 16. E Ben, 17. P set, 18. E leg, 19. P fez,
20. E less.

The items in List 1 were recorded by native speakers of English and Polish as ordered in the list. Subjects were first instructed that they would hear words which, in spite of their phonetic similarity, could be either English or Polish, and consistently were recorded by English or a Polish speakers.

Category 1 learners (kindergarten children) were investigated individually; they were asked to tell the investigator whether the given word was English or Polish. Their expected answers were: 'This word is said by an English/Polish speaker', or 'This is an English/Polish word'; in reality, elliptical answers sufficed and actually were given as: 'English' or 'Polish'. The remaining subjects listened to the recorded list of words in their groups; they were asked to identify the words by indicating their origin in twenty numbered spaces on the forms provided: they wrote P or E next to each number.

b. The imitation test

All 209 subjects were asked to articulate the following set of twenty English words containing [e]: bed, ten, then, led, pet, send, met, best, head, beg, bend, set, leg, net, neck, lest, fled, less, meadow, lenses.

To assess the learners' current pronunciation of the investigated E vowel all 209 subjects were tested individually. They were instructed to listen to List 2 and repeat each item. The list was recorded on the playing tape with each item articulated twice by two voices: one male and one female, in this order. Each pair of one item was recorded at an interval of 3 seconds between one another. Both speakers selected for the recording were native speakers of RP as this is the kind of English that is typically taught in Polish schools. The list was played to the subjects only once. The subjects were recorded twice at approximately eight-month intervals. The list of English words recorded on the playing tape was played to the subjects (earphones were used). The subjects listened and repeated the words

in the time spaces provided; they were recorded on the recording tape (two recorders were used concurrently) for analysis.

The subjects' articulations of the investigated vowel [e] in the words included in List 2 were assessed for correctness by 4 – 6 native (RP) speakers of English (NSs) and 3 Polish teachers of English (non-native speakers NNSs). The criteria for assessing the sounds as 'correct' were purely subjective; judgements such as: 'not sounding foreign', 'fully acceptable in English', and the like were made; the sounds were assessed to be 'incorrect' if they were perceived to sound non-English, giving an impression of a foreign accent.

c. The reading test

In the reading test, 175 subjects included in categories 3 – 6 were given List 2 to read each item once; no time was allowed for preparing or rehearsing: the subjects were being recorded as soon as they started reading the list. This task was given to them with regard to the initial objective A2. The reading test was not administered to categories 1 and 2 subjects who were still (respectively) illiterate or potentially unfamiliar with a number of words included in the list.

The recordings were analysed for correctness as in Test 1 above. The subjects' articulations were again assessed by the same judges.

II. The consonant

The tests were carried out to check how well Polish learners are able to improve their pronunciation of the investigated English sounds. Assessments of all learners' articulations before the experiment concerned the vowel only. As regards their articulations of E[n] in the contexts discussed earlier, assessments were not made: transfer of palatal [ɲ] followed by [i] or [j] is so common among Poles that it could be expected with all learners and highly negative results were predicted *a priori*. Therefore, assessments were made of only those subjects who participated in the experiment only after it was concluded.

a. The imitation test

The following lexical items were included in List 3:

[1] words with /n/ followed by [i],

a. in monophthongs:

sniff, beginning, knit, tonic, nick,
complaining, community, Nixon,
animal, any;

b. in diphthongs:

knee, near, neat, needle,
niece, kneel, linear;

[2] words with /n/ followed by [j] in rising diphthongs:

new, nude, neuter, news, nuisance,
neurone, onion, canyon;

The 25 items quoted above, all containing instances of [n] followed by [i] or [j], were randomized and combined in List 3:

1. new, 2. kneel, 3. complaining, 4. knit, 5. linear, 6. onion,
7. community, 8. knee, 9. nuisance, 10. tonic, 11. niece, 12. nude,
13. nick, 14. neuter, 15. near, 16. beginning, 17. knee, 18. news,
19. Nixon, 20. neurone, 21. animal, 22. sniff, 23. any, 24. neat, 25. canyon.

The list was recorded by five native speakers of English: three males and two females. and played to the subjects after List 2 had been played. The subjects' imitated the items which were recorded; their articulations were assessed for correctness by the same 4 – 6 native speakers (NSs) and 3 Polish teachers of English (NNSs) who assessed the subjects' articulations of the vowel. The assessment criteria were the same as for the vowel.

b. The reading test

List 3 was given the subjects to read after they had finished reading List 2. The recording procedure was identical; so were the assessments.

6. Results

I. The vowel

a. Listening

Pre-experiment findings

The following results were obtained of 4180 identifications made:

Subjects	E identified as P	E identified as E	P identified as E	P identified as P
Category 1	97.8%	2.2%	0.7%	99.3%
Category 2	97.2%	2.8%	0.3%	99.7%
Category 3	95.1%	4.9%	1.9%	98.1%
Category 4	94.9%	5.1%	0.8%	99.2%
Category 5	91.6%	8.4%	0.7%	99.3%
Category 6	87.2%	12.8%	0.5%	99.5%

Table 1. Identifications of E/e/ and P/e/ made by all subjects before the experiment

A very high percentage of E words were identified as P; P words were seldom identified as E ones (difficult to account for the misidentifications); the best identifications were made by cat. 6 subjects (advanced and phonetically trained, but still very poor); the E words identified best were: 'ten' and 'pet'; this can be accounted for not by the vowel quality but the aspiration of the preceding voiceless stop which could have been a cue for some subjects; the E 'sense' also ranked higher than other words, most probably due to little nasalization of the vowel and

clear occurrence of [n] – in P ‘sense’ the nasal consonant is not articulated and the vowel is strongly nasalized.

The results of the listening test reveal that Polish learners of English do not, as a rule, discriminate between the two corresponding vowels: they do not perceive the qualitative difference and so identify E/e/ with P/e/. This is also true of category 6 subjects, i.e. university English majors that have been trained in English phonetics. The results for [e] presented in Table 1 confirm and agree with those obtained in an earlier investigation presented in Zybert (1983).

Post-experiment findings

3020 identifications made by 151 subjects who did not participate in the experiment rendered the following results:

Subjects	E identified as P	E identified as E	P identified as E	P identified as P
Category 1	98.2%	1.8%	0.6%	99.4%
Category 2	96.7%	3.3%	0.5%	99.5%
Category 3	94.3%	5.7%	0.9%	99.1%
Category 4	92.3%	94.9%	0.7%	99.3%
Category 5	89.1%	10.9%	0.5%	99.5%
Category 6	84.6%	15.4%	0.4%	99.6%

Table 2. Identifications of E/e/ and P/e/ made by subjects not participating in the experiment.

Statistically no significant changes in the perception of vowel quality perception could be stated even among category 5 subjects who had native E teachers, or in category 6 who had phonetic training. Mere exposure does not increase learners' auditory sensitivity.

Results of 1160 identifications made by 58 subjects who participated in the experiment:

Subjects	E identified as P	E identified as E	P identified as E	P identified as P
Category 3	14.0%	86.0%	0.7%	99.3%
Category 4	5.1%	94.9%	0.2%	99.8%
Category 5	4.3%	95.7%	0.1%	99.9%
Category 6	1.7%	98.3%	0.0%	100%

Table 3. Identifications of E/e/ and P/e/ made by subjects participating in the experiment.

The attested sharp increase in the subjects' ability to identify the individual words is attributed to their refined perception of vowel quality (C-R).

b. Articulation

Pre-experiment findings

Imitation test

Total no.of tokens = 4180 Subjects	Correct		Incorrect	
	NSs	NNSs	NSs	NNSs
Category 1 = 440 tokens	0.0%	0.0%	100.0%	100.0%
Category 2 = 240 tokens	0.0%	0.0%	100.0%	100.0%
Category 3 = 180 tokens	0.0%	0.6%	100.0%	99.4%
Category 4 = 820 tokens	2.3%	2.4%	97.7%	97.6%
Category 5 = 1040 tokens	1.8%	3.2%	98.2%	96.8%
Category 6 = 1460 tokens	4.1%	4.8%	95.9%	95.2%

Table 4. Assessments of all subjects' articulation of E/e/ before the experiment

Only in category 6 some subjects managed to produce E [e] well acceptably. Their articulations, however, were not systematic.

Reading test

Total no.of tokens = 3500 Subjects	Correct		Incorrect	
	NSs	NNSs	NSs	NNSs
Category 3	0.0%	1.2%	100.0%	98.8%
Category 4	2.9%	2.7%	97.1%	97.3%
Category 5	2.3%	3.6%	97.7%	96.4%
Category 6	4.7%	4.4%	95.3%	93.6%

Table 5. Assessments of cat. 3-6 subjects' articulation of E/e/ before the experiment

The results are a bit better; this is attributed to the elicitation task: reading allows more time for monitoring and the graphic representation of sound reminds the learner to focus on its phonetic quality.

Post-experiment findings

The tests were replicated in all groups of subjects at the end of their courses. A comparison of data elicited from subjects not participating and participating in the experiment is presented below:

Subjects not participating

Imitation test:

Total no.of tokens = 3020	Correct		Incorrect	
	NSs	NNSs	NSs	NNSs
Subjects				
Category 1	0.0%	0.0%	100.0%	100.0%
Category 2	0.0%	0.0%	100.0%	100.0%
Category 3	0.0%	0.0%	100.0%	100.0%
Category 4	1.2%	1.8%	98.8%	98.2%
Category 5	2.1%	2.0%	97.9%	98.0%
Category 6	3.4%	4.3%	96.6%	95.7%

Table 6. Assessments of E/e/ articulated by subjects not participating in the experiment.

Statistically no significant changes in the learners' articulation of /e/ took place within the time span between the two measurements; this holds even for cat. 5 subjects who had native E teachers; a slight increase is observed only among cat.6 subjects who had phonetic training.

Reading test

Total no.of tokens = 2340	Correct		Incorrect	
	NSs	NNSs	NSs	NNSs
Subjects				
Category 3	0.2%	1.3%	99.8%	98.7%
Category 4	1.8%	2.2%	98.2%	97.8%
Category 5	2.0%	2.8%	98.0%	97.2%
Category 6	3.6%	3.2%	96.4%	96.8%

Table 7. Assessments of E/e/ articulated by subjects not participating in the experiment.

Subjects participating

Imitation test

Total no.of tokens = 1160	Correct		Incorrect	
	NSs	NNSs	NSs	NNSs
Subjects				
Category 3	83.2%	81.9%	16.8%	18.1%
Category 4	92.8%	89.3%	7.2%	10.7%
Category 5	90.7%	88.5%	9.3%	11.5%
Category 6	95.8%	94.2%	4.2%	5.8%

Table 8. Assessments of E/e/ articulated by subjects participating in the experiment.

Reading test

Total no.of tokens = 1160	Correct		Incorrect	
	NSs	NNSs	NSs	NNSs
Subjects				
Category 3	84.7%	82.1%	15.3%	17.9%
Category 4	93.6%	91.4%	6.4%	8.6%
Category 5	91.9%	90.6%	8.1%	9.4%
Category 6	96.7%	95.3%	3.3%	4.7%

Table 9. Assessments of E/e/ articulated by subjects participating in the experiment.

Spontaneous articulations

Total no.of tokens = 890	Correct		Incorrect	
	NSs	NNSs	NSs	NNSs
Subjects				
Category 3	82.3%	79.8%	17.7%	20.2%
Category 4	91.9%	88.7%	8.1%	11.3%
Category 5	90.2%	87.4%	9.8%	12.6%
Category 6	93.1%	92.6%	6.9%	7.4%

Table 10. Post-experiment assessments of E/e/ articulated spontaneously by subjects participating in the experiment.

Spontaneous articulation yielded somewhat worse results than those obtained from the imitation and reading tests; the differences suggest that in imitating and reading tasks learners still monitored their articulations which indicates an accuracy rank; the figures in Table 10, on the other hand, indicate an acquisition/fossilization degree. Whatever interpretation is proposed Tables 9-11 manifest a very high increase of correct/acceptable articulations of E[e] among the subjects participating in the experiment. The results support Hypothesis 5.

II. The consonant

Articulation

Post-experiment findings

Imitation test

Total no.of tokens = 1450	Correct		Incorrect	
	NSs	NNSs	NSs	NNSs
Subjects				
Category 3	96.8%	97.2%	3.2%	2.8%
Category 4	97.6%	97.5%	2.4%	2.5%
Category 5	96.6%	96.0%	3.4%	4.0%
Category 6	98.1%	98.4%	1.9%	1.6%

Table 11. Post-experiment assessments of E/n/ followed by [i] or [j] articulated by subjects participating in the experiment.

Reading test

Total no.of tokens = 1450	Correct		Incorrect	
	NSs	NNSs	NSs	NNSs
Subjects				
Category 3	97.0%	96.9%	3.0%	3.1%
Category 4	97.7%	97.7%	2.3%	2.3%
Category 5	96.5%	96.3%	3.5%	3.7%
Category 6	97.9%	98.2%	2.1%	1.8%

Table 12. Post-experiment assessments of E/n/ followed by [i] or [j] articulated by subjects participating in the experiment.

Spontaneous articulations

Total no.of tokens = 978	Correct		Incorrect	
	NSs	NNSs	NSs	NNSs
Subjects				
Category 3	86.3%	88.6%	13.7%	13.4%
Category 4	96.8%	97.2%	3.2%	2.8%
Category 5	96.3%	95.6%	3.7%	4.4%
Category 6	97.7%	97.9%	2.3%	2.1%

Table 13. Post-experiment assessments of E/n/ followed by [i] or [j] articulated spontaneously by subjects participating in the experiment.

As with the vowel these subjects displayed remarkable improvement validating Hypothesis 5 again; the claim that C-R helps is OK

7. Conclusions

The results of the experiment presented in Tables 1-13 indicate that all five hypotheses are valid. Hypothesis 1 is confirmed by data shown in Tables 1-2, while hypothesis 2 is supported by data in Tables 4-7. Concerning this hypothesis, experimental data were collected for the vowel only; however, empirical evidence, although impressionistic only, allows for extending the hypothesis to the consonant too. Hypothesis 3 is also supported: articulating the two E sounds, either in isolation or in a context, is not difficult for Poles (they have no problems in articulating some P sounds in completely new phonetic environments). Hypothesis 4 is supported by the results presented in Tables 2 and 6-7. Hypothesis 5, the central one, is validated by the figures shown in Tables 3 and 8-13.

Their attention directed to the issue, Polish learners of English have no problems at all in perceiving the qualitative differences between the main and raised variants of P /e/, i.e. between [e] as in 'sen' [sen] and 'sień' [še^ń]. Neither do they experience problems in discriminating between /n/ and /ɲ/ as in (pairs like:) 'sny' [sn-i-] and śni [šni], miny – mini, nygus – nigdy, etc. When monitored, the sounds are not at all difficult to produce in other phonetic contexts either. It is the articulatory problems learners face when they have to produce familiar sounds in

foreign environments. Overcoming fixed motor routines (note one's reluctance to call them 'habits'!) and developing new ones is a problem to be challenged by both the teacher and the learner alike.

Articulatory routines are highly automatized so they are also highly resistant to change; nonetheless, the experiment demonstrates that conscious work on articulatory difficulties can make development of new routines feasible. In private interviews with the investigator and the teachers the subjects themselves confirmed retrospectively that they first monitored their productions; but later, when they intuitively felt they produced the sounds correctly, they gradually stopped monitoring themselves

... skill development implies moving from the controlled to the automatized end of the automatization continuum [...]. An increase in automatization is achieved through practice ('overlearning'). (Faerch and Kasper 1986:55)

In the long run, through continual self-control (i.e. monitoring his articulatory processes) the actual realizations become automatic. Such facts strongly support the interface position in second language acquisition theory.

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